

NS TOOL

NS TOOL
PROMOZIONE
2026



Frese 2 tagli plane elica 25° MUGEN

MUGEN COATING 2-Flute LEAD25 End Mill

Totale 19 misure

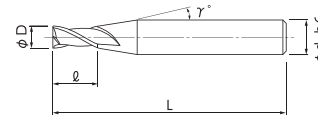
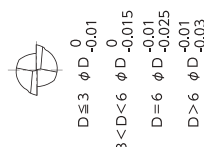
Total 19 sizes

Per ampia gamma di materiali. L/D=1.

Ideale per cave con bassa profondità di taglio e con elevata rigidità

For various work materials. L/D=1.

Best for slotting with high rigidity short length of cut



- Il rapporto L/D=1 e l'elica a 25° incrementano la rigidità per ottenere lavorazioni molto efficienti.
- Elimina vibrazioni e flessioni nella lavorazioni di cave.
- L/D=1 and helix 25° to increase rigidity and realize high efficient machining.
- Suppress chattering and deflection in slotting process.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00025-00030	0.3	0.3	12°	4	45	32,00
08-00025-00040	0.4	0.4	12°	4	45	35,30
08-00025-00050	0.5	0.5	12°	4	45	17,70
08-00025-00080	0.8	0.8	12°	4	45	17,70
08-00025-00100	1	1	12°	4	45	16,60
08-00025-00120	1.2	1.2	12°	4	45	17,70
08-00025-00150	1.5	1.5	12°	4	45	16,60
08-00025-00180	1.8	1.8	12°	4	45	17,70
08-00025-00200	2	2	12°	4	45	16,60
08-00025-00250	2.5	2.5	12°	4	45	16,60
08-00025-00300	3	3	12°	6	45	21,00
08-00025-00400	4	4	12°	6	45	22,60
08-00025-00500	5	5	12°	6	50	24,80
08-00025-00600	6	6	—	6	50	25,90
08-00025-00700	7	7	12°	8	65	114,20
08-00025-00800	8	8	—	8	65	93,80
08-00025-00900	9	9	12°	10	75	175,60
08-00025-01000	10	10	—	10	75	129,40
08-00025-01200	12	12	—	12	80	184,80

Attenzione
How to Order

Quando ordinate, indicate MX225 (D).
When you order, indicate MX225 (D).

※(γ) è un valore di riferimento
※(γ) is reference value.

Acciaio al carbonio
Carbon Steel P

Acciaio legato
Alloy Steel P

Acciaio pretemprato
Prehardened Steel P

Temprato ~52
Hardened Steel HRC H

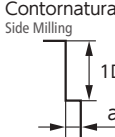
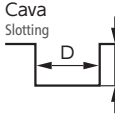
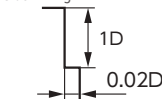
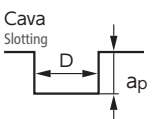
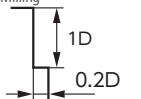
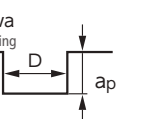
Acciaio inox
Stainless Steel M

Lega di alluminio
Aluminium Alloy N

Rame
Copper N

Resina
Resin O

Condizioni di taglio raccomandate
Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C			Acciaio legato Alloy Steels SCM・SKD・SUS			Acciaio pretemprato Prehardened Steels HPM・NAK			Acciaio temprato Hardened Steels SKD61 (～52HRC)			Rame Copper		
Velocità di taglio Cutting Speed	50～80m/min			50～70m/min			40～60m/min			20～40m/min			60～80m/min		
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed	
	g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min	
		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting
0.3	50,000	100	50	50,000	90	35	50,000	85	40	31,800	—	20	50,000	150	60
0.4	50,000	150	75	47,700	130	50	39,800	110	55	23,900	50	25	50,000	200	80
0.5	41,400	170	85	38,200	130	50	31,800	110	55	19,100	60	30	44,600	220	90
1	20,700	210	100	19,100	150	55	15,900	130	65	9,500	75	40	22,300	270	95
1.5	13,800	210	100	12,700	150	55	10,600	130	65	6,400	75	40	14,900	300	100
2	10,300	210	100	9,500	170	60	8,000	150	75	4,800	75	40	11,100	330	120
2.5	8,300	250	120	7,600	180	65	6,400	160	80	3,800	75	40	8,900	360	120
3	6,900	280	140	6,400	190	70	5,300	170	85	3,200	80	40	7,400	370	130
4	5,200	310	160	4,800	190	70	4,000	170	85	2,400	95	50	5,600	390	130
5	4,100	330	160	3,800	230	75	3,200	210	110	1,900	95	50	4,500	410	130
6	3,400	340	170	3,200	260	85	2,700	240	120	1,600	100	50	3,700	410	130
7	3,000	330	170	2,700	250	80	2,300	230	120	1,400	100	50	3,200	380	130
8	2,600	320	160	2,400	240	75	2,000	220	110	1,200	100	50	2,800	360	120
9	2,300	310	150	2,100	230	75	1,800	220	110	1,100	100	50	2,500	350	120
10	2,100	300	150	1,900	230	75	1,600	210	100	1,000	100	50	2,200	330	110
12	1,700	270	140	1,600	220	70	1,300	200	100	800	100	50	1,900	320	110
Prof. di taglio Depth of Cut	Contornatura Side Milling  ae $\varnothing 0.3 \sim 0.8 = 0.05D$ $\varnothing 1 \sim 2.5 = 0.1D$ $\varnothing 3 \sim 6 = 0.2D$ $\varnothing 7 \sim 12 = 0.25D$ Cava Slotting  ap $\varnothing 0.3 \sim 0.4 = 0.05D$ $\varnothing 0.5 \sim 1.2 = 0.2D$ $\varnothing 1.5 \sim 3 = 0.7D$ $\varnothing 4 \sim 12 = 1D$									Contornatura Side Milling  $1D$ $0.02D$ Cava Slotting  ap $\varnothing 0.3 \sim 0.4 = 0.05D$ $\varnothing 0.5 \sim 12 = 0.2D$			Contornatura Side Milling  $1D$ $0.2D$ Cava Slotting  ap $\varnothing 0.3 \sim 0.4 = 0.1D$ $\varnothing 0.5 \sim 1 = 0.5D$ $\varnothing 1.5 \sim 12 = 1D$		
(D:Diametro Dia.)															
Note	※ 1 Usare lubrorefrigerante. ※ 2 Usare lubrorefrigerante con ritardanti di fumo. ※ 3 Vi raccomandiamo di usare lubrificazione minima per la lavorazione di acciai temprati. ※ 4 Regolare nella stessa proporzione giri e avanzamento. ※ 5 Regolate le condizioni di fresatura in accordo con la profondità di taglio e la rigidità della macchina. ※ 1 Use cutting fluid. ※ 2 Use cutting fluid with smoke retardant. ※ 3 Recommend to use oil mist coolant for machining hardened steels. ※ 4 Adjust both spindle speed and feed at the same rate. ※ 5 Adjust milling conditions according to the volume of depth of cut and rigidity of the machine.														

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli plane elica 30° MUGEN

MUGEN COATING 2-Flute LEAD30 End Mill

Totale 27 misure

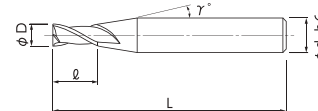
Total 27 sizes

Per ampia gamma di materiali. L/D=2.
Applicabile sia in lavorazione di cava che in contornatura

For various work materials. L/D=2.
Applicable to both slotting and side milling



$D \approx 3 \quad \phi D \quad 0$
 $3 < D < 6 \quad \phi D \quad 0$
 $D = 6 \quad \phi D \quad -0.01$
 $D > 6 \quad \phi D \quad -0.01$
 $D > 6 \quad \phi D \quad -0.03$



- Il rapporto L/D=2 e l'elica a 30° per applicazioni sia di contornatura che di cava
- L/D=2 and helix 30° standard type applicable for both slotting and side milling.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00030-00010	0.1	0.2	12°	4	45	59,60
08-00030-00020	0.2	0.4	12°	4	45	37,50
08-00030-00030	0.3	0.6	12°	4	45	32,60
08-00030-00040	0.4	0.8	12°	4	45	35,30
08-00030-00050	0.5	1	12°	4	45	17,70
08-00030-00060	0.6	1.2	12°	4	45	27,10
08-00030-00070	0.7	1.4	12°	4	45	30,90
08-00030-00080	0.8	1.6	12°	4	45	17,70
08-00030-00090	0.9	1.8	12°	4	45	30,90
08-00030-00100	1	2	12°	4	45	16,60
08-00030-00120	1.2	2.4	12°	4	45	17,70
08-00030-00150	1.5	3	12°	4	45	16,60
08-00030-00180	1.8	3.6	12°	4	45	17,70
08-00030-00200	2	4	12°	4	45	16,60
08-00030-00250	2.5	5	12°	4	45	16,60
08-00030-00300	3	6	12°	6	45	21,00
08-00030-00350	3.5	7	12°	6	45	37,50
08-00030-00400	4	8	12°	6	45	22,60
08-00030-00450	4.5	9	12°	6	50	42,50
08-00030-00500	5	10	12°	6	50	25,10
08-00030-00550	5.5	11	12°	6	50	43,60
08-00030-00600	6	12	—	6	50	25,90
08-00030-00700	7	14	12°	8	65	112,90
08-00030-00800	8	16	—	8	65	91,80
08-00030-00900	9	18	12°	10	75	167,00
08-00030-01000	10	20	—	10	75	121,50
08-00030-01200	12	24	—	12	80	175,60

Attenzione
How to Order

Quando ordinate, indicate MX230 (D). ※(γ) è un valore di riferimento
When you order, indicate MX230 (D). ※(γ) is reference value.



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C			Acciaio legato Alloy Steels SCM·SKD·SUS			Acciaio pretemprato Prehardened Steels HPM·NAK			Acciaio temprato Hardened Steels SKD61 (~52HRC)			Rame Copper		
Velocità di taglio Cutting Speed	50~80m/min			50~70m/min			40~60m/min			20~40m/min			60~80m/min		
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed	
	g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min	
		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting			
0.1	50,000	—	25	50,000	—	15	50,000	—	20	50,000	—	15	50,000	60	25
0.2	50,000	—	40	50,000	—	25	50,000	—	30	47,700	—	20	50,000	90	35
0.3	50,000	100	50	50,000	90	35	50,000	85	40	31,800	—	20	50,000	150	60
0.4	50,000	150	75	47,700	130	50	39,800	110	55	23,900	50	25	50,000	200	80
0.5	41,400	170	85	38,200	130	50	31,800	110	55	19,100	60	30	44,600	220	90
1	20,700	210	100	19,100	150	55	15,900	130	65	9,500	75	40	22,300	270	95
1.5	13,800	210	100	12,700	150	55	10,600	130	65	6,400	75	40	14,900	300	100
2	10,300	210	100	9,500	170	60	8,000	150	75	4,800	75	40	11,100	330	120
2.5	8,300	250	120	7,600	180	65	6,400	160	80	3,800	75	40	8,900	360	120
3	6,900	280	140	6,400	190	70	5,300	170	85	3,200	80	40	7,400	370	130
3.5	5,900	300	150	5,500	190	70	4,500	170	85	2,700	85	45	6,400	380	130
4	5,200	310	160	4,800	190	70	4,000	170	85	2,400	95	50	5,600	390	130
4.5	4,600	320	160	4,200	210	75	3,500	190	95	2,100	95	50	5,000	400	130
5	4,100	330	160	3,800	230	75	3,200	210	110	1,900	95	50	4,500	410	130
5.5	3,800	330	160	3,500	240	80	2,900	220	110	1,700	95	50	4,100	410	130
6	3,400	340	170	3,200	260	85	2,700	240	120	1,600	100	50	3,700	410	130
7	3,000	330	170	2,700	250	80	2,300	230	120	1,400	100	50	3,200	380	130
8	2,600	320	160	2,400	240	75	2,000	220	110	1,200	100	50	2,800	360	120
9	2,300	310	150	2,100	230	75	1,800	220	110	1,100	100	50	2,500	350	120
10	2,100	300	150	1,900	230	75	1,600	210	100	1,000	100	50	2,200	330	110
12	1,700	270	140	1,600	220	70	1,300	200	100	800	100	50	1,900	320	110

Prof. di taglio Depth of Cut	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
	ae $\varnothing 0.3 \sim 0.9 = 0.05D$ $\varnothing 1 \sim 2.9 = 0.07D$ $\varnothing 3 \sim 12 = 0.15D$		ap $\varnothing 0.1 \sim 0.4 = 0.05D$ $\varnothing 0.5 \sim 1.4 = 0.15D$ $\varnothing 1.5 \sim 3.9 = 0.5D$ $\varnothing 4 \sim 12 = 0.75D$		ae $\varnothing 0.3 \sim 0.9 = 0.05D$ $\varnothing 1 \sim 2.9 = 0.07D$ $\varnothing 3 \sim 12 = 0.15D$		ap $\varnothing 0.1 \sim 0.4 = 0.05D$ $\varnothing 0.5 \sim 1.4 = 0.15D$ $\varnothing 1.5 \sim 3.9 = 0.5D$ $\varnothing 4 \sim 12 = 0.75D$	
(D: Diametro Dia.)								

Note	※ 1 Usare lubrificante. ※ 2 Usare lubrificante con ritardanti di fumo. ※ 3 Raccomandiamo di usare lubrificazione minima per la lavorazione di acciai temprati. ※ 4 Regolate nella stessa proporzione giri e avanzamento. ※ 5 Regolate le condizioni di fresatura in accordo con la profondità di taglio e la rigidità della macchina. ※ 1 Use cutting fluid. ※ 2 Use cutting fluid with smoke retardant. ※ 3 Recommend to use oil mist coolant for machining hardened steels. ※ 4 Adjust both spindle speed and feed at the same rate. ※ 5 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.
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P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli plane elica 35° MUGEN

MUGEN COATING 2-Flute LEAD35 End Mill

Totale 27 misure

Total 27 sizes

Per ampia gamma di materiali. L/D=3.

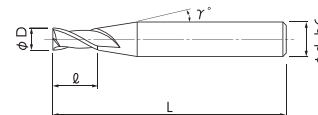
Applicabile sia nelle lavorazioni di cava che di contornatura

For various work materials. L/D=3.

Applicable to both slotting and side milling



$D \approx 3 \quad \phi D \quad -0,01$
 $3 < D < 6 \quad \phi D \quad 0$
 $D = 6 \quad \phi D \quad -0,01$
 $D > 6 \quad \phi D \quad -0,025$
 $D > 6 \quad \phi D \quad -0,01$
 $D > 6 \quad \phi D \quad -0,03$



- Il rapporto L/D=3 e l'elica a 35° assicurano una lunghezza del tagliente sufficiente, per evitare difficoltà nella scelta della fresa.
- L/D=3 and helix 35° for appropriate length of cut to avoid the inconveniences in size selection.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00035-00010	0.1	0.3	12°	4	45	59,60
08-00035-00020	0.2	0.6	12°	4	45	37,00
08-00035-00030	0.3	0.9	12°	4	45	32,60
08-00035-00040	0.4	1.2	12°	4	45	35,30
08-00035-00050	0.5	1.5	12°	4	45	17,70
08-00035-00060	0.6	1.8	12°	4	45	27,10
08-00035-00070	0.7	2.1	12°	4	45	30,90
08-00035-00080	0.8	2.4	12°	4	45	17,70
08-00035-00090	0.9	2.7	12°	4	45	30,90
08-00035-00100	1	3	12°	4	45	16,60
08-00035-00120	1.2	3.6	12°	4	45	17,70
08-00035-00150	1.5	4.5	12°	4	45	16,60
08-00035-00180	1.8	5.4	12°	4	45	17,70
08-00035-00200	2	6	12°	4	45	16,60
08-00035-00250	2.5	7.5	12°	4	45	16,60
08-00035-00300	3	9	12°	6	45	21,00
08-00035-00350	3.5	10.5	12°	6	45	38,10
08-00035-00400	4	12	12°	6	50	22,60
08-00035-00450	4.5	13.5	12°	6	50	43,60
08-00035-00500	5	15	12°	6	55	25,10
08-00035-00550	5.5	16.5	12°	6	60	43,60
08-00035-00600	6	18	—	6	60	25,90
08-00035-00700	7	21	12°	8	65	122,10
08-00035-00800	8	24	—	8	65	101,00
08-00035-00900	9	27	12°	10	75	182,20
08-00035-01000	10	30	—	10	75	134,00
08-00035-01200	12	36	—	12	80	191,40

Attenzione
How to Order

Quando ordinate, indicate MX235 (D).
When you order, indicate MX235 (D).

※(γ) è un valore di riferimento
※(γ) is reference value.



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C			Acciaio legato Alloy Steels SCM・SKD・SUS			Acciaio pretemprato Prehardened Steels HPM・NAK			Acciaio temprato Hardened Steels SKD61 (～52HRC)			Rame Copper		
Velocità di taglio Cutting Speed	45～75m/min			45～65m/min			35～55m/min			15～35m/min			55～75m/min		
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed	
	g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min	
		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting
0.1	50,000	—	25	50,000	—	15	50,000	—	20	50,000	—	15	50,000	60	25
0.2	50,000	—	40	50,000	—	25	50,000	—	30	39,800	—	20	50,000	90	40
0.3	50,000	100	50	50,000	90	35	47,700	80	40	26,500	—	20	50,000	150	60
0.4	47,700	140	70	43,800	120	50	35,800	100	50	19,900	—	20	50,000	200	80
0.5	38,200	150	75	35,000	120	50	28,600	100	50	15,900	50	25	41,400	210	85
1	19,100	190	95	17,500	140	50	14,300	110	60	8,000	65	30	20,700	250	90
1.5	12,700	190	95	11,700	140	50	9,500	110	60	5,300	65	30	13,800	280	100
2	9,500	190	95	8,800	160	55	7,200	140	70	4,000	65	30	10,300	310	110
2.5	7,600	230	110	7,000	170	60	5,700	140	70	3,200	70	35	8,300	330	120
3	6,400	260	130	5,800	170	60	4,800	150	80	2,700	70	35	6,900	350	120
3.5	5,500	270	135	5,000	180	60	4,100	150	80	2,300	75	35	5,900	350	120
4	4,800	280	140	4,400	180	60	3,600	150	80	2,000	80	40	5,200	360	120
4.5	4,200	290	145	3,900	200	65	3,200	170	90	1,800	80	40	4,600	360	120
5	3,800	300	150	3,500	210	70	2,900	190	95	1,600	80	40	4,100	370	120
5.5	3,500	310	155	3,200	220	70	2,600	200	100	1,400	80	40	3,800	370	120
6	3,200	320	160	2,900	230	75	2,400	210	110	1,300	80	40	3,400	370	120
7	2,700	300	150	2,500	220	70	2,000	200	100	1,100	80	40	3,000	360	120
8	2,400	280	140	2,200	220	70	1,800	200	100	1,000	80	40	2,600	340	110
9	2,100	270	135	1,900	210	65	1,600	190	95	900	80	40	2,300	330	100
10	1,900	260	130	1,800	210	65	1,400	180	90	800	80	40	2,100	320	100
12	1,600	260	130	1,500	210	65	1,200	170	85	700	80	40	1,700	290	95

Prof. di taglio Depth of Cut	Contornatura Side Milling		Cava Slotting		(D:Diametro Dia.)
		a_e $\varnothing 0.3 \sim 0.9 = 0.04D$ $\varnothing 1 \sim 2.9 = 0.05D$ $\varnothing 3 \sim 12 = 0.1D$		a_p $\varnothing 0.1 \sim 0.4 = 0.05D$ $\varnothing 0.5 \sim 1.4 = 0.08D$ $\varnothing 1.5 \sim 3.9 = 0.25D$ $\varnothing 4 \sim 12 = 0.4D$	
	Contornatura Side Milling		Cava Slotting		
		$3D$ $0.02D$		a_p $\varnothing 0.1 \sim 0.4 = 0.05D$ $\varnothing 0.5 \sim 1.4 = 0.3D$ $\varnothing 1.5 \sim 12 = 0.5D$	

- ※ 1 Usare lubrificante.
 ※ 2 Usare lubrificante con ritardanti di fumo.
 ※ 3 Raccomandiamo di usare lubrificazione minima per la lavorazione di acciai temprati.
 ※ 4 Regolate nella stessa proporzione giri e avanzamento.
 ※ 5 Regolate le condizioni di fresatura in accordo con la profondità di taglio e la rigidità della macchina.
 ※ 1 Use cutting fluid.
 ※ 2 Use cutting fluid with smoke retardant.
 ※ 3 Recommend to use oil mist coolant for machining hardened steels.
 ※ 4 Adjust both spindle speed and feed at the same rate.
 ※ 5 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli plane elica 40° MUGEN

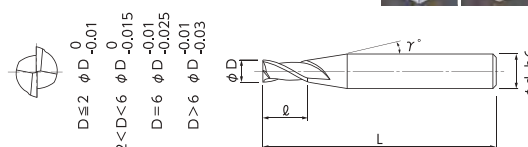
MUGEN COATING 2-Flute LEAD40 End Mill

Totale 25 misure

Total 25 sizes

Per ampia varietà di materiali. L/D=4.
Solo per lavorazioni di contornatura

For various work materials. L/D=4. For side milling only



- Il rapporto L/D=4 e l'elica a 40° la rende adatta per lavorazioni profonde con minime flessioni.
- L/D=4 and helix 40° is suitable for deep machining with minimum deflection of cutting up-right surface.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00040-00030	0.3	1.2	12°	4	45	46,90
08-00040-00040	0.4	1.6	12°	4	45	46,90
08-00040-00050	0.5	2	12°	4	45	30,90
08-00040-00060	0.6	2.4	12°	4	45	27,10
08-00040-00070	0.7	2.8	12°	4	45	30,90
08-00040-00080	0.8	3.2	12°	4	45	30,90
08-00040-00090	0.9	3.6	12°	4	45	30,90
08-00040-00100	1	4	12°	4	45	27,10
08-00040-00120	1.2	4.8	12°	4	45	32,60
08-00040-00150	1.5	6	12°	4	45	27,10
08-00040-00180	1.8	7.2	12°	4	45	32,60
08-00040-00200	2	8	12°	4	45	27,10
08-00040-00250	2.5	10	12°	4	45	27,10
08-00040-00300	3	12	12°	6	50	34,20
08-00040-00350	3.5	14	12°	6	50	43,60
08-00040-00400	4	16	12°	6	55	37,50
08-00040-00450	4.5	18	12°	6	55	49,60
08-00040-00500	5	20	12°	6	60	42,50
08-00040-00550	5.5	22	12°	6	65	49,60
08-00040-00600	6	24	—	6	65	42,50
08-00040-00700	7	28	12°	8	90	151,80
08-00040-00800	8	32	—	8	90	139,30
08-00040-00900	9	36	12°	10	100	273,30
08-00040-01000	10	40	—	10	100	160,40
08-00040-01200	12	48	—	12	105	287,80

Attenzione
How to Order

Quando ordinate, indicate MX240 (D). ※ (γ) è un valore di riferimento
When you order, indicate MX240 (D). ※ (γ) is reference value.

Acciaio al carbonio
Carbon Steel P

Acciaio legato
Alloy Steel P

Acciaio pretemprato
Prehardened Steel P

Temprato ~52
Hardened Steel HRC H

Acciaio inox
Stainless Steel M

Lega di alluminio
Aluminium Alloy N

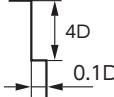
Rame
Copper N

Resina
Resin O

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK		Rame Copper	
Velocità di taglio Cutting Speed	20~30m/min		15~25m/min		15~20m/min		20~40m/min	
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
0.3	26,500	50	21,200	40	18,600	30	31,800	100
0.4	19,900	60	15,900	45	13,900	40	23,900	100
0.5	15,900	65	12,700	45	11,100	40	19,100	100
1	8,000	80	6,400	50	5,600	45	9,500	110
1.5	5,300	80	4,200	50	3,700	45	6,400	130
2	4,000	80	3,200	60	2,800	50	4,800	140
2.5	3,200	100	2,500	60	2,200	55	3,800	150
3	2,700	110	2,100	60	1,900	60	3,200	160
3.5	2,300	120	1,800	60	1,600	60	2,700	170
4	2,000	120	1,600	65	1,400	60	2,400	170
4.5	1,800	130	1,400	70	1,200	65	2,100	170
5	1,600	130	1,300	80	1,100	70	1,900	170
5.5	1,400	130	1,200	90	1,000	80	1,700	180
6	1,300	130	1,100	90	900	80	1,600	180
7	1,100	120	900	90	800	80	1,400	170
8	1,000	120	800	80	700	75	1,200	160
9	900	110	700	80	650	75	1,100	155
10	800	110	600	70	600	75	1,000	150
12	700	110	500	70	500	75	800	140
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  ae Ø0.3~0.9=0.03D Ø1~2.9=0.04D Ø3~12=0.08D						Contornatura Side Milling  0.1D	
Note Notes	※ 1 Utilizzare lubrorefrigerante. ※ 2 Utilizzare lubrorefrigerante con ritardanti di fumo. ※ 3 Regolare nella stessa proporzione giri e avanzamento. ※ 4 Regolare le condizioni di fresatura in accordo con le profondità di taglio e la rigidità della macchina. ※ 1 Use cutting fluid. ※ 2 Use cutting fluid with smoke retardant. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.							

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli plane elica 45° MUGEN

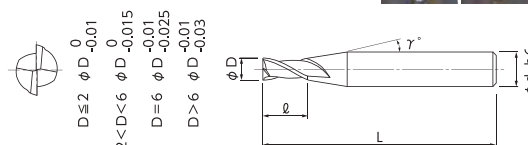
MUGEN COATING 2-Flute LEAD45 End Mill

Totale 19 misure

Total 19 sizes

Per ampia gamma di materiali. L/D=5.
Solo per lavorazioni di contornatura

For various work materials. L/D=5. For side milling only.



- Il rapporto L/D=5 e l'elica a 45° minimizzano le flessioni della fresa nonostante la lunghezza del tagliente.
- L/D=5 and helix 45° to minimize the milling deflection even though the long cutting length design.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00045-00030	0.3	1.5	12°	4	45	66,20
08-00045-00040	0.4	2	12°	4	45	66,20
08-00045-00050	0.5	2.5	12°	4	45	42,50
08-00045-00080	0.8	4	12°	4	45	42,50
08-00045-00100	1	5	12°	4	45	37,50
08-00045-00120	1.2	6	12°	4	45	42,50
08-00045-00150	1.5	7.5	12°	4	45	37,50
08-00045-00180	1.8	9	12°	4	50	42,50
08-00045-00200	2	10	12°	4	50	37,50
08-00045-00250	2.5	12.5	12°	4	50	37,50
08-00045-00300	3	15	12°	6	55	49,60
08-00045-00400	4	20	12°	6	60	51,80
08-00045-00500	5	25	12°	6	65	58,50
08-00045-00600	6	30	—	6	75	59,60
08-00045-00700	7	35	12°	8	90	172,30
08-00045-00800	8	40	—	8	90	151,80
08-00045-00900	9	45	12°	10	100	303,60
08-00045-01000	10	50	—	10	100	182,20
08-00045-01200	12	60	—	12	105	319,50

Attenzione
How to Order

Quando ordinate, indicate MX245 (D).
When you order, indicate MX245 (D).

※(γ) è un valore di riferimento
※(γ) is reference value.

Acciaio al carbonio
Carbon Steel P

Acciaio legato
Alloy Steel P

Acciaio pretemprato
Prehardened Steel P

Temprato ~52
Hardened Steel HRC H

Acciaio inox
Stainless Steel M

Lega di alluminio
Aluminium Alloy N

Rame
Copper N

Resina
Resin O

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK		Rame Copper	
Velocità di taglio Cutting Speed	15~25m/min		10~20m/min		10~15m/min		15~35m/min	
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
0.3	21,200	40	15,900	30	13,300	25	26,500	80
0.4	15,900	50	11,900	35	9,900	30	19,900	80
0.5	12,700	50	9,500	35	8,000	30	15,900	80
1	6,400	65	4,800	40	4,000	35	8,000	100
1.5	4,200	65	3,200	40	2,700	35	5,300	110
2	3,200	65	2,400	45	2,000	40	4,000	120
2.5	2,500	75	1,900	45	1,600	40	3,200	130
3	2,100	85	1,600	50	1,300	45	2,700	140
4	1,600	95	1,200	50	1,000	45	2,000	140
5	1,300	100	1,000	60	800	55	1,600	140
6	1,100	110	800	65	700	60	1,300	140
7	900	100	700	60	600	55	1,100	135
8	800	95	600	60	500	55	1,000	130
9	700	90	550	60	450	50	900	125
10	600	85	500	60	400	50	800	120
12	500	80	400	55	300	45	700	120
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  ae Ø0.3~0.8=0.02D Ø1~2.5=0.03D Ø3~12=0.06D						Contornatura Side Milling  0.06D	
Note Notes	※ 1 Utilizzare lubrorefrigerante. ※ 2 Utilizzare lubrorefrigerante con ritardanti di fumo. ※ 3 Regolare nella stessa proporzione giri e avanzamento. ※ 4 Regolare le condizioni di fresatura in accordo con le profondità di taglio e la rigidità della macchina. ※ 1 Use cutting fluid. ※ 2 Use cutting fluid with smoke retardant. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.							

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli plane elica 25° MUGEN

MUGEN COATING 4-Flute LEAD25 End Mill

Totale 14 misure

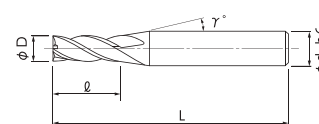
Total 14 sizes

Per ampia gamma di materiali. L/D=1 Fresa 4 tagli adatta per lavorazioni di contornatura

For various work materials. L/D=1.
Suitable for side milling with 4-flute



$D \approx 3 \varnothing D -0,01$
 $3 < D < 6 \varnothing D 0$
 $D = 6 \varnothing D -0,015$
 $D = 6 \varnothing D -0,025$
 $D > 6 \varnothing D -0,01$
 $D > 6 \varnothing D -0,03$



- Il rapporto L/D=1 e l'elica a 25° incrementano la rigidità, eliminano le vibrazioni e minimizzano le flessioni.
- L/D=1 and helix 25° type, increased the rigidity to suppress chattering and minimized milling deflection.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00075-00100	1	1	12°	4	45	40,80
08-00075-00150	1.5	1.5	12°	4	45	40,80
08-00075-00200	2	2	12°	4	45	25,90
08-00075-00250	2.5	2.5	12°	4	45	25,90
08-00075-00300	3	3	12°	6	45	30,90
08-00075-00350	3.5	3.5	12°	6	45	53,50
08-00075-00400	4	4	12°	6	45	34,20
08-00075-00450	4.5	4.5	12°	6	50	64,50
08-00075-00500	5	5	12°	6	50	37,50
08-00075-00550	5.5	5.5	12°	6	50	66,20
08-00075-00600	6	6	—	6	50	38,60
08-00075-00800	8	8	—	8	65	138,00
08-00075-01000	10	10	—	10	75	167,00
08-00075-01200	12	12	—	12	80	264,00

Attenzione
How to Order

Quando ordinate, indicate MX425(D).
When you order, indicate MX425 (D).

※(γ) è un valore di riferimento
※(γ) is reference value.

☐ Acciaio al carbonio
Carbon Steel **P**
☐ Acciaio legato
Alloy Steel **P**
☐ Acciaio temprato
Prehardened Steel **P**
☐ Temprato ~52
Hardened Steel HRC **H**

☐ Acciaio inox
Stainless Steel **M**

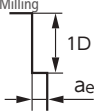
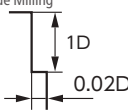
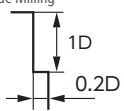
☐ Lega di alluminio
Aluminium Alloy **N**

☐ Rame
Copper **N**

☐ Resina
Resin **O**

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK		Acciaio temprato Hardened Steels SKD61 (～52HRC)		Rame Copper	
Velocità di taglio Cutting Speed	50～80m/min		50～70m/min		40～60m/min		20～40m/min		60～80m/min	
Diametro Dia.	Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
1	20,700	320	19,100	230	15,900	200	9,500	120	22,300	410
1.5	13,800	320	12,700	230	10,600	200	6,400	120	14,900	450
2	10,300	320	9,500	260	8,000	230	4,800	120	11,100	500
2.5	8,300	380	7,600	270	6,400	240	3,800	120	8,900	540
3	6,900	420	6,400	290	5,300	260	3,200	120	7,400	560
3.5	5,900	450	5,500	290	4,500	260	2,700	130	6,400	570
4	5,200	530	4,800	320	4,000	290	2,400	160	5,600	660
4.5	4,600	540	4,200	360	3,500	320	2,100	160	5,000	680
5	4,100	560	3,800	390	3,200	360	1,900	160	4,500	700
5.5	3,800	560	3,500	410	2,900	370	1,700	160	4,100	700
6	3,400	580	3,200	440	2,700	410	1,600	170	3,700	700
8	2,600	540	2,400	410	2,000	370	1,200	170	2,800	610
10	2,100	510	1,900	390	1,600	360	1,000	170	2,200	560
12	1,700	460	1,600	370	1,300	340	800	170	1,900	540
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  ae Ø1～2.5=0.1D Ø3～6=0.2D Ø8～12=0.25D						Contornatura Side Milling  1D 0.02D		Contornatura Side Milling  1D 0.2D	
Note Notes	※ 1 Usare lubrorefrigerante con ritardanti di fumo. ※ 2 Vi raccomandiamo di usare la lubrificazione minima per lavorare acciai temprati. ※ 3 Regolare con la stessa proporzione giri e avanzamento. ※ 4 Regolate le condizioni di fresatura in accordo alla profondità di taglio e alla rigidità della macchina. ※ 1 Use cutting fluid with smoke retardant. ※ 2 Recommend to use oil mist coolant for machining hardened steels. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.									

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
Resin
 Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli plane elica 30° MUGEN

MUGEN COATING 4-Flute LEAD30 End Mill

Totale 14 misure

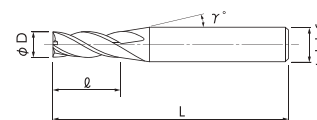
Total 14 sizes

Per ampia gamma di materiali. L/D=2.
Fresa 4 tagli adatta per lavorazioni di contornatura

For various work materials. L/D=2.
Suitable for side milling with 4-flute



$D \approx 3 \quad \varnothing D \quad -0,01$
 $3 < D < 6 \quad \varnothing D \quad 0$
 $D = 6 \quad \varnothing D \quad -0,015$
 $D = 6 \quad \varnothing D \quad -0,025$
 $D > 6 \quad \varnothing D \quad -0,01$
 $D > 6 \quad \varnothing D \quad -0,03$



- Il rapporto L/D=2 e l'elica a 30° di tipo standard la rende adatta per tutte le lavorazioni di fresatura.
- L/D=2 and helix 30° standard type, applicable to any milling process.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00080-00100	1	2	12°	4	45	28,70
08-00080-00150	1.5	3	12°	4	45	28,70
08-00080-00200	2	4	12°	4	45	24,30
08-00080-00250	2.5	5	12°	4	45	24,30
08-00080-00300	3	6	12°	6	45	24,30
08-00080-00350	3.5	7	12°	6	45	45,20
08-00080-00400	4	8	12°	6	45	28,70
08-00080-00450	4.5	9	12°	6	50	51,80
08-00080-00500	5	10	12°	6	50	28,70
08-00080-00550	5.5	11	12°	6	50	51,80
08-00080-00600	6	12	—	6	50	32,00
08-00080-00800	8	16	—	8	65	98,40
08-00080-01000	10	20	—	10	75	140,60
08-00080-01200	12	24	—	12	80	200,70

Attenzione
How to Order

Quando ordinate, indicate MX430 (D).
When you order, indicate MX430 (D).

※(γ) è un valore di riferimento
※(γ) is reference value.

☒ Acciaio al carbonio
Carbon Steel **P**

☒ Acciaio legato
Alloy Steel **P**

☒ Acciaio temprato
Prehardened Steel **P**

☐ Temprato ~52
Hardened Steel HRC **H**

☐ Acciaio inox
Stainless Steel **M**

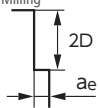
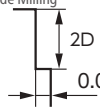
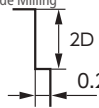
☐ Lega di alluminio
Aluminium Alloy **N**

☐ Rame
Copper **N**

☐ Resina
Resin **O**

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK		Acciaio temprato Hardened Steels SKD61 (～52HRC)		Rame Copper	
Velocità di taglio Cutting Speed	50～80m/min		50～70m/min		40～60m/min		20～40m/min		60～80m/min	
Diametro Dia.	Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
1	20,700	320	19,100	230	15,900	200	9,500	120	22,300	410
1.5	13,800	320	12,700	230	10,600	200	6,400	120	14,900	450
2	10,300	320	9,500	260	8,000	230	4,800	120	11,100	500
2.5	8,300	380	7,600	270	6,400	240	3,800	120	8,900	540
3	6,900	420	6,400	290	5,300	260	3,200	120	7,400	560
3.5	5,900	450	5,500	290	4,500	260	2,700	130	6,400	570
4	5,200	530	4,800	320	4,000	290	2,400	160	5,600	660
4.5	4,600	540	4,200	360	3,500	320	2,100	160	5,000	680
5	4,100	560	3,800	390	3,200	360	1,900	160	4,500	700
5.5	3,800	560	3,500	410	2,900	370	1,700	160	4,100	700
6	3,400	580	3,200	440	2,700	410	1,600	170	3,700	700
8	2,600	540	2,400	410	2,000	370	1,200	170	2,800	610
10	2,100	510	1,900	390	1,600	360	1,000	170	2,200	560
12	1,700	460	1,600	370	1,300	340	800	170	1,900	540
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  ae Ø1～2.5=0.07D Ø3～6=0.15D Ø8～12=0.2D						Contornatura Side Milling  0.02D		Contornatura Side Milling  0.2D	
Note Notes	※ 1 Usare lubrorefrigerante con ritardanti di fumo. ※ 2 Vi raccomandiamo di usare la lubrificazione minima per lavorare acciai temprati. ※ 3 Regolare con la stessa proporzione giri e avanzamento. ※ 4 Regolate le condizioni di fresatura in accordo alla profondità di taglio e alla rigidità della macchina. ※ 1 Use cutting fluid with smoke retardant. ※ 2 Recommend to use oil mist coolant for machining hardened steels. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.									

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
Resin
 Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli plane elica 35° MUGEN

MUGEN COATING 4-Flute LEAD35 End Mill

Totale 14 misure

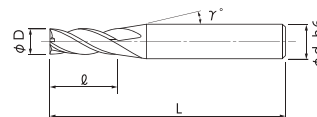
Total 14 sizes

Per ampia gamma di materiali. L/D=3 Fresa 4 tagli adatta per lavorazioni di contornatura

For various work materials. L/D=3.
Suitable for side milling with 4-flute



$D \approx 3 \quad \varnothing D \quad -0,01$
 $3 < D < 6 \quad \varnothing D \quad 0$
 $D = 6 \quad \varnothing D \quad -0,015$
 $D = 6 \quad \varnothing D \quad -0,025$
 $D > 6 \quad \varnothing D \quad -0,01$
 $D > 6 \quad \varnothing D \quad -0,03$



- Il rapporto L/D=3 e l'elica a 35° assicurano una lunghezza del tagliente sufficiente per evitare difficoltà nella scelta della fresa.
- L/D=3 and helix 35° for appropriate length of cut to avoid the inconveniences in size selection.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00085-00100	1	3	12°	4	45	40,30
08-00085-00150	1.5	4.5	12°	4	45	40,30
08-00085-00200	2	6	12°	4	45	28,70
08-00085-00250	2.5	7.5	12°	4	45	28,70
08-00085-00300	3	9	12°	6	45	30,90
08-00085-00350	3.5	10.5	12°	6	45	56,30
08-00085-00400	4	12	12°	6	50	34,20
08-00085-00450	4.5	13.5	12°	6	50	66,20
08-00085-00500	5	15	12°	6	55	37,50
08-00085-00550	5.5	16.5	12°	6	60	70,00
08-00085-00600	6	18	—	6	60	35,30
08-00085-00800	8	24	—	8	65	129,40
08-00085-01000	10	30	—	10	75	160,40
08-00085-01200	12	36	—	12	80	240,30

Attenzione
How to Order

Quando ordinate, indicate MX435 (D).
When you order, indicate MX435 (D).

※(γ) è un valore di riferimento
※(γ) is reference value.

☐ Acciaio al carbonio
Carbon Steel **P**
☐ Acciaio legato
Alloy Steel **P**
☐ Acciaio pretemprato
Prehardened Steel **P**
☐ Temprato ~52
Hardened Steel HRC **H**

☐ Acciaio inox
Stainless Steel **M**

☐ Lega di alluminio
Aluminium Alloy **N**

☐ Rame
Copper **N**

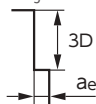
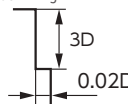
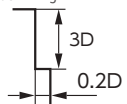
☐ Resina
Resin **O**

**Rivestimento
MUGEN**
 Regular Line
 MUGEN COATING



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK		Acciaio temprato Hardened Steels SKD61 (～52HRC)		Rame Copper	
Velocità di taglio Cutting Speed	45～75m/min		45～65m/min		35～55m/min		15～35m/min		55～75m/min	
Diametro Dia.	Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
1	19,100	290	17,500	210	14,300	170	8,000	100	20,700	380
1.5	12,700	290	11,700	210	9,500	170	5,300	100	13,800	420
2	9,500	290	8,800	240	7,200	210	4,000	100	10,300	470
2.5	7,600	350	7,000	260	5,700	210	3,200	110	8,300	500
3	6,400	390	5,800	260	4,800	230	2,700	110	6,900	530
3.5	5,500	410	5,000	270	4,100	230	2,300	120	5,900	530
4	4,800	480	4,400	310	3,600	260	2,000	140	5,200	610
4.5	4,200	490	3,900	340	3,200	290	1,800	140	4,600	610
5	3,800	510	3,500	360	2,900	320	1,600	140	4,100	630
5.5	3,500	530	3,200	370	2,600	340	1,400	140	3,800	630
6	3,200	540	2,900	390	2,400	360	1,300	140	3,400	630
8	2,400	480	2,200	370	1,800	340	1,000	140	2,600	580
10	1,900	440	1,800	360	1,400	310	800	140	2,100	540
12	1,600	440	1,500	360	1,200	290	700	140	1,700	490
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  ae Ø1～2.5=0.05D Ø3～6=0.1D Ø8～12=0.15D						Contornatura Side Milling  0.02D		Contornatura Side Milling  0.2D	
Note Notes	※ 1 Usare lubrorefrigerante con ritardanti di fumo. ※ 2 Vi raccomandiamo di usare la lubrificazione minima per lavorare acciai temprati. ※ 3 Regolare con la stessa proporzione giri e avanzamento. ※ 4 Regolate le condizioni di fresatura in accordo alla profondità di taglio e alla rigidità della macchina. ※ 1 Use cutting fluid with smoke retardant. ※ 2 Recommend to use oil mist coolant for machining hardened steels. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.									

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli plane elica 40° MUGEN

MUGEN COATING 4-Flute LEAD40 End Mill

Totale 14 misure

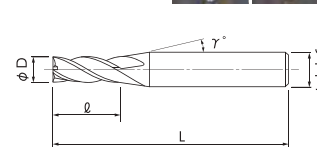
Total 14 sizes

Per ampia gamma di materiali. L/D=4 Fresa 4 tagli adatta per lavorazioni di contornatura

For various work materials. L/D=4.
Suitable for side milling with 4-flute



$D \approx 2 \quad \phi D \quad 0$
 $2 < D < 6 \quad \phi D \quad 0$
 $D = 6 \quad \phi D \quad -0.015$
 $D > 6 \quad \phi D \quad -0.025$
 $D > 6 \quad \phi D \quad -0.01$
 $D > 6 \quad \phi D \quad -0.03$



- Il rapporto L/D=4 e l'elica a 40° la rende adatta per lavorazioni profonde con minime flessioni.
- L/D=4 and helix 40° is suitable for deep machining with minimum deflection of cutting up-right surface.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00090-00100	1	4	12°	4	45	42,50
08-00090-00150	1.5	6	12°	4	45	42,50
08-00090-00200	2	8	12°	4	45	35,30
08-00090-00250	2.5	10	12°	4	45	35,30
08-00090-00300	3	12	12°	6	50	37,50
08-00090-00350	3.5	14	12°	6	50	59,60
08-00090-00400	4	16	12°	6	55	40,80
08-00090-00450	4.5	18	12°	6	55	71,70
08-00090-00500	5	20	12°	6	60	43,60
08-00090-00550	5.5	22	12°	6	65	75,00
08-00090-00600	6	24	—	6	65	47,40
08-00090-00800	8	32	—	8	90	180,90
08-00090-01000	10	40	—	10	100	209,30
08-00090-01200	12	48	—	12	105	335,30

Attenzione
How to Order

Quando ordinate, indicate MX440 (D)
When you order, indicate MX440 (D).

※(γ) è un valore di riferimento
※(γ) is reference value

☒ Acciaio al carbonio
Carbon Steel **P**

☒ Acciaio legato
Alloy Steel **P**

☒ Acciaio pretemprato
Prehardened Steel **P**

☐ Temprato ~52
Hardened Steel HRC **H**

☐ Acciaio inox
Stainless Steel **M**

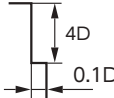
☐ Lega di alluminio
Aluminium Alloy **N**

☐ Rame
Copper **N**

☐ Resina
Resin **O**

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM•SKD•SUS		Acciaio pretemprato Prehardened Steels HPM•NAK		Rame Copper	
Velocità di taglio Cutting Speed	20~30m/min		15~25m/min		15~20m/min		20~40m/min	
Diametro Dia.	Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
1	8,000	120	6,400	80	5,600	70	9,500	170
1.5	5,300	120	4,200	80	3,700	70	6,400	200
2	4,000	120	3,200	90	2,800	75	4,800	210
2.5	3,200	150	2,500	90	2,200	85	3,800	230
3	2,700	170	2,100	90	1,900	90	3,200	240
3.5	2,300	180	1,800	90	1,600	90	2,700	260
4	2,000	200	1,600	110	1,400	100	2,400	290
4.5	1,800	220	1,400	120	1,200	110	2,100	290
5	1,600	220	1,300	140	1,100	120	1,900	290
5.5	1,400	220	1,200	150	1,000	140	1,700	310
6	1,300	220	1,100	150	900	140	1,600	310
8	1,000	200	800	140	700	130	1,200	270
10	800	190	600	120	600	130	1,000	260
12	700	190	500	120	500	130	800	240
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  a_e $\varnothing 1 \sim 2.5 = 0.04D$ $\varnothing 3 \sim 6 = 0.08D$ $\varnothing 8 \sim 12 = 0.1D$						Contornatura Side Milling  $0.1D$	
Note Notes	※ 1 Usare lubrorefrigerante con ritardanti di fumo. ※ 2 Regolare con la stessa proporzione giri e avanzamento. ※ 3 Regolate le condizioni di fresatura in accordo alla profondità di taglio e alla rigidità della macchina. ※ 1 Use cutting fluid with smoke retardant. ※ 2 Adjust both spindle speed and feed at the same rate. ※ 3 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.							

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
Resin
 Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli plane elica 45° MUGEN

MUGEN COATING 4-Flute LEAD45 End Mill

Totale 14 misure

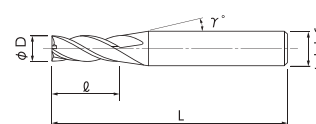
Total 14 sizes

Per ampia gamma di materiali. L/D=5
Fresa 4 tagli adatta per lavorazioni di contornatura

For various work materials. L/D=5.
Suitable for side milling with 4-flute



$D \approx 2 \quad \phi D \quad 0 \quad -0,01$
 $2 < D < 6 \quad \phi D \quad 0 \quad -0,015$
 $D = 6 \quad \phi D \quad -0,01 \quad -0,025$
 $D > 6 \quad \phi D \quad -0,01 \quad -0,03$



- Il rapporto L/D=5 e l'elica a 45° minimizzano le flessioni della fresa nonostante la lunghezza del tagliente.
- L/D=5 and helix 45° to minimize the milling deflection even though the long cutting length design.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00095-00100	1	5	12°	4	45	56,80
08-00095-00150	1.5	7.5	12°	4	45	56,80
08-00095-00200	2	10	12°	4	50	47,40
08-00095-00250	2.5	12.5	12°	4	50	47,40
08-00095-00300	3	15	12°	6	55	56,80
08-00095-00350	3.5	17.5	12°	6	60	75,00
08-00095-00400	4	20	12°	6	60	61,80
08-00095-00450	4.5	22.5	12°	6	65	84,40
08-00095-00500	5	25	12°	6	65	64,50
08-00095-00550	5.5	27.5	12°	6	75	90,40
08-00095-00600	6	30	—	6	75	69,50
08-00095-00800	8	40	—	8	90	216,50
08-00095-01000	10	50	—	10	100	258,10
08-00095-01200	12	60	—	12	105	382,80

Attenzione
How to Order

Quando ordinate, indicate MX445 (D).
When you order, indicate MX445 (D).

※(γ) è un valore di riferimento
※(γ) is reference value.

☐ Acciaio al carbonio
Carbon Steel **P**

☐ Acciaio legato
Alloy Steel **P**

☐ Acciaio pretemprato
Prehardened Steel **P**

☐ Temprato ~52
Hardened Steel HRC **H**

☐ Acciaio inox
Stainless Steel **M**

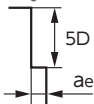
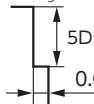
☐ Lega di alluminio
Aluminium Alloy **N**

☐ Rame
Copper **N**

☐ Resina
Resin **O**

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK		Rame Copper	
Velocità di taglio Cutting Speed	15~25m/min		10~20m/min		10~15m/min		15~35m/min	
Diametro Dia.	Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling		Contornatura Side Milling	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
1	6,400	100	4,800	60	4,000	55	8,000	150
1.5	4,200	100	3,200	60	2,700	55	5,300	170
2	3,200	100	2,400	70	2,000	60	4,000	190
2.5	2,500	120	1,900	70	1,600	60	3,200	200
3	2,100	130	1,600	75	1,300	70	2,700	210
3.5	1,800	140	1,400	75	1,100	70	2,300	210
4	1,600	160	1,200	90	1,000	80	2,000	240
4.5	1,400	170	1,100	90	900	85	1,800	240
5	1,300	170	1,000	100	800	90	1,600	240
5.5	1,200	170	900	100	700	95	1,400	240
6	1,100	190	800	110	700	100	1,300	240
8	800	160	600	100	500	90	1,000	220
10	600	150	500	100	400	85	800	200
12	500	140	400	90	300	80	700	200
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  ae Ø1~2.5=0.03D Ø3~6=0.06D Ø8~12=0.08D						Contornatura Side Milling  0.06D	
Note Notes	※ 1 Usare lubrificante con ritardanti di fumo. ※ 2 Regolare con la stessa proporzione giri e avanzamento. ※ 3 Regolate le condizioni di fresatura in accordo alla profondità di taglio e alla rigidità della macchina. ※ 1 Use cutting fluid with smoke retardant. ※ 2 Adjust both spindle speed and feed at the same rate. ※ 3 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.							

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 3 tagli plane foranti "POWER Z" MUGEN

MUGEN COATING 3-Flute POWER"Z" End Mill

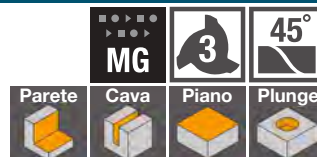
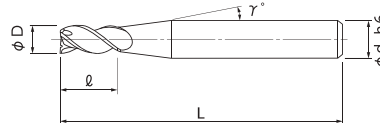
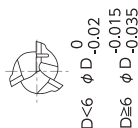
Totale 14 misure

Total 14 sizes

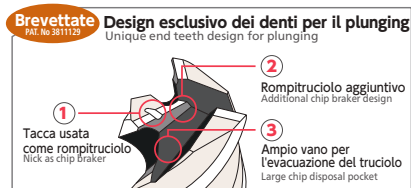
Per lavorazione di acciai. Lavorazione continua dal plunging alla cava da pieno senza necessità di preforo

For machining on steels Continuous machining from plunging without guide-hole and stepping to slotting

Brevettate PAT. No. 3811129



- Il nuovo design dell'elica conferisce alla fresa una notevole capacità di taglio.
- Grande efficienza in lavoro sia per realizzare lavorazioni di plunging che di cava da pieno!
- New flute design brought a remarkable shearing ability.
- High efficient machining is realized both for plunge cutting and slotting.



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00133-00100	1	1.5	9°	4	45	38,60
08-00133-00150	1.5	2.3	9°	4	45	38,60
08-00133-00200	2	3	9°	4	45	37,00
08-00133-00250	2.5	3.8	9°	4	45	37,00
08-00133-00300	3	6	9°	6	50	51,00
08-00133-00400	4	8	9°	6	50	52,80
08-00133-00500	5	10	9°	6	50	57,00
08-00133-00600	6	13	—	6	55	58,80
08-00133-00700	7	16	9°	8	65	96,40
08-00133-00800	8	19	—	8	65	100,00
08-00133-00900	9	19	9°	10	75	133,40
08-00133-01000	10	22	—	10	75	133,40
08-00133-01100	11	22	9°	12	80	184,90
08-00133-01200	12	26	—	12	80	187,90

Attenzione
How to Order

Quando ordinate, indicate MSZ345 (D).
When you order, indicate MSZ345 (D).

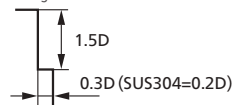
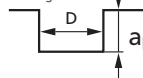
※(γ) è un valore di riferimento.
※(γ) is reference value.

Condizioni di taglio raccomandate
Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C				Acciaio legato Alloy Steels SKD·SCM				Acciaio inox Stainless Steels SUS304				Acciaio pretemperato Prehardened Steels HPM·NAK (~40HRC)			
Velocità di taglio Cutting Speed	90m/min				50m/min				35m/min				55m/min			
Diametro Dia.	N. di giri Spindle Speed	Avanzamento Feed			N. di giri Spindle Speed	Avanzamento Feed			N. di giri Spindle Speed	Avanzamento Feed			N. di giri Spindle Speed	Avanzamento Feed		
		Plung. Plunging	Cava Slotting	Cont. Side Milling		Plung. Plunging	Cava Slotting	Cont. Side Milling		Plung. Plunging	Cava Slotting	Cont. Side Milling		Plung. Plunging	Cava Slotting	Cont. Side Milling
	g/min	mm/min			g/min	mm/min			g/min	mm/min			g/min	mm/min		
1	15,000	70	200	400	15,000	40	100	210	10,000	20	70	200	15,000	50	100	200
1.5	13,000	70	250	500	13,000	40	120	270	7,000	20	70	250	13,000	50	130	250
2	11,000	100	300	600	8,000	50	140	290	5,000	20	75	250	10,000	70	150	300
2.5	10,000	100	400	700	7,000	60	160	330	4,000	20	75	250	8,000	90	170	350
3	9,600	200	550	800	5,300	80	200	400	3,600	20	100	250	5,800	100	250	400
4	7,200	210	650	900	4,000	100	250	400	2,800	30	100	250	4,400	110	250	400
5	5,700	260	700	1,000	3,200	100	250	450	2,200	40	120	300	3,500	120	300	500
6	4,800	300	720	1,200	2,700	130	300	450	1,800	40	120	300	3,000	130	330	600
7	4,100	300	740	1,100	2,300	120	300	450	1,600	40	120	300	2,500	110	330	600
8	3,600	300	760	1,000	2,000	100	300	400	1,400	30	120	300	2,200	100	330	600
9	3,200	300	770	900	1,800	80	250	380	1,200	20	100	300	1,900	90	250	500
10	3,000	300	800	900	1,600	80	200	350	1,100	20	100	300	1,700	80	200	400
11	2,800	300	760	850	1,500	80	200	350	1,000	20	100	280	1,600	80	200	400
12	2,600	280	740	850	1,400	70	180	340	900	20	100	270	1,500	70	180	340

Prof. di taglio
Depth of Cut

(D:Diametro Dia.)

Contornatura
Side MillingCava
Slotting

$$a_p$$

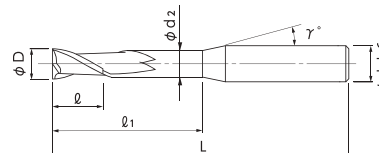
$$\begin{aligned} \varnothing 1 \sim 2.9 &= 0.5D \text{ (SKD·SCM·SUS304=0.25D)} \\ \varnothing 3 \sim 12 &= 1D \text{ (SKD·SCM·SUS304=0.5D)} \end{aligned}$$

- ※ 1 Regolare la profondità di taglio in accordo alla rigidità della macchina.
Le condizioni di fresatura variano in funzione del profilo, dello stato e dell'utilizzo della macchina.
- ※ 2 Regolare con la stessa proporzione giri e avanzamento.
- ※ 3 Si raccomanda di utilizzare aria.
- ※ 4 Per la lavorazione di acciaio inox si raccomanda lubrorefrigerante.
- ※ 5 Regolare le condizioni di fresatura con cautela per l'evacuazione dei trucioli e la generazione di fumo durante la fresatura con lubrorefrigerante.
- ※ 6 L'utilizzo di lubrorefrigeranti potrebbe provocare incendi a causa delle scintille generate durante la lavorazione o del calore causato dalla rottura. Assicurarsi di adottare adeguate misure di prevenzione incendi.
- ※ 7 Per la lavorazione in plunging di acciaio inox si raccomanda di eseguire la lavorazione a step.
- ※ 8 È importante evacuare il truciolo.
- ※ 9 Usare un mandrino rigido e preciso.
- ※ 10 La sporgenza della fresa fuori dal mandrino deve essere la minore possibile.
- ※ 1 Adjust Depth of Cut according to machine rigidity.
Final milling conditions are subject to machining profile, purpose and machine status.
- ※ 2 Adjust both spindle speed and feed at the same rate.
- ※ 3 Air blow is recommended.
- ※ 4 Water-insoluble fluid is recommended for cutting stainless steels.
- ※ 5 Adjust milling condition with caution for chip evacuation and smoke generation when milling with water-insoluble fluid.
- ※ 6 Using water-insoluble fluid could lead to fires due to sparks generated during machining or heat caused by breakage.
Ensure that you take proper fire-prevention measures.
- ※ 7 Step machining is recommended for plunging stainless steels.
- ※ 8 Chip disposal is important.
- ※ 9 Use a rigid and precise machine and chuck holder.
- ※ 10 Overhang of end mill should be as short as possible from spindle nose.

Note
NotesP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemperato
Prehardened SteelM Acciaio inox
Stainless SteelRivestimento
MUGEN
Regular Line
MUGEN COATING

Fresa 2 tagli piana scaricata. Massimo L/D=30

2-flute long neck square end mill. Maximum L/D=30



- Il rivestimento MUGEN è stato applicato alle nostre originali frese per nervature profonde.
- Particolarmente indicato per lavorazioni di nervature strette e profonde con frese lunghe.
- MUGEN COATING has been put on our original end mill for deep rib.
- The Long Neck type is suitable for narrow and deep machining.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L1) Lunghezza scarico Under Neck Length	(L) Lunghezza tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lunghezza totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00200-02005	0.2	0.5	0.3	0.18	12°	4	45	0.57	0.59	0.62	0.65	0.72	72,80
08-00200-02010		1					45	1.09	1.14	1.19	1.25	1.38	79,40
08-00200-02015		1.5					45	1.61	1.68	1.76	1.85	2.05	95,40
08-00200-03010	0.3	1	0.4	0.28	12°	4	45	1.09	1.14	1.19	1.25	1.38	64,50
08-00200-03020		2					45	2.13	2.23	2.33	2.44	2.71	78,90
08-00200-03030		3					45	3.17	3.31	3.47	3.64	4.04	82,70
08-00200-04020	0.4	2	0.6	0.37	12°	4	45	2.15	2.25	2.36	2.47	2.74	46,90
08-00200-04030		3					45	3.20	3.34	3.50	3.67	4.07	46,90
08-00200-04040		4					45	4.24	4.43	4.64	4.87	5.40	46,90
08-00200-05020	0.5	2	0.7	0.46	12°	4	45	2.18	2.28	2.38	2.50	2.77	34,20
08-00200-05040		4					45	4.26	4.46	4.66	4.89	5.43	34,20
08-00200-05060		6					45	6.35	6.63	6.95	7.29	8.08	34,20
08-00200-05080	0.6	8	0.9	0.56	12°	4	50	8.44	8.81	9.23	9.68	10.74	57,40
08-00200-06020		2					45	2.18	2.28	2.38	2.50	2.77	35,30
08-00200-06030		3					45	3.22	3.37	3.52	3.70	4.10	35,30
08-00200-06040	0.7	4	1	0.66	12°	4	45	4.26	4.46	4.66	4.89	5.43	35,30
08-00200-06060		6					45	6.35	6.63	6.95	7.29	8.08	35,30
08-00200-07020		2	1	0.66	12°	4	45	2.18	2.28	2.38	2.50	2.77	40,80
08-00200-07040	0.8	4					45	4.26	4.46	4.66	4.89	5.43	40,80
08-00200-07060		6					45	6.35	6.63	6.95	7.29	8.08	40,80
08-00200-07080	0.9	8	1.2	0.76	12°	4	50	8.44	8.81	9.23	9.68	10.74	65,60
08-00200-07100		10					50	10.52	10.99	11.51	12.07	13.39	85,50
08-00200-08040		4	1.4	0.86	12°	4	45	4.26	4.46	4.66	4.89	5.43	40,80
08-00200-08050	1	5					45	5.31	5.54	5.80	6.09	6.76	40,80
08-00200-08060		6					45	6.35	6.63	6.95	7.29	8.08	40,80
08-00200-08080	0.9	8	1.5	0.95	12°	4	50	8.44	8.81	9.23	9.68	10.74	40,80
08-00200-08100		10					50	10.52	10.99	11.51	12.07	13.39	60,10
08-00200-08120		12					50	12.61	13.17	13.79	14.47	16.05	67,80
08-00200-09060	1	6	1.5	0.95	12°	4	45	6.35	6.63	6.95	7.29	8.08	46,90
08-00200-09080		8					50	8.44	8.81	9.23	9.68	10.74	46,90
08-00200-09100		10					50	10.52	10.99	11.51	12.07	13.39	46,90
08-00200-10030		3					50	3.25	3.39	3.55	3.73	4.13	35,30

Attenzione
How to Order

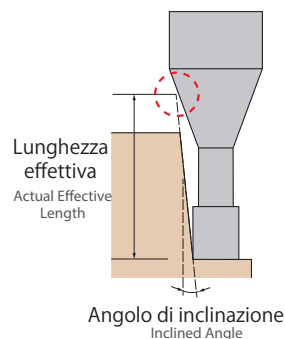
Quando ordinate indicate MHR230 (D)×(L1).
When you order, indicate MHR230 (D)×(L1).

※(γ) è un valore di riferimento.
※(γ) is reference value.



Frese 2 tagli piane scaricate MUGEN

MUGEN COATING 2 -Flute Long Neck End Mill

Unità [misura: mm]
Unit [Size: mm]

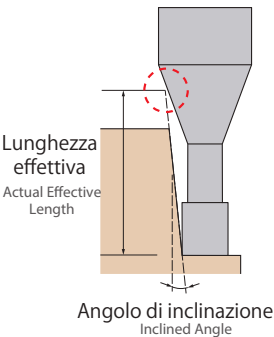
Codice Code No.	(D) Diametro Dia.	(Ø1) Lung. scarico Under Neck Length	(Ø) Lung. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lung. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00200-10040	1	4	1.5	0.95	12°	4	50	4.29	4.48	4.69	4.92	5.46	35,30
08-00200-10060		6					50	6.37	6.66	6.97	7.32	8.11	35,30
08-00200-10080		8					50	8.46	8.84	9.25	9.71	10.77	35,30
08-00200-10100		10					50	10.55	11.02	11.53	12.10	13.42	35,30
08-00200-10120		12					50	12.63	13.20	13.82	14.49	16.08	35,30
08-00200-10140		14					50	14.72	15.38	16.10	16.89	18.73	35,30
08-00200-10160		16					60	16.80	17.55	18.38	19.28	21.39	57,90
08-00200-10200		20					60	20.97	21.91	22.94	24.07	26.70	57,90
08-00200-10220		22					60	23.06	24.09	25.22	26.46	Free	66,20
08-00200-10250		25					70	26.19	27.36	28.64	30.05	Free	66,20
08-00200-10300		30					70	31.40	32.81	34.34	36.03	Free	74,40
08-00200-12040	1.2	4	1.8	1.15	12°	4	50	4.29	4.48	4.69	4.92	5.46	38,60
08-00200-12060		6					50	6.37	6.66	6.97	7.32	8.11	38,60
08-00200-12080		8					50	8.46	8.84	9.25	9.71	10.77	38,60
08-00200-12100		10					50	10.55	11.02	11.53	12.10	13.42	38,60
08-00200-12120		12					50	12.63	13.20	13.82	14.49	16.08	38,60
08-00200-12160		16					60	16.80	17.55	18.38	19.28	21.39	61,20
08-00200-12200		20					60	20.97	21.91	22.94	24.07	26.70	61,20
08-00200-15040	1.5	4	2.3	1.45	12°	4	50	4.29	4.48	4.69	4.92	5.46	34,80
08-00200-15060		6					50	6.37	6.66	6.97	7.32	8.11	34,80
08-00200-15080		8					50	8.46	8.84	9.25	9.71	10.77	34,80
08-00200-15100		10					50	10.55	11.02	11.53	12.10	13.42	34,80
08-00200-15120		12					50	12.63	13.20	13.82	14.49	16.08	34,80
08-00200-15140		14					60	14.72	15.38	16.10	16.89	18.73	35,30
08-00200-15160		16					60	16.80	17.55	18.38	19.28	21.39	35,30
08-00200-15180		18					60	18.89	19.73	20.66	21.67	Free	35,30
08-00200-15200		20					60	20.97	21.91	22.94	24.07	Free	35,30
08-00200-15250		25					70	26.19	27.36	28.64	30.05	Free	53,00
08-00200-15300		30					70	31.40	32.81	34.34	Free	Free	53,00
08-00200-20060	2	6	3	1.94	12°	4	50	6.40	6.69	7.00	7.34	8.15	34,80
08-00200-20080		8					50	8.48	8.86	9.28	9.74	10.80	34,80
08-00200-20100		10					50	10.57	11.04	11.56	12.13	13.45	34,80

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

MHR230

Frese 2 tagli plane scaricate MUGEN

MUGEN COATING 2 -Flute Long Neck End Mill



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00200-20120	2	12	3	1.94	12°	4	50	12.66	13.22	13.84	14.52	16.11	34,80
08-00200-20140		14					60	14.74	15.40	16.12	16.92	18.76	34,80
08-00200-20160		16					60	16.83	17.58	18.40	19.31	Free	34,80
08-00200-20180		18					60	18.91	19.76	20.69	21.70	Free	34,80
08-00200-20200		20					60	21.00	21.94	22.97	24.10	Free	34,80
08-00200-20250		25					70	26.21	27.39	28.67	Free	Free	34,80
08-00200-20300	2.5	30	3.7	2.4	12°	4	70	31.43	32.83	34.37	Free	Free	42,50
08-00200-25080		8					50	8.58	8.97	9.39	9.85	10.93	35,30
08-00200-25100		10					50	10.67	11.15	11.67	12.24	13.58	35,30
08-00200-25120		12					50	12.75	13.32	13.95	14.64	Free	35,30
08-00200-25160		16					60	16.93	17.68	18.51	19.42	Free	35,30
08-00200-25200		20					60	21.10	22.04	23.07	Free	Free	35,30
08-00200-25250	3	25	4.5	2.85	12°	6	70	26.31	27.49	Free	Free	Free	39,20
08-00200-25300		30					70	31.52	32.94	Free	Free	Free	39,20
08-00200-30080		8					50	8.71	9.10	9.52	9.99	11.08	46,90
08-00200-30100		10					50	10.79	11.27	11.80	12.38	13.74	46,90
08-00200-30120		12					50	12.88	13.45	14.08	14.78	16.39	46,90
08-00200-30160		16					60	17.05	17.81	18.65	19.56	21.70	46,90
08-00200-30180	3	18					60	19.13	19.99	20.93	21.96	24.35	46,90
08-00200-30200		20					60	21.22	22.17	23.21	24.35	27.01	46,90
08-00200-30250		25					70	26.43	27.62	28.91	30.33	Free	50,20
08-00200-30300		30					70	31.65	33.06	34.61	36.31	Free	59,10
08-00200-30400		40					90	42.08	43.96	46.02	Free	Free	61,50
08-00200-30500		50					100	52.50	54.85	Free	Free	Free	86,20

Attenzione
How to Order

Quando ordinate, indichiate MHR230 (D)×(Ø 1).
When you order, indicate MHR230 (D)×(Ø1).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material		Acciaio al carbonio/Acciaio legato* ₁ / Acciaio inox* ₁ Carbon Steels·Alloy Steels* ₁ ·Stainless Steels* ₁ S50C·SCM* ₁ ·SKD* ₁ ·SUS* ₁			Acciaio pretemprato Prehardened Steels NAK55·NAK80·HPM1 (~43HRC)			Rame/Leghe di alluminio Copper·Aluminium Alloy		
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut
		g/min	mm/min	ap mm	g/min	mm/min	ap mm	g/min	mm/min	ap mm
0.2	0.5	40,000	330	0.01	40,000	250	0.007	40,000	330	0.012
	1	40,000	250	0.007	40,000	180	0.005	40,000	250	0.008
	1.5	40,000	180	0.005	35,000	120	0.004	40,000	180	0.006
0.3	1	40,000	400	0.02	35,000	260	0.015	40,000	400	0.024
	2	35,000	300	0.01	30,000	180	0.007	40,000	320	0.012
	3	30,000	200	0.005	25,000	130	0.004	35,000	250	0.006
0.4	2	35,000	400	0.02	30,000	260	0.014	40,000	450	0.024
	3	30,000	300	0.015	25,000	190	0.01	35,000	350	0.018
	4	25,000	200	0.01	22,000	140	0.007	30,000	240	0.012
0.5	2	30,000	500	0.025	25,000	320	0.018	35,000	600	0.03
	4	25,000	350	0.015	22,000	230	0.01	30,000	420	0.018
	6	20,000	200	0.008	18,000	140	0.005	25,000	250	0.01
	8	18,000	150	0.003	14,000	90	0.002	20,000	160	0.003
0.6	2	30,000	600	0.035	25,000	380	0.025	35,000	700	0.04
	3	30,000	550	0.03	25,000	350	0.02	35,000	650	0.035
	4	25,000	450	0.025	22,000	300	0.018	30,000	550	0.03
	6	20,000	300	0.015	18,000	200	0.01	25,000	380	0.018
0.7	2	30,000	650	0.04	25,000	400	0.03	35,000	750	0.05
	4	25,000	500	0.03	22,000	330	0.02	30,000	600	0.04
	6	20,000	350	0.02	18,000	240	0.015	25,000	450	0.03
	8	18,000	280	0.015	15,000	180	0.01	22,000	350	0.02
	10	16,000	220	0.008	14,000	150	0.005	20,000	280	0.01
0.8	4	25,000	600	0.045	22,000	400	0.03	30,000	720	0.055
	5	22,000	500	0.035	20,000	350	0.025	30,000	650	0.05
	6	20,000	450	0.03	18,000	300	0.02	25,000	560	0.04
	8	18,000	350	0.02	15,000	240	0.015	22,000	430	0.025
	10	16,000	300	0.01	14,000	200	0.007	20,000	380	0.012
0.9	12	14,000	250	0.008	12,000	170	0.005	16,000	290	0.01
	6	20,000	600	0.04	18,000	400	0.03	25,000	750	0.05
	8	18,000	500	0.03	16,000	330	0.02	22,000	620	0.04
	10	16,000	400	0.02	14,000	260	0.015	20,000	500	0.025
	3	25,000	1,200	0.06	22,000	800	0.05	30,000	1,500	0.07
1	4	25,000	1,100	0.055	22,000	700	0.045	30,000	1,300	0.065
	6	20,000	800	0.045	18,000	500	0.035	25,000	1,000	0.055
	8	18,000	700	0.035	15,000	400	0.025	22,000	850	0.045
	10	16,000	600	0.025	14,000	350	0.018	20,000	750	0.03
	12	14,000	500	0.02	12,000	300	0.014	18,000	650	0.025
	14	13,000	400	0.015	11,000	250	0.01	15,000	450	0.018
	16	12,000	300	0.01	10,000	200	0.007	14,000	350	0.012
	20	11,000	200	0.005	9,000	120	0.003	13,000	230	0.006
	22	11,000	160	0.003	9,000	100	0.002	13,000	190	0.003
	25	10,000	120	0.002	8,500	80	0.002	12,000	140	0.002

* 1 Per lavorazioni di acciaio legato e acciaio inox, i valori di riferimento sono l'80% delle condizioni di taglio raccomandate.

* 1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

MHR230

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material		Acciaio al carbonio/Acciaio legato* ₁ / Acciaio inox* ₁ Carbon Steels•Alloy Steels* ₁ •Stainless Steels* ₁ S50C•SCM* ₁ •SKD* ₁ •SUS* ₁			Acciaio pretemprato Prehardened Steels NAK55•NAK80•HPM1 (~43HRC)			Rame/Leghe di alluminio Copper•Aluminium Alloy		
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut
		g/min	mm/min	ap mm	g/min	mm/min	ap mm	g/min	mm/min	ap mm
1.2	4	23,000	1,200	0.06	20,000	800	0.05	27,000	1,400	0.07
	6	20,000	900	0.05	18,000	600	0.04	25,000	1,200	0.06
	8	18,000	800	0.04	15,000	500	0.03	22,000	1,000	0.05
	10	16,000	700	0.03	14,000	450	0.02	20,000	850	0.04
	12	14,000	600	0.025	12,000	350	0.018	17,000	700	0.03
	16	12,000	400	0.015	10,000	250	0.01	14,000	450	0.02
1.5	20	10,000	300	0.01	8,000	180	0.007	12,000	360	0.012
	4	22,000	1,400	0.09	18,000	860	0.08	26,000	1,700	0.1
	6	20,000	1,200	0.08	16,000	720	0.07	24,000	1,500	0.09
	8	18,000	1,000	0.07	14,000	580	0.06	22,000	1,300	0.08
	10	16,000	850	0.06	13,000	520	0.05	20,000	1,100	0.07
	12	14,000	700	0.05	12,000	450	0.04	17,000	850	0.06
2.0	14	13,000	600	0.04	11,000	380	0.03	16,000	750	0.05
	16	12,000	500	0.035	10,000	320	0.025	15,000	650	0.04
	18	11,000	450	0.03	9,000	280	0.02	13,000	530	0.035
	20	10,000	400	0.02	8,000	240	0.014	12,000	480	0.025
	25	9,000	350	0.015	7,000	200	0.01	9,000	350	0.018
	30	8,000	300	0.008	6,000	170	0.005	8,000	300	0.01
2.5	6	16,000	1,400	0.12	13,000	850	0.1	20,000	1,750	0.14
	8	16,000	1,300	0.11	13,000	800	0.09	20,000	1,650	0.13
	10	16,000	1,200	0.1	13,000	750	0.08	20,000	1,500	0.12
	12	14,000	1,000	0.09	12,000	650	0.07	17,000	1,200	0.11
	14	13,000	900	0.08	11,000	570	0.06	16,000	1,100	0.1
	16	12,000	800	0.07	10,000	500	0.05	15,000	1,000	0.085
3	18	11,000	700	0.06	9,000	430	0.04	13,000	800	0.07
	20	10,000	600	0.05	8,000	360	0.035	12,000	720	0.06
	25	9,000	500	0.03	7,000	300	0.02	11,000	600	0.035
	30	8,000	400	0.02	6,000	220	0.014	9,000	450	0.025
	40	6,000	200	0.005	5,000	140	0.003	6,000	200	0.006
	50	5,000	150	0.003	4,000	90	0.002	5,000	150	0.003
3	8	13,000	1,400	0.15	11,000	900	0.12	16,000	1,700	0.18
	10	13,000	1,300	0.14	11,000	800	0.11	16,000	1,600	0.17
	12	13,000	1,200	0.13	11,000	750	0.1	16,000	1,500	0.16
	16	11,000	900	0.1	9,000	550	0.07	13,000	1,100	0.12
	20	9,000	700	0.08	7,000	400	0.05	11,000	850	0.1
	25	8,000	600	0.05	6,000	330	0.035	10,000	750	0.06
3	30	7,000	500	0.03	5,500	280	0.02	8,500	600	0.035
	8	11,000	1,500	0.2	9,000	1,000	0.16	13,000	1,800	0.24
	10	11,000	1,400	0.18	9,000	900	0.14	13,000	1,700	0.22
	12	11,000	1,300	0.16	9,000	800	0.12	13,000	1,600	0.2
	16	10,000	1,000	0.12	8,000	600	0.09	12,000	1,200	0.15
	18	10,000	900	0.11	8,000	550	0.08	12,000	1,100	0.13

* 1 Per lavorazioni di acciaio legato e acciaio inox, i valori di riferimento sono l'80% delle condizioni di taglio raccomandate.

* 1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.

Acciaio al carbonio
Carbon Steel **P**

Acciaio legato
Alloy Steel **P**

Acciaio pretemprato
Prehardened Steel **P**

Temprato ~52
Hardened Steel HRC **H**

Acciaio inox
Stainless Steel **M**

Leghe di alluminio
Aluminium Alloy **N**

Rame
Copper **N**

Resina
Resin **O**

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Rivestita
Coating

Materiale Work Material		Acciaio al carbonio/Acciaio legato* ₁ / Acciaio inox* ₁ Carbon Steels·Alloy Steels* ₁ ·Stainless Steels* ₁ S50C·SCM* ₁ ·SKD* ₁ ·SUS* ₁			Acciaio pretemprato Prehardened Steels NAK55·NAK80·HPM1 (~43HRC)			Rame/Leghe di alluminio Copper·Aluminium Alloy		
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut
		g/min	mm/min	ap mm	g/min	mm/min	ap mm	g/min	mm/min	ap mm
3	20	9,000	800	0.1	7,000	450	0.07	11,000	1,000	0.12
	25	8,000	700	0.08	6,000	380	0.06	10,000	900	0.1
	30	7,000	600	0.06	5,000	300	0.045	8,500	730	0.07
	40	5,000	400	0.025	4,000	220	0.018	6,000	480	0.03
	50	4,500	300	0.015	3,500	180	0.01	4,500	300	0.018
Note Notes		※1 Per lavorazioni di acciaio legato e acciaio inox, i valori di riferimento sono l'80% delle condizioni di taglio di raccomandate. ※2 I parametri di taglio raccomandate sono solo di riferimento e devono essere regolati secondo il tipo di macchina ed il pezzo da lavorare. ※3 ap: profondità di taglio assiale. ※4 Scegliere il fluido refrigerante più appropriato in base a materiale da lavorare, forma della fresa e tipo di lavorazione. ※5 Nelle lavorazioni profonde, la corretta adduzione del refrigerante e la corretta evacuazione del truciolo sono molto importanti. ※6 Si consiglia di applicare la lavorazione in rampa per entrare nel pezzo in maniera assiale. ※7 Si consiglia di eseguire fresatura bidirezionale. ※8 Per cave molto profonde con rapporto L/D=5, utilizzare nella prima fase di lavorazione una fresa corta e poi proseguire con quella lunga. ※9 Ridurre il numero di giri e l'avanzamento nello stesso rapporto, per eliminare vibrazioni o in caso di limitato numero di giri della macchina. ※10 Per frese di diam. inferiore a 0.5 mm. con rapporto L/D=15, regolare i parametri di taglio in maniera adeguata, per evitare rotture. ※11 Qualora la lunghezza della fresa superasse le 5xD, è molto importante regolare velocità ed avanzamento nello stesso rapporto, per evitare impatti sulla precisione di rotazione del mandrino e della fresa. ※1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions. ※2 These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type. ※3 ap: Axial Depth of Cut. ※4 Select a cutting fluid appropriate to work material, milling shape and machining content. ※5 Coolant supply and chip disposal in the deep portion are very important. ※6 Recommend to apply ramping for approaching into axial direction. ※7 Recommend reciprocating cutting. ※8 Recommend guide slotting process with short neck tool before milling with L/D 5 times or longer neck tool. ※9 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine. ※10 Major adjustment of milling conditions appropriately on milling profile, machine tool and etc. required for the tools smaller than Dia. 0.5mm, or L/D 15 times longer. ※11 Major adjustment of milling conditions, e.g. adjust spindle and feed speed at same rate, required on condition of a tool overhang length exceeding a shank diameter 5 times due to possible accuracy impact by chuck runout etc.								

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli piane scaricate MUGEN

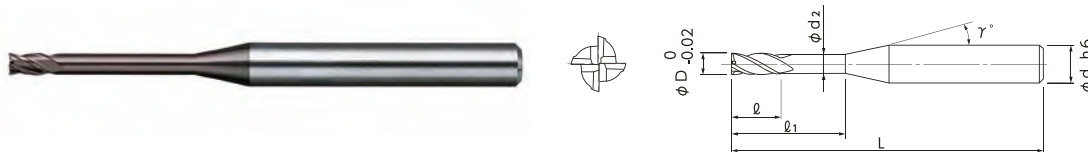
MUGEN COATING 4 -Flute Long Neck End Mill

Totale 52 misure

Total 52 sizes

Fresa 4 tagli piana scaricata. Massimo L/D=20

4-flute long neck square end mill. Maximum L/D=20



- Il rivestimento MUGEN è stato applicato alle nostre originali frese per nervature profonde.
- Particolarmente indicato per lavorazioni di nervature strette e profonde con con frese lunghe.
- MUGEN COATING has been put on our original end mill for deep rib.
- The Long Neck type is suitable for narrow and deep machining.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00210-01004	1	4	1.5	0.95	12°	4	50	4.29	4.48	4.69	4.92	5.46	37,50
08-00210-01006		6					50	6.37	6.66	6.97	7.32	8.11	37,50
08-00210-01008		8					50	8.46	8.84	9.25	9.71	10.77	37,50
08-00210-01010		10					50	10.55	11.02	11.53	12.10	13.42	37,50
08-00210-01012		12					50	12.63	13.20	13.82	14.49	16.08	37,50
08-00210-01016		16					50	16.80	17.55	18.38	19.28	21.39	60,70
08-00210-01506	1.5	6	2.3	1.45	12°	4	50	6.37	6.66	6.97	7.32	8.11	37,50
08-00210-01508		8					50	8.46	8.84	9.25	9.71	10.77	37,50
08-00210-01510		10					50	10.55	11.02	11.53	12.10	13.42	37,50
08-00210-01512		12					50	12.63	13.20	13.82	14.49	16.08	37,50
08-00210-01514		14					60	14.72	15.38	16.10	16.89	18.73	37,50
08-00210-01516		16					60	16.80	17.55	18.38	19.28	21.39	37,50
08-00210-01518	2	18	3	1.94	12°	4	60	18.89	19.73	20.66	21.67	Free	37,50
08-00210-01520		20					60	20.97	21.91	22.94	24.07	Free	37,50
08-00210-02006		6					50	6.40	6.69	7.00	7.34	8.15	37,50
08-00210-02008		8					50	8.48	8.86	9.28	9.74	10.80	37,50
08-00210-02010		10					50	10.57	11.04	11.56	12.13	13.45	37,50
08-00210-02012		12					50	12.66	13.22	13.84	14.52	16.11	37,50
08-00210-02014	2.5	14					60	14.74	15.40	16.12	16.92	18.76	37,50
08-00210-02016		16					60	16.83	17.58	18.40	19.31	Free	37,50
08-00210-02018		18					60	18.91	19.76	20.69	21.70	Free	37,50
08-00210-02020		20					60	21.00	21.94	22.97	24.10	Free	37,50
08-00210-02025		25					70	26.21	27.39	28.67	Free	Free	41,40
08-00210-02030		30					70	31.43	32.83	34.37	Free	Free	53,00
08-00210-02508	2.5	8	3.7	2.4	12°	4	50	8.58	8.97	9.39	9.85	10.93	37,50
08-00210-02512		12					50	12.75	13.32	13.95	14.64	Free	37,50

Attenzione
How to Order

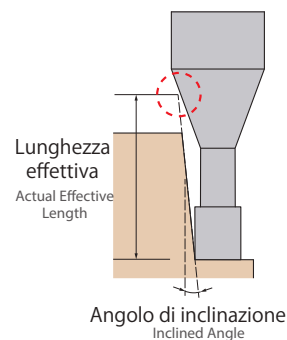
Quando ordinate, indicate MHR430 (D)×(L1).
When you order, indicate MHR430 (D)×(L1).

※(γ) è un valore di riferimento
※(γ) is reference value.



Frese 4 tagli piane scaricate MUGEN

MUGEN COATING 4 -Flute Long Neck End Mill

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00210-02516	2.5	16	3.7	2.4	12°	4	60	16.93	17.68	18.51	19.42	Free	37,50
08-00210-02520		20					60	21.10	22.04	23.07	Free	Free	37,50
08-00210-02525		25					70	26.31	27.49	Free	Free	Free	41,40
08-00210-03008	3	8	4.5	2.85	12°	6	50	8.71	9.10	9.52	9.99	11.08	56,80
08-00210-03012		12					50	12.88	13.45	14.08	14.78	16.39	56,80
08-00210-03016		16					60	17.05	17.81	18.65	19.56	21.70	56,80
08-00210-03020		20					60	21.22	22.17	23.21	24.35	27.01	56,80
08-00210-03025		25					70	26.43	27.62	28.91	30.33	Free	56,80
08-00210-03030		30					70	31.65	33.06	34.61	36.31	Free	73,20
08-00210-04012	4	12	6	3.8	12°	6	50	13.00	13.58	14.22	14.92	16.55	63,80
08-00210-04016		16					60	17.17	17.94	18.78	19.70	Free	63,80
08-00210-04020		20					60	21.34	22.30	23.34	24.49	Free	63,80
08-00210-04025		25					70	26.56	27.74	29.04	Free	Free	63,80
08-00210-04030		30					70	31.77	33.19	34.75	Free	Free	63,80
08-00210-04035		35					80	36.98	38.64	Free	Free	Free	63,80
08-00210-04040		40					90	42.20	44.09	Free	Free	Free	81,50
08-00210-04045		45					90	47.41	49.53	Free	Free	Free	97,40
08-00210-04050		50					100	52.63	54.98	Free	Free	Free	122,80
08-00210-05016	5	16	7.5	4.8	12°	6	60	17.17	17.94	18.78	Free	Free	81,50
08-00210-05025		25					70	26.56	27.74	Free	Free	Free	81,50
08-00210-05035		35					80	36.98	Free	Free	Free	Free	81,50
08-00210-05050		50					110	52.63	Free	Free	Free	Free	122,80
08-00210-06020	6	20	9	5.8	-	6	80	Free	Free	Free	Free	Free	81,50
08-00210-06030		30					90	Free	Free	Free	Free	Free	81,50
08-00210-06040		40					100	Free	Free	Free	Free	Free	97,40
08-00210-06050		50					110	Free	Free	Free	Free	Free	122,80

Attenzione
How to OrderQuando ordinate, indicate MHR430 (D) × (Ø 1).
When you order, indicate MHR430 (D) × (Ø 1).※(γ) è un valore di riferimento
※(γ) is reference value.P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
Resin



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material		Acciaio al carbonio/Acciaio legato _{*1} /Acciaio inox _{*1} Carbon Steels•Alloy Steels _{*1} •Stainless Steels _{*1} S50C•SCM _{*1} •SKD _{*1} •SUS _{*1}				Acciaio pretemprato Prehardened Steels NAK55•NAK80•HPM1 (~43HRC)			
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
		g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
5	16	6,000	2,100	0.35	3	4,500	1,200	0.3	3
	25	6,000	1,800	0.25	3	4,500	1,000	0.2	3
	35	5,000	1,200	0.15	3	3,500	630	0.1	3
	50	3,500	680	0.07	3	2,500	360	0.05	3
6	20	5,000	1,800	0.4	3.6	3,500	1,000	0.35	3.6
	30	4,000	1,400	0.35	3.6	3,000	750	0.3	3.6
	40	3,500	1,000	0.25	3.6	2,700	570	0.2	3.6
	50	3,000	750	0.15	3.6	2,200	420	0.1	3.6
Note Notes		※1 Per lavorazioni di acciaio legato e acciaio inox, i valori di riferimento sono l'80% delle condizioni di taglio raccomandate. ※2 I parametri di taglio consigliati sono solo di riferimento e devono essere regolati secondo il tipo di macchina ed il pezzo da lavorare. ※3 ap: profondità di taglio assiale, ae: profondità di taglio radiale. ※4 Scegliere il fluido refrigerante più appropriato in base a materiale da lavorare, forma della fresa e tipo di lavorazione. ※5 Nelle lavorazioni profonde, la corretta adduzione del refrigerante e la corretta evacuazione del truciolo sono molto importanti. ※6 Si consiglia di utilizzare la rampa o l'interpolazione elicoidale per l'approccio assiale del pezzo. ※7 Ridurre l'avanzamento e la profondità di taglio in prossimità delle pareti, per ridurre il carico di lavorazione. ※8 Per cave molto profonde con rapporto L/D=5, utilizzare nella prima fase di lavorazione una fresa corta e poi proseguire con quella lunga. ※9 Ridurre il numero di giri e l'avanzamento nello stesso rapporto, per eliminare vibrazioni o in caso di limitato numero di giri della macchina. ※10 Qualora la lunghezza della fresa superasse le 5xD, è molto importante regolare velocità ed avanzamento nello stesso rapporto, per evitare impatti sulla precisione di rotazione del mandrino e della fresa.							
		※1 Reference value for Alloy and Stainless Steels are 80% of recommended cutting conditions.							
		※2 These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.							
		※3 ap: Axial Depth of Cut, ae: Radial Depth of Cut.							
		※4 Select a cutting fluid appropriate to work material, milling shape and machining content.							
		※5 Coolant supply and chip disposal in the deep portion are very important.							
		※6 Recommend to apply helical or ramping for approaching into axial direction.							
		※7 Reduction of feed and Depth of Cut to reduce machining load around side wall.							
		※8 For slotting, recommend reciprocating milling by adjusting feed at 80% of recommended milling conditions as a reference value.							
		Recommend guide slotting process with short neck tool before milling with L/D 5 time or longer neck tool.							
		※9 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.							
		※10 Major adjustment of milling conditions, e.g. adjust spindle and feed speed at same rate, required on condition of a tool overhang length exceeding a shank diameter 5 times due to possible accuracy impact by chuck runout etc.							

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli sferiche MUGEN

MUGEN COATING 2-Flute Ball End Mill

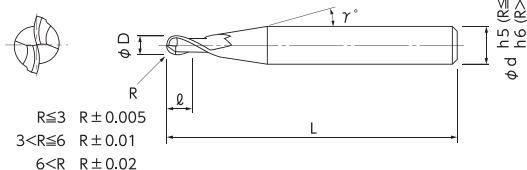
Totale 37 misure

Total 37 sizes

Fresa 2 tagli sferica con elica 30°.

Per vari tipi di lavorazioni, dalla sgrossatura alla finitura

2-flute standard type with helix angle 30°
For multi-purpose, from roughing to finishing



- Adatta per lavorazioni precise 3D in bassa e alta velocità di taglio.
- Suitable for precision three-dimensional cutting in the low to high speed range.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00501-00010	R0.1	0.2	0.2	15°	4	50	66,20
08-00500-00010	R0.1	0.2	0.2	15°	6	50	81,50
08-00501-00015	R0.15	0.3	0.3	15°	4	50	53,50
08-00500-00015	R0.15	0.3	0.3	15°	6	50	69,10
08-00501-00020	R0.2	0.6	0.4	15°	4	50	37,50
08-00500-00020	R0.2	0.6	0.4	15°	6	50	50,80
08-00501-00025	R0.25	0.8	0.5	15°	4	50	34,20
08-00500-00025	R0.25	0.8	0.5	15°	6	50	48,40
08-00501-00030	R0.3	0.9	0.6	15°	4	50	32,60
08-00500-00030	R0.3	0.9	0.6	15°	6	50	46,70
08-00501-00040	R0.4	1.2	0.8	15°	4	50	32,60
08-00500-00040	R0.4	1.2	0.8	15°	6	50	46,70
08-00501-00050	R0.5	1.5	1	15°	4	50	30,90
08-00500-00050	R0.5	1.5	1	15°	6	50	43,70
08-00501-00060	R0.6	1.8	1.2	15°	4	50	42,50
08-00500-00060	R0.6	1.8	1.2	15°	6	50	51,80
08-00501-00070	R0.7	2.1	1.4	15°	4	50	42,50
08-00500-00070	R0.7	2.1	1.4	15°	6	50	55,50
08-00501-00075	R0.75	2.3	1.5	15°	4	50	37,50

Attenzione How to Order

Quando ordinate, indicate MSB230 (R) × (d).
When you order, indicate MSB230 (R) × (d).

※ (γ) è un valore di riferimento.
※ (γ) is reference value.

Sferiche
Ball
Non scaricata
Full Cutting Length
Rivestita
Coating

Acciaio al carbonio
Carbon Steel

Acciaio legato
Alloy Steel

Acciaio temprato
Prehardened Steel

Temprato ~52
Hardened Steel

Acciaio inox
Stainless Steel

Lega di alluminio
Aluminium Alloy

Rame
Copper

Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Non scaricata
Full Cutting LengthRivestita
CoatingSferiche
BallUnità [misura: mm]
Unit [size: mm]

Codice Code No.	(R) Raggio Radius	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00500-00075	R0.75	2.3	1.5	15°	6	50	50,80
08-00501-00080	R0.8	2.4	1.6	15°	4	50	42,50
08-00500-00080	R0.8	2.4	1.6	15°	6	50	55,50
08-00501-00100	R1	3	2	9°	4	60	27,10
08-00500-00100	R1	3	2	9°	6	60	40,20
08-00501-00125	R1.25	3.8	2.5	9°	4	60	47,40
08-00500-00125	R1.25	3.8	2.5	9°	6	60	60,90
08-00501-00150	R1.5	5	3	9°	4	60	32,60
08-00500-00150	R1.5	5	3	9°	6	60	36,40
08-00500-00175	R1.75	5.3	3.5	9°	6	60	66,90
08-00500-00200	R2	6	4	9°	6	70	41,50
08-00500-00250	R2.5	8	5	9°	6	70	49,10
08-00500-00300	R3	10	6	-	6	80	51,60
08-00500-00350	R3.5	10.5	7	-	6	80	160,70
08-00500-00400	R4	12	8	-	8	90	181,00
08-00500-00450	R4.5	13.5	9	-	8	90	221,60
08-00500-00500	R5	15	10	-	10	100	254,60
08-00500-00600	R6	20	12	-	12	110	397,50

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio ad alta velocità raccomandate

Recommended High Speed Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM·SKD·SUS		Acciaio pretemprato Prehardened Steels HPM·NAK		Acciaio temprato Hardened Steels SKD61 (~52HRC)	
Velocità di taglio Cutting Speed	250m/min		200m/min		180m/min		100m/min	
Raggio Radius	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
0.2	~50,000	~1,500	~50,000	~1,200	~50,000	~1,000	~50,000	600
0.3	~50,000	~1,500	~50,000	~1,200	~50,000	~1,000	~50,000	700
0.4	~50,000	~3,000	~50,000	~2,500	~50,000	~2,200	40,000	1,000
0.5	~50,000	~3,000	~50,000	~2,500	~50,000	~2,200	32,000	1,500
1	40,000	5,000	32,000	3,200	29,000	2,900	16,000	1,500
1.5	27,000	5,000	21,000	3,200	19,000	2,900	10,600	1,500
2	20,000	5,000	16,000	3,200	14,000	2,900	8,000	1,500
3	13,500	3,000	10,600	2,000	9,500	1,800	5,300	1,200
4	10,000	3,000	8,000	2,000	7,200	1,800	4,000	1,200
5	8,000	3,000	6,400	2,000	5,700	1,800	3,200	1,200
6	6,700	2,500	5,300	1,800	4,800	1,600	2,700	1,200
Prof. di taglio Depth of Cut (Raggio Radius)								
Note	※1 Nella lavorazione di cave dal pieno, ridurre l'avanzamento al 60% dei valori sopra indicati. ※2 Si consiglia l'uso di lubrificazione minimale o aria compressa. ※3 Regolare con la stessa proporzione giri ed avanzamento. ※4 Usare una macchina ed un mandrino rigido. ※5 Regolate le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina. ※1 When slotting, reduce the feed by 60% from the above values. ※2 Recommended air blow or oil mist. ※3 Adjust both spindle speed and feed at the same rate. ※4 Use a rigid machine and chuck holder. ※5 Adjust milling conditions according to the volume of depth of cut and rigidity of the machine.							

Sferiche
Ball
Non scaricata
Full Cutting Length
Rivestita
Coating

Acciaio al carbonio
Carbon Steel P
Acciaio legato
Alloy Steel P
Acciaio pretemprato
Prehardened Steel P
Temprato ~52
Hardened Steel HRC H

Acciaio inox
Stainless Steel M

Lega di alluminio
Aluminium Alloy N
Rame
Copper N
Resina
Resin O

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato/ Acciaio pretemprato Alloy Steels Prehardened Steels SCM•SKD•SUS•HPM•NAK		Acciaio temprato Hardened Steels SKD61 (~52HRC)		Leghe di alluminio Aluminium Alloy		Rame Copper	
Velocità di taglio Cutting Speed	150m/min		120~150m/min		80~100m/min		150m/min~		100~150m/min	
Raggio Radius	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
0.1	50,000	400	50,000	340	50,000	200	50,000	500	50,000	500
0.2	50,000	630	50,000	600	50,000	630	50,000	600	50,000	600
0.3	50,000	930	50,000	940	48,000	900	50,000	750	50,000	750
0.4	50,000	1,200	48,000	1,200	36,000	900	50,000	1,000	50,000	1,000
0.5	48,000	1,430	38,000	1,200	29,000	900	50,000	1,250	48,000	1,000
0.6	40,000	1,430	32,000	1,200	24,000	810	50,000	1,480	40,000	1,080
0.8	30,000	1,270	24,000	1,000	18,000	670	50,000	1,900	30,000	1,160
1	24,000	1,160	19,000	800	14,300	600	48,000	2,400	24,000	1,200
1.5	16,000	930	13,000	600	9,600	460	32,000	2,400	16,000	1,200
2	12,000	930	10,000	570	7,200	450	24,000	2,400	12,000	1,200
2.5	9,600	930	8,000	560	5,700	450	19,000	2,400	9,600	1,200
3	8,000	930	6,400	540	4,800	450	16,000	2,400	8,000	1,200
4	6,000	900	4,800	540	3,600	450	12,000	2,400	6,000	1,200
5	4,800	900	3,800	540	2,900	450	9,600	2,300	4,800	1,150
6	4,000	900	3,200	540	2,400	450	8,000	2,100	4,000	1,050
Prof. di taglio Depth of Cut (Raggio Radius)										
Note Notes	※1 Nella lavorazione di cave dal pieno, ridurre l'avanzamento al 60% dei valori sopra indicati. ※2 Quando la lunghezza è 4xD è considerata standard. Per lunghezze superiori, riducete le condizioni di taglio. ※3 Si consiglia l'uso di lubrificazione minimale o aria compressa. ※4 Regolare con la stessa proporzione giri ed avanzamento. ※1 When slotting, reduce the feed by 60% from the above values. ※2 Length of overhang is 4 times Dia. as standard. When it is longer than 4 times Dia., adjust the conditions listed above. ※3 Recommended oil mist or airblow. ※4 Adjust both spindle speed and feed at the same rate.									

Non scaricata
Full Cutting LengthRivestita
CoatingSferiche
BallP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 3 tagli sferiche MUGEN

Totale 9 misure

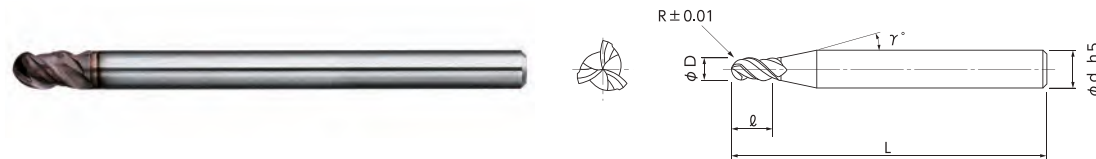
MUGEN COATING 3-Flute Ball End Mill

Total 9 sizes

Fresa 3 tagli sferica

Riduce le vibrazioni grazie ai taglienti a passo differenziato

3-flute ball end mill. Realized to control chattering by unequal flute spacing



- L'originale design della fresa a 3 tagli a passo differenziato elimina le vibrazioni e realizza lavorazioni molto efficienti.
- Original 3-flute design and unequal flute spacing to suppress chattering realize high efficient machining.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00600-00050	R0.5	1.5	1	12°	6	60	52,20
08-00600-00100	R1	3	2	12°	6	60	52,20
08-00600-00150	R1.5	5	3	12°	6	60	55,50
08-00600-00200	R2	6	4	12°	6	70	55,50
08-00600-00250	R2.5	8	5	12°	6	70	60,80
08-00600-00300	R3	10	6	—	6	80	65,40
08-00600-00400	R4	12	8	—	8	90	165,00
08-00600-00500	R5	15	10	—	10	100	206,00
08-00600-00600	R6	20	12	—	12	110	308,90

Attenzione
How to OrderQuando ordinate, indicate MSB345 (R).
When you order, indicate MSB345 (R).※(γ) è un valore di riferimento
※(γ) is reference value.

Sferiche
Ball

Non scaricata
Full Cutting Length

Rivestita
Coating

Acciaio al carbonio
Carbon Steel P

Acciaio legato
Alloy Steel P

Acciaio pretemprato
Prehardened Steel P

Temprato ~52
Hardened Steel H

Acciaio inox
Stainless Steel M

Lega di alluminio
Aluminium Alloy N

Rame
Copper N

Resina
Resin O

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Non scaricata
Full Cutting Length



Rivestita
Coating

Sferiche
Ball

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C				Acciaio legato/Acciaio pretemprato Alloy Steels • Prehardened Steels SKD • HPM • NAK				Acciaio temprato Hardened Steels STAVAX • SKD61 (~52HRC)			
	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
	a _p mm	a _e mm	mm/min	g/min	a _p mm	a _e mm	mm/min	g/min	a _p mm	a _e mm	mm/min	g/min
0.5	0.1	0.3	4,000	40,000	0.1	0.3	3,500	40,000	0.1	0.3	2,500	30,000
1	0.2	0.6	4,500	30,000	0.2	0.6	4,000	30,000	0.2	0.6	3,000	20,000
1.5	0.3	1	4,500	24,000	0.3	1	4,000	24,000	0.2	1	3,000	18,000
2	0.4	1.5	4,500	20,000	0.4	1.5	4,000	20,000	0.3	1.5	3,000	15,000
2.5	0.5	1.7	4,500	16,000	0.5	1.7	4,000	16,000	0.3	2	3,000	12,000
3	0.6	2	4,500	10,000	0.6	2	4,000	10,000	0.4	2	3,000	9,000
4	0.8	2.5	4,500	8,000	0.8	2.5	4,000	8,000	0.5	2	3,000	7,000
5	1.2	3	4,500	6,500	1.2	3	4,000	6,500	0.7	2.5	3,000	5,500
6	1.5	4	4,500	5,000	1.5	4	4,000	5,000	1	3	3,000	4,000
Note Notes	※1 Profondità di taglio: a _p =Profondità di taglio assiale, a _e =Profondità di taglio radiale. ※2 Regolate con la stessa proporzione giri ed avanzamento. ※3 Regolate le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina. ※4 Quando la lunghezza è 4 x D o 5 x D è considerata standard. Se è superiore, ridurre le condizioni di taglio. ※1 Depth of Cut: a _p =Axial Depth of Cut / a _e =Radial Depth of Cut. ※2 Adjust both spindle speed and feed at the same rate. ※3 Adjust milling conditions according to the volume of depth of cut and rigidity of machine. ※4 Length of overhang is 4 to 5 times Dia. as standard. When it is longer than 4 to 5 times Dia., adjust the conditions listed above.											

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli sferiche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Ball End Mill

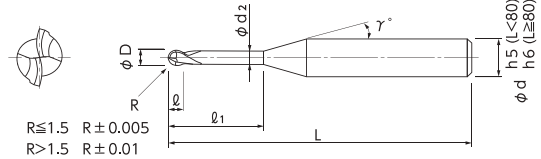
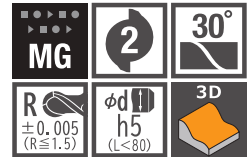
Totale 156 misure

Total 156 sizes

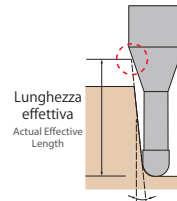
Fresa sferica scaricata.

Disponibile in 156 varianti di misure

Standard type long neck ball end mill. Sufficient variations with 156 sizes



- È particolarmente adatta per fresature in profondità e per nervature profonde.
- È possibile ottenere profonde e precise lavorazioni 3D con basse e alte velocità di taglio.
- The Long Neck type is suitable for narrow and deep machining.
- It is possible to have deep and precision three-dimensional cutting in the low to high speed range.

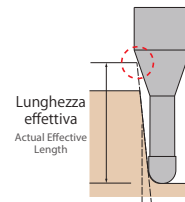
Angolo di inclinazione
Inclined AngleUnità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L1) Lunghezza scarico Under Neck Length	(L2) Lunghezza tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lunghezza totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00520-00101	R0.1	0.5	0.15	0.2	0.18	12°	4	45	0.56	0.58	0.61	0.63	0.69	77,20
08-00521-00101		0.5	0.15	0.2	0.18	12°	6	50	0.56	0.58	0.61	0.63	0.69	101,90
08-00520-00102		1	0.15	0.2	0.18	12°	4	45	1.08	1.13	1.18	1.23	1.35	77,20
08-00521-00102		1	0.15	0.2	0.18	12°	6	50	1.08	1.13	1.18	1.23	1.35	101,90
08-00520-00103		1.5	0.15	0.2	0.18	12°	4	45	1.60	1.67	1.75	1.83	2.02	84,40
08-00521-00103		1.5	0.15	0.2	0.18	12°	6	50	1.60	1.67	1.75	1.83	2.02	108,60
08-00520-00151	R0.15	1	0.2	0.3	0.28	12°	4	45	1.08	1.12	1.17	1.22	1.34	76,10
08-00521-00151		1	0.2	0.3	0.28	12°	6	50	1.08	1.12	1.17	1.22	1.34	95,90
08-00520-00152		2	0.2	0.3	0.28	12°	4	45	2.12	2.21	2.31	2.42	2.66	82,70
08-00521-00153		2	0.2	0.3	0.28	12°	6	50	2.12	2.21	2.31	2.42	2.66	106,70
08-00520-00201	R0.2	1	0.3	0.4	0.37	12°	4	45	1.10	1.14	1.19	1.24	1.35	51,80
08-00521-00201		1	0.3	0.4	0.37	12°	6	50	1.10	1.14	1.19	1.24	1.35	71,00
08-00520-00204		1.5	0.3	0.4	0.37	12°	4	45	1.62	1.69	1.76	1.84	2.02	53,50
08-00521-00202		1.5	0.3	0.4	0.37	12°	6	50	1.62	1.69	1.76	1.84	2.02	72,90
08-00520-00202		2	0.3	0.4	0.37	12°	4	45	2.15	2.23	2.33	2.43	2.68	55,20
08-00521-00203		2	0.3	0.4	0.37	12°	6	50	2.15	2.23	2.33	2.43	2.68	74,60
08-00520-00205		2.5	0.3	0.4	0.37	12°	4	45	2.67	2.78	2.90	3.03	3.34	56,30
08-00521-00204		2.5	0.3	0.4	0.37	12°	6	50	2.67	2.78	2.90	3.03	3.34	76,50
08-00520-00203		3	0.3	0.4	0.37	12°	4	45	3.19	3.32	3.47	3.63	4.01	59,60
08-00521-00205		3	0.3	0.4	0.37	12°	6	50	3.19	3.32	3.47	3.63	4.01	81,90
08-00520-00206	R0.25	4	0.3	0.4	0.37	12°	4	45	4.23	4.41	4.61	4.83	5.33	64,50
08-00520-00207		5	0.3	0.4	0.37	12°	4	45	5.27	5.50	5.75	6.02	6.66	69,50
08-00520-00251		2	0.35	0.5	0.46	12°	4	45	2.17	2.25	2.35	2.45	2.69	51,80
08-00521-00252		2	0.35	0.5	0.46	12°	6	50	2.17	2.25	2.35	2.45	2.69	71,00
08-00520-10253		3	0.35	0.5	0.46	12°	4	45	3.21	3.34	3.49	3.65	4.02	51,80
08-00520-00252		4	0.35	0.5	0.46	12°	4	45	4.25	4.43	4.63	4.85	5.35	51,80
08-00521-00253		4	0.35	0.5	0.46	12°	6	50	4.25	4.43	4.63	4.85	5.35	71,00
08-00520-00255		5	0.35	0.5	0.46	12°	4	45	5.30	5.52	5.77	6.04	6.68	53,50
08-00521-00254		5	0.35	0.5	0.46	12°	6	50	5.30	5.52	5.77	6.04	6.68	72,90
08-00520-00253		6	0.35	0.5	0.46	12°	4	45	6.34	6.61	6.91	7.24	8.00	55,20
08-00521-00255		6	0.35	0.5	0.46	12°	6	50	6.34	6.61	6.91	7.24	8.00	74,60
08-00520-00254	R0.25	8	0.35	0.5	0.46	12°	4	45	8.42	8.79	9.19	9.63	10.66	64,50
08-00521-00256		8	0.35	0.5	0.46	12°	6	50	8.42	8.79	9.19	9.63	10.66	85,00

Attenzione
How to OrderQuando ordinate, indicate MRB230 (R)×(L1)×(d).
When you order, indicate MRB230 (R)×(L1)×(d).※(γ) è un valore di riferimento.
※(γ) is reference value.

Frese 2 tagli sferiche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Ball End Mill

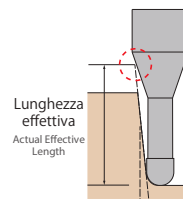
Angolo di inclinazione
Inclined AngleUnità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00520-00301	R0.3	2	0.45	0.6	0.56	12°	4	45	2.17	2.25	2.34	2.44	2.68	40,80
08-00521-00301		2	0.45	0.6	0.56	12°	6	50	2.17	2.25	2.34	2.44	2.68	57,00
08-00520-00305		3	0.45	0.6	0.56	12°	4	45	3.21	3.34	3.48	3.64	4.01	42,50
08-00521-00302		3	0.45	0.6	0.56	12°	6	50	3.21	3.34	3.48	3.64	4.01	58,90
08-00520-00302		4	0.45	0.6	0.56	12°	4	45	4.25	4.43	4.62	4.84	5.33	43,60
08-00521-00303		4	0.45	0.6	0.56	12°	6	50	4.25	4.43	4.62	4.84	5.33	60,80
08-00520-00306		5	0.45	0.6	0.56	12°	4	45	5.29	5.52	5.76	6.03	6.66	43,60
08-00520-00303		6	0.45	0.6	0.56	12°	4	45	6.34	6.61	6.90	7.23	7.99	43,60
08-00521-00304		6	0.45	0.6	0.56	12°	6	50	6.34	6.61	6.90	7.23	7.99	60,80
08-00520-00307		7	0.45	0.6	0.56	12°	4	45	7.38	7.70	8.04	8.43	9.31	48,50
08-00520-00304		8	0.45	0.6	0.56	12°	4	45	8.42	8.79	9.18	9.62	10.64	56,30
08-00521-00305		8	0.45	0.6	0.56	12°	6	50	8.42	8.79	9.18	9.62	10.64	76,50
08-00520-00400	R0.4	2	0.6	0.8	0.76	12°	4	45	2.16	2.24	2.33	2.42	2.65	40,80
08-00521-00401		2	0.6	0.8	0.76	12°	6	50	2.16	2.24	2.33	2.42	2.65	57,00
08-00520-10401		3	0.6	0.8	0.76	12°	4	45	3.20	3.33	3.47	3.62	3.97	43,60
08-00521-00402		3	0.6	0.8	0.76	12°	6	50	3.20	3.33	3.47	3.62	3.97	60,80
08-00520-00401		4	0.6	0.8	0.76	12°	4	45	4.25	4.42	4.61	4.82	5.30	43,60
08-00521-00403		4	0.6	0.8	0.76	12°	6	50	4.25	4.42	4.61	4.82	5.30	60,80
08-00520-00405		5	0.6	0.8	0.76	12°	4	45	5.29	5.51	5.75	6.01	6.63	43,60
08-00520-00402		6	0.6	0.8	0.76	12°	4	45	6.33	6.60	6.89	7.21	7.96	43,60
08-00521-00404		6	0.6	0.8	0.76	12°	6	50	6.33	6.60	6.89	7.21	7.96	60,80
08-00520-00406		7	0.6	0.8	0.76	12°	4	45	7.38	7.69	8.03	8.41	9.28	43,60
08-00520-00403		8	0.6	0.8	0.76	12°	4	45	8.42	8.78	9.17	9.60	10.61	43,60
08-00521-00405		8	0.6	0.8	0.76	12°	6	50	8.42	8.78	9.17	9.60	10.61	60,80
08-00520-00404		10	0.6	0.8	0.76	12°	4	45	10.50	10.96	11.45	12.00	13.26	56,30
08-00521-00406		10	0.6	0.8	0.76	12°	6	50	10.50	10.96	11.45	12.00	13.26	76,50
08-00520-40501	R0.5	2	0.75	1	0.95	12°	4	45	2.18	2.26	2.34	2.43	2.65	34,20
08-00520-00505		3	0.75	1	0.95	12°	4	45	3.22	3.35	3.48	3.63	3.97	34,20
08-00521-00501		3	0.75	1	0.95	12°	6	50	3.22	3.35	3.48	3.63	3.97	49,80
08-00520-00506		4	0.75	1	0.95	12°	4	45	4.27	4.44	4.62	4.83	5.30	38,60
08-00521-00502		4	0.75	1	0.95	12°	6	50	4.27	4.44	4.62	4.83	5.30	54,60
08-00520-00510		5	0.75	1	0.95	12°	4	45	5.31	5.53	5.76	6.02	6.63	38,60
08-00521-00503		5	0.75	1	0.95	12°	6	50	5.31	5.53	5.76	6.02	6.63	54,60
08-00520-00501		6	0.75	1	0.95	12°	4	45	6.35	6.62	6.90	7.22	7.96	42,50
08-00521-00504		6	0.75	1	0.95	12°	6	50	6.35	6.62	6.90	7.22	7.96	58,90
08-00520-00511		7	0.75	1	0.95	12°	4	45	7.40	7.71	8.04	8.42	9.28	42,50
08-00520-00502		8	0.75	1	0.95	12°	4	45	8.44	8.79	9.18	9.61	10.61	42,50
08-00521-00505		8	0.75	1	0.95	12°	6	50	8.44	8.79	9.18	9.61	10.61	58,90
08-00520-00512		9	0.75	1	0.95	12°	4	45	9.48	9.88	10.32	10.81	11.94	42,50
08-00520-00507		10	0.75	1	0.95	12°	4	45	10.52	10.97	11.46	12.01	13.26	42,50
08-00521-00506		10	0.75	1	0.95	12°	6	50	10.52	10.97	11.46	12.01	13.26	58,90
08-00520-00504		12	0.75	1	0.95	12°	4	45	12.61	13.15	13.75	14.40	15.92	42,50
08-00521-00507		12	0.75	1	0.95	12°	6	50	12.61	13.15	13.75	14.40	15.92	58,90

Scaricata
Long NeckRivestita
CoatingSferiche
BallP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli sferiche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Ball End Mill

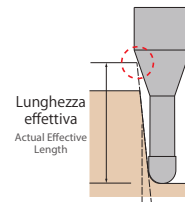
Sferiche
BallScaricata
Long NeckRivestita
CoatingAngolo di inclinazione
Inclined AngleUnità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00520-00513	R0.5	14	0.75	1	0.95	12°	4	50	14.70	15.33	16.03	16.79	18.57	48,00
08-00520-00508		16	0.75	1	0.95	12°	4	50	16.78	17.51	18.31	19.18	21.23	56,30
08-00521-00508		16	0.75	1	0.95	12°	6	60	16.78	17.51	18.31	19.18	21.23	76,50
08-00520-00514		18	0.75	1	0.95	12°	4	55	18.87	19.69	20.59	21.58	23.88	56,30
08-00520-00509		20	0.75	1	0.95	12°	4	55	20.95	21.87	22.87	23.97	26.54	69,50
08-00521-00509		20	0.75	1	0.95	12°	6	60	20.95	21.87	22.87	23.97	26.54	91,00
08-00520-00600	R0.6	6	0.9	1.2	1.15	12°	4	45	6.35	6.61	6.89	7.20	7.92	56,30
08-00521-00601		6	0.9	1.2	1.15	12°	6	50	6.35	6.61	6.89	7.20	7.92	74,60
08-00520-00601		8	0.9	1.2	1.15	12°	4	45	8.43	8.79	9.17	9.59	10.58	56,30
08-00521-00602		8	0.9	1.2	1.15	12°	6	50	8.43	8.79	9.17	9.59	10.58	74,60
08-00520-00602		10	0.9	1.2	1.15	12°	4	45	10.52	10.96	11.45	11.99	13.23	56,30
08-00521-00603		10	0.9	1.2	1.15	12°	6	50	10.52	10.96	11.45	11.99	13.23	74,60
08-00520-00603		12	0.9	1.2	1.15	12°	4	45	12.61	13.14	13.73	14.38	15.89	56,30
08-00521-00604		12	0.9	1.2	1.15	12°	6	50	12.61	13.14	13.73	14.38	15.89	74,60
08-00520-00751	R0.75	8	1.1	1.5	1.45	12°	4	45	8.43	8.77	9.15	9.56	10.53	42,50
08-00521-00751		8	1.1	1.5	1.45	12°	6	50	8.43	8.77	9.15	9.56	10.53	58,90
08-00520-00752		10	1.1	1.5	1.45	12°	4	45	10.51	10.95	11.43	11.96	13.18	45,20
08-00520-00753		12	1.1	1.5	1.45	12°	4	45	12.60	13.13	13.71	14.35	15.84	48,50
08-00521-00752		12	1.1	1.5	1.45	12°	6	50	12.60	13.13	13.71	14.35	15.84	68,00
08-00520-00754		14	1.1	1.5	1.45	12°	4	50	14.69	15.31	15.99	16.74	18.49	48,50
08-00520-00755		16	1.1	1.5	1.45	12°	4	50	16.77	17.49	18.27	19.14	21.15	48,50
08-00521-00755		16	1.1	1.5	1.45	12°	6	60	16.77	17.49	18.27	19.14	21.15	68,00
08-00520-00756		18	1.1	1.5	1.45	12°	4	55	18.86	19.67	20.55	21.53	23.80	48,50
08-00520-00757		20	1.1	1.5	1.45	12°	4	55	20.94	21.85	22.84	23.92	Free	48,50
08-00521-00757	R0.8	20	1.1	1.5	1.45	12°	6	60	20.94	21.85	22.84	23.92	26.46	68,00
08-00520-00801		8	1.2	1.6	1.55	12°	4	45	8.43	8.77	9.14	9.55	10.51	56,30
08-00520-00803		12	1.2	1.6	1.55	12°	4	45	12.60	13.13	13.70	14.34	15.82	56,30
08-00520-00805		16	1.2	1.6	1.55	12°	4	50	16.77	17.48	18.27	19.13	21.13	56,30
08-00520-00807	R1	20	1.2	1.6	1.55	12°	4	55	20.94	21.84	22.83	23.91	Free	56,30
08-00520-01000		4	1.5	2	1.94	12°	4	45	4.27	4.42	4.58	4.76	5.17	34,20
08-00521-01000		4	1.5	2	1.94	12°	6	50	4.27	4.42	4.58	4.76	5.17	49,80
08-00520-01001		6	1.5	2	1.94	12°	4	45	6.36	6.60	6.86	7.15	7.83	38,60
08-00521-01001		6	1.5	2	1.94	12°	6	50	6.36	6.60	6.86	7.15	7.83	54,60
08-00520-01002		8	1.5	2	1.94	12°	4	45	8.44	8.78	9.14	9.54	10.48	42,50
08-00521-01002		8	1.5	2	1.94	12°	6	50	8.44	8.78	9.14	9.54	10.48	58,90
08-00520-01003		10	1.5	2	1.94	12°	4	45	10.53	10.95	11.42	11.94	13.14	42,50
08-00521-01003		10	1.5	2	1.94	12°	6	50	10.53	10.95	11.42	11.94	13.14	58,90
08-00520-01004		12	1.5	2	1.94	12°	4	45	12.61	13.13	13.70	14.33	15.79	42,50
08-00521-01004	R1	12	1.5	2	1.94	12°	6	50	12.61	13.13	13.70	14.33	15.79	58,90
08-00520-01005		14	1.5	2	1.94	12°	4	50	14.70	15.31	15.98	16.72	18.45	42,50
08-00520-01006		16	1.5	2	1.94	12°	4	50	16.78	17.49	18.27	19.12	Free	42,50
08-00521-01005		16	1.5	2	1.94	12°	6	60	16.78	17.49	18.27	19.12	21.10	58,90
08-00520-01007		18	1.5	2	1.94	12°	4	55	18.87	19.67	20.55	21.51	Free	42,50
08-00520-01008		20	1.5	2	1.94	12°	4	55	20.96	21.85	22.83	23.90	Free	42,50

Attenzione
How to OrderQuando ordinate, indicate MRB230 (R) × (L1) × (d).
When you order, indicate MRB230 (R) × (L1) × (d).※ (γ) è un valore di riferimento.
※ (γ) is reference value.Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli sferiche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Ball End Mill

Angolo di inclinazione
Inclined AngleUnità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L1) Lunghezza scarico Under Neck Length	(L) Lunghezza tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lunghezza totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00521-01008	R1	20	1.5	2	1.94	12°	6	60	20.96	21.85	22.83	23.90	26.41	58,90
08-00520-01009		22	1.5	2	1.94	12°	4	60	23.04	24.03	25.11	26.30	Free	56,30
08-00520-01010		25	1.5	2	1.94	12°	4	65	26.17	27.30	28.53	Free	Free	57,90
08-00521-01010		25	1.5	2	1.94	12°	6	80	26.17	27.30	28.53	29.89	33.04	81,40
08-00520-01011		30	1.5	2	1.94	12°	4	70	31.38	32.74	34.23	Free	Free	66,20
08-00521-01012		30	1.5	2	1.94	12°	6	80	31.38	32.74	34.23	35.87	Free	92,40
08-00520-21251	R1.25	6	2.3	2.5	2.4	12°	4	45	6.44	6.68	6.93	7.21	7.87	45,20
08-00520-11251		10	2.3	2.5	2.4	12°	4	45	10.62	11.04	11.49	12.00	13.18	47,40
08-00520-11252		15	2.3	2.5	2.4	12°	4	50	15.83	16.48	17.20	17.98	Free	56,30
08-00520-11253		20	2.3	2.5	2.4	12°	4	55	21.04	21.93	22.90	Free	Free	66,20
08-00520-11255		30	2.3	2.5	2.4	12°	4	70	31.47	32.82	Free	Free	Free	70,60
08-00520-01500	R1.5	8	2.5	3	2.85	12°	6	60	8.64	8.96	9.31	9.70	10.60	42,50
08-00520-01501		10	2.5	3	2.85	12°	6	60	10.73	11.14	11.59	12.09	13.26	46,90
08-00520-31504		12	2.5	3	2.85	12°	6	60	12.81	13.32	13.88	14.49	15.91	49,10
08-00520-01503		15	2.5	3	2.85	12°	6	60	15.94	16.59	17.30	18.08	19.89	53,50
08-00520-01505		20	2.5	3	2.85	12°	6	65	21.16	22.04	23.00	24.06	26.53	53,50
08-00520-01506		25	2.5	3	2.85	12°	6	65	26.37	27.48	28.70	30.04	Free	53,50
08-00520-01507		30	2.5	3	2.85	12°	6	70	31.58	32.93	34.40	36.03	Free	61,80
08-00520-01508		35	2.5	3	2.85	12°	6	80	36.80	38.38	40.11	42.01	Free	77,20
08-00520-11501		40	2.5	3	2.85	12°	6	90	42.01	43.83	45.81	Free	Free	99,80
08-00520-02000		10	3	4	3.8	12°	6	65	10.83	11.22	11.66	12.14	13.25	43,60
08-00520-02001	R2	15	3	4	3.8	12°	6	65	16.04	16.67	17.36	18.12	19.89	53,90
08-00520-02003		20	3	4	3.8	12°	6	65	21.26	22.12	23.06	24.10	Free	56,30
08-00520-02004		25	3	4	3.8	12°	6	70	26.47	27.57	28.77	30.09	Free	56,30
08-00520-02005		30	3	4	3.8	12°	6	70	31.68	33.01	34.47	Free	Free	56,30
08-00520-02006		35	3	4	3.8	12°	6	80	36.90	38.46	Free	Free	Free	67,10
08-00520-02007		40	3	4	3.8	12°	6	85	42.11	43.91	Free	Free	Free	75,80
08-00520-02008		45	3	4	3.8	12°	6	90	47.33	49.36	Free	Free	Free	96,40
08-00520-02009		50	3	4	3.8	12°	6	100	52.54	54.80	Free	Free	Free	102,70
08-00520-13001		20	6	6	5.8	—	6	70	Free	Free	Free	Free	Free	71,70
08-00520-13002		25	6	6	5.8	—	6	70	Free	Free	Free	Free	Free	71,70
08-00520-03001	R3	30	6	6	5.8	—	6	80	Free	Free	Free	Free	Free	74,60
08-00520-13003		35	6	6	5.8	—	6	80	Free	Free	Free	Free	Free	76,90
08-00520-13004		40	6	6	5.8	—	6	90	Free	Free	Free	Free	Free	81,50
08-00520-13005		45	6	6	5.8	—	6	100	Free	Free	Free	Free	Free	86,70
08-00520-03003		50	6	6	5.8	—	6	120	Free	Free	Free	Free	Free	87,80

Scaricata
Long NeckRivestita
CoatingSferiche
BallP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio al carbonio/ Acciaio pretemprato Carbon Steels·Prehardened Steels S50C·NAK·HPM1 (~45HRC)				Acciaio temprato Hardened Steels SKD·STAVAX·HPM38 (~55HRC)				Rame Copper			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
0.1	0.5	2.5	0.01	0.02	250	20,000~50,000	0.01	0.01	210	20,000~50,000	0.01	0.02	250	20,000~50,000
	1	5	0.005	0.01	250	20,000~50,000	0.003	0.005	210	20,000~50,000	0.008	0.015	250	20,000~50,000
	1.5	7.5	0.003	0.01	150	20,000~50,000	0.003	0.005	120	20,000~50,000	0.005	0.015	150	20,000~50,000
0.15	1	3.3	0.007	0.01	250	20,000~50,000	0.005	0.01	210	20,000~50,000	0.01	0.02	250	20,000~50,000
	2	6.7	0.003	0.01	150	20,000~50,000	0.003	0.005	120	20,000~50,000	0.005	0.012	150	20,000~50,000
0.2	1	2.5	0.02	0.05	800	20,000~50,000	0.02	0.03	650	20,000~50,000	0.03	0.07	800	20,000~50,000
	1.5	3.8	0.02	0.03	700	20,000~50,000	0.01	0.02	600	20,000~50,000	0.03	0.05	700	20,000~50,000
	2	5	0.015	0.02	600	20,000~50,000	0.01	0.015	500	20,000~50,000	0.02	0.03	600	20,000~50,000
	2.5	6.3	0.015	0.02	450	20,000~50,000	0.01	0.015	380	20,000~50,000	0.02	0.03	450	20,000~50,000
	3	7.5	0.01	0.02	400	20,000~30,000	0.01	0.01	340	20,000~30,000	0.015	0.03	400	20,000~30,000
	4	10	0.005	0.01	250	20,000~30,000	0.005	0.007	210	20,000~30,000	0.008	0.015	250	20,000~30,000
	5	12.5	0.003	0.005	150	20,000~30,000	0.003	0.005	120	20,000~30,000	0.005	0.007	150	20,000~30,000
	6	15	0.002	0.004	100	20,000~30,000	0.002	0.003	80	20,000~30,000	0.003	0.005	100	20,000~30,000
0.25	2	4	0.02	0.04	600	20,000~50,000	0.02	0.03	510	20,000~50,000	0.03	0.06	600	20,000~50,000
	3	6	0.015	0.035	500	20,000~50,000	0.01	0.025	420	20,000~50,000	0.02	0.05	500	20,000~50,000
	4	8	0.012	0.02	400	20,000~50,000	0.005	0.01	340	20,000~50,000	0.018	0.03	400	20,000~50,000
	5	10	0.005	0.01	250	20,000~30,000	0.005	0.005	210	20,000~30,000	0.008	0.015	250	20,000~30,000
	6	12	0.005	0.005	150	20,000~30,000	0.003	0.003	120	20,000~30,000	0.008	0.008	150	20,000~30,000
	8	16	0.003	0.003	120	20,000~30,000	0.002	0.002	100	20,000~30,000	0.005	0.005	120	20,000~30,000
	10	20	0.002	0.002	80	20,000~30,000	0.001	0.001	60	20,000~30,000	0.003	0.003	80	20,000~30,000
	12	24	0.001	0.001	60	20,000~30,000	0.001	0.001	40	20,000~30,000	0.002	0.002	60	20,000~30,000
0.3	2	3.3	0.05	0.1	1,200	20,000~50,000	0.04	0.07	1,000	20,000~50,000	0.07	0.12	1,200	20,000~50,000
	3	5	0.025	0.1	1,000	20,000~50,000	0.03	0.05	850	20,000~50,000	0.04	0.1	1,000	20,000~50,000
	4	6.7	0.025	0.05	800	20,000~50,000	0.02	0.04	680	20,000~50,000	0.035	0.08	800	20,000~50,000
	5	8.3	0.02	0.04	500	20,000~30,000	0.01	0.02	420	20,000~30,000	0.03	0.06	500	20,000~30,000
	6	10	0.01	0.02	450	20,000~30,000	0.005	0.01	380	20,000~30,000	0.015	0.03	450	20,000~30,000
	7	11.7	0.008	0.02	400	20,000~30,000	0.005	0.005	340	20,000~30,000	0.012	0.03	400	20,000~30,000
	8	13.3	0.005	0.01	300	18,000~24,000	0.003	0.005	250	18,000~24,000	0.008	0.015	300	18,000~24,000
	10	16.7	0.003	0.005	200	18,000~24,000	0.002	0.003	150	18,000~24,000	0.005	0.01	200	18,000~24,000
0.4	2	2.5	0.1	0.15	2,000	20,000~50,000	0.1	0.12	1,700	20,000~50,000	0.15	0.2	2,000	20,000~50,000
	3	3.8	0.07	0.15	1,800	20,000~50,000	0.07	0.1	1,500	20,000~50,000	0.12	0.2	1,800	20,000~50,000
	4	5	0.05	0.12	1,500	20,000~50,000	0.05	0.08	1,300	20,000~50,000	0.1	0.2	1,500	20,000~50,000
	5	6.3	0.05	0.1	1,200	20,000~50,000	0.04	0.07	1,000	20,000~50,000	0.08	0.15	1,200	20,000~50,000
	6	7.5	0.05	0.08	900	20,000~30,000	0.03	0.05	750	20,000~30,000	0.07	0.12	900	20,000~30,000
	7	8.8	0.03	0.05	700	20,000~30,000	0.02	0.03	600	20,000~30,000	0.05	0.08	700	20,000~30,000
	8	10	0.015	0.03	500	18,000~24,000	0.01	0.01	420	18,000~24,000	0.02	0.05	500	18,000~24,000
	10	12.5	0.005	0.01	350	18,000~24,000	0.003	0.005	300	18,000~24,000	0.008	0.008	350	18,000~24,000
0.5	2	2	0.25	0.35	3,200	20,000~50,000	0.12	0.3	2,500	20,000~50,000	0.25	0.4	3,500	20,000~50,000
	3	3	0.2	0.3	3,000	20,000~50,000	0.12	0.3	2,500	20,000~50,000	0.25	0.4	3,000	20,000~50,000
	4	4	0.15	0.25	2,500	20,000~50,000	0.1	0.2	2,100	20,000~50,000	0.2	0.4	2,500	20,000~50,000
	5	5	0.1	0.25	2,000	20,000~50,000	0.08	0.17	1,700	20,000~50,000	0.15	0.35	2,000	20,000~50,000
	6	6	0.1	0.2	1,500	20,000~50,000	0.07	0.12	1,200	20,000~50,000	0.15	0.3	1,500	20,000~50,000
	7	7	0.08	0.2	1,300	20,000~30,000	0.06	0.1	1,100	20,000~30,000	0.12	0.3	1,300	20,000~30,000
	8	8	0.05	0.1	1,200	20,000~30,000	0.05	0.08	1,000	20,000~30,000	0.08	0.15	1,200	20,000~30,000
	9	9	0.04	0.06	1,000	20,000~30,000	0.05	0.05	850	20,000~30,000	0.06	0.1	1,000	20,000~30,000
	10	10	0.03	0.05	800	20,000~30,000	0.03	0.05	680	20,000~30,000	0.05	0.08	800	20,000~30,000
	12	12	0.015	0.025	600	16,000~20,000	0.01	0.03	510	16,000~20,000	0.02	0.04	600	16,000~20,000
	14	14	0.01	0.02	500	16,000~20,000	0.005	0.01	420	16,000~20,000	0.015	0.03	500	16,000~20,000
	16	16	0.005	0.01	250	12,000~16,000	0.005	0.01	210	12,000~16,000	0.01	0.015	250	12,000~16,000
	18	18	0.005	0.005	150	12,000~16,000	0.003	0.003	120	12,000~16,000	0.008	0.01	150	12,000~16,000
	20	20	0.005	0.005	100	12,000~16,000	0.003	0.003	80	12,000~16,000	0.008	0.008	100	12,000~16,000
	6	5	0.1	0.25	2,000	20,000~30,000	0.08	0.17	1,700	20,000~30,000	0.15	0.4	2,000	20,000~30,000
	8	6.7	0.08	0.2	1,300	20,000~30,000	0.06	0.15	1,100	20,000~30,000	0.12	0.3	1,300	20,000~30,000

Sferiche
BallScaricata
Long NeckRivestita
CoatingAcciaio al carbonio
Carbon Steel **P**Acciaio legato
Alloy Steel **P**Acciaio pretemprato
Prehardened Steel **P**Temprato ~52
Hardened Steel **H**Acciaio inox
Stainless Steel **M**Lega di alluminio
Aluminium Alloy **N**Rame
Copper **N**Resina
Resin **O**Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio al carbonio/ Acciaio pretemprato Carbon Steels • Prehardened Steels S50C • NAK • HPM1 (~45HRC)				Acciaio temprato Hardened Steels SKD • STAVAX • HPM38 (~55HRC)				Rame Copper			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
0.6	10	8.3	0.05	0.1	1,200	14,000~20,000	0.03	0.08	1,000	14,000~20,000	0.08	0.15	1,200	14,000~20,000
	12	10	0.03	0.05	800	14,000~20,000	0.02	0.04	680	14,000~20,000	0.05	0.08	800	14,000~20,000
0.75	8	5.3	0.1	0.25	2,400	20,000~30,000	0.08	0.18	2,000	20,000~30,000	0.15	0.4	2,400	20,000~30,000
	10	6.7	0.08	0.2	1,800	20,000~30,000	0.06	0.12	1,500	20,000~30,000	0.12	0.3	1,800	20,000~30,000
	12	8	0.07	0.13	1,200	18,000~24,000	0.05	0.09	1,000	18,000~24,000	0.1	0.2	1,200	18,000~24,000
	14	9.3	0.06	0.1	1,200	18,000~24,000	0.04	0.07	1,000	18,000~24,000	0.1	0.15	1,200	18,000~24,000
	16	10.7	0.05	0.08	800	12,000~18,000	0.035	0.06	680	12,000~18,000	0.07	0.12	800	12,000~18,000
	18	12	0.03	0.05	500	12,000~18,000	0.02	0.04	420	12,000~18,000	0.05	0.08	500	12,000~18,000
	20	13.3	0.02	0.04	400	12,000~18,000	0.015	0.03	340	12,000~18,000	0.03	0.06	400	12,000~18,000
0.8	8	5	0.1	0.3	3,000	18,000~24,000	0.09	0.2	2,500	18,000~24,000	0.15	0.45	3,000	18,000~24,000
	12	7.5	0.07	0.15	1,800	18,000~24,000	0.06	0.12	1,500	18,000~24,000	0.1	0.25	1,800	18,000~24,000
	16	10	0.05	0.1	650	12,000~18,000	0.035	0.07	550	12,000~18,000	0.08	0.15	650	12,000~18,000
	20	12.5	0.03	0.05	450	12,000~18,000	0.02	0.04	380	12,000~18,000	0.05	0.08	450	12,000~18,000
1	4	2	0.3	0.5	4,000	20,000~30,000	0.2	0.45	3,400	20,000~30,000	0.45	0.7	4,000	20,000~30,000
	6	3	0.25	0.5	3,000	20,000~30,000	0.2	0.4	2,500	20,000~30,000	0.38	0.7	3,000	20,000~30,000
	8	4	0.2	0.3	2,500	16,000~20,000	0.15	0.3	2,100	16,000~20,000	0.3	0.45	2,500	16,000~20,000
	10	5	0.15	0.3	2,500	16,000~20,000	0.1	0.2	2,100	16,000~20,000	0.23	0.45	2,500	16,000~20,000
	12	6	0.13	0.2	1,800	12,000~16,000	0.1	0.15	1,500	12,000~16,000	0.2	0.3	1,800	12,000~16,000
	14	7	0.1	0.2	1,800	12,000~16,000	0.07	0.13	1,500	12,000~16,000	0.15	0.3	1,800	12,000~16,000
	16	8	0.1	0.15	1,600	10,000~14,000	0.06	0.11	1,400	10,000~14,000	0.15	0.25	1,600	10,000~14,000
	18	9	0.07	0.12	1,600	10,000~14,000	0.05	0.1	1,400	10,000~14,000	0.1	0.2	1,600	10,000~14,000
	20	10	0.06	0.1	1,000	8,000~12,000	0.05	0.07	850	8,000~12,000	0.1	0.15	1,000	8,000~12,000
	22	11	0.05	0.1	1,000	8,000~12,000	0.04	0.06	850	8,000~12,000	0.08	0.15	1,000	8,000~12,000
	25	12.5	0.03	0.05	800	8,000~12,000	0.03	0.04	680	8,000~12,000	0.05	0.08	800	8,000~12,000
	30	15	0.02	0.04	420	6,000~10,000	0.02	0.04	360	6,000~10,000	0.03	0.06	420	6,000~10,000
1.25	6	2.4	0.35	0.5	4,000	16,000~20,000	0.3	0.4	3,400	16,000~20,000	0.5	0.8	4,000	16,000~20,000
	10	4	0.2	0.5	3,000	16,000~20,000	0.25	0.35	2,500	16,000~20,000	0.3	0.8	3,000	16,000~20,000
	15	6	0.15	0.3	2,500	16,000~20,000	0.1	0.2	2,100	16,000~20,000	0.25	0.45	2,500	16,000~20,000
	20	8	0.1	0.2	1,800	12,000~16,000	0.08	0.15	1,500	12,000~16,000	0.15	0.3	1,800	12,000~16,000
	25	10	0.075	0.14	1,100	10,000~14,000	0.05	0.1	930	10,000~14,000	0.1	0.2	1,100	10,000~14,000
1.5	30	12	0.04	0.08	800	8,000~12,000	0.02	0.06	680	8,000~12,000	0.06	0.15	800	8,000~12,000
	8	2.7	0.3	0.5	4,000	16,000~20,000	0.2	0.5	3,400	16,000~20,000	0.45	0.8	4,000	16,000~20,000
	10	3.3	0.3	0.5	4,000	16,000~20,000	0.2	0.45	3,400	16,000~20,000	0.45	0.8	4,000	16,000~20,000
	12	4	0.2	0.4	3,000	16,000~20,000	0.2	0.4	2,500	16,000~20,000	0.3	0.6	3,000	16,000~20,000
	15	5	0.15	0.4	3,000	16,000~20,000	0.13	0.35	2,500	16,000~20,000	0.23	0.6	3,000	16,000~20,000
	20	6.7	0.15	0.3	1,800	12,000~16,000	0.1	0.2	1,500	12,000~16,000	0.23	0.45	1,800	12,000~16,000
	25	8.3	0.13	0.27	1,200	12,000~16,000	0.1	0.16	1,000	12,000~16,000	0.2	0.4	1,200	12,000~16,000
	30	10	0.1	0.2	800	8,000~12,000	0.07	0.12	680	8,000~12,000	0.15	0.3	800	8,000~12,000
2	35	11.7	0.07	0.15	600	8,000~12,000	0.05	0.1	510	8,000~12,000	0.1	0.2	600	8,000~12,000
	40	13.3	0.05	0.1	460	6,000~10,000	0.05	0.07	390	6,000~10,000	0.08	0.15	460	6,000~10,000
	10	2.5	0.35	0.8	4,000	16,000~20,000	0.25	0.7	3,400	16,000~20,000	0.55	1.2	4,000	16,000~20,000
	15	3.8	0.25	0.55	3,500	16,000~20,000	0.2	0.4	3,000	16,000~20,000	0.38	0.8	3,500	16,000~20,000
	20	5	0.2	0.35	3,300	16,000~20,000	0.15	0.3	2,800	16,000~20,000	0.3	0.5	3,300	16,000~20,000
	25	6.3	0.15	0.3	2,600	12,000~16,000	0.12	0.25	2,200	12,000~16,000	0.23	0.45	2,600	12,000~16,000
	30	7.5	0.12	0.25	2,600	12,000~16,000	0.1	0.2	2,200	12,000~16,000	0.2	0.4	2,600	12,000~16,000
	35	8.8	0.12	0.2	1,800	10,000~14,000	0.07	0.15	1,500	10,000~14,000	0.18	0.3	1,800	10,000~14,000
	40	10	0.1	0.15	1,200	10,000~14,000	0.07	0.12	1,000	10,000~14,000	0.15	0.2	1,200	10,000~14,000
	45	11.3	0.07	0.12	800	10,000~14,000	0.05	0.1	700	10,000~14,000	0.1	0.17	800	10,000~14,000
	50	12.5	0.07	0.1	600	6,000~10,000	0.05	0.07	500	6,000~10,000	0.1	0.15	600	6,000~10,000

Scaricata
Long Neck



Rivestita
Coating

Steriche
Ball

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

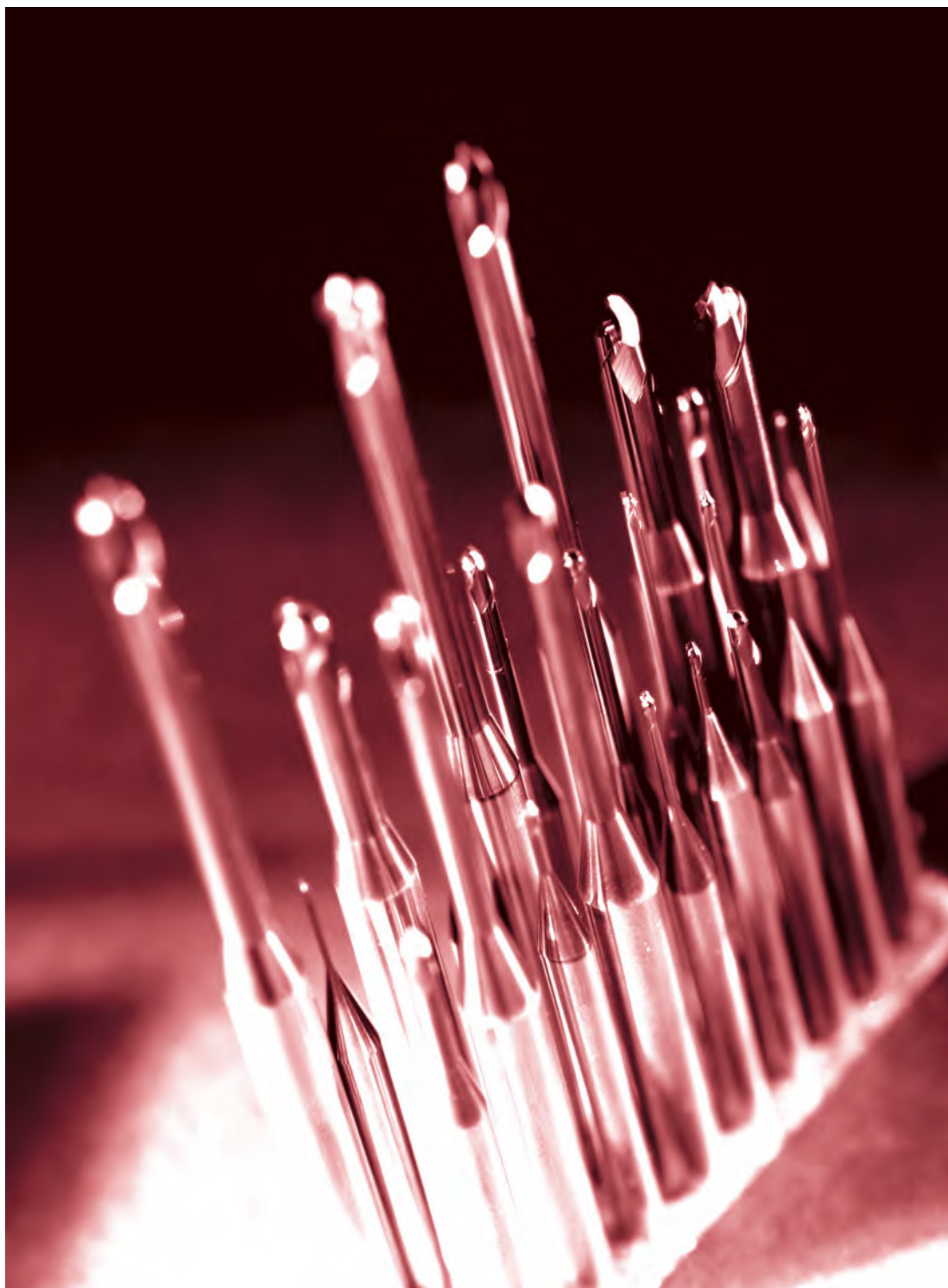
Materiale Work Material			Acciaio al carbonio/ Acciaio pretemprato Carbon Steels•Prehardened Steels S50C•NAK•HPM1 (~45HRC)				Acciaio temprato Hardened Steels SKD•STAVAX•HPM38 (~55HRC)				Rame Copper			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
2.5	10	2	0.4	1.2	4,000	16,000~20,000	0.3	1	3,400	16,000~20,000	0.6	1.8	4,000	16,000~20,000
	15	3	0.35	1	4,000	16,000~20,000	0.3	0.9	3,400	16,000~20,000	0.55	1.5	4,000	16,000~20,000
	20	4	0.3	0.7	4,000	16,000~20,000	0.25	0.7	3,400	16,000~20,000	0.45	1	4,000	16,000~20,000
	25	5	0.25	0.6	3,000	14,000~16,000	0.2	0.5	2,500	14,000~16,000	0.38	0.9	3,000	14,000~16,000
	30	6	0.2	0.5	2,400	14,000~16,000	0.15	0.4	2,000	14,000~16,000	0.3	0.8	2,400	14,000~16,000
	35	7	0.15	0.4	1,600	10,000~14,000	0.15	0.3	1,400	10,000~14,000	0.23	0.6	1,600	10,000~14,000
	40	8	0.15	0.3	1,200	8,000~12,000	0.12	0.2	1,000	8,000~12,000	0.23	0.45	1,200	8,000~12,000
	45	9	0.12	0.2	1,000	8,000~12,000	0.1	0.15	850	8,000~12,000	0.18	0.3	1,000	8,000~12,000
	50	10	0.1	0.15	680	6,000~10,000	0.07	0.1	570	6,000~10,000	0.15	0.25	680	6,000~10,000
3	20	3.3	0.5	1.2	4,000	14,000~18,000	0.35	1.1	3,400	14,000~18,000	0.75	1.8	4,000	14,000~18,000
	25	4.2	0.4	1	4,000	14,000~18,000	0.3	0.8	3,400	14,000~18,000	0.6	1.5	4,000	14,000~18,000
	30	5	0.35	0.7	3,000	8,000~12,000	0.25	0.6	2,500	8,000~12,000	0.53	1	3,000	8,000~12,000
	35	5.8	0.35	0.5	2,500	8,000~12,000	0.2	0.5	2,100	8,000~12,000	0.53	0.8	2,500	8,000~12,000
	40	6.7	0.25	0.4	2,300	8,000~12,000	0.2	0.4	1,900	8,000~12,000	0.38	0.6	2,300	8,000~12,000
	45	7.5	0.25	0.4	1,500	6,000~ 8,000	0.2	0.35	1,200	6,000~ 8,000	0.38	0.6	1,500	6,000~ 8,000
	50	8.3	0.2	0.4	1,500	6,000~ 8,000	0.2	0.3	1,200	6,000~ 8,000	0.3	0.6	1,500	6,000~ 8,000
Note Notes			※1 I Parametri di taglio raccomandati sono solo di riferimento e sono da regolare in funzione del pezzo da lavorare e le condizioni della macchina. ※2 Profondità di taglio: ap=Profondità di taglio assiale, ae=Profondità di taglio radiale. ※3 Ridurre con la stessa proporzione giri ed avanzamento, per eliminare vibrazioni o in caso di limitato numero di giri della macchina. ※4 Qualora il rapporto L/D superasse 15, trovare la condizione adeguata considerando il profilo della lavorazione. ※5 Si raccomanda l'uso di lubrificazione minimale per lavorare acciai temprati. ※1 Recommend to use the milling condition as just reference. Adjust milling conditions according to machining shape and machine status. ※2 Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut. ※3 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine. ※4 In case L/D exceeds 15, find an adequate condition considering machining profile. ※5 Oil mist coolant is recommended for the machining of hardened steels.											

- Acciaio al carbonio Carbon Steel **P**
- Acciaio legato Alloy Steel **P**
- Acciaio pretemprato Prehardened Steel **P**
- Temprato~52 Hardened Steel HRC **H**

Acciaio inox Stainless Steel **M**

- Lega di alluminio Aluminium Alloy **N**
- Rame Copper **N**
- Resina Resin **O**

Rivestimento
MUGEN
Regular Line
MUGEN COATING



Scaricata
Long Neck



Rivestita
Coating

Sferiche
Ball

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli sferiche con sforno conico serie lunga MUGEN

Totale 139 misure

MUGEN COATING 2-Flute Long Taper Neck Ball End Mill

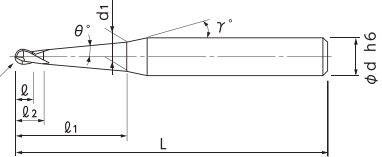
Total 139 sizes

Sforno conico per aumentare la rigidità. L/D fino a 36.
Possibilità di utilizzare la stessa inclinazione del pezzo da lavorare

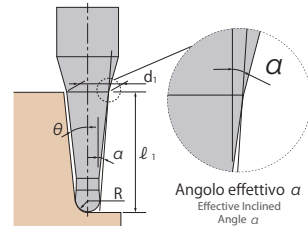
Taper neck to improve tool rigidity. L/D up to 36.
Option of same taper angle as inclined working angle



R < 0.25 R ± 0.005
R ≥ 0.25 R ± 0.01



- È possibile incrementare la rigidità grazie allo sforno conico.
- Profondità di taglio maggiore rispetto alle frese convenzionali.
- It is possible to increase rigidity with the neck taper.
- The volume of depth of cut will be more than conventional end mills.



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(θ) Angolo scarico Neck Taper Angle	(ℓ1) Lungh. scarico Under Neck Length	(d1) Diametro scarico Neck Dia.	(ℓ) Lungh. tagliente Length of Cut	(ℓ2) Lungh. scarico 2 Under Neck Length 2	(γ) Angolo Neck Taper Angle 2	(α) Angolo effettivo Effective Inclined Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00570-01020	R0.1	30°	1	0.21	0.2	0.4	12°	0°19'	4	50	75,00
08-00570-01021			1.5	0.22	0.2	0.4	12°	0°23'	4	50	80,50
08-00570-01022			2	0.23	0.2	0.4	12°	0°25'	4	50	84,90
08-00570-01040		1°	1	0.22	0.2	0.4	12°	0°38'	4	50	75,00
08-00570-01041			1.5	0.24	0.2	0.4	12°	0°47'	4	50	80,50
08-00570-01042			2	0.26	0.2	0.4	12°	0°51'	4	50	84,90
08-00570-01050		1°30'	1	0.23	0.2	0.4	12°	0°57'	4	50	75,00
08-00570-01051			1.5	0.26	0.2	0.4	12°	1°11'	4	50	80,50
08-00570-01052			2	0.28	0.2	0.4	12°	1°16'	4	50	84,90
08-00570-01060		2°	1	0.24	0.2	0.4	12°	1°16'	4	50	75,00
08-00570-01061			1.5	0.28	0.2	0.4	12°	1°35'	4	50	80,50
08-00570-01062			2	0.31	0.2	0.4	12°	1°41'	4	50	84,90
08-00570-01080		3°	1	0.26	0.2	0.4	12°	1°54'	4	50	75,00
08-00570-01081			1.5	0.32	0.2	0.4	12°	2°21'	4	50	80,50
08-00570-01082			2	0.37	0.2	0.4	12°	2°32'	4	50	84,90
08-00570-01092		5°	2	0.48	0.2	0.4	12°	4°13'	4	50	84,90
08-00570-01521	R0.15	30°	3	0.34	0.3	0.6	12°	0°25'	4	50	84,90
08-00570-01540		1°	2	0.35	0.3	0.6	12°	0°45'	4	50	80,50
08-00570-01541			3	0.38	0.3	0.6	12°	0°51'	4	50	84,90
08-00570-01550		1°30'	2	0.37	0.3	0.6	12°	1°08'	4	50	80,50
08-00570-01551			3	0.43	0.3	0.6	12°	1°16'	4	50	84,90
08-00570-01561		2°	3	0.47	0.3	0.6	12°	1°41'	4	50	84,90
08-00570-01581		3°	3	0.55	0.3	0.6	12°	2°32'	4	50	84,90
08-00570-01591		5°	3	0.72	0.3	0.6	12°	4°13'	4	50	84,90
08-00570-02021	R0.2	30°	2	0.42	0.4	0.8	12°	0°20'	4	50	61,80
08-00570-02022			4	0.46	0.4	0.8	12°	0°25'	4	50	61,80
08-00570-02041		1°	2	0.44	0.4	0.8	12°	0°40'	4	50	61,80
08-00570-02042			4	0.51	0.4	0.8	12°	0°51'	4	50	61,80
08-00570-02051		1°30'	2	0.46	0.4	0.8	12°	1°00'	4	50	61,80
08-00570-02052			4	0.57	0.4	0.8	12°	1°16'	4	50	61,80

Attenzione
How to Order

Quando ordinate, indicate MRBTN230 (R) × (θ) × (ℓ1).
When you order, indicate MRBTN230 (R) × (θ) × (ℓ1).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Sferiche
Ball

Scarico conico
Taper Neck

Rivestito
Coating

Acciaio al carbonio
Carbon Steel

Acciaio legato
Alloy Steel

Acciaio pretemprato
Prehardened Steel

Temprato ~52
Hardened Steel

Acciaio inox
Stainless Steel

Lega di alluminio
Aluminium Alloy

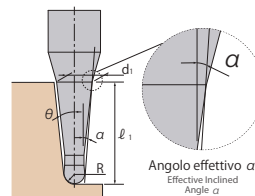
Rame
Copper

Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli sferiche con sforno conico serie lunga MUGEN

MUGEN COATING 2-Flute Long Taper Neck Ball End Mill



Unità [misura: mm]

Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(θ) Angolo scarico Neck Taper Angle	(L1) Lungh. scarico Under Neck Length	(d1) Diametro scarico Neck Dia.	(L) Lungh. tagliente Length of Cut	(L2) Lungh. scarico 2 Under Neck Length 2	(γ) Angolo Neck Taper Angle 2	(α) Angolo effettivo Effective Inclined Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00570-02061	R0.2	2°	2	0.48	0.4	0.8	12°	1°20'	4	50	61,80
08-00570-02062			4	0.62	0.4	0.8	12°	1°41'	4	50	61,80
08-00570-02081		3°	2	0.53	0.4	0.8	12°	2°00'	4	50	61,80
08-00570-02082			4	0.74	0.4	0.8	12°	2°31'	4	50	61,80
08-00570-02092		5°	4	0.96	0.4	0.8	12°	4°13'	4	50	61,80
08-00570-02521	R0.25	30°	3	0.53	0.5	1	12°	0°22'	4	50	58,50
08-00570-02522			5	0.57	0.5	1	12°	0°25'	4	50	60,10
08-00570-02541		1°	3	0.57	0.5	1	12°	0°44'	4	50	58,50
08-00570-02542			5	0.64	0.5	1	12°	0°51'	4	50	60,10
08-00570-02551		1°30'	3	0.6	0.5	1	12°	1°06'	4	50	58,50
08-00570-02552			5	0.71	0.5	1	12°	1°16'	4	50	60,10
08-00570-02561		2°	3	0.64	0.5	1	12°	1°27'	4	50	58,50
08-00570-02562			5	0.78	0.5	1	12°	1°41'	4	50	60,10
08-00570-02581		3°	3	0.71	0.5	1	12°	2°11'	4	50	58,50
08-00570-02582			5	0.92	0.5	1	12°	2°32'	4	50	60,10
08-00570-02592		5°	5	1.2	0.5	1	12°	4°13'	4	50	60,10
08-00570-03021	R0.3	30°	5	0.67	0.6	1.2	12°	0°24'	4	50	57,90
08-00570-03022			8	0.72	0.6	1.2	12°	0°27'	4	50	59,60
08-00570-03041		1°	5	0.73	0.6	1.2	12°	0°49'	4	50	57,90
08-00570-03042			8	0.84	0.6	1.2	12°	0°53'	4	50	59,60
08-00570-03051		1°30'	5	0.8	0.6	1.2	12°	1°13'	4	50	57,90
08-00570-03052			8	0.96	0.6	1.2	12°	1°19'	4	50	59,60
08-00570-03061		2°	6	0.94	0.6	1.2	12°	1°41'	4	50	57,90
08-00570-03062			8	1.07	0.6	1.2	12°	1°46'	4	50	59,60
08-00570-03081		3°	6	1.1	0.6	1.2	12°	2°32'	4	50	57,90
08-00570-03082			8	1.31	0.6	1.2	12°	2°39'	4	50	59,60
08-00570-03092		5°	8	1.79	0.6	1.2	12°	4°25'	4	50	59,60
08-00570-05021	R0.5	30°	10	1.14	1	2	12°	0°25'	4	60	53,00
08-00570-05022			15	1.23	1	2	12°	0°27'	4	60	55,20
08-00570-05023			20	1.31	1	2	12°	0°28'	4	70	66,70
08-00570-05040		1°	8	1.21	1	2	12°	0°48'	4	60	47,40
08-00570-05041			10	1.28	1	2	12°	0°50'	4	60	53,00
08-00570-05044			12	1.35	1	2	12°	0°52'	4	60	53,00
08-00570-05042			15	1.45	1	2	12°	0°54'	4	60	55,20
08-00570-05043			20	1.63	1	2	12°	0°55'	4	70	66,70
08-00570-05050		1°30'	8	1.31	1	2	12°	1°12'	4	60	47,40
08-00570-05051			10	1.42	1	2	12°	1°16'	4	60	53,00
08-00570-05054			12	1.52	1	2	12°	1°18'	4	60	53,00
08-00570-05052			15	1.68	1	2	12°	1°21'	4	60	55,20
08-00570-05053			20	1.94	1	2	12°	1°23'	4	70	66,70
08-00570-05061		2°	10	1.56	1	2	12°	1°41'	4	60	53,00

Scarico conico
Taper Neck

Sferiche
Ball

Rivestita
Coating

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

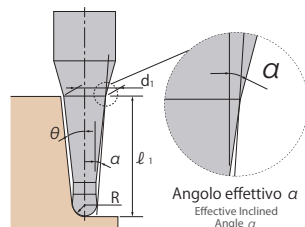
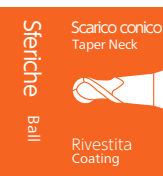
O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

MRBTN230

Frese 2 tagli sferiche con sforno conico serie lunga MUGEN

MUGEN COATING 2-Flute Long Taper Neck Ball End Mill



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(θ) Angolo scarico Neck Taper Angle	(ℓ1) Lungh. scarico Under Neck Length	(d1) Diametro scarico Neck Dia.	(ℓ) Lungh. tagliente Length of Cut	(ℓ2) Lungh. scarico 2 Under Neck Length 2	(γ) Angolo Neck Taper Angle	(α) Angolo effettivo Effective Inclined Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00570-05062	R0.5	2°	15	1.91	1	2	12°	1°48′	4	60	55,20
08-00570-05063			20	2.26	1	2	12°	1°51′	4	70	66,70
08-00570-05081			10	1.84	1	2	12°	2°31′	4	60	53,00
08-00570-05082		3°	15	2.36	1	2	12°	2°41′	4	60	55,20
08-00570-05083			20	2.89	1	2	12°	2°46′	4	70	66,70
08-00570-05093			20	4.15	1	2	12°	4°37′	6	70	90,50
08-00570-07520	R0.75	30′	10	1.62	1.5	3	12°	0°23′	4	60	55,20
08-00570-07521			15	1.71	1.5	3	12°	0°25′	4	60	60,10
08-00570-07522			30	1.97	1.5	3	12°	0°28′	4	70	84,90
08-00570-07540		1°	10	1.74	1.5	3	12°	0°45′	4	60	55,70
08-00570-07541			15	1.92	1.5	3	12°	0°51′	4	60	60,10
08-00570-07543			20	2.09	1.5	3	12°	0°53′	4	60	66,70
08-00570-07542		1°30′	30	2.44	1.5	3	12°	0°55′	4	70	84,90
08-00570-07550			10	1.87	1.5	3	12°	1°08′	4	60	55,20
08-00570-07551			15	2.13	1.5	3	12°	1°16′	4	60	60,10
08-00570-07552		2°	30	2.91	1.5	3	12°	1°23′	4	70	84,90
08-00570-07560			10	1.99	1.5	3	12°	1°31′	4	60	55,20
08-00570-07561			15	2.34	1.5	3	12°	1°41′	4	60	60,10
08-00570-07563		3°	20	2.69	1.5	3	12°	1°46′	4	60	73,90
08-00570-07562			30	3.39	1.5	3	12°	1°51′	6	70	103,10
08-00570-07581			15	2.76	1.5	3	12°	2°32′	4	60	60,10
08-00570-07583		5°	20	3.28	1.5	3	12°	2°39′	4	60	73,90
08-00570-07582			30	4.33	1.5	3	12°	2°46′	6	70	103,10
08-00570-07591			15	3.6	1.5	3	12°	4°13′	6	60	73,40
08-00570-07592			28.7	6	1.5	3	—	4°36′	6	70	103,10
08-00570-10020	R1	30′	16	2.21	2	4	12°	0°24′	4	60	50,20
08-00570-10021			20	2.28	2	4	12°	0°25′	4	60	60,10
08-00570-10022			30	2.45	2	4	12°	0°27′	4	70	73,90
08-00570-10023			40	2.63	2	4	12°	0°28′	4	80	87,10
08-00570-10040		1°	16	2.42	2	4	12°	0°48′	4	60	50,20
08-00570-10041			20	2.56	2	4	12°	0°51′	4	60	60,10
08-00570-10044			25	2.73	2	4	12°	0°53′	4	60	66,70
08-00570-10042			30	2.91	2	4	12°	0°54′	4	70	73,90
08-00570-10043			40	3.26	2	4	12°	0°55′	6	80	111,00
08-00570-10049		1°30′	12	2.42	2	4	12°	1°05′	4	60	48,00
08-00570-10050			16	2.63	2	4	12°	1°12′	4	60	50,20
08-00570-10051			20	2.84	2	4	12°	1°16′	4	60	60,10
08-00570-10054			25	3.1	2	4	12°	1°19′	4	60	66,70
08-00570-10052			30	3.36	2	4	12°	1°21′	6	70	95,90

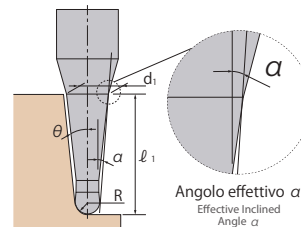
Attenzione
How to Order

Quando ordinate, indicate MRBTN230 (R) × (θ) × (ℓ1).
When you order, indicate MRBTN230 (R) × (θ) × (ℓ1).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Frese 2 tagli sferiche con sforno conico serie lunga MUGEN

MUGEN COATING 2-Flute Long Taper Neck Ball End Mill

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(θ) Angolo scarico Neck Taper Angle	(l ₁) Lungh. scarico Under Neck Length	(d ₁) Diametro scarico Neck Dia.	(l) Lungh. tagliente Length of Cut	(l ₂) Lungh. scarico 2 Under Neck Length 2	(γ) Angolo Neck Taper Angle	(α) Angolo effettivo Effective Inclined Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00570-10053	R1	1°30'	40	3.89	2	4	12°	1°23'	6	80	111,00
08-00570-10060		2°	16	2.84	2	4	12°	1°36'	4	60	50,20
08-00570-10061			20	3.12	2	4	12°	1°41'	4	60	63,40
08-00570-10062			30	3.82	2	4	12°	1°48'	6	70	95,90
08-00570-10063			40	4.51	2	4	12°	1°51'	6	80	111,00
08-00570-10080		3°	16	3.26	2	4	12°	2°24'	4	60	50,20
08-00570-10081			20	3.68	2	4	12°	2°31'	6	70	74,10
08-00570-10082			30	4.73	2	4	12°	2°41'	6	70	95,90
08-00570-10083		5°	40	5.77	2	4	12°	2°46'	6	80	111,00
08-00570-10091			20	4.8	2	4	12°	4°13'	6	70	100,70
08-00570-10092			26.8	6	2	4	—	4°25'	6	70	109,20
08-00570-10093			38.2	8	2	4	—	4°36'	8	80	185,00
08-00570-15020	R1.5	30°	30	3.43	3	6	12°	0°26'	6	70	91,70
08-00570-15022			40	3.6	3	6	12°	0°27'	6	80	100,70
08-00570-15021			50	3.77	3	6	12°	0°27'	6	90	118,30
08-00570-15040		1°	30	3.84	3	6	12°	0°51'	6	70	91,70
08-00570-15042			40	4.19	3	6	12°	0°53'	6	80	100,70
08-00570-15041			50	4.54	3	6	12°	0°54'	6	90	118,30
08-00570-15050		1°30'	30	4.26	3	6	12°	1°16'	6	70	91,70
08-00570-15052			40	4.78	3	6	12°	1°19'	6	80	100,70
08-00570-15051			50	5.3	3	6	12°	1°22'	6	90	118,30
08-00570-15060		2°	30	4.68	3	6	12°	1°41'	6	70	106,20
08-00570-15061			48.9	6	3	6	—	1°49'	6	90	118,30
08-00570-15080		3°	30	5.52	3	6	12°	2°32'	6	70	106,20
08-00570-15081			50	7.61	3	6	12°	2°43'	8	90	243,30
08-00570-20020	R2	30°	40	4.56	4	8	12°	0°25'	6	90	129,20
08-00570-20021			60	4.91	4	8	12°	0°27'	6	110	147,40
08-00570-20040		1°	40	5.12	4	8	12°	0°50'	6	90	129,20
08-00570-20041			60	5.82	4	8	12°	0°54'	6	110	147,40

Scarico conico
Taper Neck

Sferiche
Ball

Rivestita
Coating

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions



Materiale Work Material			Acciaio al carbonio/Acciaio legato/Acciaio pretemprato Carbon Steels·Alloy Steels·Prehardened Steels S50C·SCM·SKD·SUS·HPM·NAK			
Raggio Radius	Angolo scarico Neck Taper Angle	Lungh. scarico Under Neck Length	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			ap mm	ae mm		
0.1	30'	1	0.01	0.01	~300	20,000
		1.5	0.005	0.005		
		2	0.005	0.005		
	1°	1	0.01	0.01		
		1.5	0.005	0.005		
		2	0.005	0.005		
	1°30'	1	0.01	0.01		
		1.5	0.005	0.01		
		2	0.005	0.01		
	2°	1	0.01	0.01		
		1.5	0.01	0.01		
		2	0.01	0.01		
0.15	30'	1	0.01	0.02	~300	20,000
		2	0.01	0.02		
	1°	1	0.01	0.01		
		2	0.01	0.01		
	1°30'	1	0.01	0.01		
		2	0.01	0.01		
	2°	3	0.01	0.02		
0.2	30'	2	0.01	0.02	~500	20,000
		4	0.01	0.02		
	1°	2	0.01	0.02		
		4	0.01	0.02		
	1°30'	2	0.01	0.03		
		4	0.01	0.03		
	2°	2	0.02	0.03		
		4	0.02	0.03		
	3°	2	0.02	0.05		
		4	0.02	0.05		
0.25	30'	2	0.01	0.02	~500	20,000
		5	0.01	0.02		
	1°	3	0.01	0.02		
		5	0.01	0.02		
	1°30'	3	0.01	0.03		
		5	0.01	0.03		
	2°	3	0.02	0.03		
		5	0.02	0.03		
	3°	3	0.02	0.05		
		5	0.02	0.05		
0.3	30'	3	0.01	0.02	~800	20,000
		5	0.01	0.02		
	1°	3	0.01	0.02		
		5	0.01	0.02		
	1°30'	3	0.01	0.03		
		5	0.01	0.03		
	2°	3	0.02	0.03		
		5	0.02	0.03		
	3°	3	0.02	0.05		
		5	0.02	0.05		
0.5	30'	5	0.01	0.02	~1,200	16,000~20,000
		8	0.01	0.02		
		10	0.01	0.02		



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio al carbonio/Acciaio legato/Acciaio pretemprato Carbon Steels • Alloy Steels • Prehardened Steels S50C • SCM • SKD • SUS • HPM • NAK			
Raggio Radius	Angolo scarico Neck Taper Angle	Lungh. scarico Under Neck Length	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			ap mm	ae mm		
0.5	1°	8	0.03	0.06	~1,200	16,000~20,000
		10	0.02	0.05		
		12	0.02	0.05		
		15	0.02	0.03		
		20	0.01	0.02		
	1°30'	8	0.05	0.1		
		10	0.03	0.05		
		12	0.02	0.05		
		15	0.02	0.03		
		20	0.01	0.05		
	2°	10	0.05	0.1		
		15	0.02	0.05		
		20	0.01	0.03		
		10	0.07	0.15		
	3°	15	0.03	0.05		
		20	0.02	0.05		
		20	0.03	0.05		
0.75	30'	10	0.1	0.2	~1,200	16,000~20,000
		15	0.05	0.1		
		30	0.01	0.01		
	1°	10	0.1	0.2		
		15	0.05	0.1		
		20	0.02	0.05		
	1°30'	10	0.1	0.2		
		15	0.05	0.1		
		30	0.01	0.02		
	2°	10	0.1	0.3		
		15	0.05	0.12		
		20	0.03	0.05		
		30	0.02	0.03		
	3°	15	0.1	0.15		
		20	0.05	0.07		
		30	0.03	0.05		
	5°	15	0.1	0.2		
		28.7	0.05	0.07		
1	30'	16	0.07	0.15	~1,600	16,000~20,000
		20	0.05	0.1		
		30	0.02	0.05		
		40	0.01	0.015		
	1°	16	0.08	0.15		
		20	0.05	0.1		
		25	0.03	0.05		
		30	0.02	0.05		
		40	0.01	0.02		
	1°30'	12	0.15	0.3		
		16	0.1	0.15		
		20	0.05	0.12		
		25	0.03	0.07		
		30	0.03	0.05		
	2°	40	0.01	0.02		
		16	0.1	0.2		
		20	0.07	0.15		
		30	0.03	0.1		
	3°	40	0.02	0.03		
		16	0.1	0.3		
		20	0.07	0.2		
		30	0.05	0.1		
	5°	40	0.02	0.05		
		20	0.1	0.3		
		26.8	0.08	0.2		
		38.2	0.05	0.12		

Scarico conico
Taper Neck



Rivestita
Coating

Sferiche
Ball

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

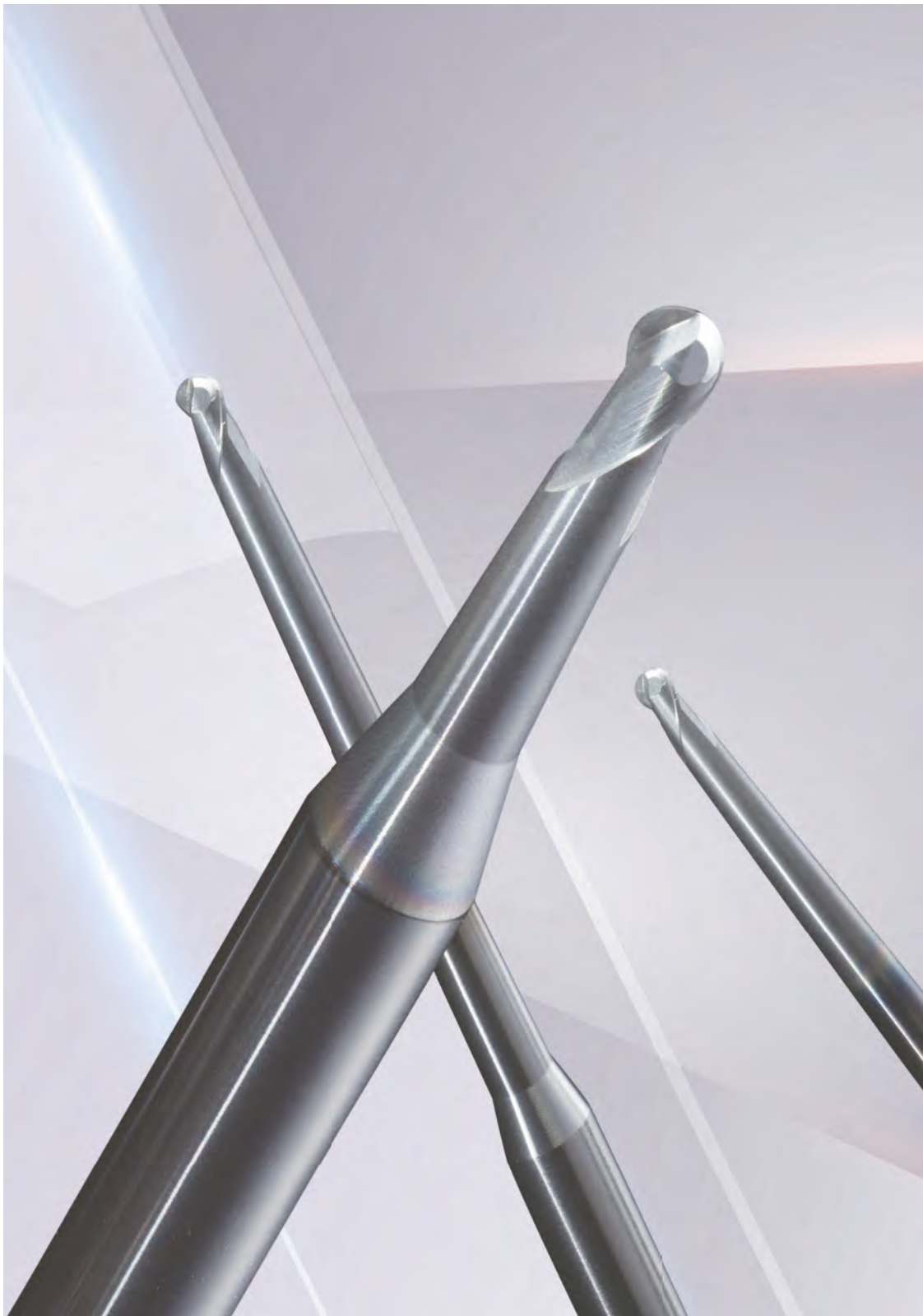


Materiale Work Material			Acciaio al carbonio/Acciaio legato/Acciaio pretemprato Carbon Steels•Alloy Steels•Prehardened Steels S50C•SCM•SKD•SUS•HPM•NAK			
Raggio Radius	Angolo scarico Neck Taper Angle	Lungh. scarico Under Neck Length	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm	mm/min	g/min
1.5	30′	30	0.03	0.05	~1,600	16,000
		40	0.02	0.03		
		50	0.01	0.01		
	1°	30	0.05	0.07		
		40	0.02	0.05		
		50	0.01	0.02		
	1°30′	30	0.07	0.1		
		40	0.03	0.05		
		50	0.02	0.03		
	2°	30	0.1	0.1		
		48.9	0.03	0.05		
	3°	30	0.1	0.15		
		50	0.05	0.1		
2	30′	40	0.05	0.1	~1,400	14,000
		60	0.01	0.02		
	1°	40	0.07	0.2		
		60	0.01	0.03		
Note Notes	※ 1 Quando si decidono i parametri di taglio, nel caso in cui la lunghezza effettiva sia lunga e/o l'angolo sia piccolo, si consiglia di scegliere sia la profondità assiale che la profondità radiale al livello inferiore entro la gamma specifica. ※ 2 Regolate nella stessa proporzione giri ed avanzamento. ※ 3 Usare lubrificante con ritardanti di fumo. ※ 4 Vi raccomandiamo di usare la lubrificazione minima per la lavorazione di acciai temprati. ※ 1 When deciding milling condition in case the effective length is long and/or the neck taper angle is small, it is recommended both axial depth of cut and radial depth of cut values are chosen at lower level within the specified range. ※ 2 Adjust both spindle speed and feed at the same rate. ※ 3 Use cutting fluid with smoke retardant. ※ 4 We recommend using oil mist coolant for hardened steels.					

○ Acciaio al carbonio Carbon Steel	P
○ Acciaio legato Alloy Steel	P
○ Acciaio pretemprato Prehardened Steel	P
○ Temprato ~52 Hardened Steel HRC	H

○ Acciaio inox Stainless Steel	M
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○ Lega di alluminio Aluminium Alloy	N
○ Rame Copper	N
○ Resina Resin	O



Scarico conico
Taper Neck

Sferiche
Ball

Rivestita
Coating

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli toriche MUGEN

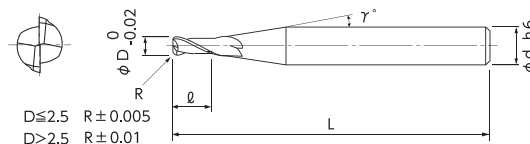
MUGEN COATING 2-Flute Corner Radius End Mill

Totale 31 misure

Total 31 sizes

Fresa 2 tagli torica con angolo d'elica a 30° Per un'ampia gamma di lavorazioni dalla sgrossatura alla finitura

2-flute standard type corner radius end mill with helix angle 30°
For multi-purpose from roughing to finishing



- 2 tagli torica fino a $\varnothing 5$ rivestimento MUGEN
- Totale 31 misure per una maggiore selezione
- Up to $\varnothing 5$ size of 2-Flute MUGEN COATING corner radius end mill.
- Total 31 sizes for suitable selection.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L) Lunghezza tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lunghezza totale Overall Length	PROMO €
08-00700-01001	1	R0.1	2	9°	4	60	49,90
08-00700-01002		R0.2					49,90
08-00700-01003		R0.3					49,90
08-00700-01501	1.5	R0.1	3	9°	4	60	49,90
08-00700-01502		R0.2					49,90
08-00700-01503		R0.3					49,90
08-00700-01505		R0.5					49,90
08-00700-02001	2	R0.1	4	9°	4	60	49,90
08-00700-02002		R0.2					49,90
08-00700-02003		R0.3					49,90
08-00700-02005		R0.5					49,90
08-00700-02501	2.5	R0.1	5	9°	4	60	49,90
08-00700-02502		R0.2					49,90
08-00700-02503		R0.3					54,60
08-00700-02505		R0.5					54,60
08-00700-03001	3	R0.1	6	9°	6	60	68,60
08-00700-03002		R0.2					68,60
08-00700-03003		R0.3					68,60
08-00700-03005		R0.5					68,60
08-00700-03010		R1					74,30
08-00700-04001	4	R0.1	8	9°	6	65	69,30
08-00700-04002		R0.2					69,30
08-00700-04003		R0.3					69,30
08-00700-04005		R0.5					69,30
08-00700-04010		R1					75,80

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L) Lunghezza tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lunghezza totale Overall Length	PROMO €
08-00700-05001	5	R0.1	10	9°	6	70	70,00
08-00700-05002		R0.2					70,00
08-00700-05003		R0.3					70,00
08-00700-05005		R0.5					70,00
08-00700-05010		R1					76,50
08-00700-05015		R1.5					79,40

Attenzione
How to Order

Quando ordinate, indicate MSRS230 (D) × (R).
When you order, indicate MSRS230 (D) × (R).

※(γ) è un valore di riferimento
※(γ) is reference value.

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C			Acciaio legato Alloy Steels SCM·SKD·SUS			Acciaio pretemprato Prehardened Steels HPM·NAK			Acciaio temprato Hardened Steels SKD61 (~52HRC)		
Velocità di taglio Cutting Speed	60~80m/min			50~70m/min			30~50m/min			20~30m/min		
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed	
	g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min	
		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting
1	25,500	200	100	19,200	130	50	12,800	80	40	6,400	60	30
1.5	17,100	340	120	12,800	180	60	8,500	90	45	4,200	70	35
2	12,800	400	150	9,600	210	70	6,400	110	55	3,200	80	40
2.5	10,200	400	150	7,700	210	70	5,100	110	55	2,500	80	40
3	8,500	450	160	6,400	250	80	4,300	120	60	2,100	100	50
4	6,400	450	160	4,800	250	80	3,200	120	60	1,600	100	50
5	5,100	600	200	3,800	300	90	2,600	150	75	1,300	120	60
6	4,300	600	220	3,200	300	100	2,200	150	90	1,100	130	70
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling Cava Slotting Contornatura Side Milling Cava Slotting											
Note Notes	※1 Regolare l'avanzamento rispetto all'angolo di inclinazione ※2 Durante la lavorazione di angoli, ridurre l'avanzamento approssimativamente del 30~50%. ※3 Regolare giri ed avanzamento nella stessa proporzione ed anche la profondità di taglio, in caso di limitato numero di giri della macchina. ※1 Adjust feed according to inclined angle. ※2 When corner machining, reduce the feed by approximately 50%~30%. ※3 Adjust spindle speed and feed at the same rate also reduce Depth of Cut, if the machine spindle speed insufficient.											

Non scaricata
Full Cutting Length

Toriche
Corner
Radius

Rivestita
Coating

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli toriche MUGEN

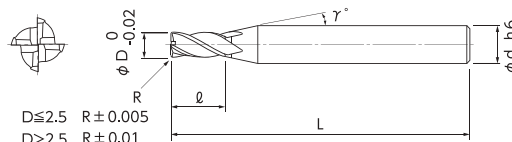
MUGEN COATING 4-Flute Corner Radius End Mill

Totale 33 misure

Total 33 sizes

Fresa 4 tagli torica con angolo d'elica a 30° Per un'ampia gamma di lavorazioni dalla sgrossatura alla finitura

4-flute standard type corner radius end mill with helix angle 30°
For multi-purpose from roughing to finishing



- Disponibili le dimensioni di piccolo diametro delle frese toriche a 4 taglienti rivestite MUGEN.
- Gamma di 33 misure da $\varnothing 6$ a $\varnothing 12$ per ottenere lavorazioni ad alta efficienza.
- Totale 33 misure per una maggiore selezione
- Small diameter sizes of 4-Flute MUGEN COATING corner radius end mill are born.
- 33 sizes Line up from $\varnothing 6$ to $\varnothing 12$ to achieve high efficient micro machining.
- Total 33 sizes for suitable selection.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Radius	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00710-06001	6	R0.1	12	—	6	80	115,40
08-00710-06002		R0.2					115,40
08-00710-06003		R0.3					115,40
08-00710-06005		R0.5					115,40
08-00710-06010		R1					123,30
08-00710-06015		R1.5					123,30
08-00710-06020		R2					123,30
08-00710-08001	8	R0.1	16	—	8	90	188,00
08-00710-08002		R0.2					188,00
08-00710-08005		R0.5					188,00
08-00710-08010		R1					188,00
08-00710-08015		R1.5					197,80
08-00710-08020		R2					197,80
08-00710-08025		R2.5					209,20
08-00710-08030		R3					209,20
08-00710-10001	10	R0.1	20	—	10	100	221,10
08-00710-10002		R0.2					221,10
08-00710-10003		R0.3					221,10
08-00710-10005		R0.5					221,10
08-00710-10010		R1					221,10
08-00710-10015		R1.5					233,80
08-00710-10020		R2					233,80
08-00710-10025		R2.5					257,50
08-00710-10030		R3					257,50
08-00710-12001	12	R0.1	24	—	12	110	349,60
08-00710-12002		R0.2					349,60
08-00710-12003		R0.3					349,60
08-00710-12005		R0.5					349,60
08-00710-12010		R1					349,60
08-00710-12015		R1.5					361,50
08-00710-12020		R2					361,50
08-00710-12025		R2.5					372,40
08-00710-12030		R3					372,40

Attenzione
How to Order

Quando ordinate, indicate MSRS430 (D) x (R).
When you order, indicate MSRS430 (D)x(R).

Toriche
Corner
Radius

Non scaricata
Full Cutting Length

Rivestita
Coating

Acciaio al carbonio
Carbon Steel

Acciaio legato
Alloy Steel

Acciaio pretemprato
Prehardened Steel

Temprato ~52
Hardened Steel HRC

Acciaio inox
Stainless Steel

Lega di alluminio
Aluminium Alloy

Rame
Copper

Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

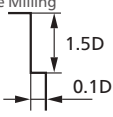
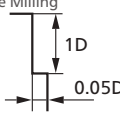
Condizioni di taglio raccomandate

Recommended Milling Conditions

Non scaricata
Full Cutting Length

Toriche
Corner
Radius

Rivestita
Coating

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK		Acciaio temprato Hardened Steels SKD61 (~52HRC)	
Velocità di taglio Cutting Speed	60~80m/min		50~70m/min		30~50m/min		20~30m/min	
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
1	25,500	300	19,100	220	12,800	120	6,400	60
1.5	17,100	510	12,700	370	8,500	130	4,300	65
2	12,800	600	9,500	430	6,400	160	3,200	80
2.5	10,200	600	7,600	430	5,100	160	2,600	80
3	8,500	670	6,400	500	4,300	180	2,200	90
4	6,400	760	4,800	570	3,200	200	1,600	90
5	5,100	760	3,800	570	2,600	260	1,300	120
6	4,300	780	3,200	580	2,200	380	1,100	160
8	3,200	780	2,400	580	1,600	380	800	160
10	2,600	780	1,900	580	1,300	380	650	160
12	2,100	780	1,600	580	1,100	380	530	160
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling 						Contornatura Side Milling 	
Note Notes	※1 Regolare l'avanzamento rispetto all'angolo di inclinazione. ※2 Durante la lavorazione di angoli, ridurre l'avanzamento approssimativamente del 30~50%. ※3 Regolare giri ed avanzamento nella stessa proporzione ed anche la profondità di taglio, in caso di limitato numero di giri della macchina. ※1 Adjust feed according to inclined angle. ※2 When corner machining, reduce the feed by approximately 50%~30%. ※3 Adjust spindle speed and feed at the same rate also reduce Depth of Cut, if the machine spindle speed insufficient.							

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli toriche scaricate MUGEN

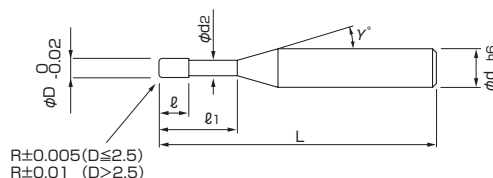
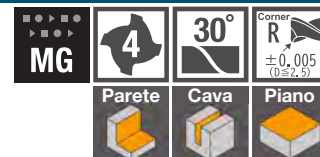
MUGEN COATING 4-Flute Long Neck Corner Radius End Mill

Totale 16 misure

Total 16 sizes

Fresa 4 tagli torica con angolo d'elica a 30° Per un'ampia gamma di lavorazioni dalla sgrossatura alla finitura

4-flute standard type corner radius end mill with helix angle 30°
For multi-purpose from roughing to finishing



- 4 tagli torica fino a $\varnothing 12$ rivestimento MUGEN
- Totale 16 misure per una maggiore selezione
- Up to $\varnothing 12$ size of 4-Flute MUGEN COATING corner radius end mill.
- Total 16 sizes for suitable selection.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00711-06003	6	0.3	20	7	5.5	6	60	95,90
08-00711-06005		0.5						95,90
08-00711-06010		1						95,90
08-00711-06015		1.5						95,90
08-00711-08005	8	0.5	26	9	7.4	8	80	123,70
08-00711-08010		1						123,70
08-00711-08015		1.5						123,70
08-00711-08020		2						123,70
08-00711-10005	10	0.5	31	11	9.2	10	90	171,00
08-00711-10010		1						171,00
08-00711-10015		1.5						171,00
08-00711-10020		2						171,00
08-00711-12010	12	1	37	12	11	12	100	214,60
08-00711-12015		1.5						214,60
08-00711-12020		2						214,60
08-00711-12030		3						214,60

Attenzione
How to Order

Quando ordinate, indicate MHRS430 (D) × (R) × (L1).
When you order, indicate MHRS430 (D) × (R).

※(γ) è un valore di riferimento
※(γ) is reference value.

Toriche
Corner
Radius

Scaricata
Long Neck



Rivestita
Coating

Acciaio al carbonio
Carbon Steel

Acciaio legato
Alloy Steel

Acciaio pretemprato
Prehardened Steel

Temprato ~52
Hardened Steel HRC

Acciaio inox
Stainless Steel

Lega di alluminio
Aluminium Alloy

Rame
Copper

Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Scaricata
Long Neck



Rivestita
Coating

Toriche
Corner
Radius

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C			Acciaio legato Alloy Steels SCM·SKD·SUS			Acciaio pretemprato Prehardened Steels HPM·NAK			Acciaio temprato Hardened Steels SKD61 (~52HRC)		
Velocità di taglio Cutting Speed	60~80m/min			50~70m/min			30~50m/min			20~30m/min		
Diametro Dia.	N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed	
	g/min	mm/min		g/min	mm/min		g/min	mm/min		g/min	mm/min	
		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting		Cont. Side Milling	Cava Slotting
6	4,300	1200	440	3,200	600	200	2,200	300	180	1,100	260	140
8	3,200	1000	500	2,400	610	200	1,600	260	130	800	250	120
10	2,600	1000	520	1,900	610	190	1,300	260	130	640	250	120
12	2,100	1000	520	1,600	620	190	1,100	220	110	530	230	110
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling Cava Slotting Contornatura Side Milling Cava Slotting											
Note Notes	※1 Regolare l'avanzamento rispetto all'angolo di inclinazione ※2 Durante la lavorazione di angoli, ridurre l'avanzamento approssimativamente del 30~50%. ※3 Regolare giri ed avanzamento nella stessa proporzione ed anche la profondità di taglio, in caso di limitato numero di giri della macchina. ※1 Adjust feed according to inclined angle. ※2 When corner machining, reduce the feed by approximately 50%~30%. ※3 Adjust spindle speed and feed at the same rate also reduce Depth of Cut, if the machine spindle speed insufficient.											

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli toriche scaricate MUGEN

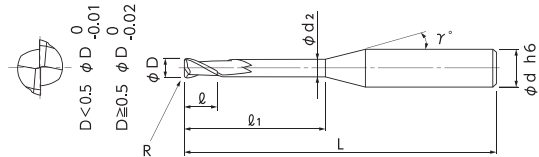
Totale 323 misure

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill

Total 323 sizes

Fresa 2 tagli torica scaricata.
Massimo L/D=20

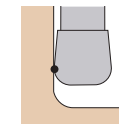
2-flute long neck corner radius end mill. Maximum L/D=20



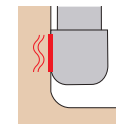
D ≤ 2.5 R ± 0.005

D > 2.5 R ± 0.01

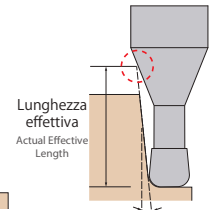
- Vibrazioni ridotte grazie al tagliente periferico studiato per minimizzare il contatto con il pezzo.
- Si possono ottenere efficienti fresature utilizzando uno step radiale più ampio rispetto alle frese sferiche.
- Precisione del raggio ±5 μm (D2.5 e inferiore).
- Si ottengono ottime performance nelle lavorazioni di acciai pretemprati, acciai temprati e elettrodi di rame
- Minimized chattering by peripheral cutting edge designed for minimal contact to work material.
- Realized high efficiency milling by obtaining larger radial depth of cutting comparing with Ball End Mill.
- Corner R accuracy: ±5 μm (Dia. ~2.5)
- Better performance in wide range of machining of direct carving on Hardened Steels, Prehardened Steels and Copper Electrode.



Elimina le vibrazioni
grazie a un solo
punto di contatto
Suppress chattering by
point milling



Fresa convenzionale
General End mill



Lunghezza
effettiva
Actual Effective
Length
Angolo di inclinazione
Inclined Angle

Unità [misura: mm]
Unit [Size: mm]

	Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
										30°	1°	1°30'	2°	3°	
Acciaio al carbonio Carbon Steel P	08-00221-05050	0.5	R0.05	1	0.4	0.46	12°	4	45	1.13	1.18	1.24	1.29	1.43	37,50
	08-00221-05051			2				4	45	2.18	2.27	2.38	2.49	2.76	37,50
	08-00220-05005			2				6	50	2.18	2.27	2.38	2.49	2.76	52,50
	08-00221-05052			3				4	45	3.22	3.36	3.52	3.69	4.09	37,50
	08-00220-05006			3				6	50	3.22	3.36	3.52	3.69	4.09	52,50
	08-00221-05053			4				4	45	4.26	4.45	4.66	4.88	5.41	37,50
	08-00220-05007			4				6	50	4.26	4.45	4.66	4.88	5.41	52,50
	08-00221-05054			5				4	45	5.31	5.54	5.80	6.08	6.74	37,50
	08-00220-05008			5				6	50	5.31	5.54	5.80	6.08	6.74	52,50
	08-00221-05055			6				4	45	6.35	6.63	6.94	7.28	8.07	37,50
Acciaio legato Alloy Steel P	08-00221-05100	0.5	R0.05	1	0.4	0.46	12°	4	45	1.13	1.18	1.23	1.28	1.42	37,50
	08-00221-05101			2				4	45	2.17	2.27	2.37	2.48	2.74	37,50
	08-00220-05011			2				6	50	2.17	2.27	2.37	2.48	2.74	52,50
	08-00221-05102			3				4	45	3.22	3.36	3.51	3.68	4.07	37,50
	08-00220-05013			3				6	50	3.22	3.36	3.51	3.68	4.07	52,50
	08-00221-05103		R0.1	4				4	45	4.26	4.45	4.65	4.87	5.40	37,50
	08-00220-05012			4				6	50	4.26	4.45	4.65	4.87	5.40	52,50
	08-00221-05104			5				4	45	5.30	5.54	5.79	6.07	6.72	37,50
	08-00220-05014			5				6	50	5.30	5.54	5.79	6.07	6.72	52,50
	08-00221-05105			6				4	45	6.35	6.63	6.93	7.27	8.05	37,50
Acciaio inox Stainless Steel M	08-00221-06050	0.6	R0.05	2	0.5	0.56	12°	4	45	2.18	2.27	2.38	2.49	2.76	37,50
	08-00221-06051			3				4	45	3.22	3.36	3.52	3.69	4.09	37,50
	08-00221-06052			4				4	45	4.26	4.45	4.66	4.88	5.41	37,50
	08-00221-06053			6				4	45	6.35	6.63	6.94	7.28	8.07	37,50
	08-00221-06054			8				4	50	8.43	8.81	9.22	9.67	10.72	37,50
	08-00221-06100		R0.1	2				4	45	2.17	2.27	2.37	2.48	2.74	37,50
	08-00221-06101			3				4	45	3.22	3.36	3.51	3.68	4.07	37,50
	08-00221-06102			4				4	45	4.26	4.45	4.65	4.87	5.40	37,50
	08-00221-06103			6				4	45	6.35	6.63	6.93	7.27	8.05	37,50
Lega di alluminio Aluminium Alloy N	08-00221-06050	0.6	R0.05	2	0.5	0.56	12°	4	45	2.18	2.27	2.38	2.49	2.76	37,50
	08-00221-06051			3				4	45	3.22	3.36	3.52	3.69	4.09	37,50
	08-00221-06052			4				4	45	4.26	4.45	4.66	4.88	5.41	37,50
	08-00221-06053			6				4	45	6.35	6.63	6.94	7.28	8.07	37,50
	08-00221-06054			8				4	50	8.43	8.81	9.22	9.67	10.72	37,50
	08-00221-06100		R0.1	2				4	45	2.17	2.27	2.37	2.48	2.74	37,50
	08-00221-06101			3				4	45	3.22	3.36	3.51	3.68	4.07	37,50
	08-00221-06102			4				4	45	4.26	4.45	4.65	4.87	5.40	37,50
	08-00221-06103			6				4	45	6.35	6.63	6.93	7.27	8.05	37,50
Rame Copper N	08-00221-06050	0.6	R0.05	2	0.5	0.56	12°	4	45	2.18	2.27	2.38	2.49	2.76	37,50
	08-00221-06051			3				4	45	3.22	3.36	3.52	3.69	4.09	37,50
	08-00221-06052			4				4	45	4.26	4.45	4.66	4.88	5.41	37,50
	08-00221-06053			6				4	45	6.35	6.63	6.94	7.28	8.07	37,50
	08-00221-06054			8				4	50	8.43	8.81	9.22	9.67	10.72	37,50
	08-00221-06100		R0.1	2				4	45	2.17	2.27	2.37	2.48	2.74	37,50
	08-00221-06101			3				4	45	3.22	3.36	3.51	3.68	4.07	37,50
	08-00221-06102			4				4	45	4.26	4.45	4.65	4.87	5.40	37,50
	08-00221-06103			6				4	45	6.35	6.63	6.93	7.27	8.05	37,50
Resina Resin O	08-00221-06050	0.6	R0.05	2	0.5	0.56	12°	4	45	2.18	2.27	2.38	2.49	2.76	37,50
	08-00221-06051			3				4	45	3.22	3.36	3.52	3.69	4.09	37,50
	08-00221-06052			4				4	45	4.26	4.45	4.66	4.88	5.41	37,50
	08-00221-06053			6				4	45	6.35	6.63	6.94	7.28	8.07	37,50
	08-00221-06054			8				4	50	8.43	8.81	9.22	9.67	10.72	37,50
	08-00221-06100		R0.1	2				4	45	2.17	2.27	2.37	2.48	2.74	37,50
	08-00221-06101			3				4	45	3.22	3.36	3.51	3.68	4.07	37,50
	08-00221-06102			4				4	45	4.26	4.45	4.65	4.87	5.40	37,50
	08-00221-06103			6				4	45	6.35	6.63	6.93	7.27	8.05	37,50

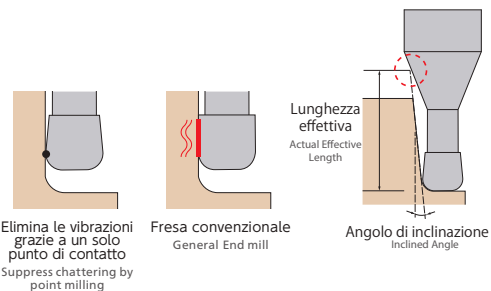
Attenzione
How to Order

Quando ordinate, indicate MHR230R Dia.(D)×(R)×(L1)×(d).
When you order, indicate MHR230R (D)×(R)×(L1)×(d).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill

Unità [misura: mm]
Unit [Size: mm]

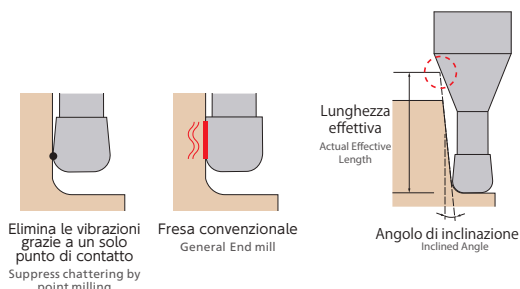
Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00221-06104	0.6	R0.1	8	0.5	0.56	12°	4	50	8.43	8.80	9.21	9.66	10.71	37,50
08-00221-06200			2				4	45	2.17	2.26	2.36	2.46	2.71	37,50
08-00221-06201		R0.2	3				4	45	3.21	3.35	3.50	3.66	4.04	37,50
08-00221-06202			4				4	45	4.26	4.44	4.64	4.86	5.37	37,50
08-00221-06203			6				4	45	6.34	6.62	6.92	7.25	8.02	37,50
08-00221-06204			8				4	50	8.43	8.80	9.20	9.64	10.67	37,50
08-00221-08050	0.8	R0.05	4	0.65	0.76	12°	4	45	4.26	4.45	4.66	4.88	5.41	43,00
08-00221-08051			6				4	45	6.35	6.63	6.94	7.28	8.07	43,00
08-00221-08052			8				4	50	8.43	8.81	9.22	9.67	10.72	43,00
08-00221-08100		R0.1	4				4	45	4.26	4.45	4.65	4.87	5.40	43,00
08-00221-08101			6				4	45	6.35	6.63	6.93	7.27	8.05	43,00
08-00221-08102		R0.2	8				4	50	8.43	8.80	9.21	9.66	10.71	43,00
08-00221-08200			4				4	45	4.26	4.44	4.64	4.86	5.37	43,00
08-00221-08201			6				4	45	6.34	6.62	6.92	7.25	8.02	43,00
08-00221-08202			8				4	50	8.43	8.80	9.20	9.64	10.67	43,00
08-00221-10050	1	R0.05	2	0.8	0.95	12°	4	50	2.20	2.30	2.40	2.52	2.79	36,40
08-00221-10051			3				4	50	3.24	3.39	3.54	3.72	4.12	36,40
08-00220-10001			3				6	50	3.24	3.39	3.54	3.72	4.12	55,70
08-00221-10052			4				4	50	4.29	4.48	4.68	4.91	5.44	36,40
08-00220-10002			4				6	50	4.29	4.48	4.68	4.91	5.44	55,70
08-00221-10053			5				4	50	5.33	5.57	5.82	6.11	6.77	36,40
08-00220-10003			5				6	50	5.33	5.57	5.82	6.11	6.77	55,70
08-00221-10054			6				4	50	6.37	6.66	6.97	7.31	8.10	39,70
08-00220-10004			6				6	50	6.37	6.66	6.97	7.31	8.10	55,70
08-00221-10055			8				4	50	8.46	8.83	9.25	9.70	10.75	39,70
08-00220-10006			8				6	50	8.46	8.83	9.25	9.70	10.75	55,70
08-00221-10056		R0.1	10				4	50	10.54	11.01	11.53	12.09	13.41	39,70
08-00220-10008			10				6	50	10.54	11.01	11.53	12.09	13.41	55,70
08-00221-10057			12				4	50	12.63	13.19	13.81	14.49	16.06	39,70
08-00220-10009			12				6	50	12.63	13.19	13.81	14.49	16.06	55,70
08-00221-10058			16				4	60	16.80	17.55	18.37	19.27	21.37	51,80
08-00221-10059			20				4	60	20.97	21.91	22.93	24.06	26.68	58,50
08-00221-10100			2				4	50	2.20	2.29	2.40	2.51	2.77	36,40
08-00221-10101			3				4	50	3.24	3.38	3.54	3.71	4.10	36,40
08-00220-10010			3				6	50	3.24	3.38	3.54	3.71	4.10	55,70
08-00221-10102			4				4	50	4.28	4.47	4.68	4.90	5.43	36,40
08-00220-10011			4				6	50	4.28	4.47	4.68	4.90	5.43	55,70

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

MHR230R

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lunghezza scarico Under Neck Length	(Ø) Lunghezza tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lunghezza totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00221-10103	1	R0.1	5	0.8	0.95	12°	4	50	5.33	5.56	5.82	6.10	6.76	36,40
08-00220-10014			5				6	50	5.33	5.56	5.82	6.10	6.76	55,70
08-00221-10104			6				4	50	6.37	6.65	6.96	7.30	8.08	39,70
08-00220-10015			6				6	50	6.37	6.65	6.96	7.30	8.08	55,70
08-00221-10105			8				4	50	8.46	8.83	9.24	9.69	10.74	39,70
08-00220-10012			8				6	50	8.46	8.83	9.24	9.69	10.74	55,70
08-00221-10106			10				4	50	10.54	11.01	11.52	12.08	13.39	39,70
08-00220-10016			10				6	50	10.54	11.01	11.52	12.08	13.39	55,70
08-00221-10107			12				4	50	12.63	13.19	13.80	14.48	16.05	39,70
08-00220-10013			12				6	50	12.63	13.19	13.80	14.48	16.05	55,70
08-00221-10108		R0.2	16				4	60	16.80	17.55	18.36	19.26	21.36	51,80
08-00221-10109			20				4	60	20.97	21.90	22.93	24.05	26.66	58,50
08-00221-10200			2				4	50	2.19	2.28	2.38	2.49	2.74	36,40
08-00221-10201			3				4	50	3.24	3.37	3.52	3.69	4.07	36,40
08-00220-10024			3				6	50	3.24	3.37	3.52	3.69	4.07	55,70
08-00221-10202			4				4	50	4.28	4.46	4.66	4.88	5.40	36,40
08-00220-10021			4				6	50	4.28	4.46	4.66	4.88	5.40	55,70
08-00221-10203			5				4	50	5.32	5.55	5.80	6.08	6.72	36,40
08-00220-10025			5				6	50	5.32	5.55	5.80	6.08	6.72	55,70
08-00221-10204			6				4	50	6.37	6.64	6.94	7.28	8.05	39,70
08-00220-10026			6				6	50	6.37	6.64	6.94	7.28	8.05	55,70
08-00221-10205			8				4	50	8.45	8.82	9.23	9.67	10.71	39,70
08-00220-10022			8				6	50	8.45	8.82	9.23	9.67	10.71	55,70
08-00221-10206			10				4	50	10.54	11.00	11.51	12.06	13.36	39,70
08-00220-10027			10				6	50	10.54	11.00	11.51	12.06	13.36	55,70
08-00221-10207			12				4	50	12.62	13.18	13.79	14.46	16.01	39,70
08-00220-10023			12				6	50	12.62	13.18	13.79	14.46	16.01	55,70
08-00221-10208		R0.3	16				4	60	16.79	17.54	18.35	19.24	21.32	51,80
08-00221-10209			20				4	60	20.97	21.89	22.91	24.03	26.63	58,50
08-00221-10300			2				4	50	2.19	2.28	2.37	2.47	2.71	36,40
08-00221-10301			3				4	50	3.23	3.36	3.51	3.67	4.04	36,40
08-00220-10034			3				6	50	3.23	3.36	3.51	3.67	4.04	55,70
08-00221-10302			4				4	50	4.28	4.45	4.65	4.86	5.36	36,40
08-00220-10031			4				6	50	4.28	4.45	4.65	4.86	5.36	55,70
08-00221-10303			5				4	50	5.32	5.54	5.79	6.06	6.69	36,40
08-00220-10035			5				6	50	5.32	5.54	5.79	6.06	6.69	55,70
08-00221-10304			6				4	50	6.36	6.63	6.93	7.26	8.02	39,70

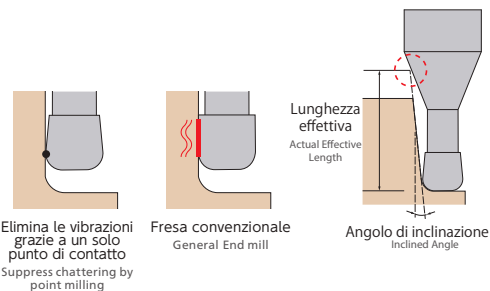
Attenzione
How to Order

Quando ordinate, indicate MHR230R Dia.(D) × (R) × (Ø 1) × (d).
When you order, indicate MHR230R (D) × (R) × (Ø 1) × (d).

※ (γ) è un valore di riferimento.
※ (γ) is reference value.

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill

Unità [misura: mm]
Unit [Size: mm]

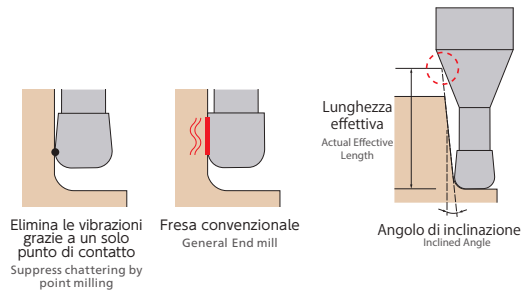
Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(d1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00220-10036	1	R0.3	6	0.8	0.95	12°	6	50	6.36	6.63	6.93	7.26	8.02	55,70
08-00221-10305			8				4	50	8.45	8.81	9.21	9.65	10.67	39,70
08-00220-10032			8				6	50	8.45	8.81	9.21	9.65	10.67	55,70
08-00221-10306			10				4	50	10.53	10.99	11.49	12.04	13.33	39,70
08-00220-10037			10				6	50	10.53	10.99	11.49	12.04	13.33	55,70
08-00221-10307			12				4	50	12.62	13.17	13.77	14.44	15.98	39,70
08-00220-10033			12				6	50	12.62	13.17	13.77	14.44	15.98	55,70
08-00221-10308			16				4	60	16.79	17.53	18.34	19.22	21.29	51,80
08-00221-10309			20				4	60	20.96	21.89	22.90	24.01	26.60	58,50
08-00221-12100	1.2	R0.1	6	1	1.14	12°	4	50	6.39	6.68	6.99	7.32	8.11	40,80
08-00221-12101			8				4	50	8.48	8.86	9.27	9.72	10.77	40,80
08-00221-12102			10				4	50	10.57	11.03	11.55	12.11	13.42	40,80
08-00221-12103			12				4	50	12.65	13.21	13.83	14.50	16.08	40,80
08-00221-12104			16				4	60	16.82	17.57	18.39	19.29	21.39	40,80
08-00221-12105			20				4	60	20.99	21.93	22.95	24.08	26.70	62,30
08-00221-12200		R0.2	6				4	50	6.39	6.67	6.97	7.30	8.08	40,80
08-00221-12201			8				4	50	8.48	8.85	9.25	9.70	10.74	40,80
08-00221-12202			10				4	50	10.56	11.03	11.53	12.09	13.39	40,80
08-00221-12203			12				4	50	12.65	13.20	13.81	14.48	16.05	40,80
08-00221-12204			16				4	60	16.82	17.56	18.38	19.27	21.35	40,80
08-00221-12205			20				4	60	20.99	21.92	22.94	24.06	26.66	62,30
08-00221-12300		R0.3	6				4	50	6.39	6.66	6.96	7.29	8.05	40,80
08-00221-12301			8				4	50	8.47	8.84	9.24	9.68	10.70	40,80
08-00221-12302			10				4	50	10.56	11.02	11.52	12.07	13.36	40,80
08-00221-12303			12				4	50	12.64	13.20	13.80	14.46	16.01	40,80
08-00221-12304			16				4	60	16.81	17.55	18.36	19.25	21.32	40,80
08-00221-12305			20				4	60	20.99	21.91	22.92	24.04	26.63	62,30
08-00221-15100	1.5	R0.1	4	1.2	1.45	12°	4	50	4.28	4.47	4.68	4.90	5.43	39,20
08-00221-15101			6				4	50	6.37	6.65	6.96	7.30	8.08	39,20
08-00220-15011			6				6	50	6.37	6.65	6.96	7.30	8.08	57,60
08-00221-15102			8				4	50	8.46	8.83	9.24	9.69	10.74	40,80
08-00221-15103			10				4	50	10.54	11.01	11.52	12.08	13.39	40,80
08-00221-15104			12				4	50	12.63	13.19	13.80	14.48	16.05	40,80
08-00220-15013			12				6	50	12.63	13.19	13.80	14.48	16.05	57,60
08-00221-15105			16				4	60	16.80	17.55	18.36	19.26	21.36	40,80
08-00221-15106			18				4	60	18.88	19.72	20.64	21.65	Free	40,80
08-00220-15015			18				6	60	18.88	19.72	20.64	21.65	24.01	57,60

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

MHR230R

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ1) Lunghezza scarico Under Neck Length	(ℓ) Lunghezza tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lunghezza totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00221-15107	1.5	R0.1	20	1.2	1.45	12°	4	60	20.97	21.90	22.93	24.05	Free	40,80
08-00221-15200			4				4	50	4.28	4.46	4.66	4.88	5.40	39,20
08-00221-15201			6				4	50	6.37	6.64	6.94	7.28	8.05	39,20
08-00220-15021			6				6	50	6.37	6.64	6.94	7.28	8.05	57,60
08-00221-15202			8				4	50	8.45	8.82	9.23	9.67	10.71	40,80
08-00221-15203			10				4	50	10.54	11.00	11.51	12.06	13.36	40,80
08-00221-15204			12				4	50	12.62	13.18	13.79	14.46	16.01	40,80
08-00220-15023			12				6	50	12.62	13.18	13.79	14.46	16.01	57,60
08-00221-15205		R0.2	16				4	60	16.79	17.54	18.35	19.24	21.32	40,80
08-00221-15206			18				4	60	18.88	19.72	20.63	21.64	23.98	40,80
08-00220-15025			18				6	60	18.88	19.72	20.63	21.64	23.98	57,60
08-00221-15207			20				4	60	20.97	21.89	22.91	24.03	Free	40,80
08-00221-15300		R0.3	4				4	50	4.28	4.45	4.65	4.86	5.36	39,20
08-00221-15301			6				4	50	6.36	6.63	6.93	7.26	8.02	39,20
08-00220-15031			6				6	50	6.36	6.63	6.93	7.26	8.02	57,60
08-00221-15302			8				4	50	8.45	8.81	9.21	9.65	10.67	40,80
08-00221-15303			10				4	50	10.53	10.99	11.49	12.04	13.33	40,80
08-00221-15304			12				4	50	12.62	13.17	13.77	14.44	15.98	40,80
08-00220-15032			12				6	50	12.62	13.17	13.77	14.44	15.98	57,60
08-00221-15305			16				4	60	16.79	17.53	18.34	19.22	21.29	40,80
08-00221-15306		R0.5	18				4	60	18.88	19.71	20.62	21.62	23.95	40,80
08-00220-15033			18				6	60	18.88	19.71	20.62	21.62	23.95	57,60
08-00221-15307			20				4	60	20.96	21.89	22.90	24.01	Free	40,80
08-00221-15500		R0.5	4				4	50	4.27	4.44	4.62	4.83	5.30	39,20
08-00221-15501			6				4	50	6.35	6.62	6.90	7.22	7.96	39,20
08-00220-15051			6				6	50	6.35	6.62	6.90	7.22	7.96	57,60
08-00221-15502			8				4	50	8.44	8.79	9.18	9.61	10.61	40,80
08-00221-15503			10				4	50	10.52	10.97	11.46	12.01	13.26	40,80
08-00221-15504			12				4	50	12.61	13.15	13.75	14.40	15.92	40,80
08-00220-15052			12				6	50	12.61	13.15	13.75	14.40	15.92	57,60
08-00221-15505			16				4	60	16.78	17.51	18.31	19.18	21.23	40,80
08-00221-15506			18				4	60	18.87	19.69	20.59	21.58	23.88	40,80
08-00220-15053			18				6	60	18.87	19.69	20.59	21.58	23.88	57,60
08-00221-15507			20				4	60	20.95	21.87	22.87	23.97	Free	40,80
08-00221-20100	2	R0.1	4	1.6	1.91	12°	4	50	4.38	4.57	4.78	5.02	5.55	39,20
08-00221-20101			6				4	50	6.47	6.75	7.07	7.41	8.21	39,20
08-00221-20102			8				4	50	8.55	8.93	9.35	9.80	10.86	40,80

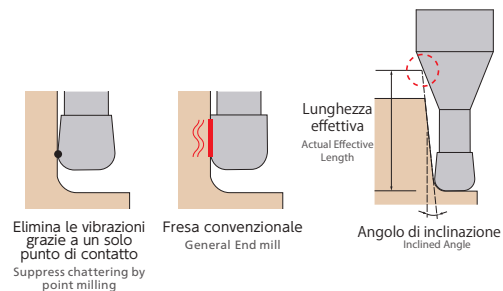
Attenzione
How to Order

Quando ordinate, indicate MHR230R Dia.(D)×(R)×(ℓ1)×(d).
When you order, indicate MHR230R (D)×(R)×(ℓ1)×(d).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(d1)Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00220-20011	2	R0.1	8	1.6	1.91	12°	6	50	8.55	8.93	9.35	9.80	10.86	58,30
08-00221-20103			10				4	50	10.64	11.11	11.63	12.19	13.52	40,80
08-00221-20104			12				4	50	12.73	13.29	13.91	14.59	16.17	40,80
08-00220-20014			12				6	50	12.73	13.29	13.91	14.59	16.17	58,30
08-00221-20105			16				4	60	16.90	17.65	18.47	19.37	Free	40,80
08-00220-20012			16				6	60	16.90	17.65	18.47	19.37	21.48	58,30
08-00221-20106			20				4	60	21.07	22.01	23.03	24.16	Free	40,80
08-00220-20015			20				6	60	21.07	22.01	23.03	24.16	26.79	58,30
08-00221-20107			24				4	70	25.24	26.36	27.59	Free	Free	43,10
08-00220-20013			24				6	70	25.24	26.36	27.59	28.95	32.10	58,30
08-00221-20108			26				4	70	27.32	28.54	29.88	Free	Free	43,10
08-00221-20109			30				4	70	31.50	32.90	34.44	Free	Free	43,10
08-00221-20200		R0.2	4				4	50	4.38	4.57	4.77	5.00	5.52	39,20
08-00221-20201			6				4	50	6.46	6.74	7.05	7.39	8.18	39,20
08-00221-20202			8				4	50	8.55	8.92	9.33	9.78	10.83	40,80
08-00220-20021			8				6	50	8.55	8.92	9.33	9.78	10.83	58,30
08-00221-20203			10				4	50	10.64	11.10	11.61	12.18	13.48	40,80
08-00221-20204			12				4	50	12.72	13.28	13.89	14.57	16.14	40,80
08-00220-20023			12				6	50	12.72	13.28	13.89	14.57	16.14	58,30
08-00221-20205			16				4	60	16.89	17.64	18.46	19.36	Free	40,80
08-00220-20025			16				6	60	16.89	17.64	18.46	19.36	21.45	58,30
08-00221-20206			20				4	60	21.06	22.00	23.02	24.14	Free	40,80
08-00220-20027			20				6	60	21.06	22.00	23.02	24.14	26.76	58,30
08-00221-20207			24				4	70	25.23	26.36	27.58	Free	Free	43,10
08-00220-20029			24				6	70	25.23	26.36	27.58	28.93	32.07	58,30
08-00221-20208			26				4	70	27.32	28.53	29.86	Free	Free	43,10
08-00221-20209			30				4	70	31.49	32.89	34.42	Free	Free	43,10
08-00221-20300		R0.3	4				4	50	4.37	4.56	4.76	4.98	5.49	39,20
08-00221-20301			6				4	50	6.46	6.74	7.04	7.37	8.14	39,20
08-00221-20302			8				4	50	8.55	8.91	9.32	9.76	10.80	40,80
08-00220-20031			8				6	50	8.55	8.91	9.32	9.76	10.80	58,30
08-00221-20303			10				4	50	10.63	11.09	11.60	12.16	13.45	40,80
08-00221-20304			12				4	50	12.72	13.27	13.88	14.55	16.11	40,80
08-00220-20034			12				6	50	12.72	13.27	13.88	14.55	16.11	58,30
08-00221-20305			16				4	60	16.89	17.63	18.44	19.34	Free	40,80
08-00220-20032	16		6				60	16.89	17.63	18.44	19.34	21.42	58,30	
08-00221-20306	20		4				60	21.06	21.99	23.00	24.12	Free	40,80	

Scaricata
Long Neck

Rivestita
Coating

Toriche
Corner
Radius

P Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
Resin

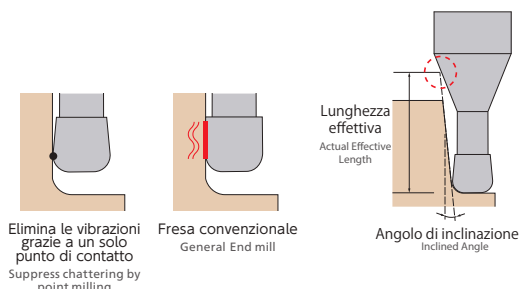
Rivestimento
MUGEN

Regular Line
MUGEN COATING

MHR230R

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00220-20035	2	R0.3	20	1.6	1.91	12°	6	60	21.06	21.99	23.00	24.12	26.73	58,30
08-00221-20307			24				4	70	25.23	26.35	27.57	28.91	Free	43,10
08-00220-20033			24				6	70	25.23	26.35	27.57	28.91	32.03	58,30
08-00221-20308			26				4	70	27.32	28.53	29.85	Free	Free	43,10
08-00221-20309			30				4	70	31.49	32.88	34.41	Free	Free	43,10
08-00221-20500			4				4	50	4.37	4.54	4.73	4.94	5.43	39,20
08-00221-20501		R0.5	6				4	50	6.45	6.72	7.01	7.33	8.08	39,20
08-00221-20502			8				4	50	8.54	8.90	9.29	9.72	10.73	40,80
08-00220-20051			8				6	50	8.54	8.90	9.29	9.72	10.73	58,30
08-00221-20503			10				4	50	10.62	11.08	11.57	12.12	13.39	40,80
08-00221-20504			12				4	50	12.71	13.25	13.85	14.51	16.04	40,80
08-00220-20054			12				6	50	12.71	13.25	13.85	14.51	16.04	58,30
08-00221-20505			16				4	60	16.88	17.61	18.42	19.30	Free	40,80
08-00220-20052			16				6	60	16.88	17.61	18.42	19.30	21.35	58,30
08-00221-20506			20				4	60	21.05	21.97	22.98	24.08	Free	40,80
08-00220-20055			20				6	60	21.05	21.97	22.98	24.08	26.66	58,30
08-00221-20507			24				4	70	25.22	26.33	27.54	28.87	Free	43,10
08-00220-20053			24				6	70	25.22	26.33	27.54	28.87	31.97	58,30
08-00221-20508			26				4	70	27.31	28.51	29.82	Free	Free	43,10
08-00221-20509			30				4	70	31.48	32.87	34.38	Free	Free	43,10
08-00221-25100	2.5	R0.1	10	2	2.39	12°	4	50	10.69	11.16	11.68	12.25	13.58	43,00
08-00220-25011			10				6	50	10.69	11.16	11.68	12.25	13.58	60,10
08-00221-25101			20				4	60	21.12	22.06	23.09	Free	Free	43,60
08-00220-25013			20				6	60	21.12	22.06	23.09	24.22	26.85	62,10
08-00221-25102			30				4	70	31.55	32.95	Free	Free	Free	47,70
08-00220-25015			30				6	70	31.55	32.95	34.49	36.18	Free	64,70
08-00221-25200		R0.2	10				4	50	10.68	11.15	11.67	12.23	13.55	43,00
08-00220-25021			10				6	50	10.68	11.15	11.67	12.23	13.55	60,10
08-00221-25201			20				4	60	21.11	22.05	23.07	Free	Free	43,60
08-00220-25023			20				6	60	21.11	22.05	23.07	24.20	26.82	62,10
08-00221-25202			30				4	70	31.54	32.94	Free	Free	Free	47,70
08-00220-25025			30				6	70	31.54	32.94	34.48	36.16	Free	64,70
08-00221-25300		R0.3	10				4	50	10.68	11.14	11.65	12.21	13.52	43,00
08-00220-25031			10				6	50	10.68	11.14	11.65	12.21	13.52	60,10
08-00221-25301			20				4	60	21.11	22.04	23.06	Free	Free	43,60
08-00220-25032			20				6	60	21.11	22.04	23.06	24.18	26.79	62,10
08-00221-25302			30				4	70	31.54	32.93	Free	Free	Free	47,70

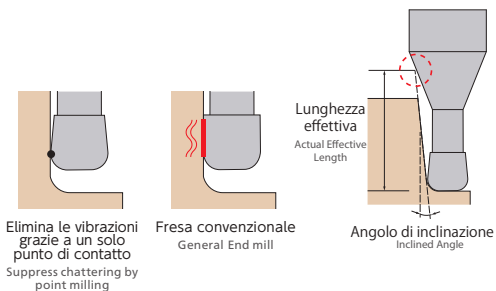
Attenzione
How to Order

Quando ordinate, indicate MHR230R Dia.(D)×(R)×(Ø1)×(d).
When you order, indicate MHR230R (D)×(R)×(Ø1)×(d).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(d1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00220-25033	2.5	R0.3	30	2	2.39	12°	6	70	31.54	32.93	34.46	36.14	Free	64,70
08-00221-25500			10				4	50	10.67	11.13	11.63	12.17	13.45	43,00
08-00220-25051		R0.5	10				6	50	10.67	11.13	11.63	12.17	13.45	60,10
08-00221-25501			20				4	60	21.10	22.02	23.03	Free	Free	43,60
08-00220-25052			20				6	60	21.10	22.02	23.03	24.14	26.72	62,10
08-00221-25502			30				4	70	31.53	32.92	Free	Free	Free	47,70
08-00220-25053			30				6	70	31.53	32.92	34.44	36.11	Free	64,70
08-00220-30011	3	R0.1	12	4.5	2.85	12°	6	50	12.87	13.44	14.07	14.76	16.36	79,40
08-00220-30013			18				6	60	19.13	19.98	20.91	21.94	24.32	81,20
08-00220-30015			24				6	70	25.39	26.52	27.76	29.12	Free	86,70
08-00220-30017			30				6	70	31.64	33.05	34.60	36.30	Free	88,30
08-00220-30019			36				6	80	37.90	39.59	41.44	Free	Free	88,30
08-00220-30021		R0.2	12				6	50	12.87	13.44	14.06	14.74	16.33	79,40
08-00220-30023			18				6	60	19.13	19.97	20.90	21.92	24.29	81,20
08-00220-30025			24				6	70	25.38	26.51	27.74	29.10	Free	86,70
08-00220-30027			30				6	70	31.64	33.05	34.58	36.28	Free	91,40
08-00220-30029		R0.3	36				6	80	37.90	39.58	41.43	Free	Free	91,40
08-00220-30031			12				6	50	12.86	13.43	14.04	14.72	16.29	82,10
08-00220-30034			18				6	60	19.12	19.96	20.88	21.90	24.26	81,20
08-00220-30032			24				6	70	25.38	26.50	27.73	29.08	Free	86,70
08-00220-30035			30				6	70	31.63	33.04	34.57	36.26	Free	91,40
08-00220-30033			36				6	80	37.89	39.57	41.41	Free	Free	91,40
08-00220-30051		R0.5	12				6	50	12.86	13.41	14.01	14.68	16.23	79,40
08-00220-30054			18				6	60	19.11	19.95	20.86	21.86	24.19	81,20
08-00220-30052			24				6	70	25.37	26.48	27.70	29.04	Free	86,70
08-00220-30055			30				6	70	31.63	33.02	34.54	36.22	Free	91,40
08-00220-30053			36				6	80	37.88	39.56	41.39	43.40	Free	91,40
08-00220-30101		R1	12				6	50	12.83	13.36	13.94	14.58	16.07	79,40
08-00220-30104			18				6	60	19.09	19.90	20.79	21.76	24.04	81,20
08-00220-30102			24				6	70	25.35	26.44	27.63	28.94	Free	86,70
08-00220-30105			30				6	70	31.60	32.97	34.47	36.12	Free	91,40
08-00220-30103			36				6	80	37.86	39.51	41.32	43.30	Free	91,40
08-00220-40011	4	R0.1	16	6	3.8	12°	6	60	17.17	17.93	18.77	19.68	Free	80,00
08-00220-40013			24				6	70	25.51	26.65	27.89	Free	Free	82,70
08-00220-40015			32				6	70	33.85	35.36	37.01	Free	Free	82,70
08-00220-40017			48				6	100	50.54	52.79	Free	Free	Free	131,70
08-00220-40021		R0.2	16				6	60	17.16	17.92	18.75	19.66	Free	82,70

Scaricata
Long Neck

Toriche
Corner
Radius

Rivestita
Coating

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

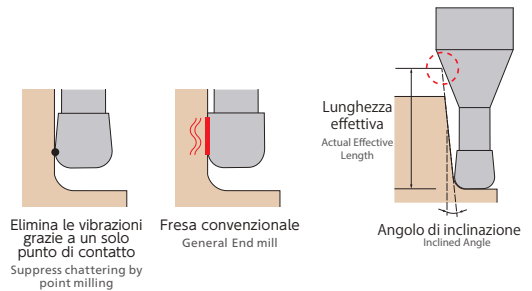
O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

MHR230R

Frese 2 tagli toriche scaricate MUGEN

MUGEN COATING 2-Flute Long Neck Corner Radius End Mill



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00220-40023	4	R0.2	24	6	3.8	12°	6	70	25.50	26.64	27.88	Free	Free	82,70
08-00220-40025			32				6	70	33.85	35.35	37.00	Free	Free	82,70
08-00220-40027			48				6	100	50.53	52.78	Free	Free	Free	131,70
08-00220-40031		R0.3	16				6	60	17.16	17.91	18.74	19.65	Free	82,70
08-00220-40034			24				6	70	25.50	26.63	27.86	Free	Free	82,70
08-00220-40032			32				6	70	33.84	35.34	36.99	Free	Free	82,70
08-00220-40033		R0.5	48				6	100	50.53	52.78	Free	Free	Free	131,70
08-00220-40051			16				6	60	17.15	17.89	18.71	19.61	Free	82,70
08-00220-40054			24				6	70	25.49	26.61	27.83	Free	Free	82,70
08-00220-40052		R1	32				6	70	33.83	35.33	36.96	Free	Free	82,70
08-00220-40053			48				6	100	50.52	52.76	Free	Free	Free	131,70
08-00220-40101			16				6	60	17.13	17.85	18.64	19.51	Free	82,70
08-00220-40104	5	R0.1	24	7.5	4.8	12°	6	70	25.47	26.57	27.77	29.08	Free	82,70
08-00220-40102			32				6	70	33.81	35.28	36.89	Free	Free	82,70
08-00220-40103			48				6	100	50.50	52.71	Free	Free	Free	131,70
08-00220-50011	5	R0.1	20				6	70	21.34	22.29	Free	Free	Free	104,60
08-00220-50013			40				6	90	42.19	Free	Free	Free	Free	131,70
08-00220-50021		R0.2	20				6	70	21.33	22.28	Free	Free	Free	104,60
08-00220-50023			40				6	90	42.19	Free	Free	Free	Free	131,70
08-00220-50031		R0.3	20				6	70	21.33	22.27	Free	Free	Free	104,60
08-00220-50032			40				6	90	42.19	Free	Free	Free	Free	131,70
08-00220-50051		R0.5	20				6	70	21.32	22.25	Free	Free	Free	104,60
08-00220-50052			40				6	90	42.18	Free	Free	Free	Free	131,70
08-00220-50101		R1	20				6	70	21.30	22.21	Free	Free	Free	104,60
08-00220-50102			40				6	90	42.16	Free	Free	Free	Free	131,70
08-00220-60011	6	R0.1	24	9	5.8	-	6	90	Free	Free	Free	Free	Free	104,60
08-00220-60013			48				6	110	Free	Free	Free	Free	Free	164,10
08-00220-60021		R0.2	24				6	90	Free	Free	Free	Free	Free	104,60
08-00220-60023			48				6	110	Free	Free	Free	Free	Free	164,10
08-00220-60031		R0.3	24				6	90	Free	Free	Free	Free	Free	104,60
08-00220-60032			48				6	110	Free	Free	Free	Free	Free	164,10
08-00220-60051		R0.5	24				6	90	Free	Free	Free	Free	Free	104,60
08-00220-60052			48				6	110	Free	Free	Free	Free	Free	164,10
08-00220-60101		R1	24				6	90	Free	Free	Free	Free	Free	104,60
08-00220-60102			48				6	110	Free	Free	Free	Free	Free	164,10

Attenzione
How to Order

Quando ordinate, indicate MHR230R Dia.(D) × (R) × (L1) × (d).
When you order, indicate MHR230R (D) × (R) × (L1) × (d).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio al carbonio/Acciaio pretemprato Carbon Steels • Prehardened Steels S50C • NAK55 • NAK80 • HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38 • STAVAX • SKD61 (~55HRC)				Leghe di alluminio/Rame Aluminium Alloy • Copper			
Dia. Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
0.5	0.05 0.1	1	30,000	500	0.03	0.14	25,000	400	0.01	0.12	30,000	650	0.036	0.14
		2	30,000	400	0.025	0.14	25,000	300	0.01	0.12	30,000	600	0.03	0.14
		3	30,000	340	0.02	0.14	25,000	250	0.008	0.12	30,000	480	0.024	0.14
		4	25,000	280	0.015	0.14	20,000	180	0.005	0.12	30,000	430	0.018	0.14
		5	25,000	230	0.01	0.14	20,000	150	0.004	0.12	30,000	360	0.012	0.14
		6	20,000	180	0.008	0.14	16,000	100	0.003	0.12	25,000	270	0.01	0.14
0.6	0.05 0.1 0.2	2	30,000	600	0.035	0.16	25,000	400	0.02	0.13	30,000	800	0.04	0.16
		3	30,000	500	0.03	0.16	25,000	350	0.015	0.13	30,000	750	0.035	0.16
		4	25,000	400	0.025	0.16	20,000	250	0.015	0.13	30,000	650	0.03	0.16
		6	20,000	250	0.015	0.16	16,000	150	0.008	0.13	25,000	400	0.018	0.16
		8	18,000	180	0.01	0.16	14,000	100	0.005	0.13	20,000	300	0.012	0.16
0.8	0.05 0.1 0.2	4	25,000	1,000	0.045	0.25	20,000	600	0.025	0.2	30,000	1,400	0.055	0.25
		6	20,000	700	0.03	0.25	16,000	400	0.02	0.2	25,000	1,000	0.04	0.25
		8	18,000	400	0.02	0.25	14,000	250	0.01	0.2	22,000	600	0.025	0.25
1	0.05 0.1 0.2 0.3	2	25,000	1,600	0.065	0.35	20,000	900	0.05	0.28	30,000	2,200	0.08	0.35
		3	25,000	1,500	0.06	0.35	20,000	850	0.05	0.28	30,000	2,100	0.07	0.35
		4	25,000	1,400	0.055	0.35	20,000	800	0.04	0.28	30,000	2,000	0.065	0.35
		5	22,000	1,200	0.05	0.35	18,000	700	0.03	0.28	27,000	1,700	0.06	0.35
		6	20,000	1,000	0.045	0.35	16,000	600	0.02	0.28	25,000	1,500	0.055	0.35
		8	18,000	700	0.035	0.35	14,000	450	0.02	0.28	22,000	1,000	0.045	0.35
		10	16,000	600	0.025	0.35	13,000	350	0.01	0.28	20,000	800	0.03	0.35
		12	14,000	350	0.02	0.35	12,000	250	0.008	0.28	18,000	600	0.025	0.35
		16	12,000	250	0.01	0.35	10,000	150	0.005	0.28	14,000	350	0.012	0.35
		20	11,000	150	0.005	0.35	9,000	100	0.003	0.28	13,000	250	0.006	0.35
1.2	0.1 0.2 0.3	5	22,000	1,500	0.055	0.4	18,000	850	0.03	0.32	26,000	2,200	0.065	0.4
		6	20,000	1,300	0.05	0.4	17,000	750	0.03	0.32	25,000	2,000	0.06	0.4
		8	18,000	1,100	0.04	0.4	15,000	600	0.025	0.32	22,000	1,600	0.05	0.4
		10	16,000	900	0.03	0.4	13,000	500	0.02	0.32	20,000	1,400	0.04	0.4
		12	14,000	700	0.025	0.4	11,000	400	0.015	0.32	17,000	1,000	0.03	0.4
		15	12,000	360	0.018	0.4	10,000	210	0.01	0.32	14,000	520	0.022	0.4
		16	12,000	350	0.015	0.4	10,000	200	0.008	0.32	14,000	500	0.02	0.4
		20	10,000	230	0.01	0.4	8,000	150	0.005	0.32	12,000	330	0.012	0.4

Scaricata
Long Neck



Rivestita
Coating



Toriche
Corner
Radius



P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

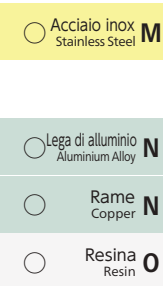
N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions



Materiale Work Material			Acciaio al carbonio/Acciaio pretemprato Carbon Steels•Prehardened Steels S50C•NAK55•NAK80•HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38•STAVAX•SKD61 (~55HRC)				Leghe di alluminio/Rame Aluminium Alloy•Copper			
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
1.5	0.1 0.2 0.3 0.5	4	22,000	1,600	0.09	0.45	18,000	1,000	0.05	0.36	26,000	2,300	0.1	0.45
		6	20,000	1,400	0.08	0.45	16,000	850	0.045	0.36	24,000	2,000	0.09	0.45
		8	18,000	1,200	0.07	0.45	15,000	700	0.04	0.36	22,000	1,800	0.08	0.45
		10	16,000	1,000	0.06	0.45	13,000	550	0.035	0.36	20,000	1,500	0.07	0.45
		12	14,000	800	0.05	0.45	11,000	450	0.03	0.36	17,000	1,200	0.06	0.45
		16	12,000	600	0.035	0.45	10,000	350	0.018	0.36	15,000	900	0.04	0.45
		18	11,000	450	0.03	0.45	9,000	280	0.01	0.36	13,000	650	0.035	0.45
		20	10,000	300	0.02	0.45	8,000	200	0.005	0.36	12,000	450	0.025	0.45
2	0.1 0.2 0.3 0.5	4	16,000	2,200	0.13	0.5	14,000	1,000	0.06	0.4	20,000	3,000	0.15	0.5
		6	16,000	2,100	0.12	0.5	14,000	900	0.055	0.4	20,000	2,800	0.14	0.5
		8	16,000	2,000	0.11	0.5	13,000	800	0.05	0.4	20,000	2,600	0.13	0.5
		10	16,000	1,800	0.1	0.5	13,000	750	0.045	0.4	20,000	2,300	0.12	0.5
		12	14,000	1,500	0.09	0.5	11,000	600	0.04	0.4	17,000	1,900	0.11	0.5
		16	12,000	1,200	0.07	0.5	10,000	500	0.03	0.4	15,000	1,600	0.085	0.5
		20	10,000	800	0.05	0.5	8,000	350	0.02	0.4	12,000	1,000	0.06	0.5
		24	9,000	700	0.03	0.5	7,000	280	0.01	0.4	11,000	900	0.04	0.5
		26	9,000	600	0.025	0.5	7,000	250	0.008	0.4	11,000	850	0.03	0.5
		30	8,000	400	0.02	0.5	6,400	200	0.005	0.4	9,000	550	0.025	0.5
2.5	0.1 0.2 0.3 0.5	10	13,000	1,800	0.14	0.8	11,000	900	0.07	0.65	16,000	3,000	0.17	0.8
		20	9,000	1,000	0.08	0.8	7,000	450	0.05	0.65	11,000	1,600	0.1	0.8
		30	7,000	500	0.03	0.8	5,600	250	0.01	0.65	8,500	850	0.035	0.8
3	0.1 0.2 0.3 0.5 1	12	11,000	1,800	0.16	0.9	9,000	900	0.08	0.75	13,000	3,000	0.2	0.9
		18	10,000	1,400	0.12	0.9	8,000	700	0.07	0.75	12,000	2,400	0.14	0.9
		24	8,000	1,000	0.08	0.9	6,400	500	0.05	0.75	10,000	1,800	0.1	0.9
		30	7,000	800	0.06	0.9	5,600	400	0.03	0.75	8,500	1,300	0.07	0.9
		36	6,000	500	0.03	0.9	4,800	300	0.01	0.75	7,200	1,000	0.04	0.9
4	0.1 0.2 0.3 0.5 1	16	8,000	2,000	0.2	1.2	6,400	850	0.1	1	10,000	3,200	0.3	1.2
		24	7,000	1,500	0.12	1.2	5,600	700	0.08	1	8,500	2,400	0.18	1.2
		32	6,000	800	0.08	1.2	4,800	500	0.04	1	8,000	1,800	0.14	1.2
		48	4,000	400	0.04	1.2	3,200	300	0.01	1	4,800	700	0.05	1.2

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio al carbonio/Acciaio pretemtrato Carbon Steels・Prehardened Steels S50C・NAK55・NAK80・HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38・STAVAX・SKD61 (~55HRC)				Leghe di alluminio/Rame Aluminium Alloy・Copper			
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
5	0.1 0.2 0.3 0.5 1	20	6,000	1,800	0.25	1.6	4,800	800	0.1	1.3	7,200	3,000	0.36	1.6
		40	4,000	700	0.07	1.6	3,200	400	0.05	1.3	4,800	1,300	0.16	1.6
6	0.1 0.2 0.3 0.5 1	24	4,500	1,500	0.3	2.1	3,600	700	0.15	1.7	5,400	2,600	0.48	2.1
		48	3,000	600	0.1	2.1	2,400	350	0.05	1.7	3,600	1,000	0.18	2.1
Note Notes			※1 I parametri di taglio sopra indicati vanno regolati in base alla forma da fresare e al tipo di macchina. ※2 ap=Profondità di taglio assiale, ae=Profondità di taglio radiale. ※3 Raccomandiamo l'uso di lubrificazione minimale specifica per materiali temprati. ※4 Raccomandiamo l'approccio a rampa o elicoidale per entrare nel pezzo in maniera assiale. ※5 Regolare l'avanzamento più basso del 50% e la profondità radiale (ae) del 30% quando la profondità di fresatura è maggiore di 8xD per stabilizzare la fresa. ※6 Per cave consigliamo la fresatura bidirezionale e la riduzione avanzamento e profondità assiale (ap) del 50%. ※7 Ridurre con la stessa proporzione giri ed avanzamento, per eliminare vibrazioni o in caso di limitato numero di giri della macchina. ※1 Adjust milling conditions according to milling shape and machine type. ※2 ap : Axial Depth of Cut, ae: Radial Depth of Cut. ※3 Recommend to use oil mist coolant for machining hardened steels. ※4 Recommend to apply helical or ramping for approaching into axial direction. ※5 Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area when L/D exceeds 8 for stable milling. ※6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition. ※7 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.											

Scaricata
Long Neck



Rivestita
Coating

Toriche
Corner

Radii
Radius

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli toriche scaricate MUGEN

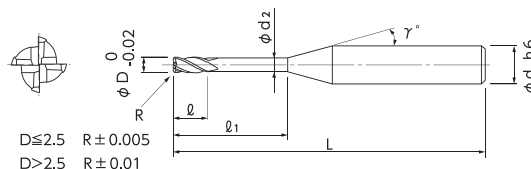
Totale 146 misure

MUGEN COATING 4-Flute Long Neck Corner Radius End Mill

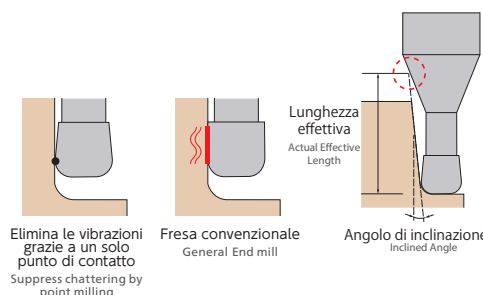
Total 146 sizes

Fresa 4 tagli torica scaricata
Massimo L/D=12

4-flute long neck corner radius end mill. Maximum L/D=12



- Vibrazioni ridotte grazie alla riduzione del carico dovuta alla forma del tagliente.
- Precisione del raggio $\pm 5 \mu\text{m}$ (D2.5 ed inferiore).
- Grazie al rivestimento MUGEN si ottengono grandi performance in fresature di acciai pretemprati e rame per elettrodi.
- Employing short flute length. Less contact to work material reduces chattering.
- Corner R accuracy: $\pm 5 \mu\text{m}$ (Dia. ~ 2.5)
- Upgraded MUGEN COATING brings outstanding performance for milling of Prehardened Steels and Copper Electrode as well.

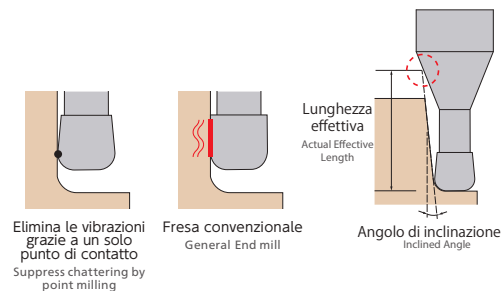
Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00230-10021	1	R0.05	3	0.8	0.95	12°	4	50	3.24	3.39	3.54	3.72	4.12	57,40
08-00230-10022			4					50	4.29	4.48	4.68	4.91	5.44	57,40
08-00230-10023			5					50	5.33	5.57	5.82	6.11	6.77	57,40
08-00230-10024			6					50	6.37	6.66	6.97	7.31	8.10	57,40
08-00230-10025			8					50	8.46	8.83	9.25	9.70	10.75	57,40
08-00230-10026			10					50	10.54	11.01	11.53	12.09	13.41	57,40
08-00230-10027			12					50	12.63	13.19	13.81	14.49	16.06	57,40
08-00230-10031		R0.1	3					50	3.24	3.38	3.54	3.71	4.10	57,40
08-00230-10032			4					50	4.28	4.47	4.68	4.90	5.43	57,40
08-00230-10033			5					50	5.33	5.56	5.82	6.10	6.76	57,40
08-00230-10034			6					50	6.37	6.65	6.96	7.30	8.08	57,40
08-00230-10035			8					50	8.46	8.83	9.24	9.69	10.74	57,40
08-00230-10036			10					50	10.54	11.01	11.52	12.08	13.39	57,40
08-00230-10037			12					50	12.63	13.19	13.80	14.48	16.05	57,40
08-00230-10041		R0.2	3					50	3.24	3.37	3.52	3.69	4.07	57,40
08-00230-10042			4					50	4.28	4.46	4.66	4.88	5.40	57,40
08-00230-10043			5					50	5.32	5.55	5.80	6.08	6.72	57,40
08-00230-10044			6					50	6.37	6.64	6.94	7.28	8.05	57,40
08-00230-10045			8					50	8.45	8.82	9.23	9.67	10.71	57,40
08-00230-10046			10					50	10.54	11.00	11.51	12.06	13.36	57,40
08-00230-10047			12					50	12.62	13.18	13.79	14.46	16.01	57,40
08-00230-10051		R0.3	3					50	3.23	3.36	3.51	3.67	4.04	57,40
08-00230-10052			4					50	4.28	4.45	4.65	4.86	5.36	57,40
08-00230-10053			5					50	5.32	5.54	5.79	6.06	6.69	57,40
08-00230-10054			6					50	6.36	6.63	6.93	7.26	8.02	57,40
08-00230-10055			8					50	8.45	8.81	9.21	9.65	10.67	57,40
08-00230-10056			10					50	10.53	10.99	11.49	12.04	13.33	57,40
08-00230-10057			12					50	12.62	13.17	13.77	14.44	15.98	57,40
08-00230-12031	1.2	R0.1	5	1	1.14	12°	4	50	5.35	5.59	5.84	6.13	6.79	60,10
08-00230-12032			10					50	10.57	11.03	11.55	12.11	13.42	60,10
08-00230-12033			15					60	15.78	16.48	17.25	18.09	20.06	91,00

Attenzione
How to OrderQuando ordinate, indicate MHR430R (D) × (R) × (L1).
When you order, indicate MHR430R (D) × (R) × (L1).※ (γ) è un valore di riferimento.
※ (γ) is reference value.

Frese 4 tagli toriche scaricate MUGEN

MUGEN COATING 4-Flute Long Neck Corner Radius End Mill

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00230-12041	1.2	R0.2	5	1	1.14	12°	4	50	5.35	5.58	5.83	6.11	6.75	60,10
08-00230-12042			10					50	10.56	11.03	11.53	12.09	13.39	60,10
08-00230-12043			15					60	15.78	16.47	17.24	18.07	20.03	91,00
08-00230-12051		R0.3	5					50	5.34	5.57	5.82	6.09	6.72	60,10
08-00230-12052			10					50	10.56	11.02	11.52	12.07	13.36	60,10
08-00230-12053			15					60	15.77	16.46	17.22	18.05	20.00	91,00
08-00230-15031	1.5	R0.1	6	1.2	1.45	12°	4	50	6.37	6.65	6.96	7.30	8.08	60,10
08-00230-15032			12					50	12.63	13.19	13.80	14.48	16.05	60,10
08-00230-15033			18					60	18.88	19.72	20.64	21.65	Free	60,10
08-00230-15041		R0.2	6					50	6.37	6.64	6.94	7.28	8.05	60,10
08-00230-15042			12					50	12.62	13.18	13.79	14.46	16.01	60,10
08-00230-15043			18					60	18.88	19.72	20.63	21.64	23.98	60,10
08-00230-15051		R0.3	6					50	6.36	6.63	6.93	7.26	8.02	60,10
08-00230-15052			12					50	12.62	13.17	13.77	14.44	15.98	60,10
08-00230-15053			18					60	18.88	19.71	20.62	21.62	23.95	60,10
08-00230-15061		R0.5	6					50	6.35	6.62	6.90	7.22	7.96	60,10
08-00230-15062			12					50	12.61	13.15	13.75	14.40	15.92	60,10
08-00230-15063			18					60	18.87	19.69	20.59	21.58	23.88	60,10
08-00230-20031	2	R0.1	8	1.6	1.91	12°	4	50	8.55	8.93	9.35	9.80	10.86	60,10
08-00230-20032			12					50	12.73	13.29	13.91	14.59	16.17	60,10
08-00230-20033			16					60	16.90	17.65	18.47	19.37	Free	60,10
08-00230-20034			20					60	21.07	22.01	23.03	24.16	Free	60,10
08-00230-20035		R0.2	24					70	25.24	26.36	27.59	Free	Free	63,20
08-00230-20041			8					50	8.55	8.92	9.33	9.78	10.83	60,10
08-00230-20042			12					50	12.72	13.28	13.89	14.57	16.14	60,10
08-00230-20043			16					60	16.89	17.64	18.46	19.36	Free	60,10
08-00230-20044			20					60	21.06	22.00	23.02	24.14	Free	60,10
08-00230-20045		R0.3	24					70	25.23	26.36	27.58	Free	Free	63,20
08-00230-20051			8					50	8.55	8.91	9.32	9.76	10.80	60,10
08-00230-20052			12					50	12.72	13.27	13.88	14.55	16.11	60,10
08-00230-20053			16					60	16.89	17.63	18.44	19.34	Free	60,10
08-00230-20054			20					60	21.06	21.99	23.00	24.12	Free	60,10
08-00230-20055		R0.5	24					70	25.23	26.35	27.57	28.91	Free	63,20
08-00230-20061			8					50	8.54	8.90	9.29	9.72	10.73	60,10
08-00230-20062			12					50	12.71	13.25	13.85	14.51	16.04	60,10
08-00230-20063			16					60	16.88	17.61	18.42	19.30	Free	60,10
08-00230-20064			20					60	21.05	21.97	22.98	24.08	Free	60,10
08-00230-20065			24					70	25.22	26.33	27.54	28.87	Free	63,20

Scaricata
Long Neck

Toriche
Corner
Radius

Rivestita
Coating

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

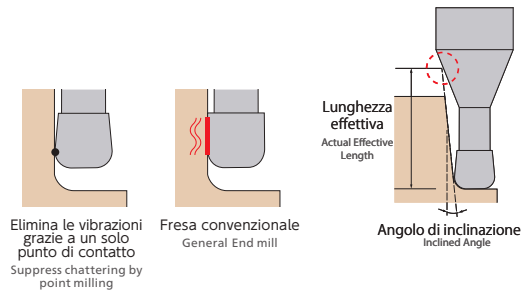
O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

MHR430R

Frese 4 tagli toriche scaricate MUGEN

MUGEN COATING 4-Flute Long Neck Corner Radius End Mill



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(D2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00230-25031	2.5	R0.1	10	2	2.39	12°	4	50	10.69	11.16	11.68	12.25	13.58	64,00
08-00230-25032			20					60	21.12	22.06	23.09	Free	Free	64,00
08-00230-25033			30					70	31.55	32.95	Free	Free	Free	70,70
08-00230-25041		R0.2	10					50	10.68	11.15	11.67	12.23	13.55	64,00
08-00230-25042			20					60	21.11	22.05	23.07	Free	Free	64,00
08-00230-25043			30					70	31.54	32.94	Free	Free	Free	67,30
08-00230-25051		R0.3	10					50	10.68	11.14	11.65	12.21	13.52	64,00
08-00230-25052			20					60	21.11	22.04	23.06	Free	Free	64,00
08-00230-25053			30					70	31.54	32.93	Free	Free	Free	70,70
08-00230-25061		R0.5	10					50	10.67	11.13	11.63	12.17	13.45	64,00
08-00230-25062			20					60	21.10	22.02	23.03	Free	Free	64,00
08-00230-25063			30					70	31.53	32.92	Free	Free	Free	70,70
08-00230-30031	3	R0.1	12	2.5	2.85	12°	6	50	12.87	13.44	14.07	14.76	16.36	96,70
08-00230-30032			18					60	19.13	19.98	20.91	21.94	24.32	96,70
08-00230-30033			24					70	25.39	26.52	27.76	29.12	Free	101,10
08-00230-30034			30					70	31.64	33.05	34.60	36.30	Free	105,60
08-00230-30035			36					80	37.90	39.59	41.44	Free	Free	105,60
08-00230-30041		R0.2	12					50	12.87	13.44	14.06	14.74	16.33	96,70
08-00230-30042			18					60	19.13	19.97	20.90	21.92	24.29	96,70
08-00230-30043			24					70	25.38	26.51	27.74	29.10	Free	101,10
08-00230-30044			30					70	31.64	33.05	34.58	36.28	Free	105,60
08-00230-30045			36					80	37.90	39.58	41.43	Free	Free	105,60
08-00230-30051		R0.3	12					50	12.86	13.43	14.04	14.72	16.29	96,70
08-00230-30052			20					60	21.21	22.14	23.17	24.29	26.91	96,70
08-00230-30053			24					70	25.38	26.50	27.73	29.08	Free	101,10
08-00230-30054			30					70	31.63	33.04	34.57	36.26	Free	105,60
08-00230-30055			36					80	37.89	39.57	41.41	Free	Free	105,60
08-00230-30061		R0.5	12					50	12.86	13.41	14.01	14.68	16.23	96,70
08-00230-30062			20					60	21.20	22.12	23.14	24.25	26.85	96,70
08-00230-30063			24					70	25.37	26.48	27.70	29.04	Free	101,10
08-00230-30064			30					70	31.63	33.02	34.54	36.22	Free	105,60
08-00230-30065			36					80	37.88	39.56	41.39	43.40	Free	105,60
08-00230-30071		R1	12					50	12.83	13.36	13.94	14.58	16.07	96,70
08-00230-30072			20					60	21.18	22.08	23.07	24.16	26.69	96,70
08-00230-30073			24					70	25.35	26.44	27.63	28.94	Free	101,10
08-00230-30074			30					70	31.60	32.97	34.47	36.12	Free	105,60
08-00230-30075			36					80	37.86	39.51	41.32	43.30	Free	105,60

Attenzione
How to Order

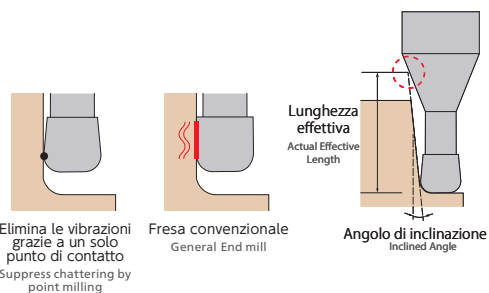
Quando ordinate, indicate MHR430R (D) × (R) × (L1).
When you order, indicate MHR430R (D) × (R) × (L1).

※ (γ) è un valore di riferimento.
※ (γ) is reference value.

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli toriche scaricate MUGEN

MUGEN COATING 4-Flute Long Neck Corner Radius End Mill

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00230-40031	4	R0.1	16	3.2	3.8	12°	6	60	17.17	17.93	18.77	19.68	Free	96,70
08-00230-40032			24					70	25.51	26.65	27.89	Free	Free	96,70
08-00230-40033			32					70	33.85	35.36	37.01	Free	Free	96,70
08-00230-40034			48					100	50.54	52.79	Free	Free	Free	159,50
08-00230-40041		R0.2	16					60	17.16	17.92	18.75	19.66	Free	96,70
08-00230-40042			24					70	25.50	26.64	27.88	Free	Free	96,70
08-00230-40043			32					70	33.85	35.35	37.00	Free	Free	96,70
08-00230-40044			48					100	50.53	52.78	Free	Free	Free	159,50
08-00230-40051		R0.3	16					60	17.16	17.91	18.74	19.65	Free	96,70
08-00230-40052			24					70	25.50	26.63	27.86	Free	Free	96,70
08-00230-40053			32					70	33.84	35.34	36.99	Free	Free	96,70
08-00230-40054			48					100	50.53	52.78	Free	Free	Free	154,20
08-00230-40061		R0.5	16					60	17.15	17.89	18.71	19.61	Free	96,70
08-00230-40062			24					70	25.49	26.61	27.83	Free	Free	96,70
08-00230-40063			32					70	33.83	35.33	36.96	Free	Free	96,70
08-00230-40064			48					100	50.52	52.76	Free	Free	Free	159,50
08-00230-40071		R1	16					60	17.13	17.85	18.64	19.51	Free	96,70
08-00230-40072			24					70	25.47	26.57	27.77	29.08	Free	96,70
08-00230-40073			32					70	33.81	35.28	36.89	Free	Free	96,70
08-00230-40074			48					100	50.50	52.71	Free	Free	Free	159,50
08-00230-50031	5	R0.1	20	4	4.75	12°	6	70	21.46	22.42	Free	Free	Free	120,90
08-00230-50032			40					90	42.32	Free	Free	Free	Free	159,50
08-00230-50041		R0.2	20					70	21.46	22.41	Free	Free	Free	120,90
08-00230-50042			40					90	42.31	Free	Free	Free	Free	159,50
08-00230-50051		R0.3	20					70	21.45	22.40	Free	Free	Free	120,90
08-00230-50052			40					90	42.31	Free	Free	Free	Free	154,20
08-00230-50061		R0.5	20					70	21.44	22.38	Free	Free	Free	120,90
08-00230-50062			40					90	42.30	Free	Free	Free	Free	159,50
08-00230-50071		R1	20					70	21.42	22.34	Free	Free	Free	120,90
08-00230-50072			40					90	42.28	Free	Free	Free	Free	159,50
08-00230-60031	6	R0.1	24	5	5.7	-	6	90	Free	Free	Free	Free	Free	125,10
08-00230-60032			48					110	Free	Free	Free	Free	Free	197,80
08-00230-60041		R0.2	24					90	Free	Free	Free	Free	Free	125,10
08-00230-60042			48					110	Free	Free	Free	Free	Free	197,80
08-00230-60051		R0.3	24					90	Free	Free	Free	Free	Free	125,10
08-00230-60052			48					110	Free	Free	Free	Free	Free	197,80
08-00230-60061		R0.5	24					90	Free	Free	Free	Free	Free	125,10
08-00230-60062			48					110	Free	Free	Free	Free	Free	197,80
08-00230-60071		R1	24					90	Free	Free	Free	Free	Free	125,10
08-00230-60072			48					110	Free	Free	Free	Free	Free	197,80

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio al carbonio/Acciaio pretemprato Carbon Steels•Prehardened Steels S50C•NAK55•NAK80•HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38•STAVAX•SKD61 (~55HRC)				Leghe di alluminio/Rame Aluminium Alloy•Copper				
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	
1	0.05 0.1 0.2 0.3		3	16,000	1,800	0.06	0.35	12,800	1,260	0.045	0.3	16,000	1,800	0.2	0.23
			4	16,000	1,500	0.05	0.35	12,800	1,050	0.04	0.3	16,000	1,500	0.15	0.23
			5	16,000	1,410	0.045	0.35	12,800	990	0.035	0.25	16,000	1,410	0.13	0.23
			6	14,500	1,200	0.04	0.25	11,600	840	0.03	0.25	14,500	1,200	0.12	0.2
			8	14,500	870	0.03	0.25	11,600	620	0.02	0.2	14,500	870	0.09	0.2
			10	11,100	660	0.025	0.25	8,900	470	0.015	0.1	11,100	660	0.075	0.15
	12	11,100	300	0.02	0.2	8,900	210	0.01	0.08	11,100	300	0.06	0.15		
1.2	0.1 0.2 0.3		5	15,500	1,740	0.06	0.4	12,400	1,220	0.045	0.35	15,500	1,740	0.18	0.28
			10	12,000	1,290	0.04	0.35	9,600	900	0.03	0.25	12,000	1,290	0.12	0.28
			15	10,600	480	0.02	0.25	8,500	330	0.01	0.1	10,600	480	0.07	0.23
1.5	0.1 0.2 0.3 0.5		6	14,000	1,910	0.08	0.53	11,200	1,340	0.05	0.4	14,000	1,910	0.24	0.35
			12	11,500	1,250	0.06	0.42	9,000	870	0.04	0.3	11,500	1,250	0.18	0.3
			18	8,500	560	0.02	0.3	6,800	390	0.01	0.15	8,500	560	0.08	0.25
2	0.1 0.2 0.3 0.5		8	11,100	2,150	0.08	0.6	8,800	1,500	0.05	0.5	11,100	2,150	0.24	0.45
			12	11,100	1,800	0.065	0.6	8,800	1,260	0.045	0.5	11,100	1,800	0.2	0.43
			16	9,600	1,500	0.05	0.5	7,700	1,050	0.04	0.35	9,600	1,500	0.15	0.39
			20	9,600	900	0.03	0.45	7,700	630	0.015	0.25	9,600	900	0.12	0.35
			24	6,400	740	0.02	0.4	5,100	510	0.01	0.2	6,400	740	0.1	0.3
2.5	0.1 0.2 0.3 0.5		10	9,200	2,280	0.1	0.85	7,400	1,590	0.07	0.7	9,200	2,280	0.3	0.5
			20	8,300	1,580	0.08	0.6	6,600	1,110	0.05	0.4	8,300	1,580	0.24	0.43
			30	5,400	710	0.025	0.45	4,300	500	0.01	0.2	5,400	710	0.1	0.33
3	0.1 0.2 0.3 0.5 1		12	8,000	2,400	0.12	0.9	6,400	1,680	0.08	0.8	8,000	2,400	0.36	0.55
			18	7,800	2,000	0.11	0.8	6,200	1,410	0.07	0.7	7,800	2,010	0.33	0.5
			20	7,700	1,850	0.1	0.8	6,200	1,250	0.06	0.6	7,700	1,850	0.3	0.5
			24	7,500	1,620	0.1	0.7	6,000	1,140	0.06	0.5	7,500	1,620	0.3	0.45
			30	6,000	1,050	0.05	0.6	4,800	740	0.03	0.4	6,000	1,050	0.15	0.4
			36	4,200	710	0.03	0.5	3,400	500	0.01	0.3	4,200	710	0.1	0.35
4	0.1 0.2 0.3 0.5 1		16	6,000	2,520	0.15	1.2	4,800	1,770	0.1	1	6,000	2,520	0.45	0.75
			24	5,400	2,030	0.12	1	4,300	1,430	0.085	0.8	5,400	2,030	0.39	0.7
			32	4,800	1,350	0.08	0.9	3,800	950	0.04	0.7	4,800	1,350	0.25	0.6
			48	3,200	570	0.04	0.8	2,600	410	0.01	0.35	3,200	570	0.12	0.5
5	0.1 0.2 0.3 0.5 1		20	5,100	2,300	0.17	1.6	4,100	1,610	0.12	1.2	5,100	2,300	0.52	1
			40	3,200	1,020	0.07	1.2	2,600	720	0.05	0.9	3,200	1,020	0.25	0.8
6	0.1 0.2 0.3 0.5 1		24	3,700	2,100	0.2	2.1	3,000	1,470	0.12	1.5	3,700	2,100	0.6	1.2
			48	2,600	950	0.09	1.5	2,100	660	0.05	1.2	2,600	950	0.32	0.9
Note Notes			※1 I parametri di taglio sopra indicati vanno regolati in base alla forma da fresare e al tipo di macchina. ※2 ap=Profondità di taglio assiale, ae=Profondità di taglio radiale. ※3 Raccomandiamo l'uso di lubrificazione minima specifica per materiali temprati. ※4 Raccomandiamo l'approccio a rampa o elicoidale per entrare nel pezzo in maniera assiale. ※5 Regolare l'avanzamento più basso del 50% e la profondità radiale (ae) del 30% quando la profondità di fresatura è maggiore di 8XD, per stabilizzare la fresa. ※6 Per cave consigliamo la fresatura bidirezionale e la riduzione avanzamento e profondità assiale (ap) del 50%. ※7 Ridurre con la stessa proporzione giri ed avanzamento, per eliminare vibrazioni o in caso di limitato numero di giri della macchina. ※1 Adjust milling conditions according to milling shape and machine type. ※2 ap: Axial Depth of Cut, ae: Radial Depth of Cut. ※3 Recommend to use oil mist coolant for machining hardened steels. ※4 Recommend to apply helical or ramping for approaching into axial direction. ※5 Adjust feed rate 50% lower and cutting depth(ae) 30% lower for milling deep wall area. When L/D exceeds 8 for stable milling. ※6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition. ※7 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.												

Condizioni di taglio ad alta velocità raccomandate

Recommended High Speed Milling Conditions

Materiale Work Material			Acciaio al carbonio/Acciaio pretemprato Carbon Steels·Prehardened Steels S50C·NAK55·NAK80·HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38·STAVAX·SKD61 (~55HRC)				Leghe di alluminio/Rame Aluminium Alloy·Copper			
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
2	0.5	8	22,000	6,200	0.06	0.4	16,000	4,500	0.04	0.3	12,800	3,000	0.03	0.2
2.5	0.5	10	18,000	6,400	0.08	0.65	13,000	4,600	0.05	0.5	10,200	3,600	0.03	0.3
3	1	12	15,000	7,100	0.1	0.7	11,000	5,100	0.06	0.6	8,500	3,700	0.04	0.4
4	1	16	11,000	7,100	0.13	1	8,000	5,100	0.08	0.8	6,300	3,800	0.05	0.5
5	1	20	9,000	8,200	0.15	1.4	6,500	5,200	0.1	1	5,100	3,700	0.05	0.7
6	1	24	7,500	7,700	0.18	1.8	5,300	5,300	0.1	1.3	4,200	3,100	0.06	0.8
Note Notes			※1 I parametri di taglio sopra indicati vanno regolati in base alla forma da fresare e al tipo di macchina.											
			※2 ap=Profondità di taglio assiale, ae=Profondità di taglio radiale.											
			※3 Raccomandiamo l'uso di lubrificazione minima specifica per materiali temprati.											
			※4 Regolare l'avanzamento più basso del 50% e la profondità radiale (ae) del 30% per fresature profonde.											
			※5 Raccomandiamo l'approccio a rampa o elicoidale per entrare nel pezzo in maniera assiale.											
			※6 Ridurre con la stessa proporzione giri ed avanzamento, per eliminare vibrazioni o in caso di limitato numero di giri della macchina.											
			※1 Adjust milling conditions according to milling shape and machine type.											
			※2 ap: Axial Depth of Cut, ae: Radial Depth of Cut.											
			※3 Recommend to use oil mist coolant for machining hardened steels.											
			※4 Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area.											
			※5 Recommend to apply helical or ramping for approaching into axial direction.											
			※6 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.											

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusP Acciaio al carbonio
Carbon SteelP Acciaio legato
Alloy SteelP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinRivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli ad alto avanzamento scaricata MUGEN

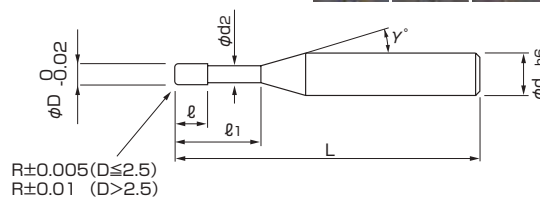
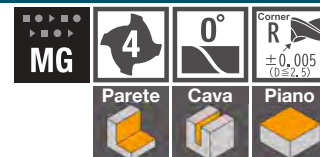
MUGEN COATING High Feed 4-Flute Neck Corner Radius End Mill

Totale 6 misure

Total 6 sizes

Fresa 4 tagli torica ad alto avanzamento scaricata

High feed 4-flute long neck corner radius end mill.



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
65-00400-00400	4	1	8	2	3.7	6	50	69,50
65-00400-00500	5	1	10	2.5	4.6	6	50	72,20
65-00400-00600	6	1.5	12	3	5.5	6	55	67,80
65-00400-00800	8	2	16	4	7.4	8	60	112,20
65-00400-01000	10	2	20	5	9.2	10	70	141,30
65-00400-01200	12	2	24	6	11	12	75	176,40

Attenzione How to Order

Quando ordinate, indicate MHR400RHF (D) × (R) × (L1).
When you order, indicate MHR400RHF (D) × (R) × (L1).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Toriche
Corner
Radius

Scaricata
Long Neck



Rivestita
Coating

Acciaio al carbonio
Carbon Steel P

Acciaio legato
Alloy Steel P

Acciaio pretemprato
Prehardened Steel P

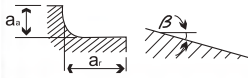
Temprato ~52
Hardened Steel HRC H

Temprato ~60
Hardened Steel HRC H

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Cutting Conditions

Materiale Work Material		Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK (~45HRC)		Acciaio temprato Hardened Steels SKD61 (~60HRC)																							
Velocità di taglio		200m/min		180m/min		150m/min		100m/min																							
Diametro Dia.	Raggio Corner Radius	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed																						
		g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min																						
4	1	16.000	17.000	14.500	16.000	12.000	10.500	8.000	4.000																						
5	1	12.800	15.000	11.500	13.000	9.600	10.000	6.400	3.800																						
6	1.5	10.600	14.000	9.600	11.500	8.000	8.500	5.400	3.800																						
8	2	7.950	14.000	7.200	11.500	6.000	8.500	4.000	3.800																						
10	2	6.350	14.000	5.700	11.500	4.800	8.500	3.200	3.800																						
12	2	5.300	14.000	4.800	11.500	4.000	8.500	2.700	3.800																						
Profondità di taglio (D = Diametro)		 <table><tr><td>a_s</td><td>a_r</td></tr><tr><td>0,1 x R</td><td>0,3D</td></tr></table>				a _s	a _r	0,1 x R	0,3D	<table><tr><td></td><td>a_s</td><td>a_r</td></tr><tr><td>R ≤ 2</td><td>0,1 x R</td><td>0,3D</td></tr><tr><td>R > 2</td><td>0,2 mm</td><td>0,3D</td></tr></table>			a _s	a _r	R ≤ 2	0,1 x R	0,3D	R > 2	0,2 mm	0,3D	<table><tr><td></td><td>a_s</td><td>a_r</td></tr><tr><td>R ≤ 2</td><td>0,05xR</td><td>0,3D</td></tr><tr><td>R > 2</td><td>0,1 mm</td><td>0,3D</td></tr></table>			a _s	a _r	R ≤ 2	0,05xR	0,3D	R > 2	0,1 mm	0,3D
						a _s	a _r																								
0,1 x R	0,3D																														
	a _s	a _r																													
R ≤ 2	0,1 x R	0,3D																													
R > 2	0,2 mm	0,3D																													
	a _s	a _r																													
R ≤ 2	0,05xR	0,3D																													
R > 2	0,1 mm	0,3D																													
Note Notes		※1 Regolate le condizioni di fresatura in accordo alla rigidità della macchina ※2 Regolare il numero dei giri in caso di vibrazioni ※3 Adatto a lavorazioni di raggi in contornatura ※4 Regolate con la stessa proporzione giri e avanzamento ※5 Utilizzare lubrificazione minimale o aria compressa ※1 Adjust the milling conditions according to rigidity of the machine. ※2 Reduce spindle speed when chattering. ※3 Apply to corner milling by contouring. ※4 Adjust both spindle speed and feed in the same proportion. ※5 Air blow or oil mist is recommended.																													

Scaricata
Long Neck



Rivestita
Coating

Toriche
Corner
Radius

- P Acciaio al carbonio
Carbon Steel
- P Acciaio legato
Alloy Steel
- P Acciaio pretemprato
Prehardened Steel
- H ~52 Temprato
HRC Hardened Steel
- H ~60 Temprato
HRC Hardened Steel

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli toriche ad alto avanzamento scaricata lunga MUGEN

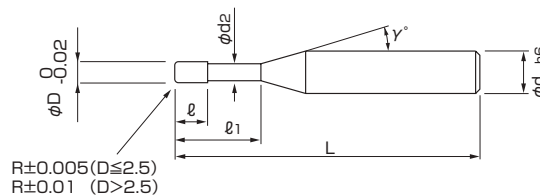
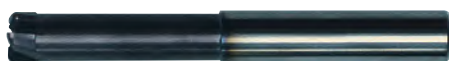
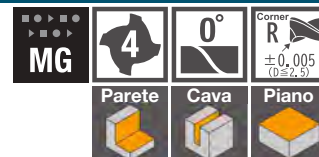
Totale 6 misure

MUGEN COATING High Feed 4-Flute Neck Corner Radius End Mill

Total 6 sizes

Fresa 4 tagli torica ad alto avanzamento scaricata lunga

High feed 4-flute long neck corner radius end mill.



Unità [misura: mm]
Unit[Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L ₁) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d ₂) Diametro scarico Neck Dia.	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
65-00410-00400	4	1	16	2	3.7	6	60	74,40
65-00410-00500	5	1	20	2.5	4.6	6	60	77,20
65-00410-00600	6	1.5	24	3	5.5	6	65	72,20
65-00410-00800	8	2	32	4	7.4	8	75	125,50
65-00410-01000	10	2	40	5	9.2	10	90	162,50
65-00410-01200	12	2	48	6	11	12	100	208,60

Attenzione How to Order

Quando ordinate, indicate MHRL400RHF (D) × (R) × (L₁).
When you order, indicate MHRL400RHF (D) × (R) × (L₁).

※(γ) è un valore di riferimento
※(γ) is reference value.

Toriche
Corner
Radius

Scaricata
Long Neck



Rivestita
Coating

Acciaio al carbonio
Carbon Steel P

Acciaio legato
Alloy Steel P

Acciaio pretemprato
Prehardened Steel P

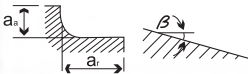
Temprato ~52
Hardened Steel HRC H

Temprato ~60
Hardened Steel HRC H

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Condizioni di taglio raccomandate

Recommended Cutting Conditions

Materiale Work Material		Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM•SKD•SUS		Acciaio pretemprato Prehardened Steels HPM•NAK (~45HRC)		Acciaio temprato Hardened Steels SKD61 (~60HRC)																												
Velocità di taglio		200m/min		180m/min		150m/min		100m/min																												
Diametro Dia.	Raggio Corner Radius	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed																											
		g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min																											
4	1	16.000	17.000	14.500	16.000	12.000	10.500	8.000	4.000																											
5	1	12.800	15.000	11.500	13.000	9.600	10.000	6.400	3.800																											
6	1.5	10.600	14.000	9.600	11.500	8.000	8.500	5.400	3.800																											
8	2	7.950	14.000	7.200	11.500	6.000	8.500	4.000	3.800																											
10	2	6.350	14.000	5.700	11.500	4.800	8.500	3.200	3.800																											
12	2	5.300	14.000	4.800	11.500	4.000	8.500	2.700	3.800																											
Profondità di taglio (D = Diametro)		 <table><tr><th></th><th>a_s</th><th>a</th></tr><tr><td>$R \leq 2$</td><td>$0,1 \times R$</td><td>$0,3D$</td></tr><tr><td>$R > 2$</td><td>$0,2 \text{ mm}$</td><td>$0,3D$</td></tr></table>					a_s	a	$R \leq 2$	$0,1 \times R$	$0,3D$	$R > 2$	$0,2 \text{ mm}$	$0,3D$	<table><tr><th></th><th>a_s</th><th>a</th></tr><tr><td>$R \leq 2$</td><td>$0,1 \times R$</td><td>$0,3D$</td></tr><tr><td>$R > 2$</td><td>$0,2 \text{ mm}$</td><td>$0,3D$</td></tr></table>			a_s	a	$R \leq 2$	$0,1 \times R$	$0,3D$	$R > 2$	$0,2 \text{ mm}$	$0,3D$	<table><tr><th></th><th>a_s</th><th>a</th></tr><tr><td>$R \leq 2$</td><td>$0,05 \times R$</td><td>$0,3D$</td></tr><tr><td>$R > 2$</td><td>$0,1 \text{ mm}$</td><td>$0,3D$</td></tr></table>			a_s	a	$R \leq 2$	$0,05 \times R$	$0,3D$	$R > 2$	$0,1 \text{ mm}$	$0,3D$
							a_s	a																												
$R \leq 2$	$0,1 \times R$	$0,3D$																																		
$R > 2$	$0,2 \text{ mm}$	$0,3D$																																		
	a_s	a																																		
$R \leq 2$	$0,1 \times R$	$0,3D$																																		
$R > 2$	$0,2 \text{ mm}$	$0,3D$																																		
	a_s	a																																		
$R \leq 2$	$0,05 \times R$	$0,3D$																																		
$R > 2$	$0,1 \text{ mm}$	$0,3D$																																		
Note Notes		※1 Regolate le condizioni di fresatura in accordo alla rigidità della macchina ※2 Regolare il numero dei giri in caso di vibrazioni ※3 Adatto a lavorazioni di raggi in contornatura ※4 Regolate con la stessa proporzione giri e avanzamento ※5 Utilizzare lubrificazione minimale o aria compressa ※1 Adjust the milling conditions according to rigidity of the machine. ※2 Reduce spindle speed when chattering. ※3 Apply to corner milling by contouring. ※4 Adjust both spindle speed and feed in the same proportion. ※5 Air blow or oil mist is recommended.																																		

Scaricata
Long Neck



Rivestita
Coating

Toriche
Corner

Radius

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

H ~60 Temprato
HRC Hardened Steel

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli ad alto avanzamento con sformo conico MUGEN

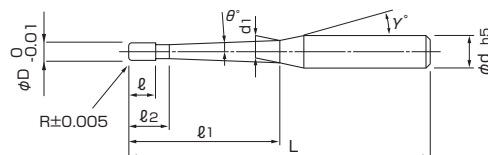
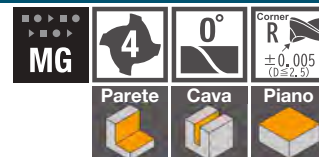
Totale 11 misure

MUGEN COATING High Feed 4-Flute Extralong Neck Corner Radius End Mill

Total 11 sizes

Fresa 4 tagli torica scaricata extralunga per alto avanzamento

High feed 4-flute extralong neck corner radius end mill.



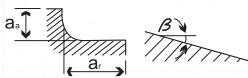
Unità [misura: mm]
Unit [Size: mm]

(D) Diametro Dia.	(R) Raggio Corner Radius	(θ) Angolo Neck Taper Angle	(ℓ ₁) Lungh. tagliente Length of Cut	(ℓ ₂) Lungh. scarico Length of Cut	(d ₂) Diametro scarico Neck Dia.	(ℓ ₁) Lungh. scarico Neck Taper Angle	(L) Lungh. totale Overall Length	(d) Diametro gambo Shank Dia.	PROMO €
1	0.3	1	0.5	1.5	0.93	8	60	6	64,00
						12			70,60
						16			72,20
2	0.5		1	3	1.85	12	70		70,60
						16			70,60
						20			72,20
3	0.8		1.5	4.5	2.8	18	80		85,50
						24			86,60
						30			90,40
4	1		2	6	3.7	32	90		95,90
						40			98,10

Attenzione How to Order

Quando ordinate, indicate MHRXL400RHF (D) × (R) × (ℓ₁). ※(γ) è un valore di riferimento
When you order, indicate MHRXL400RHF (D) × (R) × (ℓ₁). ※(γ) is reference value.

Condizioni di taglio raccomandate
 Recommended Cutting Conditions

Materiale Work Material		Acciaio al carbonio Carbon Steels S50C		Acciaio legato Alloy Steels SCM・SKD・SUS		Acciaio pretemprato Prehardened Steels HPM・NAK (~45HRC)		Acciaio temprato Hardened Steels SKD61 (~60HRC)																			
Velocità di taglio		200m/min		180m/min		150m/min		100m/min																			
Diametro Dia.	Raggio Corner Radius	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed																		
		g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min																		
1	0.3	64.000	64.000	57.000	61.000	47.700	38.000	31.800	15.900																		
2	0.5	32.000	32.000	28.600	30.800	23.900	19.000	16.000	8.000																		
3	0.8	21.000	21.000	19.000	20.500	16.000	12.000	10.600	5.300																		
4	1	16.000	16.000	14.500	16.000	12.000	10.500	8.000	4.000																		
Profondità di taglio (D = Diametro)						<table><tr><td></td><td>a_s</td><td>a</td></tr><tr><td>R ≤ 2</td><td>0.1 x R</td><td>0.3D</td></tr><tr><td>R > 2</td><td>0.2 mm</td><td>0.3D</td></tr></table>			a _s	a	R ≤ 2	0.1 x R	0.3D	R > 2	0.2 mm	0.3D	<table><tr><td></td><td>a_s</td><td>a</td></tr><tr><td>R ≤ 2</td><td>0.05xR</td><td>0.3D</td></tr><tr><td>R > 2</td><td>0.1 mm</td><td>0.3D</td></tr></table>			a _s	a	R ≤ 2	0.05xR	0.3D	R > 2	0.1 mm	0.3D
							a _s	a																			
R ≤ 2	0.1 x R	0.3D																									
R > 2	0.2 mm	0.3D																									
	a _s	a																									
R ≤ 2	0.05xR	0.3D																									
R > 2	0.1 mm	0.3D																									
Note Notes		※1 Regolate le condizioni di fresatura in accordo alla rigidità della macchina ※2 Regolare il numero dei giri in caso di vibrazioni ※3 Adatto a lavorazioni di raggi in contornatura ※4 Regolate con la stessa proporzione giri e avanzamento ※5 Utilizzare lubrificazione minimale o aria compressa ※1 Adjust the milling conditions according to rigidity of the machine. ※2 Reduce spindle speed when chattering. ※3 Apply to corner milling by contouring. ※4 Adjust both spindle speed and feed in the same proportion. ※5 Air blow or oil mist is recommended.																									

 Scarico conico
Taper Neck

 Rivestita
Coating

 Toriche
Corner Radius

 P Acciaio al carbonio
Carbon Steel

 P Acciaio legato
Alloy Steel

 P Acciaio pretemprato
Prehardened Steel

 H ~52 Temprato
HRC Hardened Steel

 H ~60 Temprato
HRC Hardened Steel

 Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 2 tagli con raggio concavo MUGEN

MUGEN COATING 2-Flute Inner Radius Cutter

Totale 23 misure

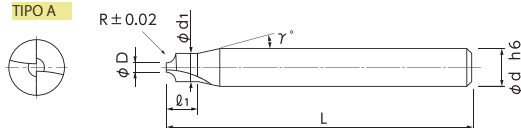
Total 23 sizes

Specializzato per lavorazione di raggi su vari materiali

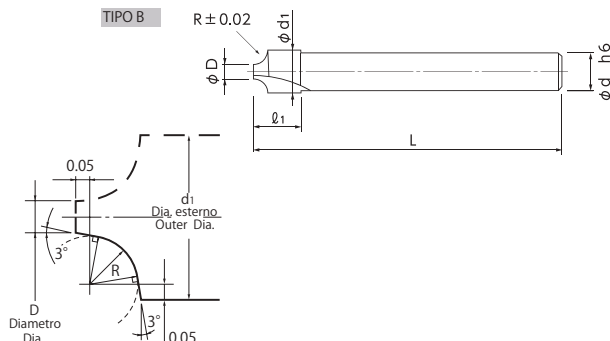
Specialized for cutting at corner radius on various materials



TIPO A



TIPO B



- Adatta per entrambi i processi: NC e MC.
- Eccezionale durata, grazie al rivestimento MUGEN, che fornisce un'alta resistenza all'usura.
- It is suitable for both machining NC and MC and can be cut at the corner radius easily.
- Tool life is exceptionally extended as MUGEN COATING provides additional wear resistance.

Unità [misura: mm]
Unit [Size: mm]

	Codice Code No.	(R) Raggio Radius	(D) Diametro Dia.	(d1) Dia. esterno Outer Dia.	(L1) Lungh. dia. esterno Outer Dia. Length	(γ) Angolo Neck Taper Angle	Tipo Type	(d) Diametro gambo Shank Dia.	(L) Lung. totale Overall Length	PROMO €
Acciaio al carbonio Carbon Steel Acciaio legato Alloy Steel Acciaio temprato Prehardened Steel Temprato ~52 Hardened Steel HRC	08-00900-00100	R0.1	0.5	0.8	3	12°	A	4	45	92,80
	08-00900-00150	R0.15	0.5	0.9	3	12°		4	45	92,80
	08-00900-00200	R0.2	0.5	1	3	12°		4	45	92,80
	08-00900-00250	R0.25	0.5	1.1	3	12°		4	45	92,80
	08-00900-00300	R0.3	0.5	1.2	3	12°		4	45	75,40
	08-00900-00400	R0.4	0.5	1.4	3	12°		4	45	75,40
	08-00900-00500	R0.5	0.5	1.6	5	12°		4	45	75,40
	08-00900-00600	R0.6	0.5	1.8	5	12°		4	45	56,80
	08-00900-00700	R0.7	0.5	2	5	12°		4	45	56,80
	08-00900-00750	R0.75	0.5	2.1	5	12°		4	45	56,80
Acciaio inox Stainless Steel	08-00900-00800	R0.8	0.8	2.5	5	12°	B	4	45	56,80
	08-00900-00900	R0.9	0.8	2.7	5	12°		4	45	56,80
	08-00900-01000	R1	0.8	2.9	8	12°		4	45	65,40
	08-00900-01250	R1.25	0.8	3.4	8	12°		4	45	65,40
	08-00900-01500	R1.5	1.5	4.6	8	—		4	45	65,40
Lega di alluminio Aluminium Alloy Rame Copper Resina Resin	08-00900-01750	R1.75	1.5	5.1	8	—	A	4	45	65,40
	08-00900-02000	R2	1.5	5.6	10	—		4	45	65,40
	08-00900-02500	R2.5	1.5	6.6	10	—		6	45	95,50
	08-00900-03000	R3	1.5	7.6	12	45°		8	55	110,20
	08-00900-03500	R3.5	2	9.1	12	45°		10	55	144,10
	08-00900-04000	R4	2	10.1	12	—	B	10	55	149,00
	08-00900-04500	R4.5	2	11.1	15	45°	A	12	65	206,70
	08-00900-05000	R5	2	12.1	15	—	B	12	65	217,60

Attenzione
How to Order

Quando ordinate, indicate MIR200 (R).
When you order, indicate MIR200 (R).

※(γ) è un valore di riferimento
※(γ) is reference value.

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio al carbonio Carbon Steels S50C			Acciaio legato Alloy Steels SCM•SKD•SUS			Acciaio pretemprato Prehardened Steels HPM•NAK		
Velocità di taglio Cutting Speed	30~40m/min			20~30m/min			15~25m/min		
Raggio	N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed		N. di giri Spindle Speed	Avanz. Feed	
	g/min	mm/min		g/min	mm/min		g/min	mm/min	
		Sgrossatura Roughing	Finitura Finishing		Sgrossatura Roughing	Finitura Finishing		Sgrossatura Roughing	Finitura Finishing
0.1	18,500	60	100	13,300	50	70	10,600	40	60
0.2	16,000	60	100	11,400	50	70	9,100	40	60
0.3	14,000	60	100	10,000	50	70	8,000	40	60
0.4	12,500	60	100	8,800	50	70	7,100	40	60
0.5	11,000	60	100	8,000	50	70	6,400	40	60
0.75	9,000	60	100	6,400	50	70	5,100	40	60
0.8	7,000	60	100	5,000	50	70	4,900	40	60
1	6,200	60	100	4,400	50	70	4,200	40	60
1.25	5,400	60	100	3,900	50	70	3,600	40	60
1.5	3,700	60	100	2,700	50	70	3,200	40	60
1.75	3,400	60	100	2,400	50	70	2,800	40	60
2	3,200	60	100	2,300	50	70	2,500	40	60
2.5	2,800	60	100	2,000	50	70	2,100	40	60
3	2,500	60	100	1,800	50	70	1,800	40	60
3.5	2,000	60	100	1,400	50	70	1,600	40	60
4	1,850	60	100	1,300	50	70	1,400	40	60
4.5	1,700	60	100	1,200	50	70	1,300	40	60
5	1,600	60	100	1,100	50	70	1,200	40	60
Prof. di taglio Depth of Cut (R:Raggio Radius)	Sgrossatura Roughing Finitura Finishing a R 0.1~0.4=0.02mm R 0.5~5=0.05mm								
Note Notes	※ 1 Usare lubrificante. ※ 2 Dividere la profondità di taglio in più passate. ※ 1 Use cutting fluid. ※ 2 Divide the cutting depth into several paths.								

Sgrassatura
Chamfering

Rivestita
Coating

P Acciaio al carbonio
Carbon Steel

P Acciaio legato
Alloy Steel

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Rivestimento
MUGEN
Regular Line
MUGEN COATING

Frese 4 tagli piane per acciai temprati MUGEN PREMIUM

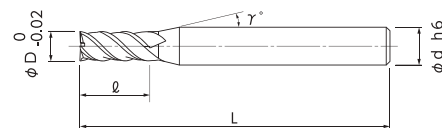
MUGEN COATING PREMIUM 4-Flute Square End Mill For Hardened Steel

Totale 5 misure

Total 5 sizes

Fresa 4 tagli con elevato angolo d'elica. Per finitura di acciai temprati (~65HRC)

4-flute with high helix angle. For finishing of hardened steels (~ 65HRC)



- Grande stabilità e lunga durata nella lavorazione di acciai temprati (48~65HRC).
- Migliorata rigidità e precisione, grazie all'avanzato design dell'elica.
- Realized stably long tool life against high hardened steels (48~65HRC).
- Improved milling deflection and accuracy by advanced flute design.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(ℓ) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00427-00100	1	2	12°	6	60	62,20
08-00427-00150	1.5	3	12°	6	60	62,20
08-00427-00200	2	4	12°	6	60	62,20
08-00427-00300	3	6	12°	6	60	70,80
08-00427-00400	4	8	12°	6	60	76,80

Attenzione
How to Order

Quando ordinate, indicate MHDH445 (D).
When you order, indicate MHDH445 (D).

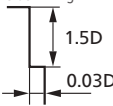
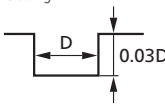
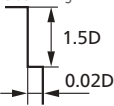
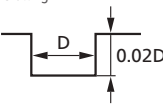
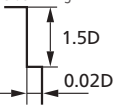
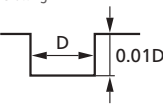
※(γ) è un valore di riferimento
※(γ) is reference value.

- ☐ Acciaio pretemprato
Prehardened Steel **P**
- ☐ Temprato ~52
Hardened Steel HRC **H**
- ☐ Temprato ~60
Hardened Steel HRC **H**
- ☐ Temprato ~65
Hardened Steel HRC **H**



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material		Acciaio temprato Hardened Steels HPM38・STAVAX・SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Dia Dia.	Largh. di taglio Length of Cut	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
		N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
		g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
1	2	30,000	800	24,000	400	25,000	500	20,000	300	20,000	240	16,000	120
1.5	3	20,000	860	16,000	460	16,000	560	12,000	380	14,000	330	10,000	160
2	4	15,000	920	12,000	500	12,000	630	10,000	420	10,000	480	8,000	240
3	6	10,000	1,000	8,000	580	8,000	700	7,500	500	7,000	560	6,000	280
4	8	8,500	1,200	7,500	620	7,000	800	6,000	540	6,000	600	5,000	300
Prof. di taglio Depth of Cut (D: Diametro Dia.)		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
													
Note Notes		※ 1 Usare un mandrino rigido e preciso ※ 2 Regolate le condizioni di fresatura in accordo alla profondità di taglio e alla rigidità della macchina ※ 3 Regolate con la stessa proporzione giri e avanzamento ※ 4 Utilizzare lubrificazione minimale ※ 1 Use a rigid and precise machine and chuck holder. ※ 2 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Use oilmist coolant.											

P Acciaio pretemprato
Prehardened Steel ○

H ~52 Temprato
HRC Hardened Steel ○

H ~60 Temprato
HRC Hardened Steel ○

H ~65 Temprato
HRC Hardened Steel ○

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 6 tagli plane per acciai temprati MUGEN PREMIUM

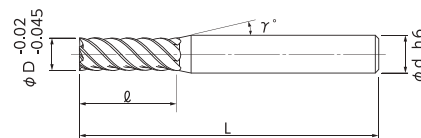
MUGEN COATING PREMIUM 6-Flute Square End Mill For Hardened Steel

Totale 10 misure

Total 10 sizes

Fresa 6 tagli con elevato angolo d'elica. Per finitura di acciai temprati (~65HRC)

6-flute with high helix angle. For finishing of hardened steels (~ 65HRC)



- Lunghezza di taglio L/D=2 e L/D=3.
- Grande stabilità e lunga durata nella lavorazione di acciai temprati (48-65HRC).
- Migliorata rigidità e precisione, grazie all'avanzato design dell'elica.
- L/D=2 and L/D=3 length of cut selection.
- Realized stably long tool life against high hardened steels (48~65HRC).
- Improved milling deflection and accuracy by advanced flute design.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(ℓ) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00428-00500	5	10	12°	6	60	83,40
08-00428-00501		15	12°	6	65	91,40
08-00428-00600	6	12	—	6	60	89,30
08-00428-00601		18	—	6	65	98,70
08-00428-00800	8	16	—	8	65	141,00
08-00428-00801		24	—	8	70	158,30
08-00428-01000	10	20	—	10	75	195,20
08-00428-01001		30	—	10	80	219,40
08-00428-01200	12	24	—	12	80	262,30
08-00428-01201		36	—	12	90	316,00

Attenzione
How to Order

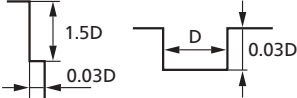
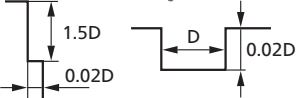
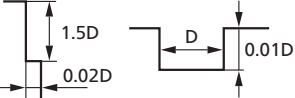
Quando ordinate, indicate MHDH645 (D)×(ℓ).
When you order, indicate MHDH645 (D)×(ℓ).

※(γ) è un valore di riferimento
※(γ) is reference value.



Condizioni di taglio raccomandate

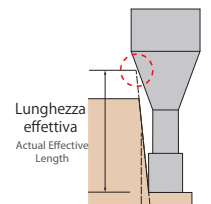
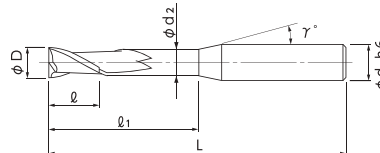
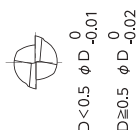
Recommended Milling Conditions

Materiale Work Material		Acciaio temprato Hardened Steels HPM38・STAVAX・SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Dia. Dia.	Largh. di taglio Length of Cut	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
		N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
		g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
5	10	7,600	1,600	6,800	900	6,200	1,200	5,600	600	5,300	800	4,800	350
	15	6,800	1,400	6,000	600	5,600	1,000	5,000	400	4,800	600	4,200	200
6	12	6,400	1,800	5,800	950	5,300	1,200	4,800	600	4,600	800	4,200	350
	18	5,800	1,600	5,000	600	4,800	1,000	4,200	400	4,200	600	3,600	200
8	16	4,800	2,000	4,300	1,000	4,000	1,400	3,600	700	3,400	1,000	3,000	400
	24	4,300	1,800	3,800	700	3,600	1,200	3,200	500	3,000	800	2,700	250
10	20	3,800	2,000	3,400	1,000	3,200	1,600	2,800	800	2,600	1,000	2,300	500
	30	3,400	1,800	3,000	800	2,800	1,400	2,500	600	2,300	800	2,000	300
12	24	3,200	2,000	2,800	1,000	2,600	1,600	2,300	800	2,200	1,000	2,000	500
	36	2,800	1,800	2,500	800	2,300	1,400	2,000	600	2,000	800	1,800	300
Prof. di taglio Depth of Cut		Contornatura Side Milling Cava Slotting 				Contornatura Side Milling Cava Slotting 				Contornatura Side Milling Cava Slotting 			
(D:Diametro Dia.)													
Note Notes		※ 1 Usare un mandrino rigido e preciso. ※ 2 Regolare le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina. ※ 3 Regolare nella stessa proporzione giri ed avanzamento. ※ 4 Utilizzare la lubrificazione minimale ※ 1 Use a rigid and precise machine and chuck holder. ※ 2 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Use oil mist coolant.											

P Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened Steel

Fresa 2 tagli piana scaricata per acciai temprati fino a 65HRC Massimo L/D=25

2-flute long neck square end mill for hardened steels up to 65HRC. Maximum L/D=25



Angolo di inclinazione
Inclined Angle
Unità [misura: mm]
Unit [Size: mm]

- Il rivestimento MUGEN PREMIUM migliora la precisione e la durata nella lavorazione di acciai temprati!
- 72 misure totali!
- MUGEN COATING PREMIUM to improve accuracy and tool life on machining hardened steels!
- Total 72 sizes!

Codice Code No.	(D) Diametro Dia.	(L1) Lung. scarico Under Neck Length	(L) Lung. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lung. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00207-01003	0.1	0.3	0.08	0.085	12°	4	45	0.34	0.36	0.38	0.40	0.44	100,40
08-00207-01005		0.5					45	0.55	0.58	0.61	0.64	0.71	109,40
08-00207-01007		0.75					45	0.81	0.85	0.89	0.93	1.04	119,90
08-00207-01010		1					45	1.07	1.12	1.18	1.23	1.37	134,10
08-00207-02005	0.2	0.5	0.15	0.18	12°	4	45	0.57	0.59	0.62	0.65	0.72	69,00
08-00207-02007		0.75					45	0.83	0.86	0.90	0.95	1.05	71,20
08-00207-02010		1					45	1.09	1.14	1.19	1.25	1.38	74,90
08-00207-02015		1.5					45	1.61	1.68	1.76	1.85	2.05	89,90
08-00207-02020	0.3	2	0.25	0.28	12°	4	45	2.13	2.23	2.33	2.44	2.71	101,90
08-00207-03010		1					45	1.09	1.14	1.19	1.25	1.38	60,70
08-00207-03015		1.5					45	1.61	1.68	1.76	1.85	2.05	60,70
08-00207-03020		2					45	2.13	2.23	2.33	2.44	2.71	74,90
08-00207-03025	0.4	2.5	0.3	0.37	12°	4	45	2.65	2.77	2.90	3.04	3.38	77,90
08-00207-03030		3					45	3.17	3.31	3.47	3.64	4.04	77,90
08-00207-04010		1					45	1.11	1.16	1.22	1.28	1.42	44,20
08-00207-04015		1.5					45	1.63	1.71	1.79	1.87	2.08	44,20
08-00207-04020	0.5	2	0.4	0.46	12°	4	45	2.15	2.25	2.36	2.47	2.74	44,20
08-00207-04025		2.5					45	2.68	2.80	2.93	3.07	3.41	44,20
08-00207-04030		3					45	3.20	3.34	3.50	3.67	4.07	44,20
08-00207-04035		3.5					45	3.72	3.89	4.07	4.27	4.73	44,20
08-00207-04040	0.8	4	0.65	0.76	12°	4	45	4.24	4.43	4.64	4.87	5.40	44,20
08-00207-05010		1					45	1.14	1.19	1.24	1.30	1.45	32,30
08-00207-05015		1.5					45	1.66	1.73	1.81	1.90	2.11	32,30
08-00207-05020		2					45	2.18	2.28	2.38	2.50	2.77	32,30
08-00207-05025	1	2.5	0.8	0.95	12°	4	45	2.70	2.82	2.95	3.10	3.44	32,30
08-00207-05030		3					45	3.22	3.37	3.52	3.70	4.10	32,30
08-00207-05040		4					45	4.26	4.46	4.66	4.89	5.43	32,30
08-00207-05050		5					45	5.31	5.54	5.80	6.09	6.76	32,30
08-00207-08040	1	4	0.8	0.95	12°	4	45	4.26	4.46	4.66	4.89	5.43	37,50
08-00207-08060		6					45	6.35	6.63	6.95	7.29	8.08	37,50
08-00207-08080		8					45	8.44	8.81	9.23	9.68	10.74	37,50
08-00207-10030		3					50	3.25	3.39	3.55	3.73	4.13	33,80
08-00207-10040		4					50	4.29	4.48	4.69	4.92	5.46	33,80

Attenzione
How to Order

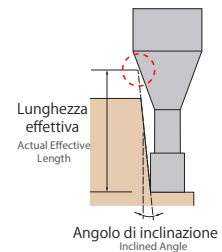
Quando ordinate, indicate MHRH230 (D) × (L 1).
When you order, indicate MHRH230 (D) × (L1).

※(γ) è un valore di riferimento.
※(γ) is reference value.



Frese 2 tagli piane scaricate per acciai temprati MUGEN PREMIUM

MUGEN COATING PREMIUM 2-Flute Long Neck End Mill for Hardened Steel

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L1) Lungh. scarico Under Neck Length	(L2) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00207-10060	1	6	0.8	0.95	12°	4	50	6.37	6.66	6.97	7.32	8.11	33,80
08-00207-10080		8					50	8.46	8.84	9.25	9.71	10.77	33,80
08-00207-10100		10					50	10.55	11.02	11.53	12.10	13.42	33,80
08-00207-12060	1.2	6	1	1.15	12°	4	50	6.37	6.66	6.97	7.32	8.11	36,00
08-00207-12080		8					50	8.46	8.84	9.25	9.71	10.77	36,00
08-00207-12100		10					50	10.55	11.02	11.53	12.10	13.42	36,00
08-00207-12120		12					50	12.63	13.20	13.82	14.49	16.08	36,00
08-00207-15040	1.5	4	1.2	1.45	12°	4	50	4.29	4.48	4.69	4.92	5.46	36,00
08-00207-15060		6					50	6.37	6.66	6.97	7.32	8.11	36,00
08-00207-15080		8					50	8.46	8.84	9.25	9.71	10.77	36,00
08-00207-15100		10					50	10.55	11.02	11.53	12.10	13.42	36,00
08-00207-15120		12					50	12.63	13.20	13.82	14.49	16.08	36,00
08-00207-15140		14					60	14.72	15.38	16.10	16.89	18.73	36,80
08-00207-15160		16					60	16.80	17.55	18.38	19.28	21.39	36,80
08-00207-18060	1.8	6	1.4	1.75	12°	4	50	6.37	6.66	6.97	7.32	8.11	36,80
08-00207-18080		8					50	8.46	8.84	9.25	9.71	10.77	36,80
08-00207-18100		10					50	10.55	11.02	11.53	12.10	13.42	36,80
08-00207-18120		12					50	12.63	13.20	13.82	14.49	16.08	36,80
08-00207-18140		14					50	14.72	15.38	16.10	16.89	18.73	36,80
08-00207-18160		16					60	16.80	17.55	18.38	19.28	Free	36,80
08-00207-18180		18					60	18.89	19.73	20.66	21.67	Free	36,80
08-00207-20060	2	6	1.6	1.94	12°	4	50	6.40	6.69	7.00	7.34	8.15	36,00
08-00207-20080		8					50	8.48	8.86	9.28	9.74	10.80	36,00
08-00207-20100		10					50	10.57	11.04	11.56	12.13	13.45	36,00
08-00207-20120		12					50	12.66	13.22	13.84	14.52	16.11	36,00
08-00207-20140		14					60	14.74	15.40	16.12	16.92	18.76	36,00
08-00207-20160		16					60	16.83	17.58	18.40	19.31	Free	36,00
08-00207-20180		18					60	18.91	19.76	20.69	21.70	Free	36,00
08-00207-20200		20					60	21.00	21.94	22.97	24.10	Free	36,00
08-00207-25080	2.5	8	2	2.4	12°	4	50	8.58	8.97	9.39	9.85	10.93	37,50
08-00207-25120		12					50	12.75	13.32	13.95	14.64	Free	37,50
08-00207-25160		16					60	16.93	17.68	18.51	19.42	Free	37,50
08-00207-25200	3	20	4.5	2.85	12°	6	60	21.10	22.04	23.07	Free	Free	37,50
08-00207-30080		8					50	8.71	9.10	9.52	9.99	11.08	48,00
08-00207-30120		12					50	12.88	13.45	14.08	14.78	16.39	48,00
08-00207-30160		16					60	17.05	17.81	18.65	19.56	21.70	48,00
08-00207-30200		20					60	21.22	22.17	23.21	24.35	27.01	48,00
08-00207-30250		25					70	26.43	27.62	28.91	30.33	Free	50,40
08-00207-30300		30					70	31.65	33.06	34.61	36.31	Free	60,60

P Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

MHRH230

Condizioni di taglio raccomandate
Recommended Milling Conditions

Materiale Work Material		Acciaio al carbonio/Acciaio pretemprato Carbon Steels•Prehardened Steels S50C•NAK55•NAK80 HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38•STAVAX•SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11•PD613 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
		g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
0.1	0.3	40,000	150	0.005	0.06	40,000	120	0.003	0.05	40,000	100	0.002	0.04	40,000	70	0.002	0.03
	0.5	40,000	100	0.005	0.06	40,000	80	0.003	0.05	40,000	60	0.002	0.04	40,000	50	0.002	0.03
	0.75	40,000	80	0.003	0.06	40,000	70	0.002	0.05	40,000	50	0.001	0.04	40,000	30	0.001	0.03
	1	40,000	60	0.002	0.06	40,000	50	0.001	0.05	40,000	40	0.001	0.04	40,000	20	0.001	0.03
0.2	0.5	30,000	240	0.005	0.12	30,000	200	0.003	0.1	30,000	160	0.003	0.08	30,000	120	0.003	0.06
	0.75	30,000	200	0.005	0.12	30,000	180	0.003	0.1	30,000	140	0.003	0.08	30,000	100	0.003	0.06
	1	30,000	180	0.005	0.12	30,000	150	0.003	0.1	30,000	120	0.003	0.08	30,000	80	0.003	0.06
	1.5	30,000	120	0.003	0.12	30,000	100	0.002	0.1	30,000	80	0.002	0.08	30,000	60	0.002	0.06
	2	30,000	80	0.003	0.12	30,000	50	0.002	0.1	30,000	40	0.002	0.08	30,000	30	0.002	0.06
0.3	1	30,000	350	0.007	0.18	30,000	300	0.003	0.15	30,000	250	0.003	0.12	30,000	200	0.003	0.09
	1.5	30,000	260	0.007	0.18	30,000	200	0.003	0.15	30,000	160	0.003	0.12	30,000	120	0.003	0.09
	2	30,000	180	0.005	0.18	30,000	150	0.003	0.15	30,000	120	0.003	0.12	25,000	100	0.003	0.09
	2.5	30,000	150	0.004	0.18	25,000	100	0.002	0.15	25,000	80	0.002	0.12	20,000	60	0.002	0.09
	3	30,000	70	0.004	0.18	25,000	50	0.002	0.15	25,000	40	0.002	0.12	20,000	30	0.002	0.09
0.4	1	30,000	450	0.01	0.24	30,000	400	0.005	0.2	30,000	350	0.005	0.16	25,000	300	0.005	0.12
	1.5	30,000	400	0.01	0.24	30,000	360	0.005	0.2	30,000	330	0.005	0.16	25,000	250	0.005	0.12
	2	30,000	360	0.01	0.24	30,000	320	0.005	0.2	25,000	280	0.005	0.16	25,000	220	0.005	0.12
	2.5	30,000	340	0.008	0.24	25,000	280	0.005	0.2	25,000	250	0.004	0.16	20,000	200	0.004	0.12
	3	30,000	320	0.008	0.24	25,000	260	0.004	0.2	20,000	220	0.003	0.16	18,000	180	0.003	0.12
	3.5	30,000	280	0.007	0.24	25,000	220	0.004	0.2	20,000	180	0.003	0.16	18,000	150	0.002	0.12
0.5	4	30,000	250	0.006	0.24	25,000	200	0.003	0.2	20,000	160	0.002	0.16	18,000	120	0.002	0.12
	1	30,000	550	0.02	0.3	25,000	500	0.01	0.25	23,000	450	0.007	0.2	20,000	400	0.005	0.15
	1.5	30,000	520	0.02	0.3	25,000	450	0.01	0.25	23,000	400	0.007	0.2	20,000	360	0.005	0.15
	2	30,000	500	0.02	0.3	25,000	420	0.01	0.25	23,000	380	0.007	0.2	20,000	320	0.005	0.15
	2.5	30,000	480	0.015	0.3	25,000	400	0.008	0.25	23,000	360	0.006	0.2	20,000	300	0.004	0.15
	3	30,000	420	0.015	0.3	25,000	350	0.007	0.25	23,000	320	0.005	0.2	20,000	280	0.003	0.15
0.8	4	25,000	380	0.01	0.3	25,000	280	0.005	0.25	23,000	240	0.003	0.2	20,000	200	0.002	0.15
	5	25,000	320	0.007	0.3	20,000	200	0.003	0.25	18,000	150	0.003	0.2	16,000	100	0.002	0.15
	4	25,000	800	0.03	0.45	25,000	700	0.025	0.4	23,000	600	0.015	0.32	20,000	500	0.007	0.24
	6	20,000	620	0.025	0.45	20,000	550	0.02	0.4	18,000	450	0.01	0.32	16,000	350	0.005	0.24
	8	16,000	500	0.015	0.45	16,000	400	0.007	0.4	14,000	300	0.005	0.32	12,000	200	0.003	0.24
2	3	25,000	1,200	0.06	0.6	23,000	1,000	0.05	0.5	18,000	900	0.04	0.4	14,000	600	0.03	0.3
	4	25,000	1,000	0.05	0.6	23,000	900	0.04	0.5	18,000	800	0.03	0.4	14,000	500	0.02	0.3
	6	20,000	900	0.03	0.6	18,000	700	0.02	0.5	14,000	600	0.01	0.4	10,000	400	0.007	0.3
	8	18,000	800	0.03	0.6	16,000	600	0.02	0.5	12,000	500	0.01	0.4	8,000	340	0.005	0.3
	10	16,000	600	0.02	0.6	14,000	500	0.01	0.5	10,000	400	0.007	0.4	6,000	250	0.005	0.3
1.2	6	20,000	900	0.04	0.7	18,000	700	0.03	0.6	14,000	600	0.02	0.5	10,000	400	0.01	0.4
	8	18,000	800	0.04	0.7	16,000	600	0.02	0.6	12,000	500	0.01	0.5	8,000	340	0.007	0.4
	10	16,000	600	0.03	0.7	12,000	500	0.02	0.6	10,000	430	0.01	0.5	8,000	300	0.005	0.4
	12	14,000	600	0.02	0.7	10,000	500	0.01	0.6	9,000	400	0.007	0.5	7,000	250	0.005	0.4
	16	12,000	400	0.018	0.7	9,000	300	0.01	0.6	8,000	260	0.005	0.5	6,000	180	0.003	0.4
1.5	4	23,000	1,200	0.07	0.9	20,000	900	0.05	0.75	18,000	800	0.04	0.6	14,000	600	0.03	0.45
	6	23,000	1,000	0.06	0.9	20,000	800	0.04	0.75	18,000	700	0.03	0.6	14,000	500	0.02	0.45
	8	20,000	900	0.06	0.9	18,000	600	0.03	0.75	14,000	600	0.03	0.6	10,000	380	0.01	0.45
	10	20,000	800	0.04	0.9	16,000	500	0.03	0.75	14,000	500	0.02	0.6	10,000	350	0.01	0.45
	12	16,000	700	0.04	0.9	14,000	500	0.02	0.75	12,000	430	0.02	0.6	8,000	310	0.007	0.45
	14	14,000	600	0.03	0.9	12,000	400	0.02	0.75	10,000	380	0.01	0.6	7,500	250	0.007	0.45
	16	12,000	500	0.02	0.9	10,000	360	0.01	0.75	9,000	300	0.007	0.6	6,800	200	0.005	0.45

Acciaio pretemprato
Prehardened Steel

P

Temprato ~52
Hardened Steel HRC

H

Temprato ~60
Hardened Steel HRC

H

Temprato ~65
Hardened Steel HRC

H

Acciaio inox
Stainless Steel

M

Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy

S

Condizioni di taglio raccomandate
Recommended Milling Conditions

Materiale Work Material		Acciaio al carbonio/Acciaio pretemprato Carbon Steels•Prehardened Steels S50C•NAK55•NAK80 HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38•STAVAX•SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11•PD613 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
		g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
1.8	6	20,000	1,000	0.07	1	18,000	900	0.05	0.9	15,000	750	0.04	0.7	12,000	600	0.03	0.5
	8	18,000	900	0.06	1	16,000	800	0.04	0.9	12,000	600	0.03	0.7	9,500	500	0.02	0.5
	10	16,000	800	0.06	1	14,000	700	0.04	0.9	12,000	500	0.03	0.7	9,500	450	0.02	0.5
	12	14,000	700	0.05	1	12,000	600	0.03	0.9	10,000	500	0.02	0.7	8,200	400	0.01	0.5
	14	14,000	700	0.05	1	12,000	600	0.03	0.9	10,000	430	0.02	0.7	8,200	360	0.01	0.5
	16	12,000	600	0.04	1	10,000	500	0.02	0.9	9,200	400	0.01	0.7	7,500	340	0.007	0.5
2	18	10,000	500	0.04	1	9,200	410	0.02	0.9	8,500	370	0.01	0.7	6,000	320	0.007	0.5
	6	20,000	1,000	0.08	1.2	18,000	900	0.06	1	15,000	750	0.05	0.8	12,000	600	0.03	0.6
	8	18,000	900	0.07	1.2	16,000	800	0.05	1	12,000	600	0.04	0.8	9,500	500	0.02	0.6
	10	16,000	800	0.06	1.2	14,000	700	0.05	1	12,000	500	0.04	0.8	9,500	450	0.02	0.6
	12	14,000	700	0.05	1.2	12,000	600	0.04	1	10,000	500	0.03	0.8	8,200	400	0.01	0.6
	14	14,000	700	0.04	1.2	12,000	600	0.03	1	10,000	430	0.02	0.8	8,200	360	0.007	0.6
2.5	16	12,000	600	0.04	1.2	10,000	500	0.03	1	9,200	400	0.02	0.8	7,500	340	0.007	0.6
	18	10,000	500	0.03	1.2	9,200	410	0.02	1	8,500	370	0.01	0.8	6,000	320	0.005	0.6
	20	10,000	400	0.03	1.2	9,200	380	0.02	1	8,500	340	0.01	0.8	6,000	260	0.005	0.6
	8	16,000	1,000	0.08	1.5	14,000	800	0.07	1.25	10,000	700	0.05	1	8,000	500	0.03	0.75
	12	14,000	800	0.07	1.5	12,000	700	0.06	1.25	9,600	600	0.04	1	7,500	480	0.02	0.75
	16	12,000	700	0.06	1.5	10,000	600	0.05	1.25	8,500	500	0.02	1	7,000	400	0.01	0.75
3	20	10,000	600	0.06	1.5	8,200	500	0.05	1.25	7,500	500	0.02	1	5,000	400	0.01	0.75
	8	16,000	1,000	0.15	1.8	14,000	900	0.1	1.5	10,000	800	0.07	1.2	8,000	600	0.05	0.9
	12	14,000	900	0.1	1.8	12,000	800	0.08	1.5	9,200	700	0.06	1.2	7,200	500	0.04	0.9
	16	12,000	800	0.08	1.8	10,000	700	0.07	1.5	8,500	600	0.05	1.2	6,500	400	0.03	0.9
	20	10,000	800	0.08	1.8	9,000	700	0.07	1.5	7,800	600	0.04	1.2	5,800	400	0.02	0.9
	25	9,000	700	0.07	1.8	8,200	600	0.06	1.5	7,000	500	0.03	1.2	5,000	360	0.01	0.9
Note Notes	30	8,000	700	0.05	1.8	7,000	600	0.03	1.5	6,500	500	0.02	1.2	4,500	330	0.007	0.9
	※1 I Parametri di taglio raccomandati sono solo di riferimento e devono essere regolati compatibilmente con la forma del pezzo ed il tipo di macchina. ※2 ap=Profondità di taglio assiale, ae=Profondità di taglio radiale. ※3 Vi raccomandiamo di usare la lubrificazione minimale per la lavorazione di acciai temprati. ※4 Si consiglia di applicare la lavorazione in rampa o elicoidale per entrare nel pezzo in maniera assiale. ※5 Per una fresatura stabile, nella lavorazione di contornature profonde, quando il rapporto L/D è superiore a 8, ridurre l'avanzamento del 50% e la profondità (ae) del 30%. ※6 Per cave dal pieno si consiglia fresatura bidirezionale e di dimezzare l'avanzamento e la profondità (ap) rispetto ai parametri di taglio consigliati. ※7 Ridurre il numero di giri e l'avanzamento nello stesso rapporto, per eliminare vibrazioni o in caso di limitato numero di giri della macchina. ※8 Per cave molto profonde con rapporto L/D = 5, utilizzare nella prima fase di lavorazione una fresa corta e poi proseguire con quella lunga. ※9 Per frese di diam. inferiore a 0.5 mm. o con rapporto L/D = 15, regolare i parametri di taglio in maniera adeguata, per evitare rotture.																
	※1 These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type. ※2 ap:Axial Depth of Cut, ae:Radial Depth of Cut. ※3 Recommend to use oil mist coolant for machining hardened steel. ※4 Recommend to apply helical or ramping for approaching into axial direction. ※5 Adjust feed rate 50% lower and cutting depth(ae) 30% lower for milling deep wall area. When L/D exceeds 8 for stable milling. ※6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition. ※7 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine. ※8 Recommend guide slotting process with short neck tool before milling with L/D 5 time or longer neck tool. ※9 Major adjustment of milling conditions appropriately on milling profile, machine tool and etc. required for the tools smaller than Dia. 0.5mm, or L/D 15 times longer.																

P Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

MHRH430

Misure
Size $\varnothing 1 \sim \varnothing 6$



Frese 4 tagli piane scaricate per acciai temprati MUGEN PREMIUM

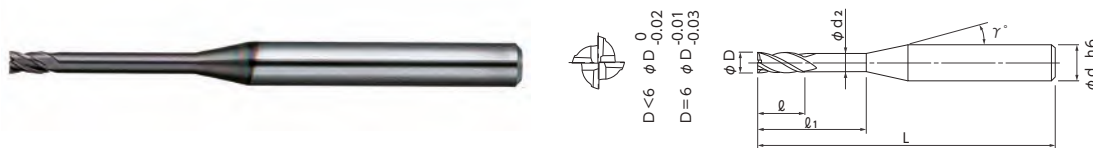
Totale 55 misure

MUGEN COATING PREMIUM 4 -Flute Long Neck End Mill for Hardened Steel

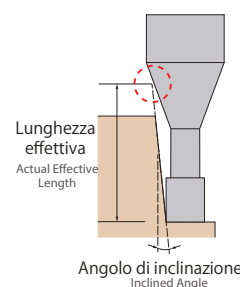
Total 55 sizes

Fresa 4 tagli piana scaricata per acciai temprati fino a 65HRC Massimo L/D=10

4-flute long neck square end mill for hardened steels up to 65HRC. Maximum L/D=10



- Il rivestimento MUGEN PREMIUM migliora la precisione e la durata, nella lavorazione di acciai temprati!
- Migliore rigidità della fresa per lavorazioni di precisione!
- 55 misure in totale.
- MUGEN COATING PREMIUM to improve accuracy and tool life on machining hardened steels!
- Improve tool rigidity for precision machining!
- Total 55 sizes!



Unità [misura: mm]
Unit [Size: mm]

	Codice Code No.	(D) Diametro Dia.	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
● Acciaio temprato Prehardened Steel P	08-00217-01004	1	4	0.8	0.95	12°	4	50	4.29	4.48	4.69	4.92	5.46	40,50
● Temprato ~52 Hardened Steel HRC H	08-00217-01006		6					50	6.37	6.66	6.97	7.32	8.11	40,50
● Temprato ~60 Hardened Steel HRC H	08-00217-01008		8					50	8.46	8.84	9.25	9.71	10.77	40,50
● Temprato ~65 Hardened Steel HRC H	08-00217-01010		10					50	10.55	11.02	11.53	12.10	13.42	40,50
	08-00217-01206	1.2	6	1	1.15	12°	4	50	6.37	6.66	6.97	7.32	8.11	40,50
	08-00217-01208		8					50	8.46	8.84	9.25	9.71	10.77	40,50
	08-00217-01210		10					50	10.55	11.02	11.53	12.10	13.42	40,50
	08-00217-01212		12					50	12.63	13.20	13.82	14.49	16.08	40,50
● Acciaio inox Stainless Steel M	08-00217-01506	1.5	6	1.2	1.45	12°	4	50	6.37	6.66	6.97	7.32	8.11	40,50
● Lega di titanio Superlega Titanium Alloy Heat Resistant Alloy S	08-00217-01508		8					50	8.46	8.84	9.25	9.71	10.77	40,50
	08-00217-01510		10					50	10.55	11.02	11.53	12.10	13.42	40,50
	08-00217-01512		12					50	12.63	13.20	13.82	14.49	16.08	40,50
	08-00217-01514	1.8	14	1.4	1.74	12°	4	60	14.72	15.38	16.10	16.89	18.73	40,50
	08-00217-01516		16					60	16.80	17.55	18.38	19.28	21.39	40,50
	08-00217-01806		6					50	6.40	6.69	7.00	7.34	8.15	40,50
	08-00217-01808		8					50	8.48	8.86	9.28	9.74	10.80	40,50
	08-00217-01810	1.8	10	1.4	1.74	12°	4	50	10.57	11.04	11.56	12.13	13.45	40,50
	08-00217-01812		12					50	12.66	13.22	13.84	14.52	16.11	40,50
	08-00217-01814		14					60	14.74	15.40	16.12	16.92	18.76	40,50
	08-00217-01816		16					60	16.83	17.58	18.40	19.31	Free	40,50
	08-00217-01818	1.8	18	1.4	1.74	12°	4	60	18.91	19.76	20.69	21.70	Free	40,50

Attenzione
How to Order

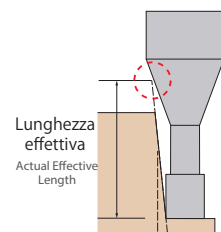
Quando ordinate, indicate MHRH430 (D)×(L1).
When you order, indicate MHRH430 (D)×(L1).

※(γ) è un valore di riferimento
※(γ) is reference value.



Frese 4 tagli piane scaricate per acciai temprati MUGEN PREMIUM

MUGEN COATING PREMIUM 4-Flute Long Neck End Mill for Hardened Steel

Angolo di inclinazione
Inclined AngleUnità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(D1) Lung. scarico Under Neck Length	(L) Lung. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lung. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
08-00217-02006	2	6	1.6	1.94	12°	4	50	6.40	6.69	7.00	7.34	8.15	40,50
08-00217-02008		8					50	8.48	8.86	9.28	9.74	10.80	40,50
08-00217-02010		10					50	10.57	11.04	11.56	12.13	13.45	40,50
08-00217-02012		12					50	12.66	13.22	13.84	14.52	16.11	40,50
08-00217-02014		14					60	14.74	15.40	16.12	16.92	18.76	40,50
08-00217-02016		16					60	16.83	17.58	18.40	19.31	Free	40,50
08-00217-02018		18					60	18.91	19.76	20.69	21.70	Free	40,50
08-00217-02020		20					60	21.00	21.94	22.97	24.10	Free	40,50
08-00217-02508	2.5	8	2	2.4	12°	4	50	8.58	8.97	9.39	9.85	10.93	40,50
08-00217-02512		12					50	12.75	13.32	13.95	14.64	Free	40,50
08-00217-02516		16					60	16.93	17.68	18.51	19.42	Free	40,50
08-00217-02520		20					60	21.10	22.04	23.07	Free	Free	40,50
08-00217-02525		25					70	26.31	27.49	Free	Free	Free	44,90
08-00217-03008	3	8	4.5	2.85	12°	6	50	8.71	9.10	9.52	9.99	11.08	69,60
08-00217-03012		12					50	12.88	13.45	14.08	14.78	16.39	69,60
08-00217-03016		16					60	17.05	17.81	18.65	19.56	21.70	69,60
08-00217-03020		20					60	21.22	22.17	23.21	24.35	27.01	69,60
08-00217-03025		25					70	26.43	27.62	28.91	30.33	Free	73,00
08-00217-03030		30					70	31.65	33.06	34.61	36.31	Free	79,80
08-00217-04012	4	12	6	3.8	12°	6	50	13.00	13.58	14.22	14.92	16.55	70,80
08-00217-04016		16					60	17.17	17.94	18.78	19.70	Free	70,80
08-00217-04020		20					60	21.34	22.30	23.34	24.49	Free	70,80
08-00217-04025		25					70	26.56	27.74	29.04	Free	Free	76,80
08-00217-04030		30					70	31.77	33.19	34.75	Free	Free	83,40
08-00217-04035		35					80	36.98	38.64	Free	Free	Free	89,30
08-00217-04040		40					90	42.20	44.09	Free	Free	Free	98,90
08-00217-05016	5	16	7.5	4.8	12°	6	60	17.17	17.94	18.78	Free	Free	89,30
08-00217-05025		25					70	26.56	27.74	Free	Free	Free	95,70
08-00217-05035		35					80	36.98	Free	Free	Free	Free	98,50
08-00217-05050		50					110	52.63	Free	Free	Free	Free	143,30
08-00217-06020	6	20	9	5.8	-	6	80	Free	Free	Free	Free	Free	91,00
08-00217-06030		30					90	Free	Free	Free	Free	Free	98,40
08-00217-06040		40					100	Free	Free	Free	Free	Free	103,20
08-00217-06050		50					110	Free	Free	Free	Free	Free	143,30

P Acciaio temprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

MHRH430

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material		Acciaio al carbonio/Acciaio pretemprato Carbon Steels•Prehardened Steels S50C•NAK55•NAK80•HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38•STAVAX•SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11•PD613 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)					
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed		Avanz. Feed		Prof. di taglio Depth of Cut		N. di giri Spindle Speed		Avanz. Feed		Prof. di taglio Depth of Cut		N. di giri Spindle Speed		Avanz. Feed		Prof. di taglio Depth of Cut	
		g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm		
1	4	25,000	2,000	0.05	0.6	23,000	1,800	0.04	0.5	18,000	1,600	0.03	0.4	14,000	1,000	0.02	0.3		
	6	20,000	1,800	0.03	0.6	18,000	1,400	0.02	0.5	14,000	1,200	0.01	0.4	10,000	800	0.007	0.3		
	8	18,000	1,600	0.03	0.6	16,000	1,200	0.02	0.5	12,000	1,000	0.01	0.4	8,000	680	0.005	0.3		
	10	16,000	1,200	0.02	0.6	14,000	1,000	0.01	0.5	10,000	800	0.007	0.4	6,000	500	0.005	0.3		
1.2	6	20,000	1,800	0.04	0.7	18,000	1,400	0.03	0.6	14,000	1,200	0.02	0.5	10,000	800	0.01	0.4		
	8	18,000	1,600	0.04	0.7	16,000	1,200	0.02	0.6	12,000	1,000	0.01	0.5	8,000	680	0.007	0.4		
	10	16,000	1,200	0.03	0.7	12,000	1,000	0.02	0.6	10,000	850	0.01	0.5	8,000	600	0.005	0.4		
	12	14,000	1,200	0.02	0.7	10,000	1,000	0.01	0.6	9,000	800	0.007	0.5	7,000	500	0.005	0.4		
1.5	6	23,000	2,000	0.06	0.9	20,000	1,600	0.04	0.75	18,000	1,400	0.03	0.6	14,000	1,000	0.02	0.45		
	8	20,000	1,800	0.06	0.9	18,000	1,200	0.03	0.75	14,000	1,200	0.03	0.6	10,000	750	0.01	0.45		
	10	20,000	1,600	0.04	0.9	16,000	1,000	0.03	0.75	14,000	1,000	0.02	0.6	10,000	700	0.01	0.45		
	12	16,000	1,400	0.04	0.9	14,000	1,000	0.02	0.75	12,000	850	0.02	0.6	8,000	620	0.007	0.45		
	14	14,000	1,200	0.03	0.9	12,000	800	0.02	0.75	10,000	750	0.01	0.6	7,500	500	0.007	0.45		
	16	12,000	1,000	0.02	0.9	10,000	720	0.01	0.75	9,000	600	0.007	0.6	6,800	400	0.005	0.45		
1.8	6	20,000	2,000	0.07	1	18,000	1,800	0.05	0.9	15,000	1,500	0.04	0.7	12,000	1,200	0.03	0.5		
	8	18,000	1,800	0.06	1	16,000	1,600	0.04	0.9	12,000	1,200	0.03	0.7	9,500	1,000	0.02	0.5		
	10	16,000	1,600	0.06	1	14,000	1,400	0.04	0.9	12,000	1,000	0.03	0.7	9,500	900	0.02	0.5		
	12	14,000	1,400	0.05	1	12,000	1,200	0.03	0.9	10,000	1,000	0.02	0.7	8,200	800	0.01	0.5		
	14	14,000	1,400	0.05	1	12,000	1,200	0.03	0.9	10,000	860	0.02	0.7	8,200	720	0.01	0.5		
	16	12,000	1,200	0.04	1	10,000	1,000	0.02	0.9	9,200	800	0.01	0.7	7,500	680	0.007	0.5		
	18	10,000	1,000	0.04	1	9,200	820	0.02	0.9	8,500	740	0.01	0.7	6,000	640	0.007	0.5		
2	6	20,000	2,000	0.08	1.2	18,000	1,800	0.06	1	15,000	1,500	0.05	0.8	12,000	1,200	0.03	0.6		
	8	18,000	1,800	0.07	1.2	16,000	1,600	0.05	1	12,000	1,200	0.04	0.8	9,500	1,000	0.02	0.6		
	10	16,000	1,600	0.06	1.2	14,000	1,400	0.05	1	12,000	1,000	0.04	0.8	9,500	900	0.02	0.6		
	12	14,000	1,400	0.05	1.2	12,000	1,200	0.04	1	10,000	1,000	0.03	0.8	8,200	800	0.01	0.6		
	14	14,000	1,400	0.04	1.2	12,000	1,200	0.03	1	10,000	860	0.02	0.8	8,200	720	0.007	0.6		
	16	12,000	1,200	0.04	1.2	10,000	1,000	0.03	1	9,200	800	0.02	0.8	7,500	680	0.007	0.6		
	18	10,000	1,000	0.03	1.2	9,200	820	0.02	1	8,500	740	0.01	0.8	6,000	640	0.005	0.6		
	20	10,000	800	0.03	1.2	9,200	760	0.02	1	8,500	680	0.01	0.8	6,000	520	0.005	0.6		
2.5	8	16,000	2,000	0.08	1.5	14,000	1,600	0.07	1.25	10,000	1,400	0.05	1	8,000	1,000	0.03	0.75		
	12	14,000	1,600	0.07	1.5	12,000	1,400	0.06	1.25	9,600	1,200	0.04	1	7,500	960	0.02	0.75		
	16	12,000	1,400	0.06	1.5	10,000	1,200	0.05	1.25	8,500	1,000	0.02	1	7,000	800	0.01	0.75		
	20	10,000	1,200	0.06	1.5	8,200	1,000	0.05	1.25	7,500	1,000	0.02	1	5,000	800	0.01	0.75		
	25	8,000	1,000	0.05	1.5	7,000	800	0.03	1.25	6,500	680	0.01	1	4,500	550	0.005	0.75		

● Acciaio pretemprato
Prehardened Steel **P**

● Temprato ~52
Hardened Steel HRC **H**

● Temprato ~60
Hardened Steel HRC **H**

● Temprato ~65
Hardened Steel HRC **H**

○ Acciaio inox
Stainless Steel **M**

○ Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy **S**

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Condizioni di taglio raccomandate

Recommended Milling Conditions

Rivestita
Coating

Materiale Work Material		Acciaio al carbonio/Acciaio pretemprato Carbon Steels-Prehardened Steels S50C·NAK55·NAK80 HPM1 (~43HRC)				Acciaio temprato Hardened Steels HPM38·STAVAX·SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11·PD613 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)					
Dia Dia.	Lungh. scarico Under Neck Length	N. di giri Spindle Speed		Avanz. Feed		Prof. di taglio Depth of Cut		N. di giri Spindle Speed		Avanz. Feed		Prof. di taglio Depth of Cut		N. di giri Spindle Speed		Avanz. Feed		Prof. di taglio Depth of Cut	
		g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm		
3	8	16,000	2,000	0.15	1.8	14,000	1,800	0.1	1.5	10,000	1,600	0.07	1.2	8,000	1,200	0.05	0.9		
	12	14,000	1,800	0.1	1.8	12,000	1,600	0.08	1.5	9,200	1,400	0.06	1.2	7,200	1,000	0.04	0.9		
	16	12,000	1,600	0.08	1.8	10,000	1,400	0.07	1.5	8,500	1,200	0.05	1.2	6,500	800	0.03	0.9		
	20	10,000	1,600	0.08	1.8	9,000	1,400	0.07	1.5	7,800	1,200	0.04	1.2	5,800	800	0.02	0.9		
	25	9,000	1,400	0.07	1.8	8,200	1,200	0.06	1.5	7,000	1,000	0.03	1.2	5,000	720	0.01	0.9		
	30	8,000	1,400	0.05	1.8	7,000	1,200	0.03	1.5	6,500	1,000	0.02	1.2	4,500	650	0.007	0.9		
4	12	12,000	2,000	0.2	2.5	9,500	2,000	0.15	2	8,000	1,600	0.08	1.6	7,000	1,000	0.06	1.2		
	16	10,000	2,000	0.15	2.5	8,000	1,800	0.1	2	7,000	1,400	0.06	1.6	6,000	1,200	0.05	1.2		
	20	8,500	1,800	0.12	2.5	7,000	1,600	0.08	2	6,500	1,200	0.05	1.6	5,500	1,000	0.04	1.2		
	25	8,000	1,600	0.1	2.5	6,000	1,400	0.07	2	5,200	1,200	0.04	1.6	4,500	1,000	0.03	1.2		
	30	6,800	1,400	0.08	2.5	4,800	1,000	0.05	2	4,200	850	0.03	1.6	3,500	620	0.02	1.2		
	35	5,500	1,000	0.07	2.5	4,200	880	0.04	2	3,800	720	0.02	1.6	3,000	550	0.01	1.2		
	40	4,000	860	0.05	2.5	3,600	720	0.03	2	3,000	600	0.01	1.6	2,500	400	0.007	1.2		
5	16	10,000	2,000	0.2	3	7,000	1,800	0.12	2.5	5,500	1,600	0.08	2	4,500	1,000	0.06	1.5		
	25	8,000	1,600	0.15	3	5,800	1,400	0.07	2.5	4,200	1,200	0.05	2	3,000	800	0.03	1.5		
	35	6,000	1,200	0.1	3	4,200	900	0.05	2.5	3,500	800	0.03	2	2,500	600	0.02	1.5		
	50	3,500	750	0.07	3	2,800	620	0.03	2.5	2,500	500	0.02	2	1,500	350	0.01	1.5		
6	20	8,000	2,000	0.25	4	6,500	1,600	0.18	3	4,500	1,400	0.08	2.4	3,500	920	0.06	1.8		
	30	7,000	1,600	0.2	4	4,500	1,200	0.12	3	3,500	1,000	0.06	2.4	2,500	660	0.04	1.8		
	40	4,500	1,200	0.15	4	3,000	1,000	0.08	3	2,500	800	0.03	2.4	2,000	550	0.02	1.8		
	50	3,000	850	0.1	4	2,500	700	0.05	3	2,000	500	0.02	2.4	1,500	380	0.01	1.8		
Note Notes		※1 I parametri di taglio consigliati sono solo di riferimento e devono essere regolati secondo il tipo di macchina ed il pezzo da lavorare.																	
		※2 ap=Profondità di taglio assiale, ae=Profondità di taglio radiale.																	
		※3 Vi raccomandiamo di usare la lubrificazione minimale per la lavorazione di acciai temprati.																	
		※4 Si consiglia di applicare la lavorazione in rampa o elicoidale, per entrare nel pezzo in maniera assiale.																	
		※5 Per una fresatura stabile, nelle lavorazioni di contornatura profonde, quando il rapporto L/D è superiore a 8, ridurre l'avanzamento del 50% e la profondità (ae) del 30%.																	
		※6 Per cave dal pieno, si consiglia fresatura bidirezionale e di ridurre del 50% l'avanzamento e la profondità (ap) rispetto ai parametri di taglio consigliati.																	
		※7 Ridurre il numero di giri e l'avanzamento nello stesso rapporto, per eliminare vibrazioni o in caso di limitato numero di giri della macchina.																	
		※1 These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type.																	
		※2 ap:Axial Depth of Cut, ae:Radial Depth of Cut.																	
		※3 Recommend to use oil mist coolant for machining hardened steel.																	
		※4 Recommend to apply helical or ramping for approaching into axial direction.																	
		※5 Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area. When L/D exceeds 8 for stable milling.																	
		※6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.																	
※7 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.																			

P Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy

Frese 2 tagli sferiche per acciai temprati MUGEN PREMIUM

MUGEN COATING PREMIUM 2-Flute Ball End Mill for Hardened Steel

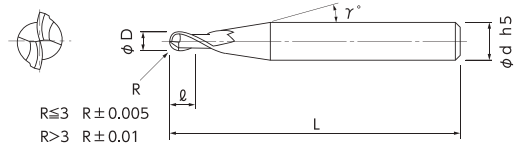
Totale 20 misure

Total 20 sizes

Fresa sferica per acciai temprati fino a 65HRC

Per un'ampia gamma di lavorazioni dalla sgrossatura alla finitura

Ball end mill for hardened steels up to 65HRC
For multi-purpose from roughing to finishing



- Frese sferiche per acciai temprati, adatta anche per operazioni di finitura.
- Adatta per acciai temprati con durezza fino a 65HRC.
- Standard ball end mill for hardened steels and suitable for finishing process.
- Applicable for hardened steels up to 65HRC.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(ℓ) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00507-00005	R0.05	0.1	0.1	12°	4	50	103,60
08-00507-00007	R0.075	0.15	0.15	12°	4	50	100,90
08-00507-00010	R0.1	0.2	0.2	12°	4	50	82,70
08-00507-00015	R0.15	0.3	0.3	12°	4	50	59,60
08-00507-00020	R0.2	0.6	0.4	12°	4	50	40,80
08-00507-00025	R0.25	0.8	0.5	12°	4	50	37,50
08-00507-00030	R0.3	0.9	0.6	12°	4	50	36,40
08-00507-00040	R0.4	1.2	0.8	12°	4	50	36,40
08-00507-00050	R0.5	1.5	1	12°	4	50	33,70
08-00507-00075	R0.75	2.3	1.5	12°	4	50	40,80
08-00507-00100	R1	3	2	12°	4	60	29,80
08-00507-00125	R1.25	3.8	2.5	12°	6	60	58,50
08-00507-00150	R1.5	5	3	12°	6	60	40,80
08-00507-00201	R2	6	4	—	4	70	41,40
08-00507-00200	R2	6	4	12°	6	70	53,10
08-00507-00250	R2.5	8	5	12°	6	70	57,80
08-00507-00300	R3	10	6	—	6	80	59,60
08-00507-00400	R4	12	8	—	8	90	188,70
08-00507-00500	R5	15	10	—	10	100	262,30
08-00507-00600	R6	20	12	—	12	100	374,10

Attenzione
How to Order

Quando ordinate, indicate MSBH230 (R) × (d).
When you order, indicate MSBH230 (R) × (d).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Esempio di lavorazioni 1 Machining case 1

Modello 3D 3D Shape Model



- Materiale : STAVAX 52HRC
Work material: STAVAX 52HRC
- Tempo totale: 9ore 23min
Total machining time: 9hr 23min
- Refrigerante: minimale
Coolant: Oil mist

Dimensioni pezzo:
100×100mm (Profondità 20mm)
Work Size: 100 x 100mm (Machining depth 20mm)

Processo Process	Sgrossatura Roughing	Semifinitura Semi-finishing	Finitura Finishing
Utensile Tool	MSBH230 R3	MSBH230 R2	MSBH230 R2
N. di giri [g/min] Spindle speed	14,000	15,000	
Avanz. [mm/min] Feed	3,000	2,000	1,800
Prof. di taglio ap × ae [mm] Depth of cut	0.3 × 2	0.2 × 0.3	0.08 × 0.05
Tempo di lavoro Machining time	2ore 30min 2hr 30min	2ore 23min 2hr 23min	4ore 30min 4hr 30min

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio temprato Hardened Steels SKD61-STAVAX-HPM38 (~52HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
Raggio Radius	ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min
0.05	0.005	0.005	150	40,000	0.003	0.005	100	40,000	0.002	0.005	60	40,000
0.075	0.005	0.005	180	40,000	0.003	0.005	150	40,000	0.002	0.005	100	40,000
0.1	0.01	0.02	360	40,000	0.01	0.01	320	40,000	0.003	0.005	240	40,000
0.15	0.01	0.03	420	40,000	0.01	0.02	360	40,000	0.005	0.01	300	40,000
0.2	0.02	0.06	1,000	40,000	0.02	0.05	820	40,000	0.01	0.02	480	40,000
0.25	0.03	0.07	1,200	40,000	0.025	0.05	1,000	40,000	0.015	0.03	600	40,000
0.3	0.05	0.1	1,600	40,000	0.03	0.06	1,200	40,000	0.02	0.05	720	30,000
0.4	0.1	0.15	2,200	40,000	0.07	0.1	1,800	40,000	0.05	0.1	1,200	30,000
0.5	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
0.75	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
1	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
1.25	0.2	0.6	3,000	25,000	0.2	0.5	2,500	20,000	0.15	0.3	2,000	16,000
1.5	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
2	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
2.5	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
3	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
4	0.5	2	2,500	10,000	0.4	1.2	1,800	7,000	0.3	1	1,200	5,000
5	0.7	2.5	2,000	7,000	0.5	1.5	1,500	5,000	0.4	1.2	1,000	4,000
6	1	3	1,500	5,000	0.6	2	1,200	4,000	0.5	1.5	800	3,000

Note

- ※1 Profondità di taglio: ap=Profondità di taglio assiale, ae=profondità di taglio radiale.
- ※2 Raccogliamo di utilizzare lubrificazione minima.
- ※3 Regolate con la stessa proporzione giri ed avanzamento.
- ※4 Regolate le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina.
- ※5 La sporgenza dell'utensile fuori dal mandrino deve essere la minore possibile.
- ※1 Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
- ※2 We recommend using oil mist coolant.
- ※3 Adjust both spindle speed and feed at the same rate.
- ※4 Adjust milling conditions according to the volume of depth of cut and rigidity of machine.
- ※5 Length of tool overhang must be as short as possible.

Non scaricata
Full Cutting Length



Rivestita
Coating

Sferiche
Ball

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

H ~60 Temprato
HRC Hardened Steel

H ~65 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

S Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 3 tagli sferiche per acciaio temprato MUGEN PREMIUM

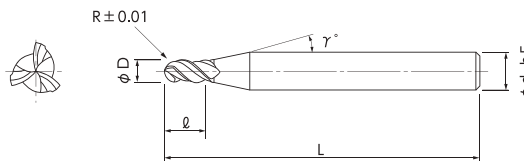
MUGEN COATING PREMIUM 3-Flute Ball End Mill for Hardened Steel

Totale 6 misure

Total 6 sizes

Fresa 3 tagli sferica con elevato angolo d'elica per acciai temprati fino a 65HRC

3-flute high helix angle ball end mill for hardened steels up to 65HRC



- Il rivestimento MUGEN PREMIUM garantisce una lunga durata nella lavorazione di acciai temprati.
- L'originale design della fresa a 3 tagli con passo differenziato elimina le vibrazioni e realizza lavorazioni molto efficienti.
- MUGEN COATING PREMIUM realizes long tool life for machining on high-hardened steel.
- Original 3-flute design and unequal flute spacing to suppress chattering realize high efficient machining.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L) Lungh. tagliante Length of Cut	(D) Diametro Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00607-00050	R0.5	1.5	1	12°	6	60	72,60
08-00607-00100	R1	3	2	12°	6	60	72,60
08-00607-00150	R1.5	5	3	12°	6	60	78,40
08-00607-00200	R2	6	4	12°	6	70	78,40
08-00607-00250	R2.5	8	5	12°	6	70	84,20
08-00607-00300	R3	10	6	—	6	80	91,20

Attenzione How to Order

Quando ordinate, indicate MSBH345(R)
When you order, indicate MSBH345 (R).

※(γ) è un valore di riferimento
※(γ) is reference value.

 Acciaio temprato
Prehardened Steel **P**

 Temprato ~52
Hardened Steel HRC **H**

 Temprato ~60
Hardened Steel HRC **H**

 Temprato ~65
Hardened Steel HRC **H**

 Acciaio inox
Stainless Steel **M**

 Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy **S**

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Esempio di lavorazioni 1 Machining case 1

Stampo attacco snowboard Binding sample



- Materiale : DC53 60HRC
Work material : DC53 60HRC
- Tempo totale: 15ore 16min
Total machining time : 15hr 16min
- Refrigerante: minimale
Coolant : Oil mist
- Dimensioni pezzo:
100×100mm (profondità 50mm)
Work Size : 100 x 100mm (Machining depth 50mm)

Processo Process	Sgrossatura Roughing	Semifinitura Semi-finishing	Finitura Finishing	Ripresa Stock removal
Utensile Tool	MSBH345 R3	MSBH345 R3	MSBH345 R3	MSBH345 R2
N. di giri [g/min] Spindle speed	7,200			12,000
Avanz. [mm/min] Feed	3,000	3,000	2,200	2,200
Prof. di taglio ap×ae[mm] Depth of cut	0.3 × 1.5	0.3 × 0.5	0.1 × 0.1	0.1 × 0.1
Tempo di lavoro Machining time	6ore 40min 6hr 40min	49min 49min	7ore 20min 7hr20min	27min 27min

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio temprato Hardened Steels SKD61-STAVAX (~52HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
	ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min
0.5	0.1	0.3	2,500	30,000	0.1	0.2	2,500	30,000	0.08	0.1	2,000	30,000
1	0.2	0.6	3,000	20,000	0.2	0.6	3,000	20,000	0.15	0.3	2,500	20,000
1.5	0.2	1	3,000	18,000	0.2	0.8	3,000	16,000	0.2	0.5	2,000	14,000
2	0.3	1.5	3,000	15,000	0.2	1	3,000	12,000	0.2	0.6	2,000	10,000
2.5	0.3	2	3,000	12,000	0.2	1.2	3,000	10,000	0.2	0.7	2,000	8,000
3	0.4	2	3,000	9,000	0.3	1.2	3,000	7,200	0.2	1	2,000	6,800
Note Notes	※1 Profondità di taglio: ap=Profondità di taglio assiale, ae=profondità di taglio radiale. ※2 Raccomandiamo di utilizzare lubrificazione minimale. ※3 Regolate con la stessa proporzione giri ed avanzamento. ※4 Regolate le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina. ※5 La sporgenza massima dell'utensile è di 4-5xD. Quando è maggiore, regolare le condizioni in tabella ※1 Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut. ※2 We recommend using oil mist coolant. ※3 Adjust both spindle speed and feed at the same rate. ※4 Adjust milling conditions according to the volume of depth of cut and rigidity of machine. ※5 Length of overhang is 4 to 5 times Dia. When it is longer than 4 to 5 times Dia., adjust the conditions listed above.											

Non scaricata
Full Cutting Length



Rivestita
Coating

Sferiche
Ball

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

H ~60 Temprato
HRC Hardened Steel

H ~65 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

S Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy

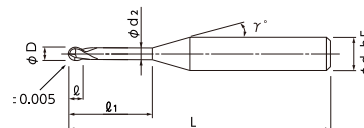
Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 2 tagli sferiche per acciai temprati MUGEN PREMIUM

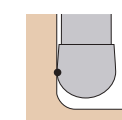
Totale 157 misure

MUGEN COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel

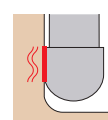
Total 157 sizes

Fresa 2 tagli sferica scaricata per acciai temprati fino a 65HRC
Ampia gamma con 156 misureLong neck ball end mill for hardened steels up to 65HRC
Abundant size variations with total 156 sizes

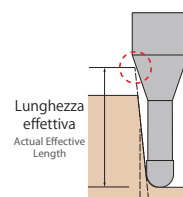
- Il rivestimento MUGEN PREMIUM ed il design unico dell'affilatura prevengono le usure e le scheggiature, garantendo un'eccellente finitura.
- Adatte per acciai temprati fino a 65HRC.
- In totale 156 misure.
- MUGEN COATING PREMIUM for hardened steel and unique cutting edge realize excellent chipping resistance and suppress chatter to improve finishing surface.
- Applicable for hardened steels up to 65HRC.
- Lineup to total 156 sizes.



Elimina le vibrazioni
grazie a un solo
punto di contatto
Suppress chatter by
point milling



Fresa convenzionale
General End mill



Lunghezza
effettiva
Actual Effective
Length
Angolo di inclinazione
Inclined Angle

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00527-00050	R0.05	0.2	0.07	0.1	0.085	12°	4	45	0.24	0.25	0.26	0.27	0.29	123,20
08-00527-00051		0.3	0.07	0.1	0.085	12°	4	45	0.34	0.36	0.37	0.39	0.42	108,20
08-00527-00053		0.5	0.07	0.1	0.085	12°	4	45	0.55	0.57	0.60	0.63	0.69	117,50
08-00527-00101	R0.1	0.5	0.15	0.2	0.18	12°	4	45	0.56	0.58	0.61	0.63	0.69	76,20
08-00527-00102		0.75	0.15	0.2	0.18	12°	4	45	0.82	0.85	0.89	0.93	1.02	76,20
08-00527-00103		1	0.15	0.2	0.18	12°	4	45	1.08	1.13	1.18	1.23	1.35	76,20
08-00527-00104		1.25	0.15	0.2	0.18	12°	4	45	1.34	1.40	1.46	1.53	1.68	81,90
08-00527-00105		1.5	0.15	0.2	0.18	12°	4	45	1.60	1.67	1.75	1.83	2.02	81,90
08-00527-00106		1.75	0.15	0.2	0.18	12°	4	45	1.86	1.94	2.03	2.13	2.35	91,90
08-00527-00107		2	0.15	0.2	0.18	12°	4	45	2.13	2.22	2.32	2.43	2.68	91,90
08-00527-00108		2.5	0.15	0.2	0.18	12°	4	45	2.65	2.76	2.89	3.02	3.34	99,70
08-00527-00109	R0.15	3	0.15	0.2	0.18	12°	4	45	3.17	3.31	3.46	3.62	4.01	107,60
08-00527-00150		0.6	0.2	0.3	0.28	12°	4	45	0.66	0.69	0.71	0.74	0.81	74,80
08-00527-00151		1	0.2	0.3	0.28	12°	4	45	1.08	1.12	1.17	1.22	1.34	74,80
08-00527-00152		1.25	0.2	0.3	0.28	12°	4	45	1.34	1.39	1.45	1.52	1.67	79,80
08-00527-00153		1.5	0.2	0.3	0.28	12°	4	45	1.60	1.67	1.74	1.82	2.00	79,80
08-00527-00154		1.75	0.2	0.3	0.28	12°	4	45	1.86	1.94	2.02	2.12	2.33	79,80
08-00527-00155		2	0.2	0.3	0.28	12°	4	45	2.12	2.21	2.31	2.42	2.66	79,80
08-00527-00156		2.25	0.2	0.3	0.28	12°	4	45	2.38	2.48	2.59	2.71	3.00	81,90
08-00527-00157	R0.2	2.5	0.2	0.3	0.28	12°	4	45	2.64	2.76	2.88	3.01	3.33	81,90
08-00527-00159		3	0.2	0.3	0.28	12°	4	45	3.17	3.30	3.45	3.61	3.99	81,90
08-00527-00160		3.5	0.2	0.3	0.28	12°	4	45	3.69	3.85	4.02	4.21	4.65	86,20
08-00527-00161		4	0.2	0.3	0.28	12°	4	45	4.21	4.39	4.59	4.81	5.32	86,20
08-00527-00201		0.8	0.3	0.4	0.37	12°	4	45	0.89	0.93	0.96	1.00	1.09	52,10
08-00527-00202		1	0.3	0.4	0.37	12°	4	45	1.10	1.14	1.19	1.24	1.35	52,10
08-00527-00203		1.5	0.3	0.4	0.37	12°	4	45	1.62	1.69	1.76	1.84	2.02	52,80
08-00527-00204		2	0.3	0.4	0.37	12°	4	45	2.15	2.23	2.33	2.43	2.68	54,20
08-00527-00205	R0.2	2.5	0.3	0.4	0.37	12°	4	45	2.67	2.78	2.90	3.03	3.34	56,30
08-00527-00206		3	0.3	0.4	0.37	12°	4	45	3.19	3.32	3.47	3.63	4.01	59,10
08-00527-00207		3.5	0.3	0.4	0.37	12°	4	45	3.71	3.87	4.04	4.23	4.67	64,10
08-00527-00208		4	0.3	0.4	0.37	12°	4	45	4.23	4.41	4.61	4.83	5.33	64,10

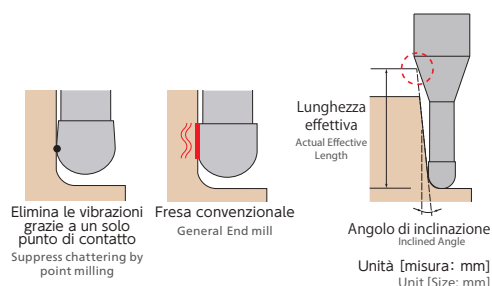
Attenzione
How to Order

Quando ordinate, indicate MRBH230 (R)x(φ1)x(d)
When you order, indicate MRBH230 (R)x(φ1)x(d).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Frese 2 tagli sferiche per acciai temprati MUGEN PREMIUM

MUGEN COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel

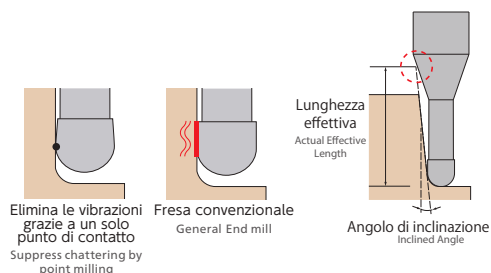


Codice Code No.	(R) Raggio Radius	(L1) Lungh. scarico Under Neck Length	(L2) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00527-00209	R0.2	4.5	0.3	0.4	0.37	12°	4	45	4.75	4.96	5.18	5.43	6.00	67,70
08-00527-00210		5	0.3	0.4	0.37	12°	4	45	5.27	5.50	5.75	6.02	6.66	67,70
08-00527-00250	R0.25	1	0.35	0.5	0.46	12°	4	45	1.13	1.16	1.21	1.26	1.37	52,10
08-00527-00251		1.5	0.35	0.5	0.46	12°	4	45	1.65	1.71	1.78	1.85	2.03	52,10
08-00527-00252		2	0.35	0.5	0.46	12°	4	45	2.17	2.25	2.35	2.45	2.69	52,10
08-00527-00253		2.5	0.35	0.5	0.46	12°	4	45	2.69	2.80	2.92	3.05	3.36	52,10
08-00527-00254		3	0.35	0.5	0.46	12°	4	45	3.21	3.34	3.49	3.65	4.02	52,10
08-00527-00255		3.5	0.35	0.5	0.46	12°	4	45	3.73	3.89	4.06	4.25	4.69	52,10
08-00527-00256		4	0.35	0.5	0.46	12°	4	45	4.25	4.43	4.63	4.85	5.35	52,10
08-00527-00257		4.5	0.35	0.5	0.46	12°	4	45	4.78	4.98	5.20	5.44	6.01	52,80
08-00527-00258		5	0.35	0.5	0.46	12°	4	45	5.30	5.52	5.77	6.04	6.68	52,80
08-00527-00259		5.5	0.35	0.5	0.46	12°	4	45	5.82	6.07	6.34	6.64	7.34	54,20
08-00527-00260		6	0.35	0.5	0.46	12°	4	45	6.34	6.61	6.91	7.24	8.00	54,20
08-00527-00262		8	0.35	0.5	0.46	12°	4	45	8.42	8.79	9.19	9.63	10.66	64,10
08-00527-00300	R0.3	1	0.45	0.6	0.56	12°	4	45	1.12	1.16	1.20	1.25	1.35	44,20
08-00527-00301		1.5	0.45	0.6	0.56	12°	4	45	1.64	1.71	1.77	1.84	2.02	40,00
08-00527-00302		2	0.45	0.6	0.56	12°	4	45	2.17	2.25	2.34	2.44	2.68	40,00
08-00527-00303		2.5	0.45	0.6	0.56	12°	4	45	2.69	2.79	2.91	3.04	3.34	41,40
08-00527-00304		3	0.45	0.6	0.56	12°	4	45	3.21	3.34	3.48	3.64	4.01	41,40
08-00527-00305		3.5	0.45	0.6	0.56	12°	4	45	3.73	3.88	4.05	4.24	4.67	42,10
08-00527-00306		4	0.45	0.6	0.56	12°	4	45	4.25	4.43	4.62	4.84	5.33	42,10
08-00527-00308		5	0.45	0.6	0.56	12°	4	45	5.29	5.52	5.76	6.03	6.66	42,10
08-00527-00310		6	0.45	0.6	0.56	12°	4	45	6.34	6.61	6.90	7.23	7.99	42,10
08-00527-00312		7	0.45	0.6	0.56	12°	4	45	7.38	7.70	8.04	8.43	9.31	47,80
08-00527-00314		8	0.45	0.6	0.56	12°	4	45	8.42	8.79	9.18	9.62	10.64	56,30
08-00527-00316		9	0.45	0.6	0.56	12°	4	45	9.47	9.88	10.33	10.82	11.97	59,10
08-00527-00318		10	0.45	0.6	0.56	12°	4	45	10.51	10.97	11.47	12.02	13.30	57,00
08-00527-00320		12	0.45	0.6	0.56	12°	4	45	12.59	13.14	13.75	14.41	15.95	64,10
08-00527-00401	R0.4	2	0.6	0.8	0.76	12°	4	45	2.16	2.24	2.33	2.42	2.65	40,00
08-00527-00402		3	0.6	0.8	0.76	12°	4	45	3.20	3.33	3.47	3.62	3.97	42,10
08-00527-00403		4	0.6	0.8	0.76	12°	4	45	4.25	4.42	4.61	4.82	5.30	42,10
08-00527-00404		5	0.6	0.8	0.76	12°	4	45	5.29	5.51	5.75	6.01	6.63	42,10
08-00527-00405		6	0.6	0.8	0.76	12°	4	45	6.33	6.60	6.89	7.21	7.96	42,10
08-00527-00406		7	0.6	0.8	0.76	12°	4	45	7.38	7.69	8.03	8.41	9.28	42,10
08-00527-00407		8	0.6	0.8	0.76	12°	4	45	8.42	8.78	9.17	9.60	10.61	42,10
08-00527-00409		10	0.6	0.8	0.76	12°	4	45	10.50	10.96	11.45	12.00	13.26	56,30
08-00527-00410		12	0.6	0.8	0.76	12°	4	45	12.59	13.14	13.73	14.39	15.92	61,30
08-00527-00500	R0.5	2	0.75	1	0.95	12°	4	45	2.18	2.26	2.34	2.43	2.65	34,30
08-00527-00501		3	0.75	1	0.95	12°	4	45	3.22	3.35	3.48	3.63	3.97	34,30
08-00527-00502		4	0.75	1	0.95	12°	4	45	4.27	4.44	4.62	4.83	5.30	38,60
08-00527-00503		5	0.75	1	0.95	12°	6	50	5.31	5.53	5.76	6.02	6.63	38,60
08-00527-00504		6	0.75	1	0.95	12°	4	45	6.35	6.62	6.90	7.22	7.96	41,40
08-00527-00505		7	0.75	1	0.95	12°	4	45	7.40	7.71	8.04	8.42	9.28	41,40
08-00527-00506		8	0.75	1	0.95	12°	4	45	8.44	8.79	9.18	9.61	10.61	41,40
08-00527-00507		9	0.75	1	0.95	12°	4	45	9.48	9.88	10.32	10.81	11.94	41,40

Scaricata
Long NeckRivestita
CoatingSferiche
BallP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 2 tagli sferiche per acciai temprati MUGEN PREMIUM

MUGEN COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel

Sferiche
BallScaricata
Long NeckRivestita
Coating

Unità [misura: mm]

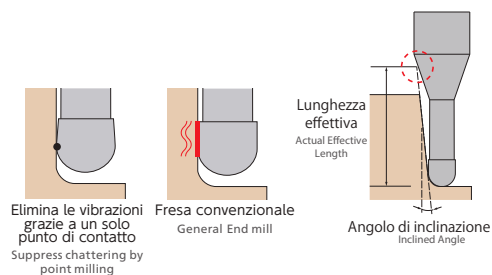
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L1) Lung. scarico Under Neck Length	(L2) Lung. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lung. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00527-00508	R0.5	10	0.75	1	0.95	12°	4	45	10.52	10.97	11.46	12.01	13.26	41,40
08-00527-00509		12	0.75	1	0.95	12°	4	45	12.61	13.15	13.75	14.40	15.92	41,40
08-00527-00510		14	0.75	1	0.95	12°	4	50	14.70	15.33	16.03	16.79	18.57	47,80
08-00527-00511		16	0.75	1	0.95	12°	4	50	16.78	17.51	18.31	19.18	21.23	56,30
08-00527-00512		18	0.75	1	0.95	12°	4	55	18.87	19.69	20.59	21.58	23.88	56,30
08-00527-00513		20	0.75	1	0.95	12°	4	55	20.95	21.87	22.87	23.97	26.54	67,70
08-00527-00600	R0.6	2.4	0.9	1.2	1.15	12°	4	45	2.59	2.68	2.78	2.89	3.15	50,70
08-00527-00601		4	0.9	1.2	1.15	12°	4	45	4.26	4.43	4.61	4.81	5.27	50,70
08-00527-00602		6	0.9	1.2	1.15	12°	4	45	6.35	6.61	6.89	7.20	7.92	54,90
08-00527-00603		8	0.9	1.2	1.15	12°	4	45	8.43	8.79	9.17	9.59	10.58	54,90
08-00527-00604		10	0.9	1.2	1.15	12°	4	45	10.52	10.96	11.45	11.99	13.23	54,90
08-00527-00605		12	0.9	1.2	1.15	12°	4	45	12.61	13.14	13.73	14.38	15.89	54,90
08-00527-00750	R0.75	3	1.1	1.5	1.45	12°	4	45	3.21	3.33	3.45	3.58	3.89	39,20
08-00527-00751		4	1.1	1.5	1.45	12°	4	45	4.26	4.41	4.59	4.78	5.22	39,20
08-00527-00753		6	1.1	1.5	1.45	12°	4	45	6.34	6.59	6.87	7.17	7.88	39,20
08-00527-00755		8	1.1	1.5	1.45	12°	4	45	8.43	8.77	9.15	9.56	10.53	41,40
08-00527-00757		10	1.1	1.5	1.45	12°	4	45	10.51	10.95	11.43	11.96	13.18	44,20
08-00527-00758		12	1.1	1.5	1.45	12°	4	45	12.60	13.13	13.71	14.35	15.84	47,80
08-00527-00759		14	1.1	1.5	1.45	12°	4	50	14.69	15.31	15.99	16.74	18.49	47,80
08-00527-00760		16	1.1	1.5	1.45	12°	4	50	16.77	17.49	18.27	19.14	21.15	47,80
08-00527-00762	R0.8	20	1.1	1.5	1.45	12°	4	55	20.94	21.85	22.84	23.92	Free	47,80
08-00527-00803		8	1.2	1.6	1.55	12°	4	45	8.43	8.77	9.14	9.55	10.51	54,90
08-00527-00805		12	1.2	1.6	1.55	12°	4	45	12.60	13.13	13.70	14.34	15.82	54,90
08-00527-00807		16	1.2	1.6	1.55	12°	4	50	16.77	17.48	18.27	19.13	21.13	54,90
08-00527-00809		20	1.2	1.6	1.55	12°	4	55	20.94	21.84	22.83	23.91	Free	54,90
08-00527-01001	R1	3	1.5	2	1.94	12°	4	45	3.23	3.33	3.44	3.56	3.85	34,30
08-00527-01002		4	1.5	2	1.94	12°	4	45	4.27	4.42	4.58	4.76	5.17	34,30
08-00527-01004		6	1.5	2	1.94	12°	4	45	6.36	6.60	6.86	7.15	7.83	38,60
08-00527-01006		8	1.5	2	1.94	12°	4	45	8.44	8.78	9.14	9.54	10.48	41,40
08-00527-01008		10	1.5	2	1.94	12°	4	45	10.53	10.95	11.42	11.94	13.14	41,40
08-00527-01010		12	1.5	2	1.94	12°	4	45	12.61	13.13	13.70	14.33	15.79	41,40
08-00527-01011		14	1.5	2	1.94	12°	4	50	14.70	15.31	15.98	16.72	18.45	41,40
08-00527-01012		16	1.5	2	1.94	12°	4	50	16.78	17.49	18.27	19.12	Free	41,40
08-00527-01013		18	1.5	2	1.94	12°	4	55	18.87	19.67	20.55	21.51	Free	41,40
08-00527-01014		20	1.5	2	1.94	12°	4	55	20.96	21.85	22.83	23.90	Free	41,40
08-00527-01015		22	1.5	2	1.94	12°	4	60	23.04	24.03	25.11	26.30	Free	56,30
08-00527-01016		25	1.5	2	1.94	12°	4	65	26.17	27.30	28.53	Free	Free	57,00
08-00527-01017		30	1.5	2	1.94	12°	4	70	31.38	32.74	34.23	Free	Free	64,10
08-00527-01018		35	1.5	2	1.94	12°	4	70	36.60	38.19	Free	Free	Free	87,60
08-00527-01019		40	1.5	2	1.94	12°	4	90	41.81	43.64	Free	Free	Free	94,70

Attenzione
How to OrderQuando ordinate, indicate MRBH230 (R)x(ℓ1)x(d)
When you order, indicate MRBH230 (R)x(ℓ1)x(d).※(γ) è un valore di riferimento.
※(γ) is reference value.

Frese 2 tagli sferiche per acciai temprati MUGEN PREMIUM

MUGEN COATING PREMIUM 2-Flute Long Neck Ball End Mill for Hardened Steel

Scaricata
Long NeckRivestita
CoatingSferiche
Ball

Unità [misura: mm]

Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(d1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00527-01252	R1.25	10	2.3	2.5	2.4	12°	4	45	10.62	11.04	11.49	12.00	13.18	54,20
08-00527-01253		15	2.3	2.5	2.4	12°	4	50	15.83	16.48	17.20	17.98	Free	54,90
08-00527-01254		20	2.3	2.5	2.4	12°	4	55	21.04	21.93	22.90	Free	Free	64,10
08-00527-01255		25	2.3	2.5	2.4	12°	4	65	26.26	27.38	28.60	Free	Free	68,40
08-00527-01256		30	2.3	2.5	2.4	12°	4	70	31.47	32.82	Free	Free	Free	79,10
08-00527-01257		35	2.3	2.5	2.4	12°	4	70	36.69	38.27	Free	Free	Free	97,60
08-00527-01501	R1.5	6	2.5	3	2.85	12°	6	60	6.56	6.78	7.03	7.31	7.95	44,80
08-00527-01502		8	2.5	3	2.85	12°	6	60	8.64	8.96	9.31	9.70	10.60	44,80
08-00527-01503		10	2.5	3	2.85	12°	6	60	10.73	11.14	11.59	12.09	13.26	51,70
08-00527-01504		12	2.5	3	2.85	12°	6	60	12.81	13.32	13.88	14.49	15.91	53,90
08-00527-01505		14	2.5	3	2.85	12°	6	60	14.90	15.50	16.16	16.88	18.57	59,30
08-00527-01506		16	2.5	3	2.85	12°	6	60	16.98	17.68	18.44	19.27	21.22	59,30
08-00527-01508		20	2.5	3	2.85	12°	6	65	21.16	22.04	23.00	24.06	26.53	57,10
08-00527-01509		25	2.5	3	2.85	12°	6	65	26.37	27.48	28.70	30.04	Free	57,10
08-00527-01510		30	2.5	3	2.85	12°	6	70	31.58	32.93	34.40	36.03	Free	64,70
08-00527-01511		35	2.5	3	2.85	12°	6	80	36.80	38.38	40.11	42.01	Free	85,40
08-00527-01512		40	2.5	3	2.85	12°	6	90	42.01	43.83	45.81	Free	Free	111,80
08-00527-02002	R2	10	3	4	3.8	12°	6	65	10.83	11.22	11.66	12.14	13.25	45,50
08-00527-02003		12	3	4	3.8	12°	6	65	12.91	13.40	13.94	14.53	15.91	59,30
08-00527-02101		14	3	4	3.8	12°	6	65	15.00	15.58	16.22	16.92	18.56	59,30
08-00527-02004		15	3	4	3.8	12°	6	65	16.04	16.67	17.36	18.12	19.89	59,30
08-00527-02006		20	3	4	3.8	12°	6	65	21.26	22.12	23.06	24.10	Free	59,30
08-00527-02008		25	3	4	3.8	12°	6	70	26.47	27.57	28.77	30.09	Free	59,30
08-00527-02010		30	3	4	3.8	12°	6	70	31.68	33.01	34.47	Free	Free	59,30
08-00527-02011		35	3	4	3.8	12°	6	80	36.90	38.46	Free	Free	Free	71,70
08-00527-02012		40	3	4	3.8	12°	6	85	42.11	43.91	Free	Free	Free	79,80
08-00527-02013		45	3	4	3.8	12°	6	90	47.33	49.36	Free	Free	Free	108,50
08-00527-02014		50	3	4	3.8	12°	6	100	52.54	54.80	Free	Free	Free	117,70
08-00527-02500	R2.5	10	3.5	5	4.8	12°	6	70	10.81	11.18	11.59	12.04	Free	69,30
08-00527-02501		15	3.5	5	4.8	12°	6	70	16.02	16.63	17.29	Free	Free	97,80
08-00527-02502		20	3.5	5	4.8	12°	6	70	21.24	22.08	Free	Free	Free	99,30
08-00527-02503		25	3.5	5	4.8	12°	6	70	26.45	27.52	Free	Free	Free	99,30
08-00527-02504		30	3.5	5	4.8	12°	6	80	31.66	Free	Free	Free	Free	109,40
08-00527-02506		40	3.5	5	4.8	12°	6	90	42.09	Free	Free	Free	Free	143,80
08-00527-03000	R3	10	6	6	5.7	—	6	70	Free	Free	Free	Free	Free	73,90
08-00527-03001		15	6	6	5.7	—	6	70	Free	Free	Free	Free	Free	73,90
08-00527-03002		20	6	6	5.7	—	6	70	Free	Free	Free	Free	Free	73,90
08-00527-03003		25	6	6	5.7	—	6	70	Free	Free	Free	Free	Free	73,90
08-00527-03004		30	6	6	5.7	—	6	80	Free	Free	Free	Free	Free	79,10
08-00527-03005		40	6	6	5.7	—	6	90	Free	Free	Free	Free	Free	90,90
08-00527-03006		50	6	6	5.7	—	6	120	Free	Free	Free	Free	Free	98,50

P Acciaio temprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Condizioni di taglio raccomandate

Recommended Milling Conditions

Steriche
BallScaricata
Long NeckRivestita
Coating

Materiale Work Material			Acciaio temprato Hardened Steels SKD61•STAVAX•HPM38 (~52HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
0.05	0.2	2.0	0.003	0.005	120	40,000	0.002	0.005	100	40,000	0.002	0.003	70	40,000
	0.3	3.0	0.003	0.005	100	40,000	0.002	0.005	70	40,000	0.002	0.003	50	40,000
	0.5	5.0	0.002	0.003	70	40,000	0.001	0.003	50	40,000	0.001	0.002	30	40,000
0.1	0.5	2.5	0.008	0.01	320	40,000	0.005	0.005	280	40,000	0.003	0.003	180	40,000
	0.75	3.8	0.005	0.01	280	40,000	0.003	0.005	200	40,000	0.002	0.003	150	40,000
	1	5.0	0.003	0.005	250	40,000	0.002	0.003	160	40,000	0.001	0.002	120	40,000
	1.25	6.3	0.003	0.005	180	40,000	0.002	0.003	140	40,000	0.001	0.002	100	40,000
	1.5	7.5	0.003	0.005	150	40,000	0.002	0.003	120	40,000	0.001	0.002	80	40,000
	1.75	8.8	0.002	0.003	120	40,000	0.001	0.002	100	40,000	0.001	0.002	60	40,000
	2	10.0	0.002	0.003	100	40,000	0.001	0.002	80	40,000	0.001	0.001	50	40,000
	2.5	12.5	0.001	0.002	70	40,000	0.001	0.001	60	40,000	0.001	0.001	40	40,000
	3	15.0	0.001	0.001	50	40,000	0.001	0.001	40	40,000	0.001	0.001	30	40,000
	0.6	2.0	0.007	0.01	350	40,000	0.005	0.007	300	40,000	0.003	0.005	250	40,000
0.15	1	3.3	0.007	0.01	320	40,000	0.005	0.007	250	40,000	0.003	0.005	200	40,000
	1.25	4.2	0.005	0.007	280	40,000	0.003	0.005	200	40,000	0.002	0.003	160	40,000
	1.5	5.0	0.005	0.007	230	40,000	0.003	0.005	180	40,000	0.002	0.003	120	40,000
	1.75	5.8	0.003	0.005	180	40,000	0.002	0.003	150	40,000	0.002	0.002	100	40,000
	2	6.6	0.003	0.005	150	40,000	0.002	0.003	120	40,000	0.002	0.002	90	40,000
	2.25	7.5	0.002	0.003	120	40,000	0.001	0.002	100	40,000	0.001	0.001	80	40,000
	2.5	8.3	0.002	0.003	100	40,000	0.001	0.002	80	40,000	0.001	0.001	70	40,000
	3	10.0	0.001	0.003	80	40,000	0.001	0.002	70	40,000	0.001	0.001	60	40,000
	3.5	11.7	0.001	0.002	70	40,000	0.001	0.001	60	40,000	0.001	0.001	50	40,000
	4	13.3	0.001	0.002	60	40,000	0.001	0.001	50	40,000	0.001	0.001	40	40,000
0.2	0.8	2.0	0.02	0.05	800	40,000	0.02	0.03	720	40,000	0.008	0.02	580	40,000
	1	2.5	0.02	0.05	800	40,000	0.02	0.03	720	40,000	0.008	0.02	580	40,000
	1.5	3.8	0.01	0.03	620	40,000	0.01	0.02	500	40,000	0.005	0.01	400	40,000
	2	5.0	0.01	0.02	500	40,000	0.01	0.01	380	40,000	0.005	0.007	300	40,000
0.2	2.5	6.3	0.007	0.01	420	40,000	0.005	0.007	300	40,000	0.003	0.005	260	40,000
	3	7.5	0.007	0.01	300	40,000	0.005	0.007	240	40,000	0.003	0.005	200	40,000
	3.5	8.8	0.005	0.007	230	40,000	0.003	0.005	160	40,000	0.002	0.003	120	40,000
	4	10.0	0.005	0.005	160	30,000	0.003	0.003	120	30,000	0.002	0.003	90	30,000
	4.5	11.3	0.003	0.005	100	30,000	0.002	0.003	80	30,000	0.001	0.002	60	30,000
	5	12.5	0.002	0.003	70	30,000	0.001	0.002	50	30,000	0.001	0.002	40	30,000
	1	2.0	0.03	0.05	1,000	40,000	0.02	0.03	860	40,000	0.01	0.02	650	40,000
0.25	1.5	3.0	0.02	0.05	850	40,000	0.01	0.03	720	40,000	0.007	0.02	520	40,000
	2	4.0	0.02	0.03	720	40,000	0.01	0.02	650	40,000	0.007	0.01	400	40,000
	2.5	5.0	0.01	0.02	600	40,000	0.007	0.01	530	40,000	0.005	0.007	360	40,000
	3	6.0	0.01	0.02	500	40,000	0.007	0.01	420	40,000	0.005	0.007	320	40,000
	3.5	7.0	0.007	0.01	420	40,000	0.005	0.007	360	40,000	0.003	0.005	280	40,000
	4	8.0	0.007	0.01	350	40,000	0.005	0.007	300	40,000	0.003	0.005	260	40,000
	4.5	9.0	0.005	0.005	300	40,000	0.003	0.003	260	40,000	0.002	0.003	220	40,000
	5	10.0	0.005	0.005	240	33,000	0.003	0.003	200	33,000	0.002	0.003	180	33,000
	5.5	11.0	0.003	0.005	200	30,000	0.002	0.003	160	30,000	0.001	0.002	120	30,000

Acciaio temprato
Prehardened Steel

Temprato ~52
Hardened Steel HRC

Temprato ~60
Hardened Steel HRC

Temprato ~65
Hardened Steel HRC

Acciaio inox
Stainless Steel

Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Condizioni di taglio raccomandate

Recommended Milling Conditions

Scaricata
Long NeckRivestita
CoatingSferiche
Ball

Materiale Work Material			Acciaio temprato Hardened Steels SKD61•STAVAX•HPM38 (~52HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			a _p mm	a _e mm			a _p mm	a _e mm			a _p mm	a _e mm		
0.25	6	12.0	0.002	0.003	120	30,000	0.001	0.002	80	30,000	0.001	0.002	70	30,000
	8	16.0	0.002	0.002	75	30,000	0.001	0.002	60	30,000	0.001	0.002	50	30,000
0.3	1	1.7	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
	1.5	2.5	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
	2	3.3	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
	2.5	4.2	0.03	0.05	1,200	40,000	0.02	0.04	840	40,000	0.02	0.03	640	30,000
	3	5.0	0.03	0.05	1,200	40,000	0.02	0.04	840	40,000	0.02	0.03	640	30,000
	3.5	5.8	0.02	0.03	1,000	40,000	0.01	0.03	620	40,000	0.01	0.02	480	30,000
	4	6.7	0.02	0.03	1,000	40,000	0.01	0.03	620	40,000	0.01	0.02	480	30,000
	5	8.3	0.01	0.02	720	30,000	0.007	0.015	500	30,000	0.007	0.01	400	30,000
	6	10.0	0.007	0.01	500	30,000	0.005	0.007	380	30,000	0.004	0.006	320	30,000
	7	11.7	0.005	0.007	400	25,000	0.003	0.005	300	25,000	0.003	0.003	260	20,000
	8	13.3	0.003	0.005	320	25,000	0.003	0.003	260	25,000	0.002	0.003	220	20,000
	9	15.0	0.003	0.003	280	25,000	0.003	0.002	220	25,000	0.001	0.002	160	20,000
0.4	10	16.6	0.002	0.003	150	20,000	0.002	0.002	120	20,000	0.001	0.002	100	18,000
	12	20.0	0.002	0.002	80	20,000	0.002	0.002	60	20,000	0.001	0.002	50	18,000
	2	2.5	0.1	0.15	2,000	40,000	0.07	0.1	1,600	40,000	0.05	0.1	1,200	30,000
	3	3.8	0.1	0.15	2,000	40,000	0.07	0.1	1,600	40,000	0.05	0.05	1,200	30,000
	4	5.0	0.05	0.1	1,600	40,000	0.05	0.05	1,200	40,000	0.03	0.05	860	30,000
	5	6.3	0.05	0.05	1,600	40,000	0.03	0.05	1,000	40,000	0.02	0.03	620	30,000
	6	7.5	0.03	0.05	1,200	30,000	0.02	0.03	760	30,000	0.01	0.02	560	25,000
	7	8.8	0.02	0.03	1,000	30,000	0.01	0.02	680	30,000	0.007	0.01	520	25,000
0.5	8	10.0	0.01	0.02	820	30,000	0.007	0.01	600	30,000	0.005	0.01	480	25,000
	10	12.5	0.005	0.005	450	25,000	0.003	0.003	380	25,000	0.002	0.003	320	20,000
	12	15.0	0.003	0.005	320	20,000	0.002	0.003	260	20,000	0.002	0.002	200	20,000
	2	2.0	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
	3	3.0	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
	4	4.0	0.1	0.2	2,500	40,000	0.05	0.15	1,800	30,000	0.05	0.1	1,200	25,000
	5	5.0	0.05	0.15	2,000	30,000	0.04	0.1	1,600	25,000	0.03	0.05	920	20,000
	6	6.0	0.05	0.1	1,800	30,000	0.04	0.05	1,200	25,000	0.02	0.05	740	20,000
0.6	7	7.0	0.04	0.06	1,200	30,000	0.03	0.04	950	25,000	0.02	0.03	680	20,000
	8	8.0	0.04	0.06	1,000	30,000	0.03	0.04	860	25,000	0.02	0.03	560	20,000
	9	9.0	0.03	0.05	820	25,000	0.02	0.03	750	20,000	0.01	0.02	500	18,000
	10	10.0	0.03	0.05	750	25,000	0.02	0.03	620	20,000	0.01	0.02	450	18,000
	12	12.0	0.01	0.03	600	20,000	0.007	0.02	520	18,000	0.005	0.01	400	16,000
	14	14.0	0.005	0.01	420	20,000	0.003	0.007	360	18,000	0.002	0.005	320	16,000
	16	16.0	0.005	0.005	300	18,000	0.003	0.005	250	16,000	0.002	0.003	200	14,000
	18	18.0	0.003	0.005	180	18,000	0.002	0.005	120	16,000	0.002	0.002	85	14,000
0.5	20	20.0	0.003	0.003	100	16,000	0.002	0.003	75	14,000	0.002	0.002	60	12,000
	2.4	2.0	0.1	0.3	2,500	30,000	0.1	0.2	2,000	30,000	0.05	0.1	1,600	25,000
	4	3.3	0.1	0.2	2,500	30,000	0.07	0.2	2,000	30,000	0.05	0.1	1,600	25,000
	6	5.0	0.07	0.1	2,000	30,000	0.05	0.1	1,600	25,000	0.03	0.07	1,200	20,000
	8	6.7	0.05	0.1	1,600	30,000	0.03	0.07	1,200	25,000	0.02	0.05	920	20,000
	10	8.3	0.03	0.07	1,200	20,000	0.02	0.05	860	20,000	0.01	0.03	680	18,000

P Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Condizioni di taglio raccomandate

Recommended Milling Conditions

Sferiche
BallScaricata
Long NeckRivestita
Coating

Materiale Work Material			Acciaio temprato Hardened Steels SKD61 • STAVAX • HPM38 (~52HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
0.6	12	10.0	0.02	0.05	860	20,000	0.01	0.03	620	20,000	0.007	0.02	480	18,000
	3	2.0	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
	4	2.7	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
	6	4.0	0.15	0.2	3,000	30,000	0.1	0.2	2,000	30,000	0.1	0.1	1,600	25,000
0.75	8	5.3	0.1	0.2	2,500	25,000	0.05	0.2	1,600	25,000	0.05	0.1	1,200	20,000
	10	6.7	0.1	0.1	2,500	25,000	0.05	0.1	1,200	25,000	0.05	0.05	860	20,000
	12	8.0	0.05	0.1	1,800	20,000	0.03	0.1	920	20,000	0.02	0.05	780	18,000
	14	9.3	0.05	0.07	1,200	20,000	0.03	0.05	820	20,000	0.02	0.03	650	18,000
	16	10.7	0.03	0.05	720	18,000	0.02	0.03	650	18,000	0.01	0.02	580	16,000
	20	13.3	0.01	0.03	450	16,000	0.01	0.02	360	16,000	0.007	0.01	300	14,000
	8	5.0	0.1	0.2	2,500	25,000	0.07	0.15	2,000	20,000	0.05	0.1	1,600	18,000
	12	7.5	0.07	0.1	1,800	20,000	0.05	0.07	1,500	16,000	0.03	0.05	1,200	14,000
0.8	16	10.0	0.03	0.05	720	16,000	0.02	0.03	600	14,000	0.015	0.02	480	12,000
	20	12.5	0.01	0.03	500	14,000	0.01	0.02	380	12,000	0.01	0.01	300	10,000
1	3	1.5	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
	4	2.0	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
	6	3.0	0.2	0.4	2,500	25,000	0.2	0.3	2,000	25,000	0.15	0.3	1,600	20,000
	8	4.0	0.2	0.3	2,000	20,000	0.1	0.2	1,600	18,000	0.1	0.2	1,200	16,000
	10	5.0	0.1	0.3	2,000	18,000	0.1	0.2	1,600	16,000	0.1	0.1	1,200	14,000
	12	6.0	0.1	0.2	1,600	16,000	0.1	0.1	1,200	14,000	0.05	0.1	940	12,000
	14	7.0	0.07	0.15	1,600	16,000	0.05	0.08	1,200	14,000	0.03	0.07	940	12,000
	16	8.0	0.07	0.15	1,600	16,000	0.05	0.08	1,200	14,000	0.03	0.07	940	12,000
	18	9.0	0.05	0.1	1,400	14,000	0.03	0.05	1,000	12,000	0.02	0.03	850	10,000
	20	10.0	0.05	0.1	1,000	14,000	0.03	0.05	820	12,000	0.02	0.03	720	10,000
	22	11.0	0.03	0.08	850	14,000	0.02	0.06	700	12,000	0.02	0.02	600	10,000
	25	12.5	0.03	0.05	680	12,000	0.02	0.03	560	10,000	0.01	0.02	420	8,500
	30	15.0	0.02	0.03	360	12,000	0.01	0.02	300	10,000	0.008	0.01	240	8,500
	35	17.5	0.01	0.02	150	10,000	0.007	0.01	120	8,000	0.005	0.007	100	6,800
	40	20.0	0.005	0.01	100	10,000	0.003	0.005	80	8,000	0.002	0.003	50	6,800
1.25	10	4.0	0.2	0.3	2,500	20,000	0.15	0.2	2,000	20,000	0.1	0.15	1,600	18,000
	15	6.0	0.1	0.2	2,000	18,000	0.07	0.15	1,600	16,000	0.05	0.1	1,200	14,000
	20	8.0	0.07	0.15	1,500	16,000	0.05	0.1	1,200	14,000	0.03	0.05	1,000	10,000
	25	10.0	0.05	0.1	1,000	14,000	0.03	0.07	850	12,000	0.02	0.03	720	8,000
	30	12.0	0.03	0.07	720	12,000	0.02	0.05	640	10,000	0.01	0.02	580	7,000
	35	14.0	0.02	0.03	450	10,000	0.01	0.02	400	8,500	0.007	0.01	320	6,200
1.5	6	2.0	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
	8	2.7	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
	10	3.3	0.2	0.6	2,500	20,000	0.2	0.4	2,000	18,000	0.1	0.3	1,500	14,000
	12	4.0	0.2	0.6	2,500	20,000	0.2	0.4	2,000	18,000	0.1	0.3	1,500	14,000
	14	4.7	0.1	0.4	2,000	18,000	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000
	16	5.3	0.1	0.4	2,000	18,000	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000

 Acciaio temprato
Prehardened Steel **P**

 Temprato ~52
Hardened Steel HRC **H**

 Temprato ~60
Hardened Steel HRC **H**

 Temprato ~65
Hardened Steel HRC **H**

 Acciaio inox
Stainless Steel **M**

 Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy **S**

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Condizioni di taglio raccomandate

Recommended Milling Conditions

Scaricata
Long Neck



Rivestita
Coating

Sferiche
Ball

Materiale Work Material			Acciaio temprato Hardened Steels SKD61•STAVAX•HPM38 (~52HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
1.5	20	6.7	0.1	0.3	1,600	18,000	0.1	0.2	1,200	16,000	0.1	0.1	960	12,000
	25	8.3	0.1	0.2	1,200	16,000	0.07	0.15	920	14,000	0.05	0.07	800	10,000
	30	10.0	0.07	0.1	750	14,000	0.05	0.07	640	12,000	0.03	0.05	600	8,600
	35	11.7	0.05	0.1	620	12,000	0.03	0.07	500	10,000	0.02	0.05	420	7,200
	40	13.3	0.03	0.07	450	10,000	0.02	0.05	320	8,200	0.01	0.03	260	6,400
2	10	2.5	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
	12	3.0	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
	14	3.5	0.3	1.5	3,000	20,000	0.2	0.8	2,000	16,000	0.2	0.6	1,600	12,000
	15	3.8	0.3	1.5	3,000	20,000	0.2	0.8	2,000	16,000	0.2	0.6	1,600	12,000
	20	5.0	0.2	1	2,400	16,000	0.1	0.6	1,800	14,000	0.1	0.4	1,400	10,000
	25	6.3	0.2	0.8	1,600	16,000	0.1	0.4	1,200	14,000	0.1	0.2	1,000	10,000
	30	7.5	0.1	0.3	1,600	14,000	0.07	0.2	1,200	10,000	0.05	0.15	1,000	8,200
	35	8.8	0.1	0.2	1,200	14,000	0.07	0.15	1,000	10,000	0.05	0.1	820	8,200
	40	10.0	0.07	0.15	1,200	12,000	0.05	0.1	1,000	8,600	0.03	0.07	820	6,800
	45	11.3	0.07	0.1	750	12,000	0.05	0.07	620	8,600	0.03	0.05	500	6,800
2.5	50	12.5	0.05	0.08	550	10,000	0.03	0.05	500	7,500	0.02	0.03	420	5,500
	10	2.0	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
	15	3.0	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
	20	4.0	0.3	1.2	3,000	15,000	0.2	1	2,000	10,000	0.15	0.5	1,600	8,000
	25	5.0	0.2	1	2,500	15,000	0.15	0.8	1,800	8,600	0.1	0.3	1,200	7,200
	30	6.0	0.2	0.8	2,000	12,000	0.15	0.5	1,500	7,600	0.1	0.2	860	6,400
	40	8.0	0.1	0.2	1,200	10,000	0.07	0.15	1,000	6,800	0.05	0.1	650	5,500
3	10	1.7	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
	15	2.5	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
	20	3.3	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
	25	4.2	0.3	1.5	3,000	16,000	0.2	1	2,000	8,000	0.15	0.7	1,500	7,000
	30	5.0	0.2	1.5	3,000	14,000	0.2	1	2,000	7,200	0.15	0.7	1,500	6,500
	40	6.7	0.2	1	1,800	12,000	0.15	0.6	1,200	6,400	0.1	0.4	1,000	5,200
	50	8.3	0.1	0.6	1,200	8,200	0.1	0.3	860	4,800	0.05	0.2	620	4,000
Note Notes			※1 Profondità di taglio: ap=Profondità di taglio assiale/ ae=Profondità di taglio radiale. ※2 Vi raccomandiamo di usare lubrificazione minima. ※3 Regolare con la stessa proporzione giri ed avanzamento. ※4 Regolare le condizioni di fresatura in accordo alla profondità di taglio e alla rigidità della macchina. ※5 La sporgenza della fresa fuori dal mandrino deve essere la minore possibile. ※1 Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut. ※2 We recommend using oil mist coolant. ※3 Adjust both spindle speed and feed at the same rate. ※4 Adjust milling conditions according to the volume of depth of cut and rigidity of machine. ※5 Length of tool overhang must be as short as possible.											

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

H ~60 Temprato
HRC Hardened Steel

H ~65 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

S Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 4 tagli toriche per acciai temprati MUGEN PREMIUM

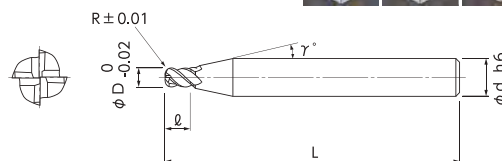
MUGEN COATING PREMIUM 4-Flute Corner Radius End Mill for Hardened Steel

Totale 6 misure

Total 6 sizes

Fresa 4 tagli con elevato angolo d'elica per acciai temprati fino a 65HRC

4-flute high helix angle corner radius end mill for hardened steels (~ 65HRC)



- Grande stabilità e lunga durata nella lavorazione di acciai temprati (48~65HRC).
- La toricità della fresa e l'alto angolo d'elica prevengono le scheggiature dei taglienti.
- Realized stably long tool life against high hardened steels (48~65HRC).
- Corner radius to prevent flute chipping, and high helix angle for cutting sharpness.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00437-03002	3	R0.2	6	12°	6	60	115,40
08-00437-03003		R0.3	6	12°	6	60	115,40
08-00437-03005		R0.5	6	12°	6	60	115,40
08-00437-04002	4	R0.2	8	12°	6	60	124,00
08-00437-04003		R0.3	8	12°	6	60	124,00
08-00437-04005		R0.5	8	12°	6	60	124,00

Attenzione
How to Order

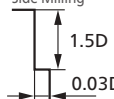
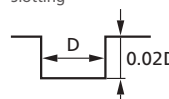
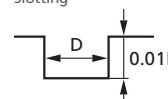
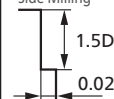
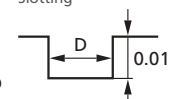
Quando ordinate, indicate MHDH445R (D) × (R).
When you order, indicate MHDH445R (D) × (R).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

- ☐ Acciaio pretemprato
Prehardened Steel **P**
- ☐ Temprato ~52
Hardened Steel HRC **H**
- ☐ Temprato ~60
Hardened Steel HRC **H**
- ☐ Temprato ~65
Hardened Steel HRC **H**

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio temprato Hardened Steels HPM38・STAVAX・SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Diametro Dia.	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
3	10,000	1,000	8,000	580	8,000	700	7,500	500	7,000	560	6,000	280
4	8,500	1,200	7,500	620	7,000	800	6,000	540	6,000	600	5,000	300
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling  Cava Slotting 				Contornatura Side Milling  Cava Slotting 				Contornatura Side Milling  Cava Slotting 			
Note Notes	※ 1 Usare un mandrino rigido e preciso. ※ 2 Regolare le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina. ※ 3 Regolare nella stessa proporzione giri ed avanzamento. ※ 4 Utilizzare lubrificazione minimale ※ 1 Use a rigid and precise machine and chuck holder. ※ 2 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Use oilmist coolant.											

Non scaricata
Full Cutting Length

Toriche
Corner
Radius

Rivestita
Coating

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

H ~60 Temprato
HRC Hardened Steel

H ~65 Temprato
HRC Hardened Steel

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 6 tagli toriche per acciai temprati MUGEN PREMIUM

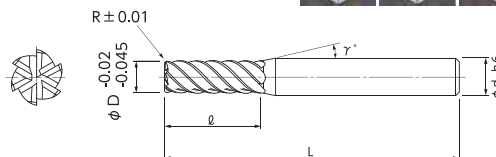
MUGEN COATING PREMIUM 6-Flute Corner Radius End Mill for Hardened Steel

Totale 21 misure

Total 21 sizes

Fresa 6 tagli con elevato angolo d'elica per acciai temprati fino a 65HRC

6-flute high helix angle corner radius end mill for hardened steels up to 65HRC



- Grande stabilità e lunga durata nella lavorazione di acciai temprati (48~65HRC).
- La toricità della fresa e l'alto angolo d'elica prevengono le scheggiature dei taglienti.
- Realized stably long tool life against high hardened steels (48~65HRC).
- Corner radius to prevent flute chipping, and high helix angle for cutting sharpness.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00438-05002	5	R0.2	10	12°	6	60	133,40
08-00438-05003		R0.3	10	12°	6	60	133,40
08-00438-05005		R0.5	10	12°	6	60	133,40
08-00438-05010		R1	10	12°	6	60	133,40
08-00438-06002	6	R0.2	12	—	6	60	142,70
08-00438-06003		R0.3	12	—	6	60	142,70
08-00438-06005		R0.5	12	—	6	60	142,70
08-00438-06010		R1	12	—	6	60	142,70
08-00438-08003	8	R0.3	16	—	8	65	197,40
08-00438-08005		R0.5	16	—	8	65	197,40
08-00438-08010		R1	16	—	8	65	197,40
08-00438-08015		R1.5	16	—	8	65	197,40
08-00438-10003	10	R0.3	20	—	10	75	279,50
08-00438-10005		R0.5	20	—	10	75	279,50
08-00438-10010		R1	20	—	10	75	279,50
08-00438-10015		R1.5	20	—	10	75	279,50
08-00438-10020	12	R2	20	—	10	75	279,50
08-00438-12005		R0.5	24	—	12	80	349,70
08-00438-12010		R1	24	—	12	80	349,70
08-00438-12015		R1.5	24	—	12	80	349,70
08-00438-12020		R2	24	—	12	80	349,70

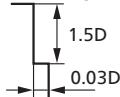
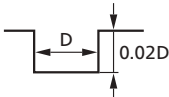
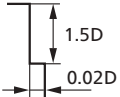
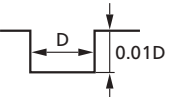
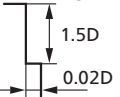
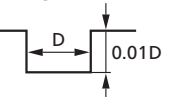
Attenzione
How to Order

Quando ordinate, indicate MHDH645R (D) × (R).
When you order, indicate MHDH645R (D) × (R).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio temprato Hardened Steels HPM38・STAVAX・SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Tool Steels SKH (~65HRC)			
Diametro Dia.	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
5	7,600	1,600	6,800	900	6,200	1,200	5,600	600	5,300	800	4,800	350
6	6,400	1,800	5,800	950	5,300	1,200	4,800	600	4,600	800	4,200	350
8	4,800	2,000	4,300	1,000	4,000	1,400	3,600	700	3,400	1,000	3,000	400
10	3,800	2,000	3,400	1,000	3,200	1,600	2,800	800	2,600	1,000	2,300	500
12	3,200	2,000	2,800	1,000	2,600	1,600	2,300	800	2,200	1,000	2,000	500
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
												
Note Notes	※ 1 Usare un mandrino rigido e preciso. ※ 2 Regolare le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina. ※ 3 Regolare nella stessa proporzione giri ed avanzamento. ※ 4 Utilizzare lubrificazione minimale ※ 1 Use a rigid and precise machine and chuck holder. ※ 2 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Use oil mist coolant.											

Non scaricata
Full Cutting Length

 Torque

 Corner Radius

Rivestita
Coating

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

H ~60 Temprato
HRC Hardened Steel

H ~65 Temprato
HRC Hardened Steel

Rivestimento
MUGEN PREMIUM

Regular Line
MUGEN PREMIUM

Frese 6 tagli toriche per acciai temprati MUGEN PREMIUM

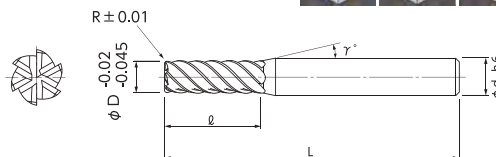
MUGEN COATING PREMIUM 6-Flute Corner Radius End Mill for Hardened Steel

Totale 15 misure

Total 15 sizes

Fresa 6 tagli con elevato angolo d'elica per acciai temprati fino a 65HRC

6-flute high helix angle corner radius end mill for hardened steels up to 65HRC



- Grande stabilità e lunga durata nella lavorazione di acciai temprati (48~65HRC).
- La toricità della fresa e l'alto angolo d'elica prevengono le scheggiature dei taglienti.
- Realized stably long tool life against high hardened steels (48~65HRC).
- Corner radius to prevent flute chipping, and high helix angle for cutting sharpness.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00413-06003	6	R0.3	15	—	6	60	88,20
08-00413-06005		R0.5	15	—	6	60	88,20
08-00413-06010		R1	15	—	6	60	92,90
08-00413-08003	8	R0.3	20	—	8	65	126,30
08-00413-08005		R0.5	20	—	8	65	126,30
08-00413-08010		R1	20	—	8	65	134,30
08-00413-08015		R1.5	20	—	8	65	134,30
08-00413-10005	10	R0.5	25	—	10	75	176,40
08-00413-10010		R1	25	—	10	75	184,40
08-00413-10015		R1.5	25	—	10	75	184,40
08-00413-10020	12	R2	25	—	10	75	184,40
08-00413-12005		R0.5	30	—	12	80	229,80
08-00413-12010		R1	30	—	12	80	239,90
08-00413-12015		R1.5	30	—	12	80	239,90
08-00413-12020		R2	30	—	12	80	239,90

Attenzione
How to Order

Quando ordinate, indicate MHDH645RK (D) × (R).
When you order, indicate MHDH645R (D) × (R).

※(γ) è un valore di riferimento
※(γ) is reference value.

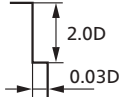
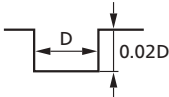
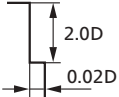
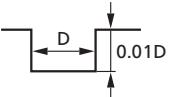
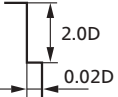
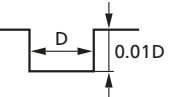
Toriche
Corner
Radius
Non scaricata
Full Cutting Length
Rivestita
Coating

○ Acciaio temprato
Prehardened Steel **P**
○ Temprato ~52
Hardened Steel HRC **H**
○ Temprato ~60
Hardened Steel HRC **H**
○ Temprato ~65
Hardened Steel HRC **H**

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material	Acciaio temprato Hardened Steels HPM38・STAVAX・SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11 (~62HRC)				Acciaio HSS High Speed Tool Steels SKH (~65HRC)			
Diametro Dia.	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed
	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min	g/min	mm/min
6	6,400	1,800	5,800	950	5,300	1,200	4,800	600	4,600	800	4,200	350
8	4,800	2,000	4,300	1,000	4,000	1,400	3,600	700	3,400	1,000	3,000	400
10	3,800	2,000	3,400	1,000	3,200	1,600	2,800	800	2,600	1,000	2,300	500
12	3,200	2,000	2,800	1,000	2,600	1,600	2,300	800	2,200	1,000	2,000	500
Prof. di taglio Depth of Cut (D:Diametro Dia.)	Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting		Contornatura Side Milling		Cava Slotting	
												
Note Notes	※ 1 Usare un mandrino rigido e preciso. ※ 2 Regolare le condizioni di fresatura in accordo alla profondità di taglio ed alla rigidità della macchina. ※ 3 Regolare nella stessa proporzione giri ed avanzamento. ※ 4 Utilizzare lubrificazione minimale ※ 1 Use a rigid and precise machine and chuck holder. ※ 2 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine. ※ 3 Adjust both spindle speed and feed at the same rate. ※ 4 Use oil mist coolant.											

Non scaricata
Full Cutting LengthRivestita
CoatingToriche
Corner
RadiusP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 2 tagli toriche scaricate per acciai temprati MUGEN PREMIUM

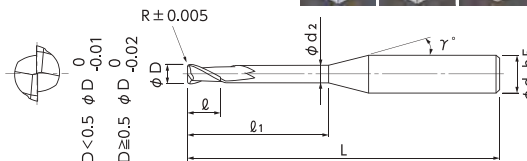
Totale 48 misure

MUGEN COATING PREMIUM 2-Flute Long Neck Corner Radius End Mill for Hardened Steel

Total 48 sizes

Fresa 2 tagli torica scaricata per acciai temprati fino a 65HRC
Massimo L/D=16

Long neck corner radius end mill for hardened steels(≤ 65HRC). Maximum L/D=16



[Forma scarico]

(γ) È un valore di riferimento. La misurazione dell'utensile è necessaria per evitare interferenze con il pezzo lavorato

[Neck Shape]

(γ) is reference value. Tool measurement required in order to avoid interference to the work material.

Unità [misura: mm]
Unit [Size: mm]

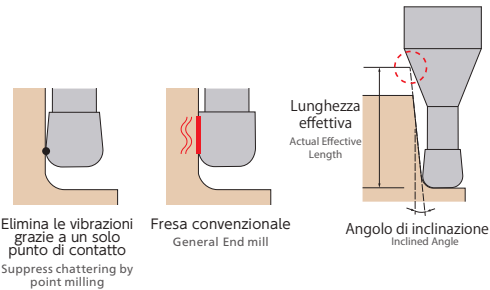
- Il rivestimento MUGEN PREMIUM ed il nuovo design dell'affilatura prevengono le usure e le scheggiature.
- MUGEN COATING PREMIUM for hardened steels and unique new design excel in chipping prevention and resolve chattering to realize excellent finished surface.

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece.					PROMO €					
									30°	1°	1°30'	2°	3°						
08-00227-02051	0.2	R0.05	0.5	0.15	0.18	12°	4	45	0.56	0.59	0.61	0.64	0.70	88,30					
08-00227-02053			1					45	1.08	1.13	1.18	1.24	1.37	88,30					
08-00227-02055			1.5					45	1.61	1.68	1.75	1.84	2.03	103,90					
08-00227-02057			2					45	2.13	2.22	2.32	2.43	2.70	113,90					
08-00227-03051	0.3	R0.05	1	0.25	0.28	12°	4	45	1.08	1.13	1.18	1.24	1.37	86,20					
08-00227-03052			1.5					45	1.61	1.68	1.75	1.84	2.03	86,20					
08-00227-03053			2					45	2.13	2.22	2.32	2.43	2.70	86,20					
08-00227-03054			2.5					45	2.65	2.77	2.89	3.03	3.36	107,60					
08-00227-03055	0.4	R0.05	3	0.3	0.37	12°	4	45	3.17	3.31	3.46	3.63	4.02	107,60					
08-00227-04051			1					45	1.11	1.16	1.21	1.27	1.40	57,00					
08-00227-04053			2					45	2.15	2.25	2.35	2.46	2.73	57,00					
08-00227-04055			3					45	3.19	3.34	3.49	3.66	4.05	57,00					
08-00227-04057		4	45					4.24	4.43	4.63	4.86	5.38	57,00						
08-00227-04101		R0.1	1					45	1.11	1.15	1.20	1.26	1.38	57,00					
08-00227-04103			2					45	2.15	2.24	2.34	2.45	2.71	57,00					
08-00227-04105			3					45	3.19	3.33	3.48	3.65	4.04	57,00					
08-00227-04107			4					45	4.24	4.42	4.62	4.85	5.36	57,00					
08-00227-05051		0.5	R0.05					1	0.4	0.46	12°	4	45	1.13	1.18	1.24	1.29	1.43	47,00
08-00227-05052								2					45	2.18	2.27	2.38	2.49	2.76	47,00
08-00227-05053								3					45	3.22	3.36	3.52	3.69	4.09	47,00
08-00227-05054	4			45	4.26	4.45	4.66	4.88					5.41	47,00					
08-00227-05055	5		45	5.31	5.54	5.80	6.08	6.74					47,00						
08-00227-05101	R0.1		1	45	1.13	1.18	1.23	1.28					1.41	47,00					
08-00227-05102			2	45	2.17	2.27	2.37	2.48					2.74	47,00					
08-00227-05103			3	45	3.22	3.36	3.51	3.68					4.07	47,00					
08-00227-05104			4	45	4.26	4.45	4.65	4.87					5.40	47,00					
08-00227-05105	5		45	5.30	5.54	5.79	6.07	6.72					47,00						
08-00227-06051	0.6		R0.05	2	0.5	0.56	12°	4					45	2.18	2.27	2.38	2.49	2.76	49,90
08-00227-06053				4									45	4.26	4.45	4.66	4.88	5.41	49,90
08-00227-06055		R0.1	6	45					6.35	6.63	6.94	7.28	8.07	49,90					
08-00227-06101			2	45					2.17	2.27	2.37	2.48	2.74	49,90					
08-00227-06103	0.7	R0.1	4	0.55	0.66	12°	4	45	4.26	4.45	4.65	4.87	5.40	49,90					
08-00227-06105			6					45	6.35	6.63	6.93	7.27	8.05	49,90					
08-00227-07051		R0.05	2					45	4.26	4.45	4.66	4.88	5.41	52,80					
08-00227-07053			6					45	6.35	6.63	6.94	7.28	8.07	52,80					
08-00227-07101	0.8	R0.1	4	0.65	0.76	12°	4	45	4.26	4.45	4.65	4.87	5.40	52,80					
08-00227-07103			6					45	6.35	6.63	6.93	7.27	8.05	52,80					
08-00227-08051		R0.05	2					45	4.26	4.45	4.66	4.88	5.41	52,80					
08-00227-08053			4					45	6.35	6.63	6.94	7.28	8.07	52,80					
08-00227-08055			6					50	8.43	8.81	9.22	9.67	10.72	54,90					
08-00227-08101			4					45	4.26	4.45	4.65	4.87	5.40	52,80					
08-00227-08103		R0.1	6					45	6.35	6.63	6.93	7.27	8.05	52,80					
08-00227-08105			8					50	8.43	8.80	9.21	9.66	10.71	54,90					
08-00227-08201			R0.2					4	45	4.26	4.44	4.64	4.85	5.36	52,80				
08-00227-08203								6	45	6.34	6.62	6.92	7.25	8.02	52,80				
08-00227-08205		8						50	8.43	8.80	9.20	9.64	10.67	54,90					
08-00227-09101		R0.1						4	0.7	0.85	12°	4	45	4.28	4.47	4.68	4.90	5.43	59,90
08-00227-09105	8		50	8.46	8.83	9.24	9.69	10.74					59,90						

Attenzione
How to OrderQuando ordinate, indicate MHRH230R (D) × (R) × (L) 1.
When you order, indicate MHRH230R (D) × (R) × (L) 1.

Condizioni di taglio raccomandate

Recommended Milling Conditions



Scaricata
Long Neck



Rivestita
Coating

Toriche
Corner Radius

Materiale Work Material			Acciaio pretemprato Prehardened Steels HPM·NAK (~42HRC)				Acciaio temprato Hardened Steels HPM38·STAVAX·SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11·PD613 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
0.2	0.05	0.5	30,000	240	0.01	0.05	30,000	200	0.003	0.04	30,000	160	0.003	0.02	30,000	120	0.003	0.01
		1	30,000	180	0.007	0.05	30,000	150	0.003	0.04	30,000	120	0.003	0.02	30,000	80	0.003	0.01
		1.5	30,000	120	0.005	0.05	30,000	100	0.002	0.04	30,000	80	0.002	0.02	30,000	60	0.002	0.01
		2	30,000	70	0.003	0.05	30,000	50	0.002	0.04	30,000	40	0.002	0.02	30,000	30	0.002	0.01
0.3	0.05	1	30,000	350	0.02	0.1	30,000	300	0.003	0.08	30,000	250	0.003	0.04	30,000	200	0.003	0.03
		1.5	30,000	240	0.015	0.1	30,000	200	0.003	0.08	30,000	160	0.003	0.04	30,000	120	0.003	0.03
		2	30,000	180	0.01	0.1	30,000	150	0.003	0.08	30,000	120	0.003	0.04	25,000	100	0.003	0.03
		2.5	30,000	150	0.007	0.1	25,000	100	0.002	0.08	25,000	80	0.002	0.04	20,000	60	0.002	0.03
		3	30,000	70	0.005	0.1	25,000	50	0.002	0.08	25,000	40	0.002	0.04	20,000	30	0.002	0.03
0.4	0.05	1	30,000	450	0.025	0.12	30,000	400	0.005	0.1	28,000	350	0.005	0.05	25,000	300	0.005	0.04
		2	30,000	360	0.02	0.12	30,000	300	0.005	0.1	25,000	250	0.005	0.05	25,000	220	0.005	0.04
		3	30,000	320	0.015	0.12	25,000	250	0.004	0.1	23,000	220	0.003	0.05	18,000	160	0.003	0.04
		4	30,000	250	0.01	0.12	25,000	200	0.003	0.1	20,000	160	0.002	0.05	18,000	120	0.002	0.04
0.5	0.05	1	30,000	600	0.03	0.14	25,000	500	0.01	0.15	23,000	450	0.007	0.1	20,000	400	0.005	0.08
		2	30,000	500	0.025	0.14	25,000	420	0.01	0.15	23,000	360	0.007	0.1	20,000	300	0.005	0.08
		3	30,000	420	0.02	0.14	25,000	350	0.008	0.15	23,000	320	0.005	0.1	20,000	280	0.003	0.08
		4	25,000	380	0.015	0.14	25,000	300	0.005	0.15	23,000	240	0.003	0.1	20,000	180	0.002	0.08
		5	25,000	300	0.01	0.14	20,000	200	0.004	0.15	18,000	150	0.003	0.1	16,000	100	0.002	0.08
0.6	0.05	4	25,000	450	0.025	0.2	23,000	400	0.015	0.2	20,000	300	0.007	0.15	18,000	200	0.005	0.1
		6	23,000	300	0.015	0.2	20,000	200	0.008	0.2	18,000	150	0.005	0.15	12,000	100	0.003	0.1
		8	18,000	200	0.01	0.2	16,000	150	0.005	0.2	14,000	100	0.002	0.15	10,000	80	0.001	0.1
0.7	0.05	4	28,000	700	0.03	0.25	25,000	600	0.02	0.25	23,000	500	0.01	0.15	20,000	350	0.007	0.12
		6	25,000	500	0.02	0.25	20,000	350	0.01	0.25	18,000	250	0.007	0.15	16,000	200	0.005	0.12
0.8	0.05	4	28,000	900	0.045	0.3	25,000	700	0.025	0.25	23,000	600	0.015	0.16	20,000	400	0.01	0.14
		6	23,000	700	0.03	0.3	20,000	550	0.02	0.25	18,000	450	0.01	0.16	16,000	320	0.007	0.14
0.9	0.1	8	18,000	500	0.02	0.3	16,000	400	0.01	0.25	14,000	300	0.005	0.16	12,000	200	0.005	0.14
		4	25,000	1,100	0.05	0.3	25,000	850	0.03	0.3	20,000	700	0.02	0.2	18,000	600	0.01	0.15
		8	18,000	500	0.03	0.3	16,000	400	0.01	0.3	14,000	350	0.008	0.2	10,000	250	0.005	0.15

Note
Notes

- ※1 I parametri di taglio sopra indicati vanno regolati in base alla forma da fresare e al tipo di macchina.
- ※2 ap=Profondità di taglio assiale, ae=profondità di taglio radiale.
- ※3 Raccomandiamo l'uso di lubrificazione minima specifica per materiali temprati.
- ※4 Raccomandiamo l'approccio a rampa o elicoidale, per entrare nel pezzo in maniera assiale.
- ※5 Regolate l'avanzamento più basso del 50% e la profondità di taglio radiale (ae) del 30% quando la profondità di fresatura è maggiore di 8xD per una fresatura stabile.
- ※6 Per cave consigliamo la fresatura bidirezionale e la riduzione di avanzamento e profondità di taglio assiale(ap) del 50%.
- ※7 Ridurre con la stessa proporzione giri ed avanzamento, per eliminare vibrazioni o in caso di limitato numero di giri della macchina.
- ※1 Adjust milling conditions according to milling shape and machine type.
- ※2 ap : Axial Depth of Cut, ae : Radial Depth of Cut.
- ※3 Recommend to use oil mist coolant for machining hardened steels.
- ※4 Recommend to apply helical or ramping for approaching into axial direction.
- ※5 Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area when L/D exceeds 8 for stable milling.
- ※6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
- ※7 Reduce both spindle speed and feed at same rate for chatter and also for insufficient spindle speed of a machine.

P Acciaio pretemprato
Prehardened Steel

H ~52 Temprato
HRC Hardened Steel

H ~60 Temprato
HRC Hardened Steel

H ~65 Temprato
HRC Hardened Steel

M Acciaio inox
Stainless Steel

S Lega di titanio
Superlega
Titanium Alloy
Heat Resistant Alloy

Rivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 4 tagli toriche scaricate per acciai temprati MUGEN PREMIUM

Totale 147 misure

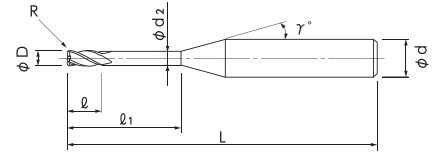
MUGEN COATING PREMIUM 4-Flute Long Neck Corner Radius End Mill for Hardened Steel

Total 147 sizes

Fresa 4 tagli torica scaricata per acciai temprati fino a 65HRC
Ampia gamma con 146 misure

Long neck corner radius end mill for hardened steels (~65HRC)

Abundant size variations with total 146 sizes



- Il rivestimento MUGEN PREMIUM ed il nuovo design dell'affilatura prevengono le usure e le scheggiature.
- Frese a 4 tagli per un'altissima efficienza.
- Frese a 4 tagli con gamma di 450 misure da $\varnothing 0.1$ a $\varnothing 6$
- MUGEN COATING PREMIUM for hardened steels and unique new design excel in chipping prevention and resolve chattering to realize excellent finished surface.
- 4 flutes end mill for higher efficiency.
- 4 flute end mill has 450 sizes in total that lineup from the smallest diameter $\varnothing 0.1$ to $\varnothing 6$.

Fare attenzione perché non c'è tagliente al centro nelle misure da $\varnothing 0.1$ a $\varnothing 0.3$.Beware of stocks because there is no blade to the shaft center of end teeth of $\varnothing 0.1$ to $\varnothing 0.3$.

Misure Size	Toll. diametro Diameter Tolerance	Toll. raggio Corner R Tolerance	Toll. gambo Shank Dia. Tolerance
$D \leq 0.15$	0 -0.007	± 0.003	-0.001 -0.003
$0.15 < D < 0.5$	0 -0.01	± 0.005	h5
$0.5 \leq D \leq 2.5$	0 -0.02	± 0.01	
$D > 2.5$			

Unità [misura: mm]

Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece.					PROMO €
									30°	1°	1°30'	2°	3°	
08-00237-10050	1	R0.05	3	0.8	0.95	12°	4	50	3.24	3.39	3.54	3.72	4.12	55,60
08-00237-10051			4					50	4.29	4.48	4.68	4.91	5.44	55,60
08-00237-10052			5					50	5.33	5.57	5.82	6.11	6.77	61,30
08-00237-10053			6					50	6.37	6.66	6.97	7.31	8.10	61,30
08-00237-10055			8					50	8.46	8.83	9.25	9.70	10.75	61,30
08-00237-10057			10					50	10.54	11.01	11.53	12.09	13.41	61,30
08-00237-10100		R0.1	3					50	3.24	3.38	3.54	3.71	4.10	55,60
08-00237-10101			4					50	4.28	4.47	4.68	4.90	5.43	55,60
08-00237-10102			5					50	5.33	5.56	5.82	6.10	6.76	61,30
08-00237-10103			6					50	6.37	6.65	6.96	7.30	8.08	61,30
08-00237-10105			8					50	8.46	8.83	9.24	9.69	10.74	61,30
08-00237-10107			10					50	10.54	11.01	11.52	12.08	13.39	61,30
08-00237-10200		R0.2	3					50	3.24	3.37	3.52	3.69	4.07	55,60
08-00237-10201			4					50	4.28	4.46	4.66	4.88	5.40	55,60
08-00237-10202			5					50	5.32	5.55	5.80	6.08	6.72	61,30
08-00237-10203			6					50	6.37	6.64	6.94	7.28	8.05	61,30
08-00237-10205			8					50	8.45	8.82	9.23	9.67	10.71	61,30
08-00237-10207			10					50	10.54	11.00	11.51	12.06	13.36	61,30
08-00237-10300		R0.3	3					50	3.23	3.36	3.51	3.67	4.04	55,60
08-00237-10301			4					50	4.28	4.45	4.65	4.86	5.36	55,60
08-00237-10302			5					50	5.32	5.54	5.79	6.06	6.69	61,30
08-00237-10303			6					50	6.36	6.63	6.93	7.26	8.02	61,30
08-00237-10305			8					50	8.45	8.81	9.21	9.65	10.67	61,30
08-00237-10307			10					50	10.53	10.99	11.49	12.04	13.33	61,30
08-00237-12101	1.2	R0.1	5		1.14	12°	4	50	5.35	5.59	5.84	6.13	6.79	62,80
08-00237-12103			10					50	10.57	11.03	11.55	12.11	13.42	62,80
08-00237-12201			5					50	5.35	5.58	5.83	6.11	6.75	62,80
08-00237-12203		R0.2	10					50	10.56	11.03	11.53	12.09	13.39	62,80
08-00237-12301			5					50	5.34	5.57	5.82	6.09	6.72	62,80
08-00237-12303			10					50	10.56	11.02	11.52	12.07	13.36	62,80
08-00237-15101	1.5	R0.1	4	1.2	1.43	12°	4	50	4.33	4.52	4.73	4.96	5.49	59,10
08-00237-15103			6					50	6.42	6.70	7.01	7.35	8.15	59,10
08-00237-15105			8					50	8.50	8.88	9.29	9.75	10.80	62,80
08-00237-15107			12					50	12.68	13.24	13.85	14.53	16.11	62,80
08-00237-15109			15					60	15.80	16.51	17.28	18.12	20.09	62,80
08-00237-15201		R0.2	4					50	4.33	4.51	4.72	4.94	5.46	59,10
08-00237-15203			6					50	6.42	6.69	7.00	7.33	8.11	59,10
08-00237-15205			8					50	8.50	8.87	9.28	9.73	10.77	62,80
08-00237-15207			12					50	12.67	13.23	13.84	14.51	16.08	62,80
08-00237-15209			15					60	15.80	16.50	17.26	18.10	20.06	62,80

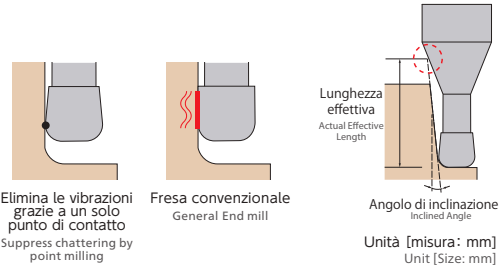
Attenzione
How to Order

Quando ordinate, indicate MHRH430R (D)×(R)×(L1).

When you order, indicate MHRH430R (D)×(R)×(L1).

Frese 4 tagli toriche scaricate per acciai temprati MUGEN PREMIUM

MUGEN COATING PREMIUM 4-Flute Long Neck Corner Radius End Mill for Hardened Steel

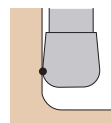


Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lung. scarico Under Neck Length	(Ø) Lung. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lung. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece.					PROMO €
									30°	1°	1°30'	2°	3°	
08-00237-15301	1.5	R0.3	4	1.2	1.43	12°	4	50	4.33	4.51	4.70	4.92	5.43	59,10
08-00237-15303			6					50	6.41	6.68	6.98	7.31	8.08	59,10
08-00237-15305			8					50	8.50	8.86	9.27	9.71	10.74	62,80
08-00237-15307			12					50	12.67	13.22	13.83	14.49	16.04	62,80
08-00237-15309			15					60	15.80	16.49	17.25	18.08	20.03	62,80
08-00237-15501		R0.5	4					50	4.32	4.49	4.68	4.88	5.36	59,10
08-00237-15503			6					50	6.40	6.67	6.96	7.27	8.02	59,10
08-00237-15505			8					50	8.49	8.85	9.24	9.67	10.67	62,80
08-00237-15507			12					50	12.66	13.20	13.80	14.45	15.98	62,80
08-00237-15509			15					60	15.79	16.47	17.22	18.04	19.96	62,80
08-00237-20101	2	R0.1	6	1.6	1.91	12°	4	50	6.47	6.75	7.07	7.41	8.21	59,10
08-00237-20103			8					50	8.55	8.93	9.35	9.80	10.86	62,80
08-00237-20105			12					50	12.73	13.29	13.91	14.59	16.17	62,80
08-00237-20107			16					60	16.90	17.65	18.47	19.37	Free	62,80
08-00237-20109			20					60	21.07	22.01	23.03	24.16	Free	62,80
08-00237-20201		R0.2	6					50	6.46	6.74	7.05	7.39	8.18	59,10
08-00237-20203			8					50	8.55	8.92	9.33	9.78	10.83	62,80
08-00237-20205			12					50	12.72	13.28	13.89	14.57	16.14	62,80
08-00237-20207			16					60	16.89	17.64	18.46	19.36	Free	62,80
08-00237-20209			20					60	21.06	22.00	23.02	24.14	Free	62,80
08-00237-20301		R0.3	6					50	6.46	6.74	7.04	7.37	8.14	59,10
08-00237-20303			8					50	8.55	8.91	9.32	9.76	10.80	62,80
08-00237-20305			12					50	12.72	13.27	13.88	14.55	16.11	62,80
08-00237-20307			16					60	16.89	17.63	18.44	19.34	Free	62,80
08-00237-20309			20					60	21.06	21.99	23.00	24.12	Free	62,80
08-00237-20501		R0.5	6					50	6.45	6.72	7.01	7.33	8.08	59,10
08-00237-20503			8					50	8.54	8.90	9.29	9.72	10.73	62,80
08-00237-20505			12					50	12.71	13.25	13.85	14.51	16.04	62,80
08-00237-20507			16					60	16.88	17.61	18.42	19.30	Free	62,80
08-00237-20509			20					60	21.05	21.97	22.98	24.08	Free	62,80
08-00237-25101	2.5	R0.1	10		2.39	12°	4	50	10.69	11.16	11.68	12.25	13.58	64,90
08-00237-25103			20					60	21.12	22.06	23.09	Free	Free	67,70
08-00237-25105			30					70	31.55	32.95	Free	Free	Free	69,20
08-00237-25201		R0.2	10					50	10.68	11.15	11.67	12.23	13.55	64,90
08-00237-25203			20					60	21.11	22.05	23.07	Free	Free	67,70
08-00237-25205			30					70	31.54	32.94	Free	Free	Free	69,20
08-00237-25301		R0.3	10					50	10.68	11.14	11.65	12.21	13.52	64,90
08-00237-25303			20					60	21.11	22.04	23.06	Free	Free	67,70
08-00237-25305			30					70	31.54	32.93	Free	Free	Free	69,20
08-00237-25501		R0.5	10					50	10.67	11.13	11.63	12.17	13.45	64,90
08-00237-25503			20					60	21.10	22.02	23.03	Free	Free	67,70
08-00237-25505			30					70	31.53	32.92	Free	Free	Free	69,20
08-00237-30101	3	R0.1	8	2.5	2.85	12°	6	50	8.70	9.09	9.51	9.97	11.05	62,90
08-00237-30103			12					50	12.87	13.44	14.07	14.76	16.36	75,30
08-00237-30105			16					60	17.04	17.80	18.63	19.54	21.67	93,40
08-00237-30107			20					60	21.21	22.16	23.19	24.33	26.98	93,40
08-00237-30109			25					70	26.43	27.61	28.90	30.31	Free	93,40
08-00237-30111			30					70	31.64	33.05	34.60	36.30	Free	105,00
08-00237-30201		R0.2	8					50	8.70	9.08	9.49	9.95	11.02	62,90
08-00237-30203			12					50	12.87	13.44	14.06	14.74	16.33	75,30
08-00237-30205			16					60	17.04	17.79	18.62	19.52	21.64	93,40
08-00237-30207			20					60	21.21	22.15	23.18	24.31	26.94	93,40
08-00237-30209			25					70	26.42	27.60	28.88	30.29	Free	93,40
08-00237-30211			30					70	31.64	33.05	34.58	36.28	Free	105,00

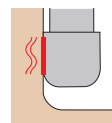
Attenzione
How to OrderQuando ordinate, indicate MHRH430R (D) × (R) × (Ø 1).
When you order, indicate MHRH430R (D) × (R) × (Ø 1).Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 4 tagli toriche scaricate per acciai temprati MUGEN PREMIUM

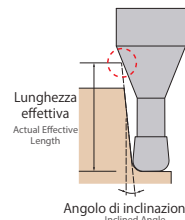
MUGEN COATING PREMIUM 4-Flute Long Neck Corner Radius End Mill for Hardened Steel



Elimina le vibrazioni
grazie a un solo
punto di contatto
Suppress chattering by
point milling



Fresa convenzionale
General End mill



Angolo di inclinazione
Inclined Angle

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ ₁) Lungh. scarico Under Neck Length	(ℓ) Lungh. tagliente Length of Cut	(d ₂) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00237-30301	3	R0.3	8	2.5	2.85	12°	6	50	8.69	9.07	9.48	9.93	10.99	62,90
08-00237-30303			12					50	12.86	13.43	14.04	14.72	16.29	75,30
08-00237-30305			16					60	17.04	17.78	18.60	19.50	21.60	93,40
08-00237-30307			20					60	21.21	22.14	23.17	24.29	26.91	93,40
08-00237-30309			25					70	26.42	27.59	28.87	30.27	Free	93,40
08-00237-30311			30					70	31.63	33.04	34.57	36.26	Free	105,00
08-00237-30501		R0.5	8					50	8.68	9.05	9.45	9.89	10.92	62,90
08-00237-30503			12					50	12.86	13.41	14.01	14.68	16.23	75,30
08-00237-30505			16					60	17.03	17.77	18.58	19.47	21.54	93,40
08-00237-30507			20					60	21.20	22.12	23.14	24.25	26.85	93,40
08-00237-30509			25					70	26.41	27.57	28.84	30.24	Free	93,40
08-00237-30511			30					70	31.63	33.02	34.54	36.22	Free	105,00
08-00237-31001		R1	8					50	8.66	9.01	9.38	9.80	10.76	62,90
08-00237-31003			12					50	12.83	13.36	13.94	14.58	16.07	75,30
08-00237-31005			16					60	17.01	17.72	18.51	19.37	21.38	93,40
08-00237-31007			20					60	21.18	22.08	23.07	24.16	26.69	93,40
08-00237-31009			25					70	26.39	27.53	28.77	30.14	Free	93,40
08-00237-31011			30					70	31.60	32.97	34.47	36.12	Free	105,00
08-00237-40101	4	R0.1	16	3.2	3.8	12°	6	60	17.17	17.93	18.77	19.68	Free	93,40
08-00237-40103			24					70	25.51	26.65	27.89	Free	Free	104,10
08-00237-40105			32					70	33.85	35.36	37.01	Free	Free	104,10
08-00237-40201		R0.2	16					60	17.16	17.92	18.75	19.66	Free	93,40
08-00237-40203			24					70	25.50	26.64	27.88	Free	Free	104,10
08-00237-40205			32					70	33.85	35.35	37.00	Free	Free	104,10
08-00237-40301		R0.3	16					60	17.16	17.91	18.74	19.65	Free	93,40
08-00237-40303			24					70	25.50	26.63	27.86	Free	Free	104,10
08-00237-40305			32					70	33.84	35.34	36.99	Free	Free	104,10
08-00237-40501		R0.5	16					60	17.15	17.89	18.71	19.61	Free	93,40
08-00237-40503			24					70	25.49	26.61	27.83	Free	Free	104,10
08-00237-40505			32					70	33.83	35.33	36.96	Free	Free	104,10
08-00237-41001		R1	16					60	17.13	17.85	18.64	19.51	Free	93,40
08-00237-41003			24					70	25.47	26.57	27.77	29.08	Free	104,10
08-00237-41005			32					70	33.81	35.28	36.89	Free	Free	104,10
08-00237-50101	5	R0.1	20	4	4.75	12°	6	70	21.46	22.42	Free	Free	Free	133,00
08-00237-50103			40					90	42.32	Free	Free	Free	Free	166,00
08-00237-50201		R0.2	20					70	21.46	22.41	Free	Free	Free	133,00
08-00237-50203			40					90	42.31	Free	Free	Free	Free	166,00
08-00237-50301		R0.3	20					70	21.45	22.40	Free	Free	Free	133,00
08-00237-50303			40					90	42.31	Free	Free	Free	Free	166,00
08-00237-50501		R0.5	20					70	21.44	22.38	Free	Free	Free	133,00
08-00237-50503			40					90	42.30	Free	Free	Free	Free	166,00
08-00237-51001		R1	20					70	21.42	22.34	Free	Free	Free	133,00
08-00237-51003			40					90	42.28	Free	Free	Free	Free	166,00
08-00237-60101	6	R0.1	24	5	5.7	-	6	90	Free	Free	Free	Free	Free	171,80
08-00237-60103			48					110	Free	Free	Free	Free	Free	209,00
08-00237-60201		R0.2	24					90	Free	Free	Free	Free	Free	171,80
08-00237-60203			48					110	Free	Free	Free	Free	Free	209,00
08-00237-60301		R0.3	24					90	Free	Free	Free	Free	Free	171,80
08-00237-60303			48					110	Free	Free	Free	Free	Free	209,00
08-00237-60501		R0.5	24					90	Free	Free	Free	Free	Free	171,80
08-00237-60503			48					110	Free	Free	Free	Free	Free	209,00
08-00237-61001		R1	24					90	Free	Free	Free	Free	Free	171,80
08-00237-61003			48					110	Free	Free	Free	Free	Free	209,00

Attenzione
How to Order

Quando ordinate, indicate MHRH430R (D)×(R)×(ℓ 1).
When you order, indicate MHRH430R (D)×(R)×(ℓ 1).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio pretemprato Prehardened Steels HPM·NAK (~42HRC)				Acciaio temprato Hardened Steels HPM38·STAVAX·SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11·PD613 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Dia. Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
1	0.05 ~ 0.3	3	28,000	2,500	0.06	0.35	23,000	2,100	0.05	0.3	20,000	1,800	0.04	0.25	16,000	1,300	0.03	0.2
		4	25,000	2,200	0.055	0.35	21,000	1,800	0.04	0.3	18,000	1,500	0.03	0.25	14,000	1,100	0.02	0.2
		5	23,000	1,900	0.05	0.35	19,000	1,600	0.03	0.3	16,000	1,400	0.02	0.25	13,000	1,000	0.01	0.2
		6	20,000	1,700	0.045	0.35	16,000	1,400	0.02	0.3	14,000	1,200	0.01	0.25	11,000	850	0.007	0.2
		8	18,000	1,400	0.035	0.35	15,000	1,100	0.015	0.3	13,000	900	0.008	0.25	10,000	650	0.005	0.2
1.2	0.1 ~ 0.3	10	16,000	1,000	0.025	0.35	13,000	800	0.01	0.3	11,000	700	0.006	0.25	9,000	500	0.005	0.2
		5	24,000	2,200	0.06	0.45	20,000	1,800	0.045	0.4	17,000	1,500	0.03	0.3	14,000	1,100	0.02	0.2
		10	16,000	1,400	0.04	0.45	13,000	1,100	0.03	0.4	11,000	950	0.01	0.3	9,000	700	0.005	0.2
		4	25,000	2,400	0.08	0.55	21,000	2,000	0.05	0.5	18,000	1,700	0.04	0.4	14,000	1,200	0.03	0.3
		6	23,000	2,200	0.08	0.55	19,000	1,800	0.045	0.5	16,000	1,500	0.03	0.4	13,000	1,100	0.02	0.3
1.5	0.1 ~ 0.5	8	20,000	1,800	0.06	0.55	16,000	1,500	0.04	0.5	14,000	1,300	0.025	0.4	11,000	900	0.01	0.3
		12	16,000	1,400	0.06	0.55	13,000	1,100	0.03	0.5	11,000	950	0.02	0.4	9,000	650	0.007	0.3
		15	14,000	1,000	0.03	0.55	11,000	800	0.02	0.5	9,000	700	0.007	0.4	7,000	500	0.005	0.3
		6	22,000	2,500	0.12	0.7	18,000	2,100	0.06	0.6	15,000	1,800	0.05	0.5	12,000	1,300	0.03	0.35
		8	20,000	2,200	0.11	0.7	16,000	1,800	0.05	0.6	14,000	1,500	0.04	0.5	11,000	1,100	0.02	0.35
2	0.1 ~ 0.5	12	16,000	1,700	0.09	0.7	13,000	1,400	0.04	0.6	11,000	1,200	0.03	0.5	9,000	850	0.01	0.35
		16	14,000	1,400	0.07	0.7	11,000	1,100	0.03	0.6	9,500	950	0.02	0.5	7,500	650	0.007	0.35
		20	10,000	800	0.05	0.7	8,000	650	0.02	0.6	7,000	550	0.01	0.5	5,500	400	0.005	0.35
		10	16,000	2,200	0.14	0.85	13,000	1,800	0.07	0.7	11,000	1,500	0.05	0.5	9,000	1,100	0.03	0.5
		20	11,000	1,400	0.08	0.85	9,000	1,100	0.04	0.7	7,500	950	0.02	0.5	6,000	650	0.01	0.5
2.5	0.1 ~ 0.5	30	7,000	800	0.03	0.85	5,500	650	0.01	0.7	4,500	550	0.01	0.5	3,500	400	0.005	0.5
3	0.1 ~ 0.5	8	14,000	2,200	0.16	1	11,000	1,800	0.1	0.8	9,500	1,500	0.07	0.7	7,500	1,100	0.05	0.6
		12	13,500	2,000	0.16	1	11,000	1,600	0.08	0.8	9,500	1,400	0.06	0.7	7,500	1,000	0.04	0.6
		16	12,000	1,800	0.14	1	10,000	1,500	0.07	0.8	8,500	1,300	0.05	0.7	7,000	900	0.03	0.6
		20	10,000	1,400	0.12	1	8,000	1,100	0.05	0.8	7,000	950	0.04	0.7	5,500	700	0.02	0.6
		25	9,000	1,200	0.08	1	7,500	1,000	0.04	0.8	6,500	850	0.02	0.7	5,000	600	0.01	0.6
	1	30	8,000	800	0.06	1	6,500	650	0.03	0.8	5,500	550	0.02	0.7	4,500	400	0.007	0.6
		8	14,000	2,200	0.16	1	11,000	1,800	0.1	0.8	9,500	1,500	0.07	0.7	7,500	1,100	0.05	0.6
		12	13,500	2,000	0.16	1	11,000	1,600	0.08	0.8	9,500	1,400	0.06	0.7	7,500	1,000	0.04	0.6
		16	12,000	1,800	0.14	1	10,000	1,500	0.07	0.8	8,500	1,300	0.05	0.7	7,000	900	0.03	0.6
		20	10,000	1,400	0.12	1	8,000	1,100	0.05	0.8	7,000	950	0.04	0.7	5,500	700	0.02	0.6
4	0.1 ~ 1	25	9,000	1,200	0.08	1	7,500	1,000	0.04	0.8	6,500	850	0.02	0.7	5,000	600	0.01	0.6
		30	8,000	800	0.06	1	6,500	650	0.03	0.8	5,500	550	0.02	0.7	4,500	400	0.007	0.6
		16	10,000	2,200	0.17	1.4	8,000	1,800	0.1	1.2	7,000	1,500	0.06	1	5,500	1,100	0.05	0.8
		24	8,000	1,600	0.14	1.4	6,500	1,300	0.08	1.2	5,500	1,100	0.05	1	4,500	750	0.03	0.8
		32	6,500	1,300	0.08	1.4	5,500	1,100	0.04	1.2	4,500	950	0.02	1	3,500	650	0.01	0.8
5	0.1 ~ 1	20	8,000	2,000	0.18	2.2	6,500	1,600	0.1	2	5,500	1,400	0.07	1.6	4,500	1,000	0.05	1.2
		40	5,000	1,200	0.09	2.2	4,000	1,000	0.05	2	3,500	850	0.02	1.6	3,000	600	0.01	1.2
6	0.1 ~ 0.3	24	6,000	1,800	0.2	2.7	5,000	1,500	0.15	2.5	4,000	1,300	0.07	2	3,000	900	0.05	1.5
		48	3,000	900	0.1	2.7	2,500	750	0.05	2.5	2,000	650	0.03	2	2,000	450	0.02	1.5

Note
Notes

- ※ 1 I parametri di taglio sopra indicati vanno regolati in base alla forma da fresare e al tipo di macchina.
- ※ 2 ap=Profondità di taglio assiale, ae=Profondità di taglio radiale.
- ※ 3 Raccomandiamo l'uso di lubrificazione minimale specifica per materiali temprati.
- ※ 4 Raccomandiamo l'approccio a rampa o elicoidale, per entrare nel pezzo in maniera assiale.
- ※ 5 Regolate l'avanzamento più basso del 50% e la profondità di taglio radiale (ae) del 30% quando la profondità di fresatura è maggiore di 8XD per stabilizzare la fresa.
- ※ 6 Per cave consigliamo la fresatura bidirezionale e la riduzione di avanzamento e profondità di taglio assiale (ap) del 50%.
- ※ 7 Ridurre con la stessa proporzione giri ed avanzamento, per eliminare vibrazioni o in caso di limitato numero di giri della macchina.
- ※ 1 Adjust milling conditions according to milling shape and machine type.
- ※ 2 ap: Axial Depth of Cut, ae: Radial Depth of Cut.
- ※ 3 Recommend to use oil mist coolant for machining hardened steels.
- ※ 4 Recommend to apply helical or ramping for approaching into axial direction.
- ※ 5 Adjust feed rate 50% lower and cutting depth (ae) 30% lower for milling deep wall area when L/D exceeds 8 for stable milling.
- ※ 6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
- ※ 7 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusP Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelM Acciaio inox
Stainless SteelS Lega di titanio
Superlega
Titanium Alloy
Heat Resistant AlloyRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

Frese 3 tagli a lente ad alta efficienza MUGEN PREMIUM

Totale 7 misure

MUGEN COATING PREMIUM High Efficiency Lens Form 3-Flute End Mill

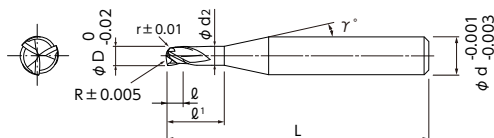
Total 7 sizes

Consente elevati incrementi laterali anche con diametri di piccole dimensioni

Fresa a 3 tagli a lente per maggiore produttività rispetto alle frese sferiche.

Realizes large pick feed even with small size diameter

Specialized lens form 3-Flute end mill improves productivity compared to ball end mills



- Utilizzare il rivestimento MUGEN PREMIUM per acciaio temprato fino ai 65 HRC.
- La forma a lente a 3 tagli consente un incremento laterale più ampio rispetto alle frese sferiche, migliorando l'efficienza della lavorazione.
- È possibile ottenere una produttività ancora più elevata nella lavorazione a 5 assi, che consente incrementi del passo laterale mantenendo costante il punto di taglio.
- Adopt MUGEN COATING PREMIUM for hardened steel to support machining hardened steel up to 65HRC.
- 3-flute lens form combines larger pick feed than ball end mills improve machining efficiency.
- High productivity can be achieved by using the 5-axis machining to take large pick feeds while keeping the cut point constant.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio fondo End Tooth Bottom Radius	(L1) Lungh. scarico Under Neck Length	(r) Raggio Corner Radius	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00790-10103	1	R1	3	R0.03	1	0.95	12°	6	50	75,30
08-00790-20206	2	R2	6	R0.05	2	1.91	12°	6	50	79,50
08-00790-30309	3	R3	9	R0.1	3	2.85	12°	6	60	83,60
08-00790-40412	4	R4	12	R0.1	4	3.8	12°	6	60	87,80
08-00790-50515	5	R5	15	R0.2	5	4.75	12°	6	60	92,00
08-00790-60620	6	R6	20	R0.3	6	5.7	-	6	60	92,00
08-00790-60820	6	R8	20	R0.3	6	5.7	-	6	60	92,00

Attenzione How to Order

Quando ordinate, indicate MLFH330 (D) x (R) x (L1)
When you order, indicate MLFH330 (D) x (R) x (L1).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

■ Se il CAM può utilizzare frese a forma di lente, utilizzare il profilo reale.

Richiedere al produttore CAM la disponibilità della gestione dell' utensile a lente e la generazione del percorso.

If your CAM can use lens form end mills, please use it as is.

Make an inquiry to CAM manufacturer regarding the availability of tool registration and tool path generation.

■ Un esempio di procedura nel caso la forma a lente non può essere definita dal CAM in uso è mostrata sul web

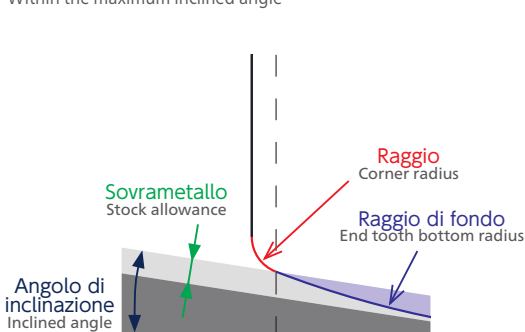
Example of procedure shown on web when the shape of this tool cannot be defined with the CAM in using.

■ L'inclinazione massima indicata si riferisce alla massima inclinazione del pezzo che può essere lavorata senza problemi, mantenendo il sovrametallo massimo riportato.

Maximum inclined angle means the workpiece that can be machined without problems with the machining allowance shown in the cutting conditions above.

Entro l'angolo massimo

Within the maximum inclined angle



Oltre l'angolo massimo

Exceed the maximum inclined angle



Condizioni di taglio raccomandate

Recommended Milling Conditions

Sgrossatura Roughing

Materiale Work Material			Acciaio pretemprato/Acciaio temprato Prehardened Steels•Hardened Steels HPM•NAK (~42HRC) HPM38•STAVAX•SKD61 (~55HRC)				Acciaio temprato Hardened Steels SKD11•PD613 (~62HRC)				Acciaio HSS High Speed Steels SKH (~65HRC)			
Dia. Dia.	Raggio fondo End Tooth Bottom Radius	Scarico Under Neck Length	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min
1	1	3	0.1	0.4	3,500	26,000	0.1	0.28	2,400	21,000	0.08	0.15	1,500	14,000
2	2	6	0.2	0.7	3,500	16,000	0.2	0.5	2,400	12,000	0.15	0.45	1,800	10,000
3	3	9	0.2	1.1	4,200	13,000	0.2	0.85	3,000	10,000	0.2	0.7	2,200	7,600
4	4	12	0.3	2.1	4,200	11,000	0.2	1.2	3,000	9,000	0.2	1	2,200	6,600
5	5	15	0.3	2.4	4,200	10,000	0.2	1.6	3,000	8,200	0.2	1.2	2,200	6,000
6	6	20	0.3	2.8	4,200	9,500	0.3	1.8	3,000	7,000	0.2	1.6	2,200	5,600
6	8	20	0.3	3.2	4,200	9,000	0.3	2	3,000	6,500	0.2	1.8	2,200	5,000
Note Notes			※1 Profondità di taglio: ap=Profondità di taglio assiale, ae=Profondità di taglio radiale. ※2 Regolare i parametri in funzione del serraggio del pezzo da lavorare e le condizioni della macchina. ※3 In caso di vibrazioni, ecc., regolare le condizioni di taglio se necessario. ※4 Impostare con attenzione le condizioni di fresatura, il percorso utensile ecc. nelle zone, come negli angoli, dove il tagliente è sovraccaricato. ※5 Se le vibrazioni della macchina utensile sono elevate durante la lavorazione, regolare la velocità di avanzamento. ※6 Attenzione al rischio scheggiatura o rottura nel caso di scarico del truciolo insufficiente. ※7 Aggiustare il numero di giri e l' avanzamento della stessa proporzione. ※8 La sporgenza della fresa deve essere la più corta possibile dal naso del mandrino. ※9 Si raccomanda l' utilizzo della lubrificazione minimale. ※10 Si consiglia di utilizzare il profilo della lente nella creazione del percorso utensile con il CAM. ※11 Per la misurazione dell' utensile, scaricare il DXF dal nostro sito Web e controllare la geometria prima della misurazione. ※1 Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut. ※2 Adjust milling condition according to machine rigidity and clamp condition of work material. ※3 In case of chattering etc., please adjust cutting conditions if necessary. ※4 Required careful set up of milling conditions, tool path and etc. at cutting parts, such as corners where will become overloaded. ※5 If machine tool vibration is high during machining, adjust the feed rate as necessary. ※6 Attention to a risk of chipping and breakage when insucient chip flow. ※7 Adjust both spindle speed and feed at the same rate. ※8 Overhang of end mill should be as short as possible form spindle nose. ※9 Oil mist coolant is recommended. ※10 When creating toolpaths in CAM software, tool defintion is recommended by using a lens-shaped end mill. ※11 When measuring tool lengths, download the DXF of the tool geometry from our website and check the tool geometry before measuring.											

Scaricata
Long NeckRivestita
CoatingToriche
Corner
Radius

Finitura Finishing

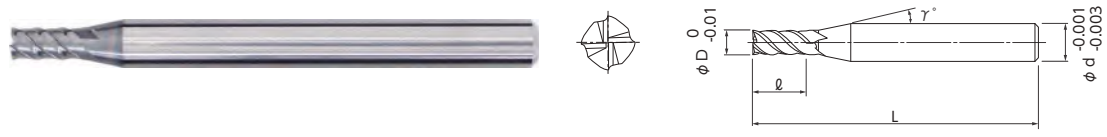
Materiale Work Material						Acciaio pretemprato/ Acciaio temprato Prehardened Steels- Hardened Steels HPM-NAK (~42HRC) HPM38-STAVAX-SKD61 (~55HRC)		Acciaio temprato Hardened Steels SKD11-PD613 (~62HRC)		Acciaio HSS High Speed Steels SKH (~65HRC)		
Dia Dia.	Raggio fondo End Tooth Bottom Radius	Scarico Under Neck Length	Inclinazione max. Maximum Inclined Angle	Altezza cresta Cusp Height µm	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed	Avanz. Feed	N. di giri Spindle Speed
					Sovrametallo Stock Allowance mm	Passo Pick Feed mm	mm/min	g/min	mm/min	g/min	mm/min	g/min
1	1	3	17°	0.1	0.02	0.025	2,000	26,000	1,700	21,000	1,100	14,000
2	2	6	20°	0.1	0.02	0.04	1,900	16,000	1,400	12,000	1,100	10,000
3	3	9	20°	0.1	0.03	0.05	1,900	13,000	1,400	10,000	1,100	7,600
4	4	12	21°	0.1	0.03	0.055	1,800	11,000	1,400	9,000	1,100	6,600
5	5	15	21°	0.1	0.04	0.06	1,800	10,000	1,400	8,200	1,100	6,000
6	6	20	21°	0.1	0.04	0.065	1,800	9,500	1,400	7,000	1,100	5,600
6	8	20	14°	0.1	0.04	0.08	2,100	9,000	1,500	6,500	1,200	5,000
Note Notes			※1 Le condizioni di taglio sono impostate in modo che il passo dia un'altezza di cuspidi di 0,1 µm e l'avanzamento per dente sia pari al passo									
			※2 Regolare i parametri in funzione del serraggio del pezzo da lavorare e le condizioni della macchina.									
			※3 La sporgenza della fresa deve essere la più corta possibile dal naso del mandrino.									
			※4 Si raccomanda l' utilizzo della lubrificazione minimale.									
			※5 Aggiustare il numero di giri e l' avanzamento della stessa proporzione.									
			※6 Impostare la profondità di taglio con cura, poiché maggiore è la profondità di taglio minore è l' angolo massimo di inclinazione.									
			※7 Si consiglia di utilizzare il profilo della lente nella creazione del percorso utensile con il CAM.									
			※8 Per la misurazione dell' utensile, scaricare il DXF dal nostro sito Web e controllare la geometria prima della misurazione.									
※1 The cutting condition is set that the pick feed achieves a cusp height of 0.1 µm, feed per tooth achieves as same amount as pick feed. Adjust according to machine rigidity and accuracy requirements.												
※2 Adjust milling condition according to machine rigidity and clamp condition of work material.												
※3 Overhang of end mill should be as short as possible form spindle nose.												
※4 Oil mist coolant is recommended.												
※5 Adjust both spindle speed and feed at the same rate.												
※6 Cutting depth set with care, as the larger the depth of cut, the smaller the maximum inclination angle.												
※7 When creating toolpaths in CAM software, tool definition is recommended by using a lens-shaped end mill.												
※8 When measuring tool lengths, download the DXF of the tool geometry from our website and check the tool geometry before measuring.												

P Acciaio pretemprato
Prehardened SteelH ~52 Temprato
HRC Hardened SteelH ~60 Temprato
HRC Hardened SteelH ~65 Temprato
HRC Hardened SteelRivestimento
MUGEN PREMIUM
Regular Line
MUGEN PREMIUM

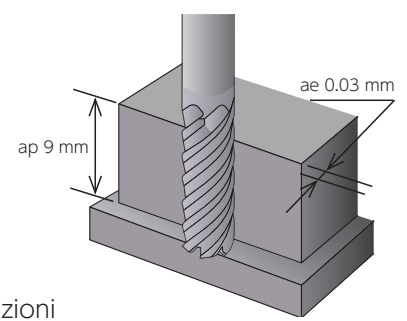
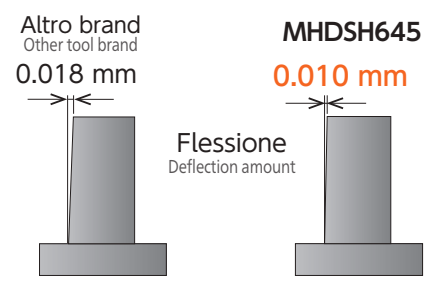
Il design ad alta rigidità riduce la flessione e garantisce una lunga durata dell'utensile nella lavorazione di acciaio temprato fino ai 70HRC
High rigidity tool design suppresses deflection and realizes long tool life on machining 70HRC hardened steel



Disponibile max. 3xD
Available max. L/D=3



- 4 taglienti e lunghezza di taglio 2xD, 3xD
- Il rivestimento MUGEN PREMIUM Plus consentono di ottenere una lunga durata utensile su acciai temprati a 70 HRC.
- Il design ad alta rigidità incrementa la precisione di lavorazione
- 4-flute is lineup of length of cut expands 2D, 3D and 5D.
- MUGEN COATING PREMIUM Plus realizes long tool life even for hardened steel up to 70HRC.
- High rigidity tool design improves machining accuracy.



Il passo differenziato elimina le vibrazioni anche nella lavorazione ad alto avanzamento
Unequal spacing suppresses chattering even high feed rate machining

Codice Code No.	(D) Diametro Dia.	(L) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00429-00102	1	2	12°	6	60	62,40
08-00429-00103		3	12°	6	60	64,10
08-00431-00122	1.2	2.4	12°	6	60	88,30
08-00431-00123		3.6	12°	6	60	90,40
08-00429-00152	1.5	3	12°	6	60	62,40
08-00429-00153		4.5	12°	6	60	64,10
08-00431-00182	1.8	3.6	12°	6	60	88,30
08-00431-00183		5.4	12°	6	60	90,40
08-00429-00202	2	4	12°	6	60	62,40
08-00429-00203		6	12°	6	60	64,10
08-00431-00252	2.5	5	12°	6	60	88,30
08-00431-00253		7.5	12°	6	60	90,40
08-00429-00302	3	6	12°	6	60	72,40
08-00429-00303		9	12°	6	60	74,10
08-00431-00305	3.5	15	12°	6	65	136,20
08-00431-00352		7	12°	6	60	102,20
08-00431-00353	4	10.5	12°	6	60	105,00
08-00429-00402		8	12°	6	60	78,20
08-00429-00403	4.5	12	12°	6	60	80,70
08-00431-00405		20	12°	6	70	149,40
08-00431-00452	4.5	9	12°	6	60	110,50
08-00431-00453		13.5	12°	6	60	114,00

Attenzione
How to Order

Quando ordinate, indicate MSZ345 (D)x(L)
When you order, indicate MHDSH445(D)x(L).

※(γ) è un valore di riferimento
※(γ) is reference value.

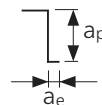


Condizioni di taglio raccomandate

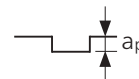
Recommended Milling Conditions

Materiale Work Material			Acciaio HSS/Acciaio temprato High Speed Steels / Hardened Steels SKH51·SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55·HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57·HAP72 (~70HRC)			
	Diametro Dia.	Lungh. di taglio Length of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
Contornatura Side Milling	1	2	25,000	500	1.5	0.02	20,000	240	1.5	0.02	16,000	160	1.5	0.02
		3	22,000	360	1.5	0.02	18,000	200	1.5	0.02	14,000	120	1.5	0.02
	1.2	2.4	20,000	520	1.8	0.025	17,000	280	1.8	0.025	13,000	200	1.8	0.025
		3.6	18,000	390	1.8	0.025	15,500	220	1.8	0.025	11,500	140	1.8	0.025
	1.5	3	16,000	560	2.25	0.03	14,000	330	2.25	0.03	10,000	240	2.25	0.03
		4.5	14,000	420	2.25	0.03	12,000	240	2.25	0.03	8,000	160	2.25	0.03
	1.8	3.6	13,000	600	2.7	0.035	11,500	410	2.7	0.035	8,400	280	2.7	0.035
		5.4	11,500	460	2.7	0.035	9,400	300	2.7	0.035	6,900	200	2.7	0.035
	2	4	12,000	630	3	0.04	10,000	480	3	0.04	8,000	320	3	0.04
		6	10,000	500	3	0.04	8,000	330	3	0.04	6,000	240	3	0.04
	2.5	5	9,500	670	3.75	0.05	8,000	520	3.75	0.05	6,700	360	3.75	0.05
		7.5	8,400	550	3.75	0.05	7,000	410	3.75	0.05	5,500	280	3.75	0.05
	3	6	8,000	700	4.5	0.06	7,000	560	4.5	0.06	5,600	400	4.5	0.06
		9	7,600	600	4.5	0.06	6,400	480	4.5	0.06	5,000	320	4.5	0.06
	3.5	15	2,800	90	3	0.03	2,100	70	3	0.03	1,800	50	3	0.03
		7	7,500	750	5.25	0.07	6,500	580	5.25	0.07	5,300	400	5.25	0.07
	4	10.5	7,100	650	5.25	0.07	6,000	520	5.25	0.07	4,800	320	5.25	0.07
		8	7,000	800	6	0.08	6,000	600	6	0.08	5,000	400	6	0.08
	4.5	12	6,600	700	6	0.08	5,600	560	6	0.08	4,600	320	6	0.08
		20	2,400	100	4	0.04	1,900	70	4	0.04	1,600	50	4	0.04
Cava Slotting	1	9	6,600	800	6.75	0.09	5,800	600	6.75	0.09	4,800	400	6.75	0.09
		13.5	6,100	700	6.75	0.09	5,400	560	6.75	0.09	4,400	320	6.75	0.09
	1.2	2	20,000	300	0.02	-	16,000	120	0.01	-	14,000	100	0.01	-
		3	18,000	240	0.02	-	14,000	80	0.01	-	12,000	50	0.01	-
	1.5	2.4	16,000	340	0.02	-	13,000	140	0.01	-	11,000	110	0.01	-
		3.6	14,000	250	0.02	-	11,000	90	0.01	-	9,700	55	0.01	-
	1.8	3	12,000	380	0.03	-	10,000	160	0.015	-	8,000	120	0.015	-
		4.5	10,000	260	0.03	-	9,000	100	0.015	-	7,500	60	0.015	-
	2	3.6	11,000	400	0.03	-	9,000	200	0.015	-	7,500	140	0.015	-
		5.4	9,000	280	0.03	-	8,000	110	0.015	-	6,700	70	0.015	-
	2.5	4	10,000	420	0.04	-	8,000	240	0.02	-	7,000	160	0.02	-
		6	8,000	300	0.04	-	7,000	120	0.02	-	6,000	80	0.02	-
	3	5	8,700	460	0.05	-	7,000	260	0.025	-	6,000	170	0.025	-
		7.5	7,500	310	0.05	-	6,300	130	0.025	-	5,200	90	0.025	-
	3.5	6	7,500	500	0.06	-	6,000	280	0.03	-	5,000	180	0.03	-
		9	7,000	320	0.06	-	5,600	140	0.03	-	4,500	100	0.03	-
	4	15	-	-	-	-	-	-	-	-	-	-	-	-
		7	6,700	520	0.07	-	5,500	290	0.035	-	4,700	180	0.035	-
	4.5	10.5	6,300	340	0.07	-	5,200	150	0.035	-	4,200	100	0.035	-
		8	6,000	540	0.08	-	5,000	300	0.04	-	4,500	180	0.04	-
Note	Notes	12	5,600	360	0.08	-	4,800	160	0.04	-	4,000	100	0.04	-
		20	-	-	-	-	-	-	-	-	-	-	-	-
Note	Notes	9	5,800	540	0.09	-	4,900	300	0.045	-	4,300	180	0.045	-
		13.5	5,300	360	0.09	-	4,500	160	0.045	-	3,800	100	0.045	-

Contornatura
Side Milling



Cava
Slotting



- ※1 Usare un mandrino rigido e preciso.
 ※2 Regolate i parametri di taglio in accordo con la profondità di taglio e la rigidità della macchina.
 ※3 Regolate con la stessa proporzione giri e avanzamento.
 ※4 Non usare la fresa 5xD in cava.
 ※5 Si consiglia di utilizzare la lubrificazione minimale.
 ※1 Use a rigid and precise machine and chuck holder.
 ※2 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.
 ※3 Adjust both spindle speed and feed at the same rate.
 ※4 Do not use 5D cutting length for slotting.
 ※5 Use oil mist coolant.

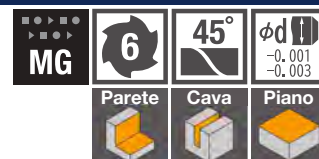
H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

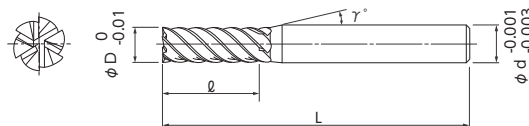
Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Il design della fresa ad alta rigidità elimina la deflessione e garantisce una lunga durata della fresa sulla lavorazione di acciaio temprato 70HRC

High rigidity tool design suppresses deflection and realizes long tool life on machining 70HRC hardened steel



Disponibile max. 3xD
Available max. L/D=3



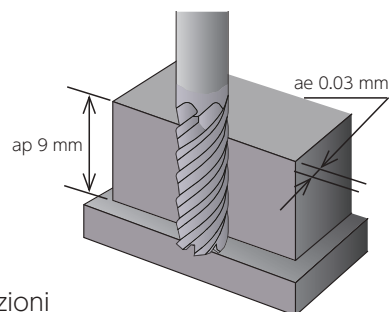
- 6 taglienti e lunghezza di taglio 2xD, 3xD
- Il rivestimento MUGEN PREMIUM Plus consentono di ottenere una lunga durata utensile su acciai temprati a 70 HRC.
- Il design ad alta rigidità incrementa la precisione di lavorazione
- 4-flute is lineup of length of cut expands 2D, 3D and 5D.
- MUGEN COATING PREMIUM Plus realizes long tool life even for hardened steel up to 70HRC.
- High rigidity tool design improves machining accuracy.

Competitore
Other tool brand
0.018 mm

MHDSH645

0.010 mm

Flessione
Deflection amount



Il passo differenziato elimina le vibrazioni anche nella lavorazione ad alto avanzamento
Unequal spacing suppresses chattering even high feed rate machining

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L) Lung. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lung. totale Overall Length	PROMO €
08-00430-00502	5	10	12°	6	60	82,30
08-00430-00503		15	12°	6	65	90,70
08-00432-00505		25	12°	6	75	177,20
08-00432-00552	5.5	11	12°	6	60	121,00
08-00432-00553		16.5	12°	6	65	132,80
08-00430-00602	6	12	-	6	60	89,90
08-00430-00603		18	-	6	65	99,00
08-00432-00605		30	-	6	75	193,20

Attenzione
How to Order

Quando ordinate, indicate MHDSH645 (D)x(L)
When you order, indicate MHDSH645(D)x(L).

※(γ) è un valore di riferimento.
※(γ) is reference value.

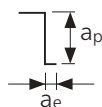


Condizioni di taglio raccomandate

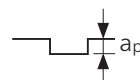
Recommended Milling Conditions

Materiale Work Material			Acciaio HSS/Acciaio temprato High Speed Steels / Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
	Diametro Dia.	Lungh. di taglio Length of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	a _p mm	a _e mm	g/min	mm/min	a _p mm	a _e mm	g/min	mm/min	a _p mm	a _e mm
Contornatura Side Milling	5	10	6,200	1,200	7.5	0.1	5,300	800	7.5	0.1	4,600	560	7.5	0.1
		15	5,600	1,000	7.5	0.1	4,800	600	7.5	0.1	4,200	480	7.5	0.1
		25	2,200	140	5	0.05	1,600	90	5	0.05	1,500	70	5	0.05
	5.5	11	5,700	1,200	8.25	0.11	5,000	800	8.25	0.11	4,300	560	8.25	0.11
		16.5	5,200	1,000	8.25	0.11	4,500	600	8.25	0.11	3,900	480	8.25	0.11
	6	12	5,300	1,200	9	0.12	4,600	800	9	0.12	4,000	560	9	0.12
		18	4,800	1,000	9	0.12	4,200	600	9	0.12	3,600	480	9	0.12
		30	1,800	150	6	0.06	1,400	90	6	0.06	1,300	70	6	0.06
Cava Slotting	5	10	5,600	600	0.1	-	4,800	350	0.05	-	4,000	200	0.05	-
		15	5,000	400	0.1	-	4,200	200	0.05	-	3,600	120	0.05	-
		25	-	-	-	-	-	-	-	-	-	-	-	
	5.5	11	5,200	600	0.11	-	4,500	350	0.055	-	3,800	200	0.055	-
		16.5	4,600	400	0.11	-	3,900	200	0.055	-	3,400	120	0.055	-
	6	12	4,800	600	0.12	-	4,200	350	0.06	-	3,600	200	0.06	-
		18	4,200	400	0.12	-	3,600	200	0.06	-	3,200	120	0.06	-
		30	-	-	-	-	-	-	-	-	-	-	-	-

Contornatura
Side Milling



Cava
Slotting



Note
Notes

- ※1 Usare un mandrino rigido e preciso
- ※2 Regolate i parametri di taglio in accordo con la profondità di taglio e la rigidità della macchina.
- ※3 Regolate con la stessa proporzione giri e avanzamento.
- ※4 Non usare la fresa 5xD per scanalatura
- ※5 Si consiglia di utilizzare la lubrificazione minimale.
- ※1 Use a rigid and precise machine and chuck holder.
- ※2 Adjust milling conditions according to the volume of Depth of Cut and rigidity of the machine.
- ※3 Adjust both spindle speed and feed at the same rate.
- ※4 Do not use 5D cutting length for slotting.
- ※5 Use oil mist coolant.

H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Frese 2 tagli sferiche per temprato MUGEN PREMIUM Plus

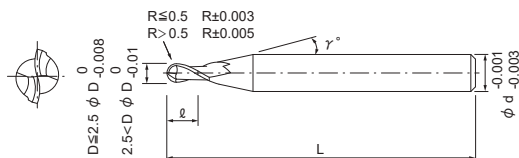
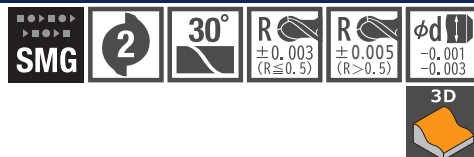
Totale 15 misure

MUGEN COATING PREMIUM Plus 2-Flute Ball End Mill for Hardened Steel and High Accuracy Machining

Total 15 sizes

Adatta alla lavorazione di acciai temprati fino a 70 HRC, come stampi per tranciatura e forgiatura. Le condizioni di taglio raccomandate coprono dalla sgrossatura alla finitura per garantire una lavorazione stabile.

Suitable for machining hardened steels up to 70HRC, such as press dies and forging dies
Recommended cutting conditions cover roughing to finishing to ensure stable machining



※ R precisione si basa su metà del valore del diametro
※ R accuracy is based on a half value of actual diameter

- Fresa sferica per lavorazioni di acciaio temprato.
- Il rivestimento MUGEN COATING PREMIUM Plus garantisce una lunga durata utensile anche su acciai temprati fino a 70 HRC.
- La tolleranza del diametro del gambo, ad alta precisione, è - 0,001 ~ - 0,003.
- Standard type ball end mill for machining on hardened steel.
- MUGEN COATING PREMIUM Plus provides optimal performance for high precision 3D machining of hardened steels up to 70HRC.
- Shank diameter tolerance, high accuracy type, is - 0.001mm / - 0.003mm.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00502-00005	R0.05	0.1	0.1	12°	4	45	64,80
08-00502-00007	R0.075	0.15	0.15	12°	4	45	64,80
08-00502-00010	R0.1	0.2	0.2	12°	4	45	53,50
08-00502-00015	R0.15	0.3	0.3	12°	4	45	52,20
08-00502-00020	R0.2	0.6	0.4	12°	4	45	38,80
08-00502-00025	R0.25	0.8	0.5	12°	4	45	38,80
08-00502-00030	R0.3	0.9	0.6	12°	4	45	37,50
08-00502-00040	R0.4	1.2	0.8	12°	4	45	34,80
08-00502-00050	R0.5	1.5	1	12°	4	45	30,80
08-00502-00075	R0.75	2.3	1.5	12°	4	45	34,80
08-00502-00100	R1	3	2	12°	4	45	30,80
08-00502-00150	R1.5	5	3	12°	6	60	49,50
08-00502-00200	R2	6	4	12°	6	60	49,50
08-00502-00250	R2.5	8	5	12°	6	60	53,50
08-00502-00300	R3	10	6	-	6	60	53,50

Attenzione
How to Order

Quando ordinate, indicate MSBSH230 (R)
When you order, indicate MSBSH230 (R)x(d).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Temprato ~65 HRC

Temprato ~70 HRC

Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Condizioni di taglio raccomandate

Recommended Milling Conditions

Non scaricata
Full Cutting Length



Rivestita
Coating

Sferiche
Ball

Materiale Work Material	Acciaio HSS/Acciaio temprato High Speed Steels/Hardened Steels SKH51·SKD11 (~62HRC)									
Raggio Radius	Sgrossatura Roughing						Ripresa Stock removal (Inner Corner)			
	N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		Sovrametallo Stock allowance	Volume truci. MRR	N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance
	g/min	mm/min	ap mm	ae mm	mm	mm³/min	g/min	mm/min	ap mm oppure ae mm	mm
R0.05	40,000	100	0.003	0.005	0.005	0.002	40,000	90	0.003	0.005
R0.075	40,000	150	0.003	0.005	0.006	0.002	40,000	130	0.003	0.006
R0.1	40,000	320	0.01	0.01	0.009	0.032	40,000	280	0.009	0.009
R0.15	40,000	360	0.01	0.02	0.012	0.072	40,000	320	0.009	0.012
R0.2	40,000	820	0.02	0.05	0.015	0.82	40,000	730	0.018	0.015
R0.25	40,000	1,000	0.025	0.05	0.019	1.3	40,000	900	0.023	0.019
R0.3	40,000	1,200	0.03	0.06	0.022	2.2	40,000	1,080	0.027	0.022
R0.4	40,000	1,800	0.07	0.1	0.027	13	40,000	1,620	0.063	0.027
R0.5	30,000	2,000	0.1	0.2	0.036	40	30,000	1,800	0.09	0.036
R0.75	30,000	2,500	0.1	0.3	0.048	75	30,000	2,250	0.09	0.048
R1	25,000	2,500	0.2	0.5	0.06	250	25,000	2,250	0.18	0.06
R1.5	18,000	2,500	0.2	0.6	0.065	300	18,000	2,250	0.18	0.065
R2	16,000	2,500	0.2	0.8	0.065	400	16,000	2,250	0.18	0.065
R2.5	12,000	2,500	0.2	1.2	0.065	600	12,000	2,250	0.18	0.065
R3	8,000	2,500	0.3	1.2	0.065	900	8,000	2,250	0.27	0.065

Materiale Work Material	Acciaio HSS/Acciaio temprato High Speed Steels/Hardened Steels SKH51·SKD11 (~62HRC)							
Raggio Radius	Semifinitura Semi-Finishing				Finitura Finishing			
	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance
	g/min	mm/min	ap mm oppure ae mm	mm	g/min	mm/min	ap mm oppure ae mm	mm
R0.05	40,000	270	0.003	0.002	40,000	160	0.002	0
R0.075	40,000	390	0.005	0.003	40,000	270	0.003	0
R0.1	40,000	450	0.006	0.004	40,000	320	0.004	0
R0.15	40,000	610	0.008	0.005	40,000	480	0.006	0
R0.2	40,000	780	0.01	0.006	40,000	560	0.007	0
R0.25	40,000	1,010	0.013	0.008	40,000	710	0.009	0
R0.3	40,000	1,170	0.015	0.009	40,000	780	0.01	0
R0.4	40,000	1,430	0.018	0.011	40,000	1,010	0.013	0
R0.5	30,000	1,410	0.024	0.015	30,000	1,000	0.017	0
R0.75	30,000	1,910	0.032	0.02	30,000	1,310	0.022	0
R1	25,000	2,000	0.04	0.025	25,000	1,410	0.028	0
R1.5	18,000	1,760	0.049	0.03	18,000	1,240	0.035	0
R2	16,000	1,810	0.057	0.03	16,000	1,280	0.04	0
R2.5	12,000	1,510	0.063	0.03	12,000	1,070	0.045	0
R3	8,000	1,100	0.069	0.03	8,000	780	0.049	0

Note
Notes

- ※1 Profondità di taglio: ap=profondità di taglio assiale / ae=profondità di taglio radiale.
 ※2 Regolate le condizioni di fresatura in accordo con il serraggio del pezzo ed alla rigidità della macchina.
 ※3 In caso di vibrazioni, regolare le condizioni di taglio.
 ※4 Se il carico di taglio è elevato negli angoli, ecc., impostare con attenzione le condizioni di fresatura e il percorso utensile per ridurre il carico di taglio.
 ※5 In caso di lavorazioni ad alta efficienza, aumentare la velocità del mandrino e la velocità di avanzamento nella stessa proporzione.
 ※6 Se la velocità massima del mandrino della macchina utensile è inferiore al valore di riferimento, ridurre la velocità del mandrino e la velocità di avanzamento nella stessa proporzione.
 ※7 Ridurre al minimo possibile la lunghezza di sbalzo dell'utensile.
 ※8 Si consiglia di utilizzare la lubrificazione minima.
 ※9 Il sovrametallo e la profondità di passata nelle operazioni di semifinitura e finitura per questo utensile sono indicativi; si prega di regolarli in base alle condizioni di lavorazione del processo precedente e alla precisione richiesta.
 ※10 I parametri per il processo di asportazione del materiale (ripresa) sono valori di riferimento basati sulle condizioni dopo la sgrossatura, in cui si utilizza una fresa sferica circa 1.5 volte più grande dell'utensile utilizzato.
- ※1 Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
 ※2 Adjust milling condition according to machine rigidity and clamp condition of work material.
 ※3 In case of chattering etc., please adjust milling conditions if necessary.
 ※4 If the cutting load is high at corners, etc., set the milling conditions and tool path carefully to reduce the cutting load.
 ※5 In case high-efficient machining, increase spindle speed and feed rate at the same rate.
 ※6 If the maximum spindle speed of the machine tool is lower than the reference value, please reduce the spindle speed and feed rate in the same proportion.
 ※7 Minimize a possible tool overhang length.
 ※8 We recommend using oil mist coolant.
 ※9 The stock allowance and depth of cut at semi-finishing and finishing for this tool are guideline, please adjust them according to the machining condition of the previous process and required accuracy.
 ※10 The parameters for the Stock Removal (Inner Corner) process are reference values based on the condition after roughing, where a ball end mill approximately 1.5 times larger than the tool used in this process was applied. Please adjust the depth of cut and feed rate according to the amount of remaining material from the previous roughing operation.

H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material		Acciaio HSS High Speed Steels SKH55·HAP40 (~66HRC)									
Raggio Radius	Sgrossatura Roughing						Ripresa Stock removal (Inner Corner)				
	N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		Sovrametallo Stock allowance	Volume truci. MRR	N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance	
	g/min	mm/min	ap mm	ae mm	mm	mm³/min	g/min	mm/min	ap mm oppure ae mm	mm	
R0.05	40,000	60	0.002	0.005	0.004	0.001	40,000	50	0.002	0.004	
R0.075	40,000	100	0.002	0.005	0.004	0.001	40,000	90	0.002	0.004	
R0.1	40,000	240	0.003	0.005	0.006	0.004	40,000	210	0.003	0.006	
R0.15	40,000	300	0.005	0.01	0.01	0.015	40,000	270	0.005	0.01	
R0.2	40,000	480	0.01	0.02	0.012	0.096	40,000	430	0.009	0.012	
R0.25	40,000	600	0.015	0.03	0.016	0.27	40,000	540	0.014	0.016	
R0.3	30,000	720	0.02	0.05	0.019	0.72	30,000	640	0.018	0.019	
R0.4	30,000	1,200	0.05	0.1	0.023	6	30,000	1,080	0.045	0.023	
R0.5	25,000	1,400	0.08	0.1	0.031	11	25,000	1,260	0.072	0.031	
R0.75	25,000	2,000	0.1	0.2	0.041	40	25,000	1,800	0.09	0.041	
R1	20,000	2,000	0.15	0.3	0.052	90	20,000	1,800	0.135	0.052	
R1.5	14,000	2,000	0.2	0.5	0.062	200	14,000	1,800	0.18	0.062	
R2	12,000	2,000	0.2	0.6	0.065	240	12,000	1,800	0.18	0.065	
R2.5	9,200	2,000	0.2	0.7	0.065	280	9,200	1,800	0.18	0.065	
R3	7,000	2,000	0.2	1	0.065	400	7,000	1,800	0.18	0.065	

Materiale Work Material		Acciaio HSS High Speed Steels SKH55·HAP40 (~66HRC)							
Raggio Radius	Semifinitura Semi-Finishing				Finitura Finishing				
	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance	
	g/min	mm/min	ap mm oppure ae mm	mm	g/min	mm/min	ap mm oppure ae mm	mm	
R0.05	40,000	270	0.003	0.002	40,000	160	0.002	0	
R0.075	40,000	390	0.005	0.002	40,000	270	0.003	0	
R0.1	40,000	450	0.005	0.003	40,000	320	0.004	0	
R0.15	40,000	610	0.008	0.005	40,000	480	0.006	0	
R0.2	40,000	780	0.01	0.005	40,000	560	0.007	0	
R0.25	40,000	1,010	0.013	0.007	40,000	710	0.009	0	
R0.3	30,000	880	0.015	0.008	30,000	580	0.01	0	
R0.4	30,000	1,070	0.018	0.01	30,000	750	0.013	0	
R0.5	25,000	1,180	0.024	0.013	25,000	830	0.017	0	
R0.75	25,000	1,590	0.032	0.017	25,000	1,090	0.022	0	
R1	20,000	1,600	0.04	0.022	20,000	1,130	0.028	0	
R1.5	14,000	1,370	0.049	0.027	14,000	960	0.035	0	
R2	12,000	1,350	0.057	0.03	12,000	960	0.04	0	
R2.5	9,200	1,160	0.063	0.03	9,200	820	0.045	0	
R3	7,000	960	0.069	0.03	7,000	680	0.049	0	

Steriche
Ball

Non scaricata
Full Cutting Length

Rivestita
Coating

Temprato ~65
Hardened Steel H

Temprato ~70
Hardened Steel H

Rivestimento
MUGEN PREMIUM Plus

Regular Line
MUGEN PREMIUM Plus

Condizioni di taglio raccomandate

Recommended Milling Conditions

Non scaricata
Full Cutting Length



Rivestita
Coating

Sferiche
Ball

Materiale Work Material	Acciaio HSS High Speed Steels SKH57·HAP72 (~70HRC)									
Raggio Radius	Sgrossatura Roughing						Ripresa Stock removal (Inner Corner)			
	N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		Sovrametallo Stock allowance	Volume truc. MRR	N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance
	g/min	mm/min	ap mm	ae mm	mm	mm³/min	g/min	mm/min	ap mm oppure ae mm	mm
R0.05	40,000	40	0.002	0.003	0.004	0.0002	40,000	30	0.002	0.004
R0.075	40,000	80	0.002	0.003	0.004	0.0005	40,000	70	0.002	0.004
R0.1	40,000	190	0.003	0.003	0.006	0.002	40,000	170	0.003	0.006
R0.15	40,000	240	0.005	0.005	0.009	0.006	40,000	210	0.005	0.009
R0.2	35,000	330	0.01	0.02	0.011	0.066	35,000	290	0.009	0.011
R0.25	30,000	360	0.015	0.02	0.014	0.108	30,000	320	0.014	0.014
R0.3	25,000	540	0.02	0.05	0.016	0.54	25,000	480	0.018	0.016
R0.4	25,000	900	0.03	0.1	0.02	2.7	25,000	810	0.027	0.02
R0.5	20,000	1,000	0.05	0.1	0.027	5	20,000	900	0.045	0.027
R0.75	20,000	1,500	0.06	0.2	0.036	18	20,000	1,350	0.054	0.036
R1	16,000	1,500	0.1	0.3	0.045	45	16,000	1,350	0.09	0.045
R1.5	12,000	1,500	0.12	0.5	0.056	90	12,000	1,350	0.108	0.056
R2	9,500	1,500	0.15	0.6	0.063	135	9,500	1,350	0.135	0.063
R2.5	8,000	1,500	0.15	0.7	0.065	158	8,000	1,350	0.135	0.065
R3	5,500	1,500	0.15	1	0.065	225	5,500	1,350	0.135	0.065

Materiale Work Material	Acciaio HSS High Speed Steels SKH57·HAP72 (~70HRC)							
Raggio Radius	Semifinitura Semi-Finishing				Finitura Finishing			
	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	Sovrametallo Stock allowance
	g/min	mm/min	ap mm oppure ae mm	mm	g/min	mm/min	ap mm oppure ae mm	mm
R0.05	40,000	270	0.003	0.002	40,000	160	0.002	0
R0.075	40,000	390	0.003	0.002	40,000	270	0.003	0
R0.1	40,000	450	0.003	0.003	40,000	320	0.003	0
R0.15	40,000	610	0.005	0.004	40,000	480	0.005	0
R0.2	35,000	680	0.01	0.005	35,000	490	0.007	0
R0.25	30,000	750	0.013	0.006	30,000	530	0.009	0
R0.3	25,000	730	0.015	0.007	25,000	480	0.01	0
R0.4	25,000	890	0.018	0.009	25,000	630	0.013	0
R0.5	20,000	940	0.024	0.012	20,000	660	0.017	0
R0.75	20,000	1,270	0.032	0.016	20,000	870	0.022	0
R1	16,000	1,280	0.04	0.02	16,000	900	0.028	0
R1.5	12,000	1,170	0.049	0.025	12,000	830	0.035	0
R2	9,500	1,070	0.057	0.028	9,500	760	0.04	0
R2.5	8,000	1,010	0.063	0.03	8,000	710	0.045	0
R3	5,500	760	0.069	0.03	5,500	530	0.049	0

Note
Notes

- ※1 Profondità di taglio: ap=profondità di taglio assiale / ae=profondità di taglio radiale.
 ※2 Regolate le condizioni di fresatura in accordo con il serraggio del pezzo ed alla rigidità della macchina.
 ※3 In caso di vibrazioni, regolare le condizioni di taglio.
 ※4 Se il carico di taglio è elevato negli angoli, ecc., impostare con attenzione le condizioni di fresatura e il percorso utensile per ridurre il carico di taglio.
 ※5 In caso di lavorazioni ad alta efficienza, aumentare la velocità del mandrino e la velocità di avanzamento nella stessa proporzione.
 ※6 Se la velocità massima del mandrino della macchina utensile è inferiore al valore di riferimento, ridurre la velocità del mandrino e la velocità di avanzamento nella stessa proporzione.
 ※7 Ridurre al minimo possibile la lunghezza di sbalzo dell' utensile.
 ※8 Si consiglia di utilizzare la lubrificazione minima.
 ※9 Il sovrametallo e la profondità di passata nelle operazioni di semifinitura e finitura per questo utensile sono indicativi; si prega di regolarli in base alle condizioni di lavorazione del processo precedente e alla precisione richiesta.
 ※10 I parametri per il processo di asportazione del materiale (ripresa) sono valori di riferimento basati sulle condizioni dopo la sgrossatura, in cui si utilizza una fresa sferica circa 1.5 volte più grande dell' utensile utilizzato.
- ※1 Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut.
 ※2 Adjust milling condition according to machine rigidity and clamp condition of work material.
 ※3 In case of chattering etc., please adjust milling conditions if necessary.
 ※4 If the cutting load is high at corners, etc., set the milling conditions and tool path carefully to reduce the cutting load.
 ※5 In case high-efficient machining, increase spindle speed and feed rate at the same rate.
 ※6 If the maximum spindle speed of the machine tool is lower than the reference value, please reduce the spindle speed and feed rate in the same proportion.
 ※7 Minimize a possible tool overhang length.
 ※8 We recommend using oil mist coolant.
 ※9 The stock allowance and depth of cut at semi-finishing and finishing for this tool are guideline, please adjust them according to the machining condition of the previous process and required accuracy.
 ※10 The parameters for the Stock Removal (Inner Corner) process are reference values based on the condition after roughing, where a ball end mill approximately 1.5 times larger than the tool used in this process was applied. Please adjust the depth of cut and feed rate according to the amount of remaining material from the previous roughing operation.

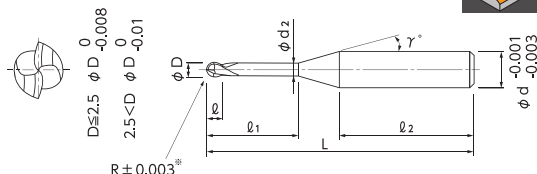
H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

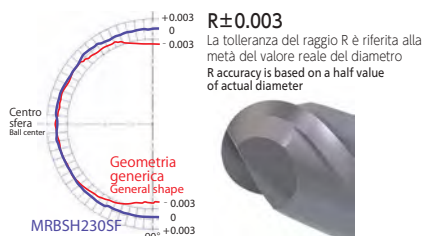
Alta precisione e lunga durata anche su acciai temprati fino a 70 HRC

High precision and long tool life even for hardened steels up to 70HRC



- Consente prestazioni di taglio stabili anche su acciai temprati a 70 HRC
- Nuovo rivestimento MUGEN PREMIUM Plus sviluppato per incrementare la resistenza all'ossidazione e all'abrasione.
- Materiale e design dell'utensile ottimizzati per ridurre il carico di taglio.
- Precisione del raggio $\pm 0.003\text{mm}$ (riferita a metà del valore reale del diametro)
- La tolleranza del diametro del gambo, ad alta precisione, è - 0,001 ~ - 0,003.
- Realize stable cutting performance even for 70 HRC hardened steels.
- Developed new MUGEN COATING PREMIUM Plus to upgrade oxidation resistance and abrasion resistance.
- Adopt optimized new tool material and tool design to reduce cutting load.
- R accuracy is $\pm 0.003\text{mm}$ (R accuracy is based on a half value of actual diameter).
- Shank diameter tolerance, high accuracy type, is - 0.001mm / - 0.003mm.

* R precisione si basa su metà del valore del diametro
* R accuracy is based on a half value of actual diameter

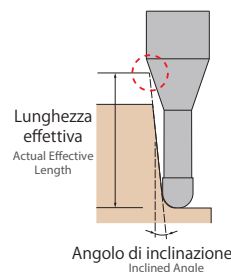


R ± 0.003

La tolleranza del raggio R è riferita alla metà del valore reale del diametro
R accuracy is based on a half value of actual diameter



Elimina le vibrazioni grazie a un solo punto di contatto
Suppress chattering by point milling



Design senza segni di giunzione tra il raggio fresa e il tagliente periferico.
Questo consente di ottenere un'elevata precisione del raggio.
Seamless design on rake face and flank face from R-curve to peripheral cutting edge.
Realized high precision R accuracy

Fresa convenzionale
General End Mill

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L1) Lungh. scarico	(L) Lungh. tagliente	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €	
		Under Neck Length	Length of Cut								30°	1°	1°30'	2°		3°
08-00537-00052	R0.05	0.2	0.07	0.1	0.085	15°	4	27.4	35	0.23	0.24	0.24	0.25	0.27	72,50	
08-00537-00056		0.25	0.07	0.1	0.085	15°	4	27.4	35	0.28	0.29	0.30	0.31	0.33	72,50	
08-00537-00053		0.3	0.07	0.1	0.085	15°	4	27.3	35	0.33	0.34	0.35	0.36	0.39	74,00	
08-00537-00054		0.4	0.07	0.1	0.085	15°	4	27.2	35	0.44	0.45	0.46	0.48	0.52	74,00	
08-00537-00055		0.5	0.07	0.1	0.085	15°	4	27.1	35	0.54	0.56	0.57	0.59	0.64	79,30	
08-00537-00076	R0.075	0.25	0.1	0.15	0.13	15°	4	27.5	35	0.29	0.30	0.31	0.31	0.33	76,30	
08-00537-00072		0.3	0.1	0.15	0.13	15°	4	27.4	35	0.34	0.35	0.36	0.37	0.40	76,30	
08-00537-00077		0.4	0.1	0.15	0.13	15°	4	27.3	35	0.44	0.46	0.47	0.49	0.52	76,30	
08-00537-00073		0.5	0.1	0.15	0.13	15°	4	27.2	35	0.55	0.56	0.58	0.60	0.65	79,30	
08-00537-00074		0.6	0.1	0.15	0.13	15°	4	27.1	35	0.65	0.67	0.69	0.72	0.77	79,30	
08-00537-00075	R0.1	0.7	0.1	0.15	0.13	15°	4	27.0	35	0.75	0.78	0.80	0.83	0.89	79,30	
08-00537-00101		0.3	0.15	0.2	0.18	15°	4	27.5	35	0.34	0.35	0.36	0.37	0.39	58,00	
08-00537-00106		0.4	0.15	0.2	0.18	15°	4	27.4	35	0.44	0.46	0.47	0.48	0.51	58,00	
08-00537-00102		0.5	0.15	0.2	0.18	15°	4	27.3	35	0.55	0.56	0.58	0.60	0.64	58,00	
08-00537-00107		0.6	0.15	0.2	0.18	15°	4	27.2	35	0.65	0.67	0.69	0.71	0.76	58,00	
08-00537-00103	R0.15	0.75	0.15	0.2	0.18	15°	4	27.1	35	0.81	0.83	0.86	0.89	0.95	58,00	
08-00537-00104		0.85	0.15	0.2	0.18	15°	4	27.0	35	0.91	0.94	0.97	1.00	1.07	58,00	
08-00537-00105		1	0.15	0.2	0.18	15°	4	26.8	35	1.06	1.10	1.13	1.17	1.26	58,00	
08-00537-00150		0.5	0.2	0.3	0.28	15°	4	27.5	35	0.55	0.56	0.57	0.59	0.63	57,20	
08-00537-00151		0.6	0.2	0.3	0.28	15°	4	27.4	35	0.65	0.67	0.69	0.71	0.75	57,20	
08-00537-00152	R0.15	0.75	0.2	0.3	0.28	15°	4	27.3	35	0.80	0.83	0.85	0.88	0.94	57,20	
08-00537-00153		1	0.2	0.3	0.28	15°	4	27.0	35	1.06	1.09	1.13	1.17	1.25	57,20	
08-00537-00154		1.25	0.2	0.3	0.28	15°	4	26.8	35	1.32	1.36	1.41	1.45	1.56	57,20	
08-00537-00155		1.5	0.2	0.3	0.28	15°	4	26.5	35	1.58	1.63	1.68	1.74	1.87	61,00	

Attenzione
How to Order

Quando ordinate, indicate MRBSH230SF (R)x(L)
When you order, indicate MRBSH230SF (R)x(L).

* (γ) è un valore di riferimento
* (γ) is reference value.

Frese 2 tagli sferiche scaricate con gambo corto per temprato MUGEN PREMIUM Plus

MUGEN COATING PREMIUM Plus 2-Flute Long Neck Ball End Mill with Short Shank for Hardened Steel and High Accuracy Cutting

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(d1) Lungh. scarico Under Neck Length	(d2) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
										30°	1°	1°30'	2°	3°	
08-00537-00201	R0.2	0.5	0.3	0.4	0.37	15°	4	27.7	35	0.56	0.58	0.59	0.60	0.64	42,00
08-00537-00207		0.65	0.3	0.4	0.37	15°	4	27.6	35	0.72	0.74	0.76	0.78	0.83	42,00
08-00537-00202		0.8	0.3	0.4	0.37	15°	4	27.4	35	0.87	0.90	0.92	0.95	1.01	42,00
08-00537-00203		1	0.3	0.4	0.37	15°	4	27.2	35	1.08	1.11	1.14	1.18	1.26	42,00
08-00537-00208		1.25	0.3	0.4	0.37	15°	4	27.0	35	1.34	1.38	1.42	1.47	1.57	43,50
08-00537-00204		1.5	0.3	0.4	0.37	15°	4	26.7	35	1.60	1.65	1.70	1.75	1.88	43,50
08-00537-00209		1.75	0.3	0.4	0.37	15°	4	26.5	35	1.86	1.91	1.98	2.04	2.19	44,30
08-00537-00205		2	0.3	0.4	0.37	15°	4	26.2	35	2.11	2.18	2.25	2.33	2.50	44,30
08-00537-00210		2.25	0.3	0.4	0.37	15°	4	26.0	35	2.37	2.45	2.53	2.62	2.81	45,80
08-00537-00206		2.5	0.3	0.4	0.37	15°	4	25.7	35	2.63	2.72	2.81	2.90	3.13	45,80
08-00537-00251	R0.25	0.5	0.35	0.5	0.46	15°	4	27.8	35	0.58	0.59	0.61	0.62	0.65	42,00
08-00537-00252		1	0.35	0.5	0.46	15°	4	27.3	35	1.10	1.13	1.16	1.19	1.27	42,00
08-00537-00253		1.5	0.35	0.5	0.46	15°	4	26.8	35	1.61	1.66	1.71	1.77	1.89	42,00
08-00537-00254		2	0.35	0.5	0.46	15°	4	26.3	35	2.13	2.20	2.27	2.34	2.51	42,00
08-00537-00255		2.5	0.35	0.5	0.46	15°	4	25.8	35	2.65	2.73	2.82	2.92	3.14	42,00
08-00537-00256		3	0.35	0.5	0.46	15°	4	25.3	35	3.16	3.27	3.38	3.49	3.76	42,00
08-00537-00307	R0.3	0.6	0.45	0.6	0.56	15°	4	27.9	35	0.68	0.70	0.71	0.73	0.76	35,90
08-00537-00300		1	0.45	0.6	0.56	15°	4	27.5	35	1.10	1.12	1.15	1.19	1.26	35,90
08-00537-00301		1.5	0.45	0.6	0.56	15°	4	27.0	35	1.61	1.66	1.71	1.76	1.88	32,80
08-00537-00302		2	0.45	0.6	0.56	15°	4	26.5	35	2.13	2.19	2.26	2.34	2.50	32,80
08-00537-00303		2.5	0.45	0.6	0.56	15°	4	26.0	35	2.65	2.73	2.82	2.91	3.12	33,60
08-00537-00304		3	0.45	0.6	0.56	15°	4	25.5	35	3.16	3.26	3.37	3.49	3.75	33,60
08-00537-00305		3.5	0.45	0.6	0.56	15°	4	25.0	35	3.68	3.80	3.92	4.06	4.37	34,40
08-00537-00306		4	0.45	0.6	0.56	15°	4	29.5	40	4.20	4.33	4.48	4.64	4.99	34,40
08-00537-00401	R0.4	1	0.6	0.8	0.76	15°	4	27.9	35	1.09	1.12	1.14	1.17	1.24	32,80
08-00537-00402		2	0.6	0.8	0.76	15°	4	26.9	35	2.13	2.19	2.25	2.32	2.48	32,80
08-00537-00403		3	0.6	0.8	0.76	15°	4	25.9	35	3.16	3.26	3.36	3.47	3.72	34,40
08-00537-00405		4	0.6	0.8	0.76	15°	4	24.9	35	4.19	4.33	4.47	4.62	4.97	34,40
08-00537-00406		5	0.6	0.8	0.76	15°	4	28.9	40	5.23	5.40	5.58	5.77	6.21	34,40
08-00537-00507	R0.5	1	0.75	1	0.95	15°	4	28.3	35	1.11	1.13	1.15	1.18	1.24	28,30
08-00537-00508		1.5	0.75	1	0.95	15°	4	27.8	35	1.63	1.66	1.71	1.75	1.86	28,30
08-00537-00501		2	0.75	1	0.95	15°	4	27.3	35	2.14	2.20	2.26	2.33	2.48	28,30
08-00537-00502		2.5	0.75	1	0.95	15°	4	26.8	35	2.66	2.73	2.82	2.90	3.10	28,30
08-00537-00503		3	0.75	1	0.95	15°	4	26.3	35	3.18	3.27	3.37	3.48	3.72	28,30
08-00537-00504		4	0.75	1	0.95	15°	4	25.3	35	4.21	4.34	4.48	4.63	4.97	31,30
08-00537-00505		5	0.75	1	0.95	15°	4	29.3	40	5.24	5.41	5.59	5.78	6.21	31,30
08-00537-00506		6	0.75	1	0.95	15°	4	28.3	40	6.28	6.48	6.69	6.93	7.45	34,40
08-00537-00602	R0.6	2.4	0.9	1.2	1.15	15°	4	27.2	35	2.55	2.62	2.69	2.77	2.95	41,20
08-00537-00603		4	0.9	1.2	1.15	15°	4	25.6	35	4.21	4.33	4.47	4.61	4.94	41,20
08-00537-00605		6	0.9	1.2	1.15	15°	4	28.6	40	6.27	6.47	6.68	6.91	7.43	45,00
08-00537-00606		8	0.9	1.2	1.15	15°	4	26.6	40	8.34	8.61	8.90	9.21	9.91	45,00
08-00537-00751	R0.75	2	1.1	1.5	1.45	15°	4	28.2	35	2.13	2.18	2.23	2.29	2.42	32,10
08-00537-00752		3	1.1	1.5	1.45	15°	4	27.2	35	3.17	3.25	3.34	3.44	3.66	32,10
08-00537-00753		4	1.1	1.5	1.45	15°	4	26.2	35	4.20	4.32	4.45	4.59	4.91	32,10
08-00537-00754		6	1.1	1.5	1.45	15°	4	29.2	40	6.27	6.46	6.67	6.89	7.39	32,10
08-00537-00755		8	1.1	1.5	1.45	15°	4	27.2	40	8.34	8.60	8.88	9.19	9.88	33,60
08-00537-00756		10	1.1	1.5	1.45	15°	4	25.2	40	10.40	10.74	11.10	11.49	12.36	35,90
08-00537-00805	R0.8	8	1.2	1.6	1.55	15°	4	27.4	40	8.33	8.60	8.88	9.18	9.87	45,00
08-00537-00901	R0.9	3	1.3	1.8	1.74	15°	4	27.8	35	3.18	3.26	3.35	3.44	3.65	42,70
08-00537-00902		4	1.3	1.8	1.74	15°	4	26.8	35	4.22	4.33	4.46	4.59	4.89	42,70
08-00537-00903		6	1.3	1.8	1.74	15°	4	29.8	40	6.28	6.47	6.67	6.89	7.38	47,30
08-00537-00904		8	1.3	1.8	1.74	15°	4	27.8	40	8.35	8.61	8.89	9.19	9.87	50,40
08-00537-00905		10	1.3	1.8	1.74	15°	4	25.8	40	10.42	10.75	11.11	11.49	12.35	50,40
08-00537-01006	R1	2	1.5	2	1.94	15°	4	29.1	35	2.14	2.19	2.23	2.28	2.38	28,30
08-00537-01000		3	1.5	2	1.94	15°	4	28.1	35	3.18	3.25	3.34	3.43	3.63	28,30
08-00537-01001		4	1.5	2	1.94	15°	4	27.1	35	4.21	4.32	4.45	4.58	4.87	28,30
08-00537-01002		6	1.5	2	1.94	15°	4	25.1	35	6.28	6.46	6.66	6.88	7.36	31,30
08-00537-01003		8	1.5	2	1.94	15°	4	28.1	40	8.35	8.60	8.88	9.18	9.84	33,60
08-00537-01004		10	1.5	2	1.94	15°	4	26.1	40	10.41	10.74	11.10	11.48	12.33	33,60
08-00537-01005		12	1.5	2	1.94	15°	4	29.1	45	12.48	12.88	13.31	13.77	14.82	33,60

Scaricata
Long NeckRivestita
CoatingSferiche
BallH ~65 Temprato
HRC Hardened SteelH ~70 Temprato
HRC Hardened SteelRivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

MRBSH230SF

Frese 2 tagli sferiche scaricate con gambo corto per temprato MUGEN PREMIUM Plus

MUGEN COATING PREMIUM Plus 2-Flute Long Neck Ball End Mill with Short Shank for Hardened Steel and High Accuracy Cutting

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
										30°	1°	1°30'	2°	3°	
08-00537-01251	R1.25	4	2.3	2.5	2.4	15°	4	28.0	35	4.28	4.39	4.50	4.62	4.90	42,00
08-00537-01252		6	2.3	2.5	2.4	15°	4	26.0	35	6.35	6.53	6.72	6.92	7.39	42,00
08-00537-01253		8	2.3	2.5	2.4	15°	4	29.0	40	8.42	8.67	8.93	9.22	9.88	36,60
08-00537-01254		10	2.3	2.5	2.4	15°	4	27.0	40	10.48	10.81	11.15	11.52	12.36	44,30
08-00537-01256		15	2.3	2.5	2.4	15°	4	27.0	45	15.65	16.15	16.69	17.27	Free	45,00
08-00537-01500	R1.5	6	2.5	3	2.85	15°	6	33.1	45	6.44	6.61	6.79	7.00	7.45	39,00
08-00537-01501		8	2.5	3	2.85	15°	6	31.1	45	8.50	8.75	9.01	9.29	9.93	39,00
08-00537-01502		10	2.5	3	2.85	15°	6	29.1	45	10.57	10.89	11.23	11.59	12.42	45,00
08-00537-01503		12	2.5	3	2.85	15°	6	27.1	45	12.64	13.03	13.44	13.89	14.91	46,70
08-00537-01504		14	2.5	3	2.85	15°	6	30.1	50	14.71	15.17	15.66	16.19	17.39	52,60
08-00537-01505		16	2.5	3	2.85	15°	6	28.1	50	16.77	17.31	17.88	18.49	19.88	52,60
08-00537-01507		18	2.5	3	2.85	15°	6	31.1	55	18.84	19.45	20.09	20.79	22.36	52,60
08-00537-01506		20	2.5	3	2.85	15°	6	29.1	55	20.91	21.58	22.31	23.09	24.85	50,00
08-00537-02000	R2	8	3	4	3.8	15°	6	32.8	45	8.58	8.81	9.06	9.33	9.93	39,90
08-00537-02001		10	3	4	3.8	15°	6	30.8	45	10.65	10.95	11.28	11.63	12.42	39,90
08-00537-02002		12	3	4	3.8	15°	6	28.8	45	12.72	13.09	13.49	13.93	14.90	52,60
08-00537-02004		15	3	4	3.8	15°	6	30.8	50	15.82	16.30	16.82	17.38	18.63	52,60
08-00537-02005		20	3	4	3.8	15°	6	30.8	55	20.99	21.65	22.36	23.13	Free	52,60
08-00537-02006		25	3	4	3.8	15°	6	30.8	60	26.16	27.00	27.90	28.88	Free	52,60
08-00537-02502	R2.5	10	3.5	5	4.8	15°	6	32.7	45	10.63	10.92	11.22	11.55	Free	61,00
08-00537-02503		15	3.5	5	4.8	15°	6	27.7	45	15.80	16.27	16.77	Free	Free	83,90
08-00537-02504		20	3.5	5	4.8	15°	6	27.7	50	20.97	21.62	Free	Free	Free	84,70
08-00537-02505		25	3.5	5	4.8	15°	6	27.7	55	26.14	26.96	Free	Free	Free	89,00
08-00537-02506		30	3.5	5	4.8	15°	6	27.7	60	31.31	Free	Free	Free	Free	93,20
08-00537-03000	R3	10	6	6	5.7	—	6	34.4	45	Free	Free	Free	Free	Free	65,30
08-00537-03001		15	6	6	5.7	—	6	29.4	45	Free	Free	Free	Free	Free	65,30
08-00537-03002		20	6	6	5.7	—	6	29.4	50	Free	Free	Free	Free	Free	65,30
08-00537-03003		25	6	6	5.7	—	6	29.4	55	Free	Free	Free	Free	Free	65,30
08-00537-03004		30	6	6	5.7	—	6	29.4	60	Free	Free	Free	Free	Free	67,00
08-00537-03005		35	6	6	5.7	—	6	29.4	65	Free	Free	Free	Free	Free	73,80
08-00537-03006		40	6	6	5.7	—	6	29.4	70	Free	Free	Free	Free	Free	78,00

Attenzione
How to Order

Quando ordinate, indicate MRBSH230SF (R)x(Ø1)
When you order, indicate MRBSH230SF (R)x(Ø1).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Temprato ~65 HRC
Hardened Steel

Temprato ~70 HRC
Hardened Steel

Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio HSS/Acciaio temprato High Speed Steels/Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
R0.05	0.2	2	0.002	0.005	100	40,000	0.002	0.003	70	40,000	0.002	0.003	50	40,000
	0.25	2.5	0.002	0.005	80	40,000	0.002	0.003	50	40,000	0.002	0.003	40	40,000
	0.3	3	0.002	0.005	70	40,000	0.002	0.003	50	40,000	0.002	0.003	40	40,000
	0.4	4	0.001	0.005	70	40,000	0.001	0.003	50	40,000	0.001	0.002	30	40,000
	0.5	5	0.001	0.003	50	40,000	0.001	0.002	30	40,000	0.001	0.002	20	40,000
R0.075	0.25	1.7	0.002	0.005	160	40,000	0.002	0.003	120	40,000	0.002	0.003	100	40,000
	0.3	2	0.002	0.005	150	40,000	0.002	0.003	100	40,000	0.002	0.003	80	40,000
	0.4	2.7	0.002	0.005	120	40,000	0.002	0.003	70	40,000	0.002	0.003	50	40,000
	0.5	3.3	0.002	0.005	120	40,000	0.002	0.003	70	40,000	0.002	0.003	50	40,000
	0.6	4	0.001	0.003	100	40,000	0.001	0.002	50	40,000	0.001	0.002	40	40,000
R0.1	0.7	4.7	0.001	0.003	80	40,000	0.001	0.002	40	40,000	0.001	0.002	30	40,000
	0.3	1.5	0.005	0.005	300	40,000	0.003	0.003	200	40,000	0.003	0.003	150	40,000
	0.4	2	0.005	0.005	290	40,000	0.003	0.003	200	40,000	0.003	0.003	150	40,000
	0.5	2.5	0.005	0.005	280	40,000	0.003	0.003	180	40,000	0.003	0.003	130	40,000
	0.6	3	0.003	0.005	250	40,000	0.002	0.003	160	40,000	0.002	0.003	120	40,000
R0.15	0.75	3.75	0.003	0.005	200	40,000	0.002	0.003	150	40,000	0.002	0.003	110	40,000
	0.85	4.3	0.002	0.005	180	40,000	0.001	0.003	130	40,000	0.001	0.002	100	40,000
	1	5	0.002	0.003	160	40,000	0.001	0.002	120	40,000	0.001	0.002	90	40,000
	0.5	1.7	0.007	0.01	300	40,000	0.003	0.005	280	40,000	0.003	0.005	210	40,000
	0.6	2	0.005	0.007	300	40,000	0.003	0.005	250	40,000	0.003	0.005	180	40,000
R0.2	0.75	2.5	0.005	0.007	280	40,000	0.003	0.005	230	40,000	0.003	0.005	170	40,000
	1	3.3	0.005	0.007	250	40,000	0.003	0.005	200	40,000	0.003	0.005	150	40,000
	1.25	4.2	0.003	0.005	200	40,000	0.002	0.003	160	40,000	0.002	0.003	120	40,000
	1.5	5	0.003	0.005	180	40,000	0.002	0.003	120	40,000	0.002	0.003	90	40,000
	0.5	1.25	0.03	0.03	720	40,000	0.009	0.02	580	40,000	0.009	0.02	420	35,000
R0.25	0.65	1.6	0.025	0.03	720	40,000	0.009	0.02	580	40,000	0.009	0.02	420	35,000
	0.8	2	0.02	0.03	720	40,000	0.008	0.02	580	40,000	0.008	0.02	420	35,000
	1	2.5	0.02	0.03	720	40,000	0.008	0.02	580	40,000	0.008	0.02	400	35,000
	1.25	3.1	0.015	0.02	620	40,000	0.006	0.02	470	40,000	0.006	0.02	320	35,000
	1.5	3.75	0.01	0.02	500	40,000	0.005	0.01	400	40,000	0.005	0.01	280	35,000
R0.3	1.75	4.4	0.01	0.02	450	40,000	0.005	0.01	340	40,000	0.005	0.01	250	35,000
	2	5	0.007	0.01	380	40,000	0.005	0.007	300	40,000	0.005	0.007	220	35,000
	2.25	5.6	0.005	0.01	330	40,000	0.003	0.005	280	40,000	0.003	0.005	200	35,000
	2.5	6.25	0.005	0.007	300	40,000	0.003	0.005	260	40,000	0.003	0.005	190	35,000
	0.5	1	0.03	0.04	860	40,000	0.015	0.03	650	40,000	0.015	0.02	450	30,000
R0.4	1	2	0.02	0.03	860	40,000	0.01	0.02	650	35,000	0.01	0.02	450	30,000
	1.5	3	0.01	0.03	720	40,000	0.007	0.02	520	35,000	0.007	0.02	350	30,000
	2	4	0.01	0.02	650	40,000	0.007	0.01	400	35,000	0.007	0.01	270	30,000
	2.5	5	0.007	0.01	530	40,000	0.005	0.007	360	35,000	0.005	0.007	240	30,000
	3	6	0.007	0.01	420	35,000	0.005	0.007	320	35,000	0.005	0.007	220	30,000
R0.5	0.6	1	0.03	0.08	1,000	40,000	0.02	0.05	720	35,000	0.02	0.05	540	28,000
	1	1.7	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000	0.02	0.05	540	25,000
	1.5	2.5	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000	0.02	0.05	540	25,000
	2	3.3	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000	0.02	0.05	540	25,000
	2.5	4.1	0.02	0.04	840	40,000	0.02	0.03	640	30,000	0.02	0.03	480	25,000
R0.6	3	5	0.02	0.04	840	40,000	0.02	0.03	600	30,000	0.02	0.03	450	25,000
	3.5	5.9	0.01	0.03	600	30,000	0.01	0.02	420	30,000	0.01	0.02	310	25,000
	4	6.7	0.01	0.03	600	30,000	0.01	0.02	420	30,000	0.01	0.02	310	25,000
	1	1.3	0.08	0.12	1,600	38,000	0.06	0.1	1,200	35,000	0.035	0.1	900	28,000
	2	2.5	0.07	0.1	1,600	35,000	0.05	0.1	1,200	30,000	0.03	0.1	900	25,000
R0.7	3	3.75	0.05	0.1	1,600	35,000	0.05	0.05	1,200	30,000	0.03	0.05	900	25,000
	4	5	0.04	0.06	1,200	30,000	0.03	0.05	860	25,000	0.02	0.05	640	20,000
	5	6.25	0.03	0.05	1,000	25,000	0.02	0.03	620	25,000	0.015	0.03	460	20,000

Scaricata
Long Neck



Rivestita
Coating

Sferiche
Ball

H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Condizioni di taglio raccomandate

Recommended Milling Conditions

Sferiche
BallScaricata
Long NeckRivestita
Coating

Materiale Work Material			Acciaio HSS/Acciaio temprato High Speed Steels/Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min	Prof. di taglio Depth of Cut		Avanz. Feed mm/min	N. di giri Spindle Speed g/min
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
R0.5	1	1	0.1	0.2	2,000	30,000	0.08	0.12	1,400	25,000	0.05	0.12	1,000	20,000
	1.5	1.5	0.1	0.2	2,000	30,000	0.08	0.12	1,400	25,000	0.05	0.12	1,000	20,000
	2	2	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000	0.05	0.1	1,000	20,000
	2.5	2.5	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000	0.05	0.1	1,000	20,000
	3	3	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000	0.05	0.1	1,000	20,000
	4	4	0.05	0.15	1,600	28,000	0.05	0.1	1,200	25,000	0.03	0.1	900	20,000
	5	5	0.04	0.1	1,400	25,000	0.03	0.05	920	20,000	0.02	0.05	700	16,000
R0.6	6	6	0.04	0.05	1,200	22,000	0.02	0.05	740	20,000	0.015	0.05	550	16,000
	2.4	2	0.1	0.2	2,000	30,000	0.08	0.1	1,600	25,000	0.05	0.1	1,200	20,000
	4	3.3	0.1	0.2	2,000	30,000	0.06	0.1	1,600	25,000	0.05	0.1	1,200	20,000
	6	5	0.05	0.1	1,400	25,000	0.03	0.07	1,000	20,000	0.02	0.07	750	16,000
R0.75	8	6.7	0.03	0.07	1,200	22,000	0.02	0.05	850	20,000	0.015	0.05	650	16,000
	2	1.3	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000	0.06	0.2	1,500	20,000
	3	2	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000	0.06	0.2	1,500	20,000
	4	2.7	0.1	0.3	2,000	25,000	0.1	0.2	1,600	22,000	0.06	0.2	1,200	18,000
	6	4	0.1	0.2	1,600	22,000	0.1	0.1	1,200	20,000	0.06	0.1	950	16,000
	8	5.3	0.05	0.2	1,400	20,000	0.05	0.1	1,000	18,000	0.03	0.1	700	13,000
R0.8	10	6.7	0.05	0.1	1,200	18,000	0.05	0.05	850	16,000	0.03	0.05	650	13,000
	8	5	0.07	0.2	1,400	20,000	0.05	0.1	1,000	16,000	0.03	0.1	750	13,000
R0.9	3	1.7	0.12	0.3	2,500	25,000	0.1	0.25	2,000	20,000	0.08	0.2	1,500	16,000
	4	2.2	0.12	0.25	2,500	25,000	0.1	0.2	1,800	20,000	0.08	0.2	1,500	16,000
	6	3.3	0.12	0.25	2,500	25,000	0.1	0.2	1,600	18,000	0.08	0.2	1,200	16,000
	8	4.4	0.08	0.2	2,300	23,000	0.08	0.15	1,400	17,000	0.06	0.1	750	13,000
	10	5.6	0.08	0.2	1,700	18,000	0.08	0.12	1,100	14,000	0.03	0.1	750	11,000
R1	2	1	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000	0.1	0.3	1,500	16,000
	3	1.5	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000	0.1	0.3	1,500	16,000
	4	2	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000	0.1	0.3	1,500	16,000
	6	3	0.2	0.3	2,000	22,000	0.15	0.3	1,600	20,000	0.1	0.3	1,200	16,000
	8	4	0.1	0.2	1,600	18,000	0.1	0.15	1,200	16,000	0.06	0.15	950	13,000
	10	5	0.1	0.2	1,400	16,000	0.1	0.1	1,000	14,000	0.06	0.1	750	11,000
	12	6	0.07	0.1	1,200	14,000	0.05	0.1	850	12,000	0.03	0.1	650	9,500
R1.25	4	1.6	0.2	0.5	2,500	20,000	0.15	0.4	2,000	18,000	0.1	0.4	1,500	14,000
	6	2.4	0.2	0.5	2,500	20,000	0.15	0.4	2,000	18,000	0.1	0.4	1,500	14,000
	8	3.2	0.2	0.3	2,100	20,000	0.15	0.3	1,800	18,000	0.1	0.3	1,300	14,000
	10	4	0.15	0.2	1,800	18,000	0.1	0.15	1,500	16,000	0.06	0.15	1,100	13,000
	15	6	0.07	0.15	1,200	14,000	0.05	0.1	900	12,000	0.03	0.1	700	9,500

 Temprato ~65
Hardened Steel HRC

 Temprato ~70
Hardened Steel HRC

Condizioni di taglio raccomandate

Recommended Milling Conditions

Scaricata
Long Neck



Rivestita
Coating

Sferiche
Ball

Materiale Work Material			Acciaio HSS/Acciaio temprato High Speed Steels/Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
R1.5	6	2	0.2	0.6	2,500	18,000	0.2	0.5	2,000	15,000	0.12	0.5	1,500	12,000
	8	2.7	0.2	0.6	2,500	18,000	0.2	0.5	2,000	15,000	0.12	0.5	1,500	12,000
	10	3.3	0.2	0.4	2,100	18,000	0.15	0.3	1,800	15,000	0.1	0.3	1,300	12,000
	12	4	0.2	0.4	2,000	18,000	0.1	0.3	1,500	15,000	0.06	0.3	1,100	12,000
	14	4.7	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000	0.06	0.2	900	10,000
	16	5.3	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000	0.06	0.2	900	10,000
	18	6	0.1	0.2	1,400	16,000	0.1	0.15	960	12,000	0.06	0.15	750	9,500
	20	6.7	0.08	0.2	1,200	14,000	0.08	0.1	850	12,000	0.06	0.1	650	9,500
R2	8	2	0.2	0.8	2,500	15,000	0.2	0.6	2,000	12,000	0.15	0.6	1,500	9,500
	10	2.5	0.2	0.8	2,500	15,000	0.2	0.6	2,000	12,000	0.15	0.6	1,500	9,500
	12	3	0.2	0.8	2,500	15,000	0.2	0.6	2,000	12,000	0.15	0.6	1,500	9,500
	15	3.75	0.2	0.8	2,000	15,000	0.15	0.6	1,600	12,000	0.12	0.6	1,200	9,500
	20	5	0.1	0.6	1,700	14,000	0.1	0.4	1,200	10,000	0.08	0.4	900	8,000
	25	6.25	0.1	0.4	1,200	14,000	0.1	0.2	850	10,000	0.08	0.2	650	8,000
R2.5	10	2	0.2	1.2	2,500	12,000	0.2	0.7	2,000	10,000	0.15	0.7	1,500	8,000
	15	3	0.2	1.2	2,500	12,000	0.2	0.7	2,000	10,000	0.15	0.7	1,500	8,000
	20	4	0.2	1	2,000	10,000	0.15	0.6	1,600	8,500	0.12	0.6	1,200	6,500
	25	5	0.15	0.8	1,800	8,600	0.1	0.3	1,200	7,200	0.08	0.3	1,000	6,500
	30	6	0.15	0.5	1,500	7,600	0.1	0.2	860	6,400	0.08	0.2	750	6,000
R3	10	1.7	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000	0.15	1	1,500	5,500
	15	2.5	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000	0.15	1	1,500	5,500
	20	3.3	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000	0.15	1	1,500	5,500
	25	4.1	0.2	1	2,200	8,000	0.15	0.7	1,600	7,000	0.12	0.7	1,200	5,500
	30	5	0.2	1	1,800	7,000	0.15	0.7	1,300	6,500	0.12	0.7	950	5,000
	35	5.8	0.17	0.8	1,600	6,800	0.12	0.5	1,200	5,800	0.1	0.5	800	4,500
	40	6.7	0.15	0.6	1,200	6,400	0.1	0.4	1,000	5,200	0.08	0.4	650	4,000
Note Notes			※1 Profondità di taglio: ap=Profondità di taglio assiale / ae=Profondità di taglio radiale. ※2 In caso di vibrazioni, ecc., regolare le condizioni di taglio se necessario ※3 Nelle zone in cui il carico di taglio è elevato (es. gli angoli) prestare attenzione alle condizioni di taglio e dei percorsi utensile. ※4 Regolare con la stessa proporzione giri ed avanzamento. ※5 Si consiglia l'utilizzo di mandrini a calettamento a caldo. Se si utilizza la pinza o altro, attenersi alla lunghezza di presa minima. ※6 Si raccomanda l'utilizzo della lubrificazione minima ※1 Depth of Cut ap indicates Axial Depth of Cut, ae indicates Radial Depth of Cut. ※2 In case of chattering etc., please adjust cutting conditions if necessary. ※3 At point where cutting load is high such as at corners, pay attention to setting cutting conditions and tool paths particularly. ※4 Adjust both spindle speed and feed at the same rate. ※5 A shrink fit type is recommended for tool holder. When using collet type or others, strictly adhere to minimum gripping length. ※6 We recommend using oil mist coolant.											

H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Frese 3 tagli sferiche scaricate ad alta efficienza per temprato MUGEN PREMIUM Plus

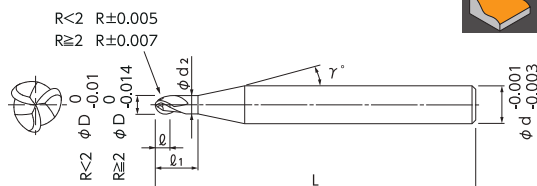
Totale 31 misure

MUGEN COATING PREMIUM Plus 2-Flute Long Neck Ball End Mill with Short Shank for Hardened Steel and High Accuracy Cutting

Total 31 sizes

Alta efficienza e precisione nella lavorazione stampi grazie alla migliore rigidità del tagliente e all'evacuazione truciolo ottimizzata

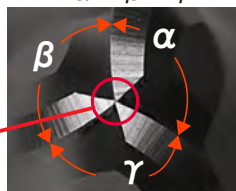
High efficiency high-precision die machining with improved cutting edge rigidity and chip evacuation



- Fresa sferica Z3 ad elevata efficienza grazie alla geometria del centro ottimizzata che consente elevate profondità di taglio.
- Elevata durata ed efficienza anche nella lavorazione di acciaio dai 45 ai 70 HRC.
- La tolleranza del diametro del gambo, ad alta precisione, è - 0,001 ~ - 0,003.
- High-efficiency 3-flute ball end mill optimizes a shape of central edge and enables high depth of cutting.
- Even hardened steel of 60 to 70HRC can be machining with long tool life and high efficiency.
- Shank diameter tolerance, high accuracy type, is - 0.001 ~ - 0.003.

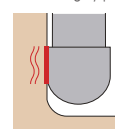
Il passo differenziato elimina le vibrazioni anche nelle lavorazioni ad alto avanzamento
Unequal spacing suppresses chattering even high feed rate machining

$$\alpha \neq \beta \neq \gamma$$



Tagliente al centro ottimizzato per lavorazioni ad elevata profondità di passata e ad alto avanzamento
Optimizes center edge shape enables high depth of cut and high feed machining

Elimina le vibrazioni grazie a un solo punto di contatto
Suppress chattering by point milling



Fresa convenzionale
General End Mill

Lunghezza effettiva
Actual Effective Length



Angolo di inclinazione
Inclined Angle

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00634-01003	R0.1	0.3	0.15	0.2	0.18	12°	4	45	0.35	0.36	0.38	0.39	0.42	80,10
08-00634-01005		0.5	0.15	0.2	0.18	12°	4	45	0.56	0.58	0.61	0.63	0.69	80,10
08-00634-01505		0.5	0.2	0.3	0.28	12°	4	45	0.56	0.58	0.60	0.62	0.67	79,30
08-00634-01506	R0.15	0.6	0.2	0.3	0.28	12°	4	45	0.66	0.69	0.71	0.74	0.81	79,30
08-00634-01507		0.75	0.2	0.3	0.28	12°	4	45	0.82	0.85	0.88	0.92	1.01	79,30
08-00634-01510		1	0.2	0.3	0.28	12°	4	45	1.08	1.12	1.17	1.22	1.34	79,30
08-00634-02005	R0.2	0.5	0.3	0.4	0.37	12°	4	45	0.58	0.60	0.62	0.64	0.69	54,20
08-00634-02008		0.8	0.3	0.4	0.37	12°	4	45	0.89	0.93	0.96	1.00	1.09	54,20
08-00634-02010		1	0.3	0.4	0.37	12°	4	45	1.1	1.14	1.19	1.24	1.35	54,20
08-00634-02510	R0.25	1	0.35	0.5	0.46	12°	4	45	1.13	1.16	1.21	1.26	1.37	54,20
08-00634-02515		1.5	0.35	0.5	0.46	12°	4	45	1.65	1.71	1.78	1.85	2.03	54,20
08-00634-03010		1	0.45	0.6	0.56	12°	4	45	1.12	1.16	1.20	1.25	1.35	46,60
08-00634-03015	R0.3	1.5	0.45	0.6	0.56	12°	4	45	1.64	1.71	1.77	1.84	2.02	46,60
08-00634-03020		2	0.45	0.6	0.56	12°	4	45	2.17	2.25	2.34	2.44	2.68	46,60
08-00634-05020		2	0.75	1	0.95	12°	4	45	2.18	2.26	2.34	2.43	2.65	43,50
08-00634-05025	R0.5	2.5	0.75	1	0.95	12°	4	45	2.7	2.80	2.91	3.03	3.31	43,50
08-00634-05030		3	0.75	1	0.95	12°	4	45	3.22	3.35	3.48	3.63	3.97	43,50
08-00634-07503		3	1.1	1.5	1.45	12°	4	45	3.21	3.33	3.45	3.58	3.89	49,60
08-00634-07504	R0.75	4	1.1	1.5	1.45	12°	4	45	4.26	4.41	4.59	4.78	5.22	49,60
08-00634-10003		3	1.5	2	1.94	12°	4	45	3.23	3.33	3.44	3.56	3.85	38,90
08-00634-10004		4	1.5	2	1.94	12°	4	45	4.27	4.42	4.58	4.76	5.17	38,90
08-00634-10006	R1	6	1.5	2	1.94	12°	4	45	6.36	6.60	6.86	7.15	7.83	38,90
08-00634-15006		6	2.5	3	2.85	12°	6	60	6.56	6.78	7.03	7.31	7.95	56,40
08-00634-15008		8	2.5	3	2.85	12°	6	60	8.64	8.96	9.31	9.70	10.60	56,40
08-00634-15010	R1.5	10	2.5	3	2.85	12°	6	60	10.73	11.14	11.59	12.09	13.26	56,40
08-00634-20008		8	3	4	3.80	12°	6	65	8.74	9.05	9.38	9.74	10.60	59,70
08-00634-20010		10	3	4	3.80	12°	6	65	10.83	11.22	11.66	12.14	13.25	59,70
08-00634-20012	R2	12	3	4	3.80	12°	6	65	12.91	13.40	13.94	14.53	15.91	59,70
08-00634-30010		10	6	6	5.70	-	6	65	Free	Free	Free	Free	Free	70,80
08-00634-30015		15	6	6	5.70	-	6	65	Free	Free	Free	Free	Free	70,80
08-00634-30020	R3	20	6	6	5.70	-	6	65	Free	Free	Free	Free	Free	70,80

Attenzione
How to Order

Quando ordinate, indicate MRBSH330 (R) x (L1).
When you order, indicate MRBSH330(R)(L1).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Condizioni di taglio raccomandate

Recommended Milling Conditions

 Scaricata
Long Neck

 Rivestita
Coating

 Steriche
Ball

Materiale Work Material			Acciaio HSS/Acciai temprati High Speed Steels/Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm			ap mm	ae mm			ap mm	ae mm		
R0.1	0.3	1.5	0.006	0.007	450	40,000	0.004	0.005	300	40,000	0.004	0.005	220	40,000
	0.5	2.5	0.006	0.007	400	40,000	0.004	0.005	250	40,000	0.004	0.005	190	40,000
R0.15	0.5	1.7	0.01	0.01	450	40,000	0.005	0.005	400	40,000	0.005	0.005	300	40,000
	0.6	2	0.007	0.007	450	40,000	0.005	0.005	350	40,000	0.005	0.005	270	40,000
	0.75	2.5	0.007	0.007	400	40,000	0.005	0.005	350	40,000	0.005	0.005	250	40,000
	1	3.3	0.007	0.007	350	40,000	0.005	0.005	300	40,000	0.005	0.005	220	40,000
R0.2	0.5	1.25	0.035	0.04	1,100	40,000	0.013	0.02	850	40,000	0.013	0.02	650	35,000
	0.8	2	0.03	0.03	1,000	40,000	0.012	0.02	850	40,000	0.012	0.02	600	35,000
R0.25	1	2.5	0.03	0.03	1,000	40,000	0.012	0.02	850	40,000	0.012	0.02	600	35,000
	1	2	0.03	0.03	1,300	40,000	0.015	0.02	1,000	35,000	0.015	0.02	700	30,000
R0.3	1.5	3	0.015	0.03	1,000	40,000	0.01	0.02	800	35,000	0.01	0.02	500	30,000
	1	1.7	0.045	0.06	1,500	40,000	0.03	0.05	1,100	30,000	0.03	0.05	800	25,000
R0.3	1.5	2.5	0.045	0.06	1,500	40,000	0.03	0.05	1,100	30,000	0.03	0.05	800	25,000
	2	3.3	0.045	0.06	1,500	40,000	0.03	0.05	1,100	30,000	0.03	0.05	800	25,000
R0.5	2	2	0.15	0.2	3,000	30,000	0.12	0.1	2,000	25,000	0.075	0.1	1,500	20,000
	2.5	2.5	0.15	0.2	3,000	30,000	0.12	0.1	2,000	25,000	0.075	0.1	1,500	20,000
R0.5	3	3	0.15	0.2	3,000	30,000	0.12	0.1	2,000	25,000	0.075	0.1	1,500	20,000
	3	2	0.15	0.3	3,800	30,000	0.15	0.2	3,000	25,000	0.09	0.2	2,200	20,000
R0.75	4	2.7	0.15	0.3	3,000	25,000	0.15	0.2	2,400	22,000	0.09	0.2	1,800	18,000
	3	1.5	0.3	0.5	3,800	25,000	0.22	0.3	3,000	20,000	0.15	0.3	2,200	16,000
R1	4	2	0.3	0.5	3,800	25,000	0.22	0.3	3,000	20,000	0.15	0.3	2,200	16,000
	6	3	0.3	0.3	3,000	22,000	0.22	0.3	2,400	20,000	0.15	0.3	1,800	16,000
R1.5	6	2	0.3	0.6	3,800	18,000	0.25	0.5	3,000	15,000	0.15	0.5	2,250	12,000
	8	2.7	0.3	0.6	3,800	18,000	0.25	0.5	3,000	15,000	0.15	0.5	2,250	12,000
R2	10	3.3	0.3	0.6	3,200	18,000	0.25	0.5	2,600	15,000	0.15	0.5	2,000	12,000
	8	2	0.3	0.8	3,800	15,000	0.25	0.6	3,000	12,000	0.18	0.6	2,250	9,500
R2	10	2.5	0.3	0.8	3,800	15,000	0.25	0.6	3,000	12,000	0.18	0.6	2,250	9,500
	12	3	0.3	0.8	3,800	15,000	0.25	0.6	3,000	12,000	0.18	0.6	2,250	9,500
R3	10	1.7	0.38	1.2	3,800	8,000	0.25	1	3,000	7,000	0.18	1	2,250	5,500
	15	2.5	0.38	1.2	3,800	8,000	0.25	1	3,000	7,000	0.18	1	2,250	5,500
R3	20	3.3	0.38	1.2	3,800	8,000	0.25	1	3,000	7,000	0.18	1	2,250	5,500
Note Notes			※1 Profondità di taglio: ap=Profondità di taglio assiale / ae=Profondità di taglio radiale. ※2 Regolare le condizioni di taglio in base alla rigidità della macchina e allo staffaggio del pezzo. ※3 In caso di vibrazioni, ecc., regolare le condizioni di taglio se necessario. ※4 Nelle zone in cui il carico di taglio è elevato (es. gli angoli) prestare attenzione alle condizioni di taglio e dei percorsi utensile. ※5 Se le vibrazioni durante la lavorazione sono elevate, regolare la velocità di avanzamento. ※6 Attenzione al rischio di scheggiatura e rottura in caso di evacuazione truciolo insufficiente. ※7 Regolare con la stessa proporzione giri ed avanzamento. ※8 La sporgenza della fresa dovrebbe essere la più corta possibile. ※9 Si raccomanda l'utilizzo della lubrificazione minima. ※1 Depth of Cut : ap = Axial Depth of Cut / ae = Radial Depth of Cut. ※2 Adjust milling condition according to machine rigidity and clamp condition of work material. ※3 In case of chattering etc., please adjust cutting conditions if necessary. ※4 At point where cutting load is high such as at corners, pay attention to setting cutting conditions and tool paths particularly. ※5 If machine tool vibration is high during machining, adjust the feed rate as necessary. ※6 Attention to a risk of chipping and breakage when insufficient chip flow. ※7 Adjust both spindle speed and feed at the same rate. ※8 Overhang of end mill should be as short as possible from spindle nose. ※9 We recommend using oil mist coolant.											

 H ~65 Temprato
HRC Hardened Steel

 H ~70 Temprato
HRC Hardened Steel

 Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Frese 4 tagli toriche per temprato MUGEN PREMIUM Plus

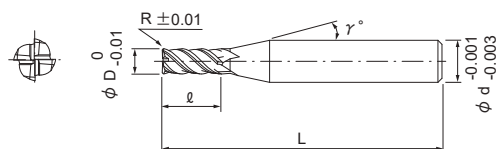
Totale 15 misure

MUGEN COATING PREMIUM Plus 4-Flute Corner Radius End Mill for Hardened Steel

Total 15 sizes

Adatta alla lavorazione di acciai temprati fino a 70 HRC, come stampi per tranciatura e forgiatura. Il design multitaglianti ad elevata rigidità e elevato angolo d'elica consentire la lavorazione di materiali difficili, come l'HSS.

Suitable for machining hardened steels up to 70HRC, such as press dies and forging dies. Adopt multi-flute design with high rigidity and strong helix angle to realize machining on tough materials, such as high speed steel.



- 4 taglianti e lunghezza di taglio 2xD, 3xD
- Il rivestimento MUGEN PREMIUM Plus consentono di ottenere una lunga durata utensile su acciai temprati a 70 HRC.
- Il design ad alta rigidità incrementa la precisione di lavorazione
- Tolleranza del diametro del gambo ad alta precisione: $-0.001 \text{ mm} \sim -0.003 \text{ mm}$.
- 4-flute is lineup of length of cut expands 2D and 3D ($D \geq 3$).
- MUGEN COATING PREMIUM Plus realizes long tool life even for hardened steel up to 70HRC.
- High rigidity tool design improves machining accuracy.
- Shank diameter tolerance, high accuracy type, is $-0.001 \text{ mm} \sim -0.003 \text{ mm}$.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00439-10012	1	R0.1	2	12°	6	60	117,60
08-00439-15012	1.5	R0.1	3	12°	6	60	117,60
08-00439-20012	2	R0.1	4	12°	6	60	117,60
08-00439-30022	3	R0.2	6	12°	6	60	135,90
08-00439-30023			9	12°	6	60	138,20
08-00439-30032		R0.3	6	12°	6	60	135,90
08-00439-30033			9	12°	6	60	138,20
08-00439-30052		R0.5	6	12°	6	60	135,90
08-00439-30053			9	12°	6	60	138,20
08-00439-40022	4	R0.2	8	12°	6	60	146,60
08-00439-40023			12	12°	6	60	151,20
08-00439-40032		R0.3	8	12°	6	60	146,60
08-00439-40033			12	12°	6	60	151,20
08-00439-40052		R0.5	8	12°	6	60	146,60
08-00439-40053			12	12°	6	60	151,20

Attenzione
How to Order

Quando ordinate, indicate MHDSH445R (D) × (R) × (ℓ).
When you order, indicate MHDH645R (D) × (R).

※(γ) è un valore di riferimento
※(γ) is reference value.



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio HSS/Acciaio temprato High Speed Steels/Hardened Steels SKH51•SKD11 (~62HRC)							
Diametro Dia.	Raggio Corner Radius	Lungh. di taglio Length of Cut	Contornatura Side milling				Cava da piano Slotting			
			N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
1	R0.1	2	22,000	500	1.5	0.02	18,000	300	0.01	-
1.5	R0.1	3	15,000	560	2.25	0.03	12,000	380	0.015	-
2	R0.1	4	11,000	630	3	0.04	10,000	420	0.02	-
3	R0.2	6	7,500	700	4.5	0.06	7,200	500	0.03	-
		9	7,100	600	4.5	0.06	6,800	320	0.03	-
	R0.3	6	7,500	700	4.5	0.06	7,200	500	0.03	-
		9	7,100	600	4.5	0.06	6,800	320	0.03	-
	R0.5	6	7,500	700	4.5	0.06	7,200	500	0.03	-
		9	7,100	600	4.5	0.06	6,800	320	0.03	-
4	R0.2	8	6,300	800	6	0.08	5,800	540	0.04	-
		12	6,000	700	6	0.08	5,400	360	0.04	-
	R0.3	8	6,300	800	6	0.08	5,800	540	0.04	-
		12	6,000	700	6	0.08	5,400	360	0.04	-
	R0.5	8	6,300	800	6	0.08	5,800	540	0.04	-
		12	6,000	700	6	0.08	5,400	360	0.04	-

Non scaricata
Full Cutting Length

 Toriche
Corner
Radius

Rivestita
Coating

Materiale Work Material			Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)							
Diametro Dia.	Raggio Corner Radius	Lungh. di taglio Length of Cut	Contornatura Side milling				Cava da piano Slotting			
			N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
1	R0.1	2	20,000	240	1.5	0.02	15,000	120	0.01	-
1.5	R0.1	3	13,000	330	2.25	0.03	10,000	160	0.015	-
2	R0.1	4	10,000	480	3	0.04	8,000	240	0.02	-
3	R0.2	6	6,800	560	4.5	0.06	5,900	280	0.03	-
		9	6,100	480	4.5	0.06	5,500	140	0.03	-
	R0.3	6	6,800	560	4.5	0.06	5,900	280	0.03	-
		9	6,100	480	4.5	0.06	5,500	140	0.03	-
	R0.5	6	6,800	560	4.5	0.06	5,900	280	0.03	-
		9	6,100	480	4.5	0.06	5,500	140	0.03	-
4	R0.2	8	5,700	600	6	0.08	4,900	300	0.04	-
		12	5,300	560	6	0.08	4,700	160	0.04	-
	R0.3	8	5,700	600	6	0.08	4,900	300	0.04	-
		12	5,300	560	6	0.08	4,700	160	0.04	-
	R0.5	8	5,700	600	6	0.08	4,900	300	0.04	-
		12	5,300	560	6	0.08	4,700	160	0.04	-

H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Materiale Work Material			Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)							
Diametro Dia.	Raggio Corner Radius	Lungh. di taglio Length of Cut	Contornatura Side milling				Cava da piano Slotting			
			N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
1	R0.1	2	15,000	160	1.5	0.02	14,000	100	0.01	-
1.5	R0.1	3	10,000	240	2.25	0.03	8,000	120	0.015	-
2	R0.1	4	8,000	320	3	0.04	7,000	160	0.02	-
3	R0.2	6	5,600	400	4.5	0.06	5,000	180	0.03	-
		9	5,000	320	4.5	0.06	4,500	100	0.03	-
	R0.3	6	5,600	400	4.5	0.06	5,000	180	0.03	-
		9	5,000	320	4.5	0.06	4,500	100	0.03	-
	R0.5	6	5,600	400	4.5	0.06	5,000	180	0.03	-
		9	5,000	320	4.5	0.06	4,500	100	0.03	-
4	R0.2	8	4,900	400	6	0.08	4,500	180	0.04	-
		12	4,500	320	6	0.08	4,000	100	0.04	-
	R0.3	8	4,900	400	6	0.08	4,500	180	0.04	-
		12	4,500	320	6	0.08	4,000	100	0.04	-
	R0.5	8	4,900	400	6	0.08	4,500	180	0.04	-
		12	4,500	320	6	0.08	4,000	100	0.04	-

Rivestimento
MUGEN PREMIUM Plus

Regular Line
MUGEN PREMIUM Plus

Frese 6 tagli toriche per temprato MUGEN PREMIUM Plus

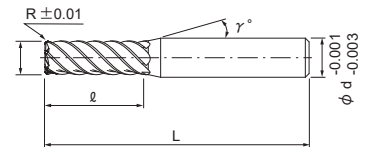
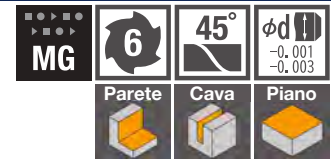
Totale 8 misure

MUGEN COATING PREMIUM Plus 6-Flute Corner Radius End Mill for Hardened Steel

Total 8 sizes

Adatta alla lavorazione di acciai temprati fino a 70 HRC, come stampi per tranciatura e forgiatura. Il design multitaglienti ad elevata rigidità e elevato angolo d'elica consentire la lavorazione di materiali difficili, come l'HSS.

Suitable for machining hardened steels up to 70HRC, such as press dies and forging dies. Adopt multi-flute design with high rigidity and strong helix angle to realize machining on tough materials, such as high speed steel.



- 6 taglienti e lunghezza di taglio 2xD, 3xD
- Il rivestimento MUGEN PREMIUM Plus consentono di ottenere una lunga durata utensile su acciai temprati a 70 HRC.
- Il design ad alta rigidità incrementa la precisione di lavorazione
- Tolleranza del diametro del gambo ad alta precisione: $-0.001 \text{ mm} \sim -0.003 \text{ mm}$.
- 4-flute is lineup of length of cut expands 2D and 3D ($D \geq 3$).
- MUGEN COATING PREMIUM Plus realizes long tool life even for hardened steel up to 70HRC.
- High rigidity tool design improves machining accuracy.
- Shank diameter tolerance, high accuracy type, is $-0.001 \text{ mm} \sim -0.003 \text{ mm}$.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ) Lungh. tagliente Length of Cut	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
08-00440-50022	5	R0.2	10	12°	6	60	154,30
08-00440-50023			15	12°	6	65	169,50
08-00440-50032		R0.3	10	12°	6	60	154,30
08-00440-50033			15	12°	6	65	169,50
08-00440-50052		R0.5	10	12°	6	60	154,30
08-00440-50053			15	12°	6	65	169,50
08-00440-60022	6	R0.2	12	-	6	60	168,80
08-00440-60023			18	-	6	65	184,80
08-00440-60032		R0.3	12	-	6	60	168,80
08-00440-60033			18	-	6	65	184,80
08-00440-60052		R0.5	12	-	6	60	168,80
08-00440-60053			18	-	6	65	184,80
08-00440-60102		R1	12	-	6	60	168,80
08-00440-60103			18	-	6	65	184,80

Attenzione
How to Order

Quando ordinate, indicate MHDSH645R (D) × (R) × (ℓ).
When you order, indicate MHDH645R (D) × (R).

※(γ) è un valore di riferimento
※(γ) is reference value.



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Acciaio HSS/Acciaio temprato High Speed Steels/Hardened Steels SKH51•SKD11 (~62HRC)							
Diametro Dia.	Raggio Corner Radius	Lungh. di taglio Length of Cut	Contornatura Side milling				Cava da piano Slotting			
			N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
5	R0.2	10	5,600	1,200	7.5	0.1	5,400	600	0.05	-
		15	5,200	1,000	7.5	0.1	4,700	400	0.05	-
	R0.3	10	5,600	1,200	7.5	0.1	5,400	600	0.05	-
		15	5,200	1,000	7.5	0.1	4,700	400	0.05	-
	R0.5	10	5,600	1,200	7.5	0.1	5,400	600	0.05	-
		15	5,200	1,000	7.5	0.1	4,700	400	0.05	-
6	R0.2	12	4,800	1,200	9	0.12	4,600	600	0.06	-
		18	4,500	1,000	9	0.12	4,000	400	0.06	-
	R0.3	12	4,800	1,200	9	0.12	4,600	600	0.06	-
		18	4,500	1,000	9	0.12	4,000	400	0.06	-
	R0.5	12	4,800	1,200	9	0.12	4,600	600	0.06	-
		18	4,500	1,000	9	0.12	4,000	400	0.06	-
	R1	12	4,800	1,200	9	0.12	4,600	600	0.06	-
		18	4,500	1,000	9	0.12	4,000	400	0.06	-

Non scaricata
Full Cutting Length

 Toriche
Corner
Radius

Rivestita
Coating

Materiale Work Material			Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)							
Diametro Dia.	Raggio Corner Radius	Lungh. di taglio Length of Cut	Contornatura Side milling				Cava da piano Slotting			
			N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
5	R0.2	10	5,100	800	7.5	0.1	4,700	350	0.05	-
		15	4,600	600	7.5	0.1	4,100	200	0.05	-
	R0.3	10	5,100	800	7.5	0.1	4,700	350	0.05	-
		15	4,600	600	7.5	0.1	4,100	200	0.05	-
	R0.5	10	5,100	800	7.5	0.1	4,700	350	0.05	-
		15	4,600	600	7.5	0.1	4,100	200	0.05	-
6	R0.2	12	4,400	800	9	0.12	4,100	350	0.06	-
		18	4,000	600	9	0.12	3,500	200	0.06	-
	R0.3	12	4,400	800	9	0.12	4,100	350	0.06	-
		18	4,000	600	9	0.12	3,500	200	0.06	-
	R0.5	12	4,400	800	9	0.12	4,100	350	0.06	-
		18	4,000	600	9	0.12	3,500	200	0.06	-
	R1	12	4,400	800	9	0.12	4,100	350	0.06	-
		18	4,000	600	9	0.12	3,500	200	0.06	-

H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Materiale Work Material			Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)							
Diametro Dia.	Raggio Corner Radius	Lungh. di taglio Length of Cut	Contornatura Side milling				Cava da piano Slotting			
			N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
5	R0.2	10	4,500	560	7.5	0.1	4,000	200	0.05	-
		15	4,100	480	7.5	0.1	3,600	120	0.05	-
	R0.3	10	4,500	560	7.5	0.1	4,000	200	0.05	-
		15	4,100	480	7.5	0.1	3,600	120	0.05	-
	R0.5	10	4,500	560	7.5	0.1	4,000	200	0.05	-
		15	4,100	480	7.5	0.1	3,600	120	0.05	-
6	R0.2	12	3,900	560	9	0.12	3,600	200	0.06	-
		18	3,500	480	9	0.12	3,200	120	0.06	-
	R0.3	12	3,900	560	9	0.12	3,600	200	0.06	-
		18	3,500	480	9	0.12	3,200	120	0.06	-
	R0.5	12	3,900	560	9	0.12	3,600	200	0.06	-
		18	3,500	480	9	0.12	3,200	120	0.06	-
	R1	12	3,900	560	9	0.12	3,600	200	0.06	-
		18	3,500	480	9	0.12	3,200	120	0.06	-

Rivestimento
MUGEN PREMIUM Plus

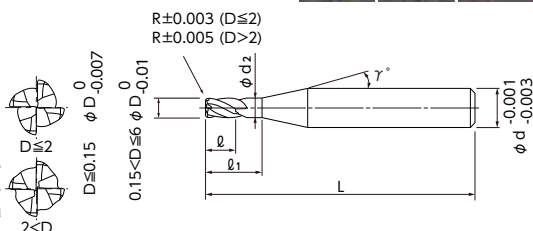
Regular Line
MUGEN PREMIUM Plus

Gamma estesa fino al Ø6, combinazione tra design dell'utensile ed elevata precisione del raggio per migliorare le prestazioni di finitura su acciai temprati

Lineup extended up to Ø6, combining specialized tool design and high accuracy corner R enhance finishing performance on hardened steels



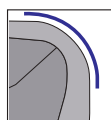
- Il rivestimento MUGEN PREMIUM Plus per acciai temprati e l'elevata rastremazione posteriore del tagliente per la riduzione delle vibrazioni consentono di ottenere una lunga durata utensile e un'eccellente finitura
- Fresa a 4 taglienti per lavorazioni ad elevata efficienza
- Fresa a 4 taglienti dal diametro più piccolo Ø0.1 fino al Ø6 con 205 misure disponibili
- MUGEN COATING PREMIUM Plus for hardened steels with strong back taper reduce chattering to realize long tool life and excellent finishing surface.
- 4-flute end mill for high efficiency machining.
- 4-Flute end mill has 205 sizes in total that lineup from the smallest diameter Ø0.1 to Ø6.



Si prega di fare attenzione al sovrametallo perché la fresa non ha il taglio al centro
Please be aware of stock since there is no cutting edge from the center to the bottom.

Migliora la finitura delle pareti (D ≤ 2)

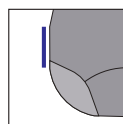
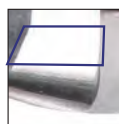
Enhances accuracy on side machining



Senza giunzione
Seamless

Migliora la finitura dei piani grazie al wiper (D ≥ 0.4)

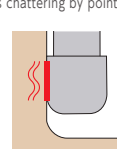
Enhances surface roughness on bottom by wiper



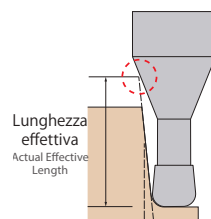
La fase wiper alla fine del tagliente migliora la rugosità superficiale nella lavorazione dei piani
By adopting wiper at the end tooth, improves the surface roughness on bottom surface machining



Elimina le vibrazioni grazie a un solo punto di contatto
Suppress chattering by point milling



Fresa convenzionale
General End Mill



Angolo di inclinazione
Inclined Angle

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scario Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scario Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
Temprato ~65 HRC	0.1	R0.01	0.2	0.08	0.085	15°	4	35	0.23	0.24	0.25	0.26	0.28	98,40
08-00239-01001			0.25	0.08	0.085	15°	4	35	0.28	0.29	0.3	0.31	0.34	98,50
08-00239-01003			0.3	0.08	0.085	15°	4	35	0.33	0.35	0.36	0.37	0.4	98,40
08-00239-01004			0.4	0.08	0.085	15°	4	35	0.44	0.45	0.47	0.49	0.52	98,50
08-00239-01005			0.5	0.08	0.085	15°	4	35	0.54	0.56	0.58	0.6	0.65	98,50
08-00239-01503	0.15	R0.01	0.3	0.12	0.135	15°	4	35	0.33	0.35	0.36	0.37	0.4	98,40
08-00239-01504			0.4	0.12	0.135	15°	4	35	0.44	0.45	0.47	0.49	0.52	98,50
08-00239-01505			0.5	0.12	0.135	15°	4	35	0.54	0.56	0.58	0.6	0.65	98,40
08-00239-01506			0.6	0.12	0.135	15°	4	35	0.64	0.67	0.69	0.72	0.77	98,50
08-00239-01507			0.75	0.12	0.135	15°	4	35	0.8	0.83	0.86	0.89	0.96	98,50
08-00239-01523		R0.02	0.3	0.12	0.135	15°	4	35	0.33	0.34	0.36	0.37	0.4	98,40
08-00239-01524			0.4	0.12	0.135	15°	4	35	0.44	0.45	0.47	0.48	0.52	98,50
08-00239-01525			0.5	0.12	0.135	15°	4	35	0.54	0.56	0.58	0.6	0.65	98,40
08-00239-01526			0.6	0.12	0.135	15°	4	35	0.64	0.67	0.69	0.71	0.77	98,50
08-00239-01527			0.75	0.12	0.135	15°	4	35	0.8	0.83	0.86	0.89	0.96	98,50
08-00239-02203	0.2	R0.02	0.3	0.15	0.18	15°	4	35	0.34	0.35	0.37	0.38	0.41	98,40
08-00239-02204			0.4	0.15	0.18	15°	4	35	0.45	0.46	0.48	0.49	0.53	98,50
08-00239-02205			0.5	0.15	0.18	15°	4	35	0.55	0.57	0.59	0.61	0.66	98,40
08-00239-02207			0.75	0.15	0.18	15°	4	35	0.81	0.84	0.87	0.9	0.97	98,40
08-00239-02210			1	0.15	0.18	15°	4	35	1.07	1.1	1.14	1.18	1.28	98,40
08-00239-02403		R0.05	0.3	0.15	0.18	15°	4	35	0.34	0.35	0.36	0.38	0.4	98,40
08-00239-02404			0.4	0.15	0.18	15°	4	35	0.45	0.46	0.47	0.49	0.53	98,50
08-00239-02405			0.5	0.15	0.18	15°	4	35	0.55	0.57	0.59	0.61	0.65	98,40
08-00239-02407			0.75	0.15	0.18	15°	4	35	0.81	0.83	0.86	0.89	0.96	98,40
08-00239-02410			1	0.15	0.18	15°	4	35	1.07	1.1	1.14	1.18	1.27	98,40

Attenzione
How to Order

Quando ordinate, indicate MHRSH430RSF (D) × (R) × (L1)
When you order, indicate MHRSH430RSF (D) × (R) × (L1).

※(γ) è valore di riferimento
※(γ) is reference value.

Frese 4 tagli toriche scaricate con gambo corto per temprato MUGEN PREMIUM Plus

MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with Short Shank for Hardened Steel and High Accuracy Cutting

Unità [misura: mm]

Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(d1) Lungh. scarico Under Neck Length	(l) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00239-03205	0.3	R0.02	0.5	0.25	0.28	15°	4	35	0.55	0.57	0.59	0.61	0.66	98,40
08-00239-03206			0.6	0.25	0.28	15°	4	35	0.65	0.68	0.7	0.72	0.78	98,50
08-00239-03207			0.75	0.25	0.28	15°	4	35	0.81	0.84	0.87	0.9	0.97	98,40
08-00239-03210			1	0.25	0.28	15°	4	35	1.07	1.1	1.14	1.18	1.28	98,40
08-00239-03212			1.25	0.25	0.28	15°	4	35	1.32	1.37	1.42	1.47	1.59	98,50
08-00239-03215			1.5	0.25	0.28	15°	4	35	1.58	1.64	1.7	1.76	1.9	98,40
08-00239-03405		R0.05	0.5	0.25	0.28	15°	4	35	0.55	0.57	0.59	0.61	0.65	98,40
08-00239-03406			0.6	0.25	0.28	15°	4	35	0.65	0.67	0.7	0.72	0.78	98,50
08-00239-03407			0.75	0.25	0.28	15°	4	35	0.81	0.83	0.86	0.89	0.96	98,40
08-00239-03410			1	0.25	0.28	15°	4	35	1.07	1.1	1.14	1.18	1.27	98,40
08-00239-03412			1.25	0.25	0.28	15°	4	35	1.32	1.37	1.42	1.47	1.58	98,50
08-00239-03415			1.5	0.25	0.28	15°	4	35	1.58	1.64	1.69	1.76	1.89	98,40
08-00239-04205	0.4	R0.02	0.5	0.3	0.37	15°	4	35	0.57	0.59	0.61	0.63	0.68	63,30
08-00239-04207			0.75	0.3	0.37	15°	4	35	0.83	0.86	0.89	0.92	0.99	63,40
08-00239-04210			1	0.3	0.37	15°	4	35	1.09	1.12	1.16	1.21	1.3	63,30
08-00239-04215			1.5	0.3	0.37	15°	4	35	1.6	1.66	1.72	1.78	1.92	63,30
08-00239-04220			2	0.3	0.37	15°	4	35	2.12	2.19	2.27	2.36	2.55	63,30
08-00239-04405		R0.05	0.5	0.3	0.37	15°	4	35	0.57	0.59	0.61	0.63	0.67	63,30
08-00239-04407			0.75	0.3	0.37	15°	4	35	0.83	0.85	0.88	0.91	0.99	63,40
08-00239-04410			1	0.3	0.37	15°	4	35	1.08	1.12	1.16	1.2	1.3	63,30
08-00239-04415			1.5	0.3	0.37	15°	4	35	1.6	1.66	1.71	1.78	1.92	63,30
08-00239-04420			2	0.3	0.37	15°	4	35	2.12	2.19	2.27	2.35	2.54	63,30
08-00239-04505		R0.1	0.5	0.3	0.37	15°	4	35	0.57	0.58	0.6	0.62	0.66	63,40
08-00239-04507			0.75	0.3	0.37	15°	4	35	0.82	0.85	0.88	0.91	0.97	63,40
08-00239-04510			1	0.3	0.37	15°	4	35	1.08	1.12	1.15	1.19	1.28	63,40
08-00239-04515			1.5	0.3	0.37	15°	4	35	1.6	1.65	1.71	1.77	1.91	63,40
08-00239-04520			2	0.3	0.37	15°	4	35	2.12	2.19	2.26	2.34	2.53	63,40
08-00239-05210	0.5	R0.02	1	0.4	0.46	15°	4	35	1.11	1.14	1.18	1.23	1.33	51,10
08-00239-05215			1.5	0.4	0.46	15°	4	35	1.62	1.68	1.74	1.8	1.95	51,10
08-00239-05220			2	0.4	0.46	15°	4	35	2.14	2.21	2.29	2.38	2.57	51,10
08-00239-05225			2.5	0.4	0.46	15°	4	35	2.66	2.75	2.85	2.95	3.19	51,10
08-00239-05410		R0.05	1	0.4	0.46	15°	4	35	1.1	1.14	1.18	1.22	1.32	51,10
08-00239-05415			1.5	0.4	0.46	15°	4	35	1.62	1.68	1.73	1.8	1.94	51,10
08-00239-05420			2	0.4	0.46	15°	4	35	2.14	2.21	2.29	2.37	2.56	51,10
08-00239-05425			2.5	0.4	0.46	15°	4	35	2.65	2.75	2.84	2.95	3.18	51,10
08-00239-05510		R0.1	1	0.4	0.46	15°	4	35	1.1	1.14	1.18	1.22	1.31	51,10
08-00239-05515			1.5	0.4	0.46	15°	4	35	1.62	1.67	1.73	1.79	1.93	51,10
08-00239-05520			2	0.4	0.46	15°	4	35	2.14	2.21	2.28	2.37	2.55	51,10
08-00239-05525			2.5	0.4	0.46	15°	4	35	2.65	2.74	2.84	2.94	3.17	51,10
08-00239-06210	0.6	R0.02	1	0.5	0.56	15°	4	35	1.11	1.14	1.18	1.23	1.33	51,10
08-00239-06215			1.5	0.5	0.56	15°	4	35	1.62	1.68	1.74	1.8	1.95	51,20
08-00239-06220			2	0.5	0.56	15°	4	35	2.14	2.21	2.29	2.38	2.57	51,10
08-00239-06225			2.5	0.5	0.56	15°	4	35	2.66	2.75	2.85	2.95	3.19	51,20
08-00239-06230			3	0.5	0.56	15°	4	35	3.17	3.28	3.4	3.53	3.81	51,10
08-00239-06410		R0.05	1	0.5	0.56	15°	4	35	1.1	1.14	1.18	1.22	1.32	51,10
08-00239-06415			1.5	0.5	0.56	15°	4	35	1.62	1.68	1.73	1.8	1.94	51,20
08-00239-06420			2	0.5	0.56	15°	4	35	2.14	2.21	2.29	2.37	2.56	51,10
08-00239-06425			2.5	0.5	0.56	15°	4	35	2.65	2.75	2.84	2.95	3.18	51,20
08-00239-06430			3	0.5	0.56	15°	4	35	3.17	3.28	3.4	3.52	3.81	51,10
08-00239-06510		R0.1	1	0.5	0.56	15°	4	35	1.1	1.14	1.18	1.22	1.31	51,10
08-00239-06515			1.5	0.5	0.56	15°	4	35	1.62	1.67	1.73	1.79	1.93	51,20
08-00239-06520			2	0.5	0.56	15°	4	35	2.14	2.21	2.28	2.37	2.55	51,10
08-00239-06525			2.5	0.5	0.56	15°	4	35	2.65	2.74	2.84	2.94	3.17	51,20
08-00239-06530			3	0.5	0.56	15°	4	35	3.17	3.28	3.39	3.52	3.79	51,10
08-00239-08202	0.8	R0.02	2	0.65	0.76	15°	4	35	2.14	2.21	2.29	2.38	2.57	57,20
08-00239-08225			2.5	0.65	0.76	15°	4	35	2.66	2.75	2.85	2.95	3.19	57,30
08-00239-08203			3	0.65	0.76	15°	4	35	3.17	3.28	3.4	3.53	3.81	57,20
08-00239-08235			3.5	0.65	0.76	15°	4	35	3.69	3.82	3.95	4.1	4.43	57,30
08-00239-08204			4	0.65	0.76	15°	4	35	4.21	4.35	4.51	4.68	5.06	57,20

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusH ~65 Temprato
HRC Hardened SteelH ~70 Temprato
HRC Hardened SteelRivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Frese 4 tagli toriche scaricate con gambo corto per temprato MUGEN PREMIUM Plus

MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with Short Shank for Hardened Steel and High Accuracy Cutting

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00239-08402	0.8	R0.05	2	0.65	0.76	15°	4	35	2.14	2.21	2.29	2.37	2.56	57,20
08-00239-08425			2.5	0.65	0.76	15°	4	35	2.65	2.75	2.84	2.95	3.18	57,30
08-00239-08403			3	0.65	0.76	15°	4	35	3.17	3.28	3.4	3.52	3.81	57,20
08-00239-08435			3.5	0.65	0.76	15°	4	35	3.69	3.82	3.95	4.1	4.43	57,30
08-00239-08404		R0.1	4	0.65	0.76	15°	4	35	4.21	4.35	4.51	4.67	5.05	57,20
08-00239-08502			2	0.65	0.76	15°	4	35	2.14	2.21	2.28	2.37	2.55	57,20
08-00239-08525			2.5	0.65	0.76	15°	4	35	2.65	2.74	2.84	2.94	3.17	57,30
08-00239-08503			3	0.65	0.76	15°	4	35	3.17	3.28	3.39	3.52	3.79	57,20
08-00239-08535		R0.2	3.5	0.65	0.76	15°	4	35	3.69	3.81	3.95	4.09	4.42	57,30
08-00239-08504			4	0.65	0.76	15°	4	35	4.2	4.35	4.5	4.67	5.04	57,20
08-00239-08602			2	0.65	0.76	15°	4	35	2.13	2.2	2.27	2.35	2.53	57,20
08-00239-08625			2.5	0.65	0.76	15°	4	35	2.65	2.74	2.83	2.93	3.15	57,30
08-00239-08603		R0.2	3	0.65	0.76	15°	4	35	3.17	3.27	3.38	3.5	3.77	57,20
08-00239-08635			3.5	0.65	0.76	15°	4	35	3.68	3.8	3.94	4.08	4.39	57,30
08-00239-08604			4	0.65	0.76	15°	4	35	4.2	4.34	4.49	4.65	5.01	57,20
08-00239-10202			2	0.8	0.95	15°	4	35	2.16	2.23	2.31	2.4	2.59	51,90
08-00239-10203	1	R0.02	3	0.8	0.95	15°	4	35	3.19	3.3	3.42	3.55	3.84	51,90
08-00239-10204			4	0.8	0.95	15°	4	35	4.23	4.37	4.53	4.7	5.08	51,90
08-00239-10205			5	0.8	0.95	15°	4	40	5.26	5.44	5.64	5.85	6.32	51,90
08-00239-10402		R0.05	2	0.8	0.95	15°	4	35	2.16	2.23	2.31	2.39	2.59	51,90
08-00239-10403			3	0.8	0.95	15°	4	35	3.19	3.3	3.42	3.54	3.83	51,90
08-00239-10404			4	0.8	0.95	15°	4	35	4.22	4.37	4.53	4.69	5.07	51,90
08-00239-10405			5	0.8	0.95	15°	4	40	5.26	5.44	5.63	5.84	6.31	51,90
08-00239-10502		R0.1	2	0.8	0.95	15°	4	35	2.16	2.23	2.3	2.39	2.57	51,90
08-00239-10503			3	0.8	0.95	15°	4	35	3.19	3.3	3.41	3.54	3.82	51,90
08-00239-10504			4	0.8	0.95	15°	4	35	4.22	4.37	4.52	4.69	5.06	51,90
08-00239-10505			5	0.8	0.95	15°	4	40	5.26	5.44	5.63	5.84	6.3	51,90
08-00239-10602		R0.2	2	0.8	0.95	15°	4	35	2.15	2.22	2.29	2.37	2.55	51,90
08-00239-10603			3	0.8	0.95	15°	4	35	3.19	3.29	3.4	3.52	3.79	51,90
08-00239-10604			4	0.8	0.95	15°	4	35	4.22	4.36	4.51	4.67	5.04	51,90
08-00239-10605			5	0.8	0.95	15°	4	40	5.25	5.43	5.62	5.82	6.28	51,90
08-00239-10702		R0.3	2	0.8	0.95	15°	4	35	2.15	2.21	2.28	2.36	2.53	51,90
08-00239-10703			3	0.8	0.95	15°	4	35	3.18	3.28	3.39	3.51	3.77	51,90
08-00239-10704			4	0.8	0.95	15°	4	35	4.22	4.35	4.5	4.66	5.01	51,90
08-00239-10705			5	0.8	0.95	15°	4	40	5.25	5.42	5.61	5.81	6.26	51,90
08-00239-15203	1.5	R0.02	3	1.2	1.43	15°	4	35	3.23	3.34	3.46	3.59	3.88	54,20
08-00239-15204			4	1.2	1.43	15°	4	35	4.26	4.41	4.57	4.74	5.13	54,20
08-00239-15206			6	1.2	1.43	15°	4	40	6.33	6.55	6.79	7.04	7.61	54,20
08-00239-15208			8	1.2	1.43	15°	4	40	8.4	8.69	9	9.34	10.1	58,00
08-00239-15403		R0.05	3	1.2	1.43	15°	4	35	3.23	3.34	3.46	3.59	3.87	54,20
08-00239-15404			4	1.2	1.43	15°	4	35	4.26	4.41	4.57	4.74	5.12	54,20
08-00239-15406			6	1.2	1.43	15°	4	40	6.33	6.55	6.78	7.04	7.6	54,20
08-00239-15408			8	1.2	1.43	15°	4	40	8.4	8.69	9	9.34	10.09	58,00
08-00239-15503		R0.1	3	1.2	1.43	15°	4	35	3.23	3.34	3.45	3.58	3.86	54,20
08-00239-15504			4	1.2	1.43	15°	4	35	4.26	4.41	4.56	4.73	5.11	54,20
08-00239-15506			6	1.2	1.43	15°	4	40	6.33	6.55	6.78	7.03	7.59	54,20
08-00239-15508			8	1.2	1.43	15°	4	40	8.4	8.69	9	9.33	10.08	58,00
08-00239-15603		R0.2	3	1.2	1.43	15°	4	35	3.22	3.33	3.44	3.57	3.84	54,20
08-00239-15604			4	1.2	1.43	15°	4	35	4.26	4.4	4.55	4.72	5.08	54,20
08-00239-15606			6	1.2	1.43	15°	4	40	6.33	6.54	6.77	7.01	7.57	54,20
08-00239-15608			8	1.2	1.43	15°	4	40	8.39	8.68	8.98	9.31	10.06	58,00
08-00239-15703		R0.3	3	1.2	1.43	15°	4	35	3.22	3.32	3.43	3.55	3.82	54,20
08-00239-15704			4	1.2	1.43	15°	4	35	4.25	4.39	4.54	4.7	5.06	54,20
08-00239-15706			6	1.2	1.43	15°	4	40	6.32	6.53	6.76	7	7.55	54,20
08-00239-15708			8	1.2	1.43	15°	4	40	8.39	8.67	8.97	9.3	10.03	58,00
08-00239-15803	1.5	R0.5	3	1.2	1.43	15°	4	35	3.21	3.31	3.41	3.52	3.77	54,20
08-00239-15804			4	1.2	1.43	15°	4	35	4.25	4.38	4.52	4.67	5.01	54,20
08-00239-15806			6	1.2	1.43	15°	4	40	6.32	6.52	6.74	6.97	7.5	54,20
08-00239-15808			8	1.2	1.43	15°	4	40	8.38	8.66	8.95	9.27	9.98	58,00

Attenzione
How to OrderQuando ordinate, indicate MHRSH430RSF (D)×(R)×(L1)
When you order, indicate MHRSH430RSF (D)×(R)×(L1).※(γ) è valore di riferimento
※(γ) is reference value.

Frese 4 tagli toriche scaricate con gambo corto per temprato MUGEN PREMIUM Plus

MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with Short Shank for Hardened Steel and High Accuracy Cutting

Unità [misura: mm]

Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(d1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00239-20204	2	R0.02	4	1.6	1.91	15°	4	35	4.3	4.45	4.61	4.78	5.17	54,20
08-00239-20206			6	1.6	1.91	15°	4	35	6.37	6.59	6.83	7.08	7.66	54,20
08-00239-20208			8	1.6	1.91	15°	4	40	8.44	8.73	9.05	9.38	10.14	58,00
08-00239-20210			10	1.6	1.91	15°	4	40	10.5	10.87	11.26	11.68	12.63	58,00
08-00239-20404		R0.05	4	1.6	1.91	15°	4	35	4.3	4.45	4.61	4.78	5.16	54,20
08-00239-20406			6	1.6	1.91	15°	4	35	6.37	6.59	6.83	7.08	7.65	54,20
08-00239-20408			8	1.6	1.91	15°	4	40	8.44	8.73	9.04	9.38	10.14	58,00
08-00239-20410			10	1.6	1.91	15°	4	40	10.5	10.87	11.26	11.68	12.62	58,00
08-00239-20504		R0.1	4	1.6	1.91	15°	4	35	4.3	4.45	4.6	4.77	5.15	54,20
08-00239-20506			6	1.6	1.91	15°	4	35	6.37	6.59	6.82	7.07	7.64	54,20
08-00239-20508			8	1.6	1.91	15°	4	40	8.43	8.73	9.04	9.37	10.13	58,00
08-00239-20510			10	1.6	1.91	15°	4	40	10.5	10.86	11.25	11.67	12.61	58,00
08-00239-20604		R0.2	4	1.6	1.91	15°	4	35	4.3	4.44	4.59	4.76	5.13	54,20
08-00239-20606			6	1.6	1.91	15°	4	35	6.36	6.58	6.81	7.06	7.62	54,20
08-00239-20608			8	1.6	1.91	15°	4	40	8.43	8.72	9.03	9.36	10.1	58,00
08-00239-20610			10	1.6	1.91	15°	4	40	10.5	10.86	11.24	11.66	12.59	58,00
08-00239-20704		R0.3	4	1.6	1.91	15°	4	35	4.29	4.43	4.58	4.74	5.11	54,20
08-00239-20706			6	1.6	1.91	15°	4	35	6.36	6.57	6.8	7.04	7.59	54,20
08-00239-20708			8	1.6	1.91	15°	4	40	8.43	8.71	9.02	9.34	10.08	58,00
08-00239-20710			10	1.6	1.91	15°	4	40	10.5	10.85	11.23	11.64	12.56	58,00
08-00239-20804		R0.5	4	1.6	1.91	15°	4	35	4.29	4.42	4.56	4.71	5.06	54,20
08-00239-20806			6	1.6	1.91	15°	4	35	6.35	6.56	6.78	7.01	7.54	54,20
08-00239-20808			8	1.6	1.91	15°	4	40	8.42	8.7	8.99	9.31	10.03	58,00
08-00239-20810			10	1.6	1.91	15°	4	40	10.49	10.84	11.21	11.61	12.52	58,00
08-00239-25406	2.5	R0.05	6	2	2.39	15°	4	35	6.41	6.63	6.87	7.12	7.7	58,80
08-00239-25408			8	2	2.39	15°	4	40	8.47	8.77	9.08	9.42	10.18	61,90
08-00239-25410			10	2	2.39	15°	4	40	10.54	10.91	11.3	11.72	12.67	61,90
08-00239-25412			12	2	2.39	15°	4	40	12.61	13.05	13.52	14.02	Free	61,90
08-00239-25506		R0.1	6	2	2.39	15°	4	35	6.41	6.63	6.86	7.12	7.69	58,80
08-00239-25508			8	2	2.39	15°	4	40	8.47	8.77	9.08	9.42	10.17	61,90
08-00239-25510			10	2	2.39	15°	4	40	10.54	10.9	11.29	11.71	12.66	61,90
08-00239-25512			12	2	2.39	15°	4	40	12.61	13.04	13.51	14.01	Free	61,90
08-00239-25606		R0.2	6	2	2.39	15°	4	35	6.4	6.62	6.85	7.1	7.66	58,80
08-00239-25608			8	2	2.39	15°	4	40	8.47	8.76	9.07	9.4	10.15	61,90
08-00239-25610			10	2	2.39	15°	4	40	10.54	10.9	11.28	11.7	12.63	61,90
08-00239-25612			12	2	2.39	15°	4	40	12.6	13.04	13.5	14	Free	61,90
08-00239-25706		R0.3	6	2	2.39	15°	4	35	6.4	6.61	6.84	7.09	7.64	58,80
08-00239-25708			8	2	2.39	15°	4	40	8.47	8.75	9.06	9.39	10.12	61,90
08-00239-25710			10	2	2.39	15°	4	40	10.53	10.89	11.27	11.69	12.61	61,90
08-00239-25712			12	2	2.39	15°	4	40	12.6	13.03	13.49	13.99	Free	61,90
08-00239-25806		R0.5	6	2	2.39	15°	4	35	6.39	6.6	6.82	7.06	7.59	58,80
08-00239-25808			8	2	2.39	15°	4	40	8.46	8.74	9.04	9.36	10.08	61,90
08-00239-25810			10	2	2.39	15°	4	40	10.53	10.88	11.25	11.66	12.56	61,90
08-00239-25812			12	2	2.39	15°	4	40	12.59	13.02	13.47	13.96	Free	61,90
08-00239-30404	3	R0.05	4	2.5	2.85	15°	6	45	4.42	4.57	4.73	4.91	5.3	63,70
08-00239-30406			6	2.5	2.85	15°	6	45	6.48	6.71	6.95	7.21	7.79	63,70
08-00239-30408			8	2.5	2.85	15°	6	45	8.55	8.85	9.17	9.51	10.28	63,70
08-00239-30410			10	2.5	2.85	15°	6	50	10.62	10.99	11.38	11.81	12.76	70,80
08-00239-30412			12	2.5	2.85	15°	6	50	12.69	13.13	13.6	14.11	15.25	70,80
08-00239-30415			15	2.5	2.85	15°	6	55	15.79	16.34	16.92	17.56	18.98	78,10
08-00239-30504		R0.1	4	2.5	2.85	15°	6	45	4.42	4.57	4.73	4.9	5.29	63,70
08-00239-30506			6	2.5	2.85	15°	6	45	6.48	6.71	6.94	7.2	7.78	63,70
08-00239-30508			8	2.5	2.85	15°	6	45	8.55	8.84	9.16	9.5	10.26	63,70
08-00239-30510			10	2.5	2.85	15°	6	50	10.62	10.98	11.38	11.8	12.75	70,80
08-00239-30512			12	2.5	2.85	15°	6	50	12.68	13.12	13.59	14.1	15.24	70,80
08-00239-30515			15	2.5	2.85	15°	6	55	15.79	16.33	16.92	17.55	18.97	78,10
08-00239-30604		R0.2	4	2.5	2.85	15°	6	45	4.41	4.56	4.72	4.89	5.27	63,70
08-00239-30606			6	2.5	2.85	15°	6	45	6.48	6.7	6.93	7.19	7.75	63,70
08-00239-30608			8	2.5	2.85	15°	6	45	8.55	8.84	9.15	9.49	10.24	63,70
08-00239-30610			10	2.5	2.85	15°	6	50	10.61	10.98	11.37	11.79	12.73	70,80
08-00239-30612			12	2.5	2.85	15°	6	50	12.68	13.12	13.58	14.09	15.21	70,80
08-00239-30615			15	2.5	2.85	15°	6	55	15.78	16.33	16.91	17.54	18.94	78,10

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusH ~65 Temprato
HRC Hardened SteelH ~70 Temprato
HRC Hardened SteelRivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

MHRSH430RSF

Frese 4 tagli toriche scaricate con gambo corto per temprato MUGEN PREMIUM Plus

MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with Short Shank for Hardened Steel and High Accuracy Cutting

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
08-00239-30704	3	R0.3	4	2.5	2.85	15°	6	45	4.41	4.55	4.71	4.87	5.24	63,70
08-00239-30706			6	2.5	2.85	15°	6	45	6.48	6.69	6.92	7.17	7.73	63,70
08-00239-30708			8	2.5	2.85	15°	6	45	8.54	8.83	9.14	9.47	10.22	63,70
08-00239-30710			10	2.5	2.85	15°	6	50	10.61	10.97	11.36	11.77	12.7	70,80
08-00239-30712			12	2.5	2.85	15°	6	50	12.68	13.11	13.57	14.07	15.19	70,80
08-00239-30715			15	2.5	2.85	15°	6	55	15.78	16.32	16.9	17.52	18.92	78,10
08-00239-30804		R0.5	4	2.5	2.85	15°	6	45	4.4	4.54	4.69	4.84	5.2	63,70
08-00239-30806			6	2.5	2.85	15°	6	45	6.47	6.68	6.9	7.14	7.68	63,70
08-00239-30808			8	2.5	2.85	15°	6	45	8.54	8.82	9.12	9.44	10.17	63,70
08-00239-30810			10	2.5	2.85	15°	6	50	10.6	10.96	11.33	11.74	12.66	70,80
08-00239-30812			12	2.5	2.85	15°	6	50	12.67	13.1	13.55	14.04	15.14	70,80
08-00239-30815			15	2.5	2.85	15°	6	55	15.77	16.31	16.88	17.49	18.87	78,10
08-00239-40408	4	R0.05	8	3.2	3.8	15°	6	45	8.65	8.95	9.27	9.62	10.39	87,10
08-00239-40412			12	3.2	3.8	15°	6	50	12.78	13.23	13.7	14.22	15.36	87,10
08-00239-40416			16	3.2	3.8	15°	6	55	16.92	17.51	18.14	18.81	Free	87,10
08-00239-40420			20	3.2	3.8	15°	6	55	21.05	21.78	22.57	23.41	Free	97,00
08-00239-40508		R0.1	8	3.2	3.8	15°	6	45	8.65	8.94	9.26	9.61	10.38	87,00
08-00239-40512			12	3.2	3.8	15°	6	50	12.78	13.22	13.7	14.21	15.35	87,00
08-00239-40516			16	3.2	3.8	15°	6	55	16.92	17.5	18.13	18.81	Free	87,00
08-00239-40520			20	3.2	3.8	15°	6	55	21.05	21.78	22.56	23.41	Free	97,40
08-00239-40608		R0.2	8	3.2	3.8	15°	6	45	8.64	8.94	9.25	9.59	10.36	87,00
08-00239-40612			12	3.2	3.8	15°	6	50	12.78	13.22	13.69	14.19	15.33	87,00
08-00239-40616			16	3.2	3.8	15°	6	55	16.91	17.5	18.12	18.79	Free	87,00
08-00239-40620			20	3.2	3.8	15°	6	55	21.05	21.77	22.55	23.39	Free	97,40
08-00239-40708		R0.3	8	3.2	3.8	15°	6	45	8.64	8.93	9.24	9.58	10.33	87,00
08-00239-40712			12	3.2	3.8	15°	6	50	12.77	13.21	13.68	14.18	15.31	87,00
08-00239-40716			16	3.2	3.8	15°	6	55	16.91	17.49	18.11	18.78	Free	87,00
08-00239-40720			20	3.2	3.8	15°	6	55	21.04	21.77	22.54	23.38	Free	97,40
08-00239-40808		R0.5	8	3.2	3.8	15°	6	45	8.63	8.92	9.22	9.55	10.29	87,00
08-00239-40812			12	3.2	3.8	15°	6	50	12.77	13.2	13.65	14.15	15.26	87,00
08-00239-40816			16	3.2	3.8	15°	6	55	16.9	17.47	18.09	18.75	Free	87,00
08-00239-40820			20	3.2	3.8	15°	6	55	21.04	21.75	22.52	23.35	Free	97,40
08-00239-50515	5	R0.1	15	4	4.75	15°	6	50	15.98	16.53	17.13	Free	Free	122,30
08-00239-50520			20	4	4.75	15°	6	55	21.15	21.88	Free	Free	Free	122,30
08-00239-50525			25	4	4.75	15°	6	55	26.32	27.23	Free	Free	Free	122,20
08-00239-50615		R0.2	15	4	4.75	15°	6	50	15.98	16.53	17.12	Free	Free	122,30
08-00239-50620			20	4	4.75	15°	6	55	21.14	21.87	Free	Free	Free	122,30
08-00239-50625			25	4	4.75	15°	6	55	26.31	27.22	Free	Free	Free	122,20
08-00239-50715		R0.3	15	4	4.75	15°	6	50	15.97	16.52	17.1	Free	Free	122,30
08-00239-50720			20	4	4.75	15°	6	55	21.14	21.87	Free	Free	Free	122,30
08-00239-50725			25	4	4.75	15°	6	55	26.31	27.22	Free	Free	Free	122,20
08-00239-50815		R0.5	15	4	4.75	15°	6	50	15.97	16.5	17.08	Free	Free	122,30
08-00239-50820			20	4	4.75	15°	6	55	21.13	21.85	Free	Free	Free	122,30
08-00239-50825			25	4	4.75	15°	6	55	26.3	27.2	Free	Free	Free	122,20
08-00239-60512	6	R0.1	12	5	5.7	-	6	45	Free	Free	Free	Free	Free	88,60
08-00239-60518			18	5	5.7	-	6	50	Free	Free	Free	Free	Free	109,50
08-00239-60524			24	5	5.7	-	6	60	Free	Free	Free	Free	Free	109,50
08-00239-60530			30	5	5.7	-	6	65	Free	Free	Free	Free	Free	109,50
08-00239-60612		R0.2	12	5	5.7	-	6	45	Free	Free	Free	Free	Free	88,60
08-00239-60618			18	5	5.7	-	6	50	Free	Free	Free	Free	Free	109,50
08-00239-60624			24	5	5.7	-	6	60	Free	Free	Free	Free	Free	109,50
08-00239-60630			30	5	5.7	-	6	65	Free	Free	Free	Free	Free	109,50
08-00239-60712		R0.3	12	5	5.7	-	6	45	Free	Free	Free	Free	Free	88,60
08-00239-60718			18	5	5.7	-	6	50	Free	Free	Free	Free	Free	109,50
08-00239-60724			24	5	5.7	-	6	60	Free	Free	Free	Free	Free	109,50
08-00239-60730			30	5	5.7	-	6	65	Free	Free	Free	Free	Free	109,50
08-00239-60812		R0.5	12	5	5.7	-	6	45	Free	Free	Free	Free	Free	88,60
08-00239-60818			18	5	5.7	-	6	50	Free	Free	Free	Free	Free	109,50
08-00239-60824			24	5	5.7	-	6	60	Free	Free	Free	Free	Free	109,50
08-00239-60830			30	5	5.7	-	6	65	Free	Free	Free	Free	Free	109,50
08-00239-60912		R1	12	5	5.7	-	6	45	Free	Free	Free	Free	Free	88,60
08-00239-60918			18	5	5.7	-	6	50	Free	Free	Free	Free	Free	109,50
08-00239-60924			24	5	5.7	-	6	60	Free	Free	Free	Free	Free	109,50
08-00239-60930			30	5	5.7	-	6	65	Free	Free	Free	Free	Free	109,50

Attenzione
How to Order

Quando ordinate, indicate MHRSH430RSF (D)×(R)×(L1)
When you order, indicate MHRSH430RSF (D)×(R)×(L1).

※(γ) è valore di riferimento
※(γ) is reference value.



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Acciaio HSS/Acciaio temprato High Speed Steels / Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
Dia. Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
0.1	0.01	0.2	2	40,000	200	0.002	0.01	40,000	150	0.002	0.01	40,000	120	0.002	0.01
		0.25	2.5	40,000	180	0.002	0.01	40,000	130	0.002	0.01	40,000	100	0.002	0.01
		0.3	3	40,000	160	0.002	0.01	40,000	120	0.002	0.01	40,000	90	0.002	0.01
		0.4	4	40,000	140	0.001	0.01	40,000	100	0.001	0.01	40,000	70	0.001	0.01
0.15	0.01	0.5	5	40,000	120	0.001	0.01	40,000	90	0.001	0.01	40,000	60	0.001	0.01
		0.3	2	40,000	240	0.002	0.015	40,000	180	0.002	0.01	40,000	140	0.002	0.01
		0.4	2.7	40,000	200	0.002	0.015	40,000	150	0.002	0.01	40,000	110	0.002	0.01
		0.5	3.3	40,000	160	0.002	0.015	40,000	120	0.002	0.01	40,000	90	0.002	0.01
	0.02	0.6	4	40,000	140	0.001	0.015	40,000	100	0.001	0.01	40,000	70	0.001	0.01
		0.75	5	40,000	120	0.001	0.015	40,000	90	0.001	0.01	40,000	60	0.001	0.01
		0.3	2	40,000	240	0.002	0.015	40,000	180	0.002	0.01	40,000	140	0.002	0.01
		0.4	2.7	40,000	200	0.002	0.015	40,000	150	0.002	0.01	40,000	110	0.002	0.01
	0.05	0.5	3.3	40,000	160	0.002	0.015	40,000	120	0.002	0.01	40,000	90	0.002	0.01
		0.6	4	40,000	140	0.001	0.015	40,000	100	0.001	0.01	40,000	70	0.001	0.01
		0.75	5	40,000	120	0.001	0.015	40,000	90	0.001	0.01	40,000	60	0.001	0.01
0.2	0.02	0.3	1.5	30,000	360	0.003	0.02	30,000	280	0.003	0.01	30,000	220	0.003	0.01
		0.4	2	30,000	340	0.003	0.02	30,000	260	0.003	0.01	30,000	200	0.003	0.01
		0.5	2.5	30,000	320	0.003	0.02	30,000	240	0.003	0.01	30,000	180	0.003	0.01
		0.75	3.8	30,000	270	0.003	0.02	30,000	190	0.003	0.01	30,000	150	0.003	0.01
		1	5	30,000	240	0.002	0.02	30,000	160	0.002	0.01	30,000	120	0.002	0.01
	0.05	0.3	1.5	30,000	360	0.003	0.02	30,000	280	0.003	0.01	30,000	220	0.003	0.01
		0.4	2	30,000	340	0.003	0.02	30,000	260	0.003	0.01	30,000	200	0.003	0.01
		0.5	2.5	30,000	320	0.003	0.02	30,000	240	0.003	0.01	30,000	180	0.003	0.01
		0.75	3.8	30,000	270	0.003	0.02	30,000	190	0.003	0.01	30,000	150	0.003	0.01
		1	5	30,000	240	0.003	0.02	30,000	160	0.003	0.01	30,000	120	0.003	0.01
	0.02	0.5	1.7	30,000	600	0.003	0.04	30,000	500	0.003	0.03	30,000	400	0.003	0.03
		0.6	2	30,000	580	0.003	0.04	30,000	480	0.003	0.03	30,000	380	0.003	0.03
		0.75	2.5	30,000	560	0.003	0.04	30,000	460	0.003	0.03	30,000	360	0.003	0.03
		1	3.3	30,000	500	0.003	0.04	30,000	400	0.003	0.03	30,000	300	0.003	0.03
		1.25	4.2	30,000	400	0.003	0.04	30,000	300	0.003	0.03	30,000	220	0.003	0.03
		1.5	5	30,000	320	0.003	0.04	30,000	240	0.003	0.03	30,000	180	0.003	0.03
	0.05	0.5	1.7	30,000	600	0.003	0.04	30,000	500	0.003	0.03	30,000	400	0.003	0.03
		0.6	2	30,000	580	0.003	0.04	30,000	480	0.003	0.03	30,000	380	0.003	0.03
		0.75	2.5	30,000	560	0.003	0.04	30,000	460	0.003	0.03	30,000	360	0.003	0.03
		1	3.3	30,000	500	0.003	0.04	30,000	400	0.003	0.03	30,000	300	0.003	0.03
		1.25	4.2	30,000	400	0.003	0.04	30,000	300	0.003	0.03	30,000	220	0.003	0.03
		1.5	5	30,000	320	0.003	0.04	30,000	240	0.003	0.03	30,000	180	0.003	0.03
0.3	0.02	0.5	1.3	28,000	760	0.005	0.05	25,000	650	0.004	0.04	22,000	480	0.004	0.04
		0.75	1.9	28,000	730	0.005	0.05	25,000	620	0.004	0.04	22,000	460	0.004	0.04
		1	2.5	28,000	700	0.005	0.05	25,000	600	0.004	0.04	22,000	450	0.004	0.04
		1.5	3.8	28,000	600	0.005	0.05	25,000	520	0.004	0.04	22,000	390	0.004	0.04
		2	5	25,000	500	0.005	0.05	25,000	440	0.003	0.04	22,000	330	0.003	0.04
	0.05	0.5	1.3	28,000	760	0.005	0.05	25,000	650	0.005	0.04	22,000	480	0.005	0.04
		0.75	1.9	28,000	730	0.005	0.05	25,000	620	0.005	0.04	22,000	460	0.005	0.04
		1	2.5	28,000	700	0.005	0.05	25,000	600	0.005	0.04	22,000	450	0.005	0.04
		1.5	3.8	28,000	600	0.005	0.05	25,000	520	0.005	0.04	22,000	390	0.005	0.04
		2	5	25,000	500	0.005	0.05	25,000	440	0.005	0.04	22,000	330	0.005	0.04
	0.1	0.5	1.3	28,000	760	0.005	0.05	25,000	650	0.005	0.04	22,000	480	0.005	0.04
		0.75	1.9	28,000	730	0.005	0.05	25,000	620	0.005	0.04	22,000	460	0.005	0.04
		1	2.5	28,000	700	0.005	0.05	25,000	600	0.005	0.04	22,000	450	0.005	0.04
		1.5	3.8	28,000	600	0.005	0.05	25,000	520	0.005	0.04	22,000	390	0.005	0.04
		2	5	25,000	500	0.005	0.05	25,000	440	0.005	0.04	22,000	330	0.005	0.04
		2.5	5	23,000	900	0.006	0.1	20,000	800	0.004	0.08	18,000	600	0.004	0.08
0.5	0.02	1.5	3	23,000	800	0.006	0.1	20,000	640	0.004	0.08	18,000	480	0.004	0.08
		2	4	23,000	720	0.005	0.1	20,000	600	0.003	0.08	18,000	450	0.003	0.08
		2.5	5	23,000	680	0.005	0.1	20,000	580	0.003	0.08	18,000	420	0.003	0.08
		2.5	5	23,000	680	0.005	0.1	20,000	580	0.003	0.08	18,000	420	0.003	0.08

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusH ~65 Temprato
HRC Hardened SteelH ~70 Temprato
HRC Hardened SteelRivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Acciaio HSS/Acciaio temprato High Speed Steels / Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
0.5	0.05	1	2	23,000	900	0.007	0.1	20,000	800	0.005	0.08	18,000	600	0.005	0.08
		1.5	3	23,000	800	0.007	0.1	20,000	640	0.005	0.08	18,000	480	0.005	0.08
		2	4	23,000	720	0.007	0.1	20,000	600	0.005	0.08	18,000	450	0.005	0.08
	0.1	2.5	5	23,000	680	0.006	0.1	20,000	580	0.004	0.08	18,000	420	0.004	0.08
		1	2	23,000	900	0.007	0.1	20,000	800	0.005	0.08	18,000	600	0.005	0.08
		1.5	3	23,000	800	0.007	0.1	20,000	640	0.005	0.08	18,000	480	0.005	0.08
		2	4	23,000	720	0.007	0.1	20,000	600	0.005	0.08	18,000	450	0.005	0.08
		2.5	5	23,000	680	0.006	0.1	20,000	580	0.004	0.08	18,000	420	0.004	0.08
	0.6	1	1.7	23,000	1,000	0.006	0.15	20,000	850	0.004	0.1	17,000	640	0.004	0.1
		1.5	2.5	23,000	900	0.006	0.15	20,000	740	0.004	0.1	17,000	540	0.004	0.1
		2	3.3	23,000	800	0.006	0.15	20,000	640	0.004	0.1	17,000	480	0.004	0.1
		2.5	4.2	23,000	750	0.005	0.15	20,000	620	0.003	0.1	17,000	460	0.003	0.1
		3	5	23,000	700	0.005	0.15	20,000	600	0.003	0.1	17,000	450	0.003	0.1
		1	1.7	23,000	1,000	0.01	0.15	20,000	850	0.01	0.1	17,000	640	0.008	0.1
		1.5	2.5	23,000	900	0.01	0.15	20,000	740	0.008	0.1	17,000	540	0.007	0.1
		2	3.3	23,000	800	0.01	0.15	20,000	640	0.007	0.1	17,000	480	0.006	0.1
		2.5	4.2	23,000	750	0.009	0.15	20,000	620	0.006	0.1	17,000	460	0.005	0.1
		3	5	23,000	700	0.008	0.15	20,000	600	0.006	0.1	17,000	450	0.005	0.1
		1	1.7	23,000	1,000	0.01	0.15	20,000	850	0.01	0.1	17,000	640	0.008	0.1
		1.5	2.5	23,000	900	0.01	0.15	20,000	740	0.008	0.1	17,000	540	0.007	0.1
		2	3.3	23,000	800	0.01	0.15	20,000	640	0.007	0.1	17,000	480	0.006	0.1
		2.5	4.2	23,000	750	0.009	0.15	20,000	620	0.006	0.1	17,000	460	0.005	0.1
		3	5	23,000	700	0.008	0.15	20,000	600	0.006	0.1	17,000	450	0.005	0.1
		2	2.5	23,000	1,400	0.006	0.16	20,000	1,000	0.005	0.14	17,000	700	0.005	0.14
		2.5	3.1	23,000	1,350	0.006	0.16	20,000	950	0.004	0.14	17,000	670	0.004	0.14
		3	3.8	23,000	1,300	0.005	0.16	20,000	900	0.003	0.14	17,000	650	0.003	0.14
		3.5	4.4	23,000	1,250	0.005	0.16	20,000	850	0.003	0.14	17,000	620	0.003	0.14
		4	5	23,000	1,200	0.005	0.16	20,000	800	0.003	0.14	17,000	600	0.003	0.14
0.8	0.02	2	2.5	23,000	1,400	0.02	0.16	20,000	1,000	0.015	0.14	17,000	700	0.012	0.14
		2.5	3.1	23,000	1,350	0.017	0.16	20,000	950	0.012	0.14	17,000	670	0.010	0.14
		3	3.8	23,000	1,300	0.015	0.16	20,000	900	0.01	0.14	17,000	650	0.008	0.14
		3.5	4.4	23,000	1,250	0.015	0.16	20,000	850	0.01	0.14	17,000	620	0.007	0.14
		4	5	23,000	1,200	0.015	0.16	20,000	800	0.01	0.14	17,000	600	0.006	0.14
	0.05	2	2.5	23,000	1,400	0.02	0.16	20,000	1,000	0.015	0.14	17,000	700	0.012	0.14
		2.5	3.1	23,000	1,350	0.017	0.16	20,000	950	0.012	0.14	17,000	670	0.010	0.14
		3	3.8	23,000	1,300	0.015	0.16	20,000	900	0.01	0.14	17,000	650	0.008	0.14
		3.5	4.4	23,000	1,250	0.015	0.16	20,000	850	0.01	0.14	17,000	620	0.007	0.14
	0.1	2	2.5	23,000	1,400	0.02	0.16	20,000	1,000	0.015	0.14	17,000	700	0.012	0.14
		2.5	3.1	23,000	1,350	0.017	0.16	20,000	950	0.012	0.14	17,000	670	0.010	0.14
		3	3.8	23,000	1,300	0.015	0.16	20,000	900	0.01	0.14	17,000	650	0.008	0.14
		3.5	4.4	23,000	1,250	0.015	0.16	20,000	850	0.01	0.14	17,000	620	0.007	0.14
	0.2	2	2.5	23,000	1,400	0.02	0.16	20,000	1,000	0.015	0.14	17,000	700	0.012	0.14
		2.5	3.1	23,000	1,350	0.017	0.16	20,000	950	0.012	0.14	17,000	670	0.010	0.14
		3	3.8	23,000	1,300	0.015	0.16	20,000	900	0.01	0.14	17,000	650	0.008	0.14
		3.5	4.4	23,000	1,250	0.015	0.16	20,000	850	0.01	0.14	17,000	620	0.007	0.14
	0.02	2	2	21,000	2,000	0.01	0.25	17,000	1,400	0.008	0.2	15,000	1,000	0.005	0.2
		3	3	20,000	1,800	0.01	0.25	16,000	1,300	0.008	0.2	14,000	900	0.005	0.2
		4	4	18,000	1,500	0.008	0.25	14,000	1,100	0.005	0.2	12,000	750	0.003	0.2
		5	5	16,000	1,400	0.005	0.25	13,000	1,000	0.003	0.2	11,000	650	0.003	0.2
	0.05	2	2	21,000	2,000	0.04	0.25	17,000	1,400	0.03	0.2	15,000	1,000	0.018	0.2
		3	3	20,000	1,800	0.04	0.25	16,000	1,300	0.03	0.2	14,000	900	0.018	0.2
		4	4	18,000	1,500	0.03	0.25	14,000	1,100	0.02	0.2	12,000	750	0.012	0.2
		5	5	16,000	1,400	0.02	0.25	13,000	1,000	0.01	0.2	11,000	650	0.006	0.2
	0.1	2	2	21,000	2,000	0.04	0.25	17,000	1,400	0.03	0.2	15,000	1,000	0.018	0.2
		3	3	20,000	1,800	0.04	0.25	16,000	1,300	0.03	0.2	14,000	900	0.018	0.2
		4	4	18,000	1,500	0.03	0.25	14,000	1,100	0.02	0.2	12,000	750	0.012	0.2
		5	5	16,000	1,400	0.02	0.25	13,000	1,000	0.01	0.2	11,000	650	0.006	0.2



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Acciaio HSS/Acciaio temprato High Speed Steels / Hardened Steels SKH51•SKD11 (～62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (～66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (～70HRC)			
Dia. Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
1	0.2	2	2	21,000	2,000	0.04	0.25	17,000	1,400	0.03	0.2	15,000	1,000	0.018	0.2
		3	3	20,000	1,800	0.04	0.25	16,000	1,300	0.03	0.2	14,000	900	0.018	0.2
		4	4	18,000	1,500	0.03	0.25	14,000	1,100	0.02	0.2	12,000	750	0.012	0.2
		5	5	16,000	1,400	0.02	0.25	13,000	1,000	0.01	0.2	11,000	650	0.006	0.2
	0.3	2	2	21,000	2,000	0.04	0.25	17,000	1,400	0.03	0.2	15,000	1,000	0.018	0.2
		3	3	20,000	1,800	0.04	0.25	16,000	1,300	0.03	0.2	14,000	900	0.018	0.2
		4	4	18,000	1,500	0.03	0.25	14,000	1,100	0.02	0.2	12,000	750	0.012	0.2
		5	5	16,000	1,400	0.02	0.25	13,000	1,000	0.01	0.2	11,000	650	0.006	0.2
1.5	0.02	3	2	20,000	2,000	0.01	0.4	16,000	1,400	0.008	0.3	14,000	1,000	0.006	0.3
		4	2.7	18,000	1,700	0.01	0.4	14,000	1,200	0.008	0.3	12,000	800	0.006	0.3
		6	4	16,000	1,500	0.008	0.4	13,000	1,100	0.005	0.3	11,000	750	0.004	0.3
		8	5.3	14,000	1,300	0.008	0.4	11,000	900	0.003	0.3	10,000	600	0.003	0.3
	0.05	3	2	20,000	2,000	0.04	0.4	16,000	1,400	0.03	0.3	14,000	1,000	0.018	0.3
		4	2.7	18,000	1,700	0.04	0.4	14,000	1,200	0.03	0.3	12,000	800	0.018	0.3
		6	4	16,000	1,500	0.03	0.4	13,000	1,100	0.02	0.3	11,000	750	0.012	0.3
		8	5.3	14,000	1,300	0.025	0.4	11,000	900	0.01	0.3	10,000	600	0.006	0.3
	0.1	3	2	20,000	2,000	0.04	0.4	16,000	1,400	0.03	0.3	14,000	1,000	0.018	0.3
		4	2.7	18,000	1,700	0.04	0.4	14,000	1,200	0.03	0.3	12,000	800	0.018	0.3
		6	4	16,000	1,500	0.03	0.4	13,000	1,100	0.02	0.3	11,000	750	0.012	0.3
		8	5.3	14,000	1,300	0.025	0.4	11,000	900	0.01	0.3	10,000	600	0.006	0.3
	0.2	3	2	20,000	2,000	0.04	0.4	16,000	1,400	0.03	0.3	14,000	1,000	0.018	0.3
		4	2.7	18,000	1,700	0.04	0.4	14,000	1,200	0.03	0.3	12,000	800	0.018	0.3
		6	4	16,000	1,500	0.03	0.4	13,000	1,100	0.02	0.3	11,000	750	0.012	0.3
		8	5.3	14,000	1,300	0.025	0.4	11,000	900	0.01	0.3	10,000	600	0.006	0.3
	0.3	3	2	20,000	2,000	0.04	0.4	16,000	1,400	0.03	0.3	14,000	1,000	0.018	0.3
		4	2.7	18,000	1,700	0.04	0.4	14,000	1,200	0.03	0.3	12,000	800	0.018	0.3
		6	4	16,000	1,500	0.03	0.4	13,000	1,100	0.02	0.3	11,000	750	0.012	0.3
		8	5.3	14,000	1,300	0.025	0.4	11,000	900	0.01	0.3	10,000	600	0.006	0.3
	0.5	3	2	20,000	2,000	0.04	0.4	16,000	1,400	0.03	0.3	14,000	1,000	0.018	0.3
		4	2.7	18,000	1,700	0.04	0.4	14,000	1,200	0.03	0.3	12,000	800	0.018	0.3
		6	4	16,000	1,500	0.03	0.4	13,000	1,100	0.02	0.3	11,000	750	0.012	0.3
		8	5.3	14,000	1,300	0.025	0.4	11,000	900	0.01	0.3	10,000	600	0.006	0.3
2	0.02	4	2	17,000	2,000	0.012	0.5	14,000	1,400	0.008	0.35	12,000	1,000	0.006	0.35
		6	3	15,000	1,800	0.012	0.5	12,000	1,200	0.008	0.35	11,000	900	0.006	0.35
		8	4	14,000	1,500	0.01	0.5	11,000	1,100	0.005	0.35	10,000	750	0.004	0.35
		10	5	12,000	1,300	0.01	0.5	10,000	1,000	0.003	0.35	9,000	650	0.003	0.35
	0.05	4	2	17,000	2,000	0.05	0.5	14,000	1,400	0.03	0.35	12,000	1,000	0.018	0.35
		6	3	15,000	1,800	0.05	0.5	12,000	1,200	0.03	0.35	11,000	900	0.018	0.35
		8	4	14,000	1,500	0.04	0.5	11,000	1,100	0.02	0.35	10,000	750	0.012	0.35
		10	5	12,000	1,300	0.04	0.5	10,000	1,000	0.02	0.35	9,000	650	0.012	0.35
	0.1	4	2	17,000	2,000	0.05	0.5	14,000	1,400	0.03	0.35	12,000	1,000	0.018	0.35
		6	3	15,000	1,800	0.05	0.5	12,000	1,200	0.03	0.35	11,000	900	0.018	0.35
		8	4	14,000	1,500	0.04	0.5	11,000	1,100	0.02	0.35	10,000	750	0.012	0.35
		10	5	12,000	1,300	0.04	0.5	10,000	1,000	0.02	0.35	9,000	650	0.012	0.35
	0.2	4	2	17,000	2,000	0.05	0.5	14,000	1,400	0.03	0.35	12,000	1,000	0.018	0.35
		6	3	15,000	1,800	0.05	0.5	12,000	1,200	0.03	0.35	11,000	900	0.018	0.35
		8	4	14,000	1,500	0.04	0.5	11,000	1,100	0.02	0.35	10,000	750	0.012	0.35
		10	5	12,000	1,300	0.04	0.5	10,000	1,000	0.02	0.35	9,000	650	0.012	0.35
	0.3	4	2	17,000	2,000	0.05	0.5	14,000	1,400	0.03	0.35	12,000	1,000	0.018	0.35
		6	3	15,000	1,800	0.05	0.5	12,000	1,200	0.03	0.35	11,000	900	0.018	0.35
		8	4	14,000	1,500	0.04	0.5	11,000	1,100	0.02	0.35	10,000	750	0.012	0.35
		10	5	12,000	1,300	0.04	0.5	10,000	1,000	0.02	0.35	9,000	650	0.012	0.35
	0.5	4	2	17,000	2,000	0.05	0.5	14,000	1,400	0.03	0.35	12,000	1,000	0.018	0.35
		6	3	15,000	1,800	0.05	0.5	12,000	1,200	0.03	0.35	11,000	900	0.018	0.35
		8	4	14,000	1,500	0.04	0.5	11,000	1,100	0.02	0.35	10,000	750	0.012	0.35
		10	5	12,000	1,300	0.04	0.5	10,000	1,000	0.02	0.35	9,000	650	0.012	0.35

Condizioni di taglio raccomandate

Recommended Milling Conditions



Materiale Work Material				Acciaio HSS/Acciaio temprato High Speed Steels / Hardened Steels SKH51•SKD11 (~62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (~66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (~70HRC)			
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
2.5	0.05	6	2.4	14,000	1,800	0.05	0.5	12,000	1,300	0.03	0.5	9,000	900	0.018	0.5
		8	3.2	12,000	1,700	0.05	0.5	10,000	1,200	0.03	0.5	7,500	800	0.018	0.5
		10	4	11,000	1,500	0.04	0.5	9,000	1,100	0.03	0.5	7,000	750	0.018	0.5
		12	4.8	10,000	1,300	0.03	0.5	8,000	1,000	0.02	0.5	6,700	650	0.012	0.5
	0.1	6	2.4	14,000	1,800	0.06	0.5	12,000	1,300	0.03	0.5	9,000	900	0.018	0.5
		8	3.2	12,000	1,700	0.05	0.5	10,000	1,200	0.03	0.5	7,500	800	0.018	0.5
		10	4	11,000	1,500	0.05	0.5	9,000	1,100	0.03	0.5	7,000	750	0.018	0.5
		12	4.8	10,000	1,300	0.04	0.5	8,000	1,000	0.02	0.5	6,700	650	0.012	0.5
	0.2	6	2.4	14,000	1,800	0.06	0.5	12,000	1,300	0.03	0.5	9,000	900	0.018	0.5
		8	3.2	12,000	1,700	0.05	0.5	10,000	1,200	0.03	0.5	7,500	800	0.018	0.5
		10	4	11,000	1,500	0.05	0.5	9,000	1,100	0.03	0.5	7,000	750	0.018	0.5
		12	4.8	10,000	1,300	0.04	0.5	8,000	1,000	0.02	0.5	6,700	650	0.012	0.5
	0.3	6	2.4	14,000	1,800	0.06	0.5	12,000	1,300	0.03	0.5	9,000	900	0.018	0.5
		8	3.2	12,000	1,700	0.05	0.5	10,000	1,200	0.03	0.5	7,500	800	0.018	0.5
		10	4	11,000	1,500	0.05	0.5	9,000	1,100	0.03	0.5	7,000	750	0.018	0.5
		12	4.8	10,000	1,300	0.04	0.5	8,000	1,000	0.02	0.5	6,700	650	0.012	0.5
	0.5	6	2.4	14,000	1,800	0.06	0.5	12,000	1,300	0.03	0.5	9,000	900	0.018	0.5
		8	3.2	12,000	1,700	0.05	0.5	10,000	1,200	0.03	0.5	7,500	800	0.018	0.5
		10	4	11,000	1,500	0.05	0.5	9,000	1,100	0.03	0.5	7,000	750	0.018	0.5
		12	4.8	10,000	1,300	0.04	0.5	8,000	1,000	0.02	0.5	6,700	650	0.012	0.5
3	0.05	4	1.3	13,000	2,000	0.05	0.7	10,000	1,400	0.05	0.6	8,000	1,100	0.03	0.6
		6	2	11,500	1,700	0.05	0.7	9,500	1,300	0.05	0.6	7,500	1,000	0.03	0.6
		8	2.7	10,500	1,500	0.05	0.7	8,000	1,100	0.05	0.6	6,000	800	0.03	0.6
		10	3.3	10,000	1,350	0.05	0.7	7,500	1,000	0.05	0.6	6,000	750	0.03	0.6
		12	4	10,000	1,350	0.04	0.7	7,500	1,000	0.04	0.6	6,000	750	0.024	0.6
	0.1	15	5	9,000	1,200	0.03	0.7	7,000	900	0.03	0.6	5,500	650	0.018	0.6
		4	1.3	13,000	2,000	0.07	0.7	10,000	1,400	0.05	0.6	8,000	1,100	0.03	0.6
		6	2	11,500	1,700	0.07	0.7	9,500	1,300	0.05	0.6	7,500	1,000	0.03	0.6
		8	2.7	10,500	1,500	0.07	0.7	8,000	1,100	0.05	0.6	6,000	800	0.03	0.6
		10	3.3	10,000	1,350	0.07	0.7	7,500	1,000	0.05	0.6	6,000	750	0.03	0.6
	0.2	12	4	10,000	1,350	0.06	0.7	7,500	1,000	0.04	0.6	6,000	750	0.024	0.6
		15	5	9,000	1,200	0.05	0.7	7,000	900	0.03	0.6	5,500	650	0.018	0.6
		4	1.3	13,000	2,000	0.07	0.7	10,000	1,400	0.05	0.6	8,000	1,100	0.03	0.6
		6	2	11,500	1,700	0.07	0.7	9,500	1,300	0.05	0.6	7,500	1,000	0.03	0.6
		8	2.7	10,500	1,500	0.07	0.7	8,000	1,100	0.05	0.6	6,000	800	0.03	0.6
	0.3	10	3.3	10,000	1,350	0.07	0.7	7,500	1,000	0.05	0.6	6,000	750	0.03	0.6
		12	4	10,000	1,350	0.06	0.7	7,500	1,000	0.04	0.6	6,000	750	0.024	0.6
		15	5	9,000	1,200	0.05	0.7	7,000	900	0.03	0.6	5,500	650	0.018	0.6
		4	1.3	13,000	2,000	0.07	0.7	10,000	1,400	0.05	0.6	8,000	1,100	0.03	0.6
		6	2	11,500	1,700	0.07	0.7	9,500	1,300	0.05	0.6	7,500	1,000	0.03	0.6
	0.5	8	2.7	10,500	1,500	0.07	0.7	8,000	1,100	0.05	0.6	6,000	800	0.03	0.6
		10	3.3	10,000	1,350	0.07	0.7	7,500	1,000	0.05	0.6	6,000	750	0.03	0.6
		12	4	10,000	1,350	0.06	0.7	7,500	1,000	0.04	0.6	6,000	750	0.024	0.6
		15	5	9,000	1,200	0.05	0.7	7,000	900	0.03	0.6	5,500	650	0.018	0.6
4	0.05	8	2	8,500	1,800	0.07	1	7,000	1,300	0.06	0.8	5,500	1,000	0.03	0.8
		12	3	8,500	1,800	0.06	1	7,000	1,300	0.05	0.8	5,500	1,000	0.03	0.8
		16	4	7,500	1,500	0.05	1	5,500	1,000	0.05	0.8	5,200	900	0.024	0.8
		20	5	6,000	1,200	0.04	1	4,500	800	0.04	0.8	4,000	650	0.018	0.8
	0.1	8	2	8,500	1,800	0.08	1	7,000	1,300	0.06	0.8	5,500	1,000	0.036	0.8
		12	3	8,500	1,800	0.07	1	7,000	1,300	0.05	0.8	5,500	1,000	0.03	0.8
		16	4	7,500	1,500	0.06	1	5,500	1,000	0.05	0.8	5,200	900	0.03	0.8
		20	5	6,000	1,200	0.06	1	4,500	800	0.05	0.8	4,000	650	0.03	0.8

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Acciaio HSS/Acciaio temprato High Speed Steels / Hardened Steels SKH51•SKD11 (～62HRC)				Acciaio HSS High Speed Steels SKH55•HAP40 (～66HRC)				Acciaio HSS High Speed Steels SKH57•HAP72 (～70HRC)			
Dia Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
4	0.2	8	2	8,500	1,800	0.08	1	7,000	1,300	0.06	0.8	5,500	1,000	0.036	0.8
		12	3	8,500	1,800	0.07	1	7,000	1,300	0.05	0.8	5,500	1,000	0.03	0.8
		16	4	7,500	1,500	0.06	1	5,500	1,000	0.05	0.8	5,200	900	0.03	0.8
		20	5	6,000	1,200	0.06	1	4,500	800	0.05	0.8	4,000	650	0.03	0.8
	0.3	8	2	8,500	1,800	0.08	1	7,000	1,300	0.06	0.8	5,500	1,000	0.036	0.8
		12	3	8,500	1,800	0.07	1	7,000	1,300	0.05	0.8	5,500	1,000	0.03	0.8
		16	4	7,500	1,500	0.06	1	5,500	1,000	0.05	0.8	5,200	900	0.03	0.8
		20	5	6,000	1,200	0.06	1	4,500	800	0.05	0.8	4,000	650	0.03	0.8
	0.5	8	2	8,500	1,800	0.08	1	7,000	1,300	0.06	0.8	5,500	1,000	0.036	0.8
		12	3	8,500	1,800	0.07	1	7,000	1,300	0.05	0.8	5,500	1,000	0.03	0.8
		16	4	7,500	1,500	0.06	1	5,500	1,000	0.05	0.8	5,200	900	0.03	0.8
		20	5	6,000	1,200	0.06	1	4,500	800	0.05	0.8	4,000	650	0.03	0.8
5	0.1	15	3	7,000	1,700	0.08	1.6	5,500	1,300	0.06	1.2	4,400	900	0.036	1.2
		20	4	6,000	1,400	0.07	1.6	5,000	1,100	0.05	1.2	4,000	750	0.03	1.2
		25	5	4,800	1,100	0.06	1.6	4,000	900	0.05	1.2	3,200	550	0.03	1.2
	0.2	15	3	7,000	1,700	0.08	1.6	5,500	1,300	0.06	1.2	4,400	900	0.036	1.2
		20	4	6,000	1,400	0.07	1.6	5,000	1,100	0.05	1.2	4,000	750	0.03	1.2
		25	5	4,800	1,100	0.06	1.6	4,000	900	0.05	1.2	3,200	550	0.03	1.2
	0.3	15	3	7,000	1,700	0.08	1.6	5,500	1,300	0.06	1.2	4,400	900	0.036	1.2
		20	4	6,000	1,400	0.07	1.6	5,000	1,100	0.05	1.2	4,000	750	0.03	1.2
		25	5	4,800	1,100	0.06	1.6	4,000	900	0.05	1.2	3,200	550	0.03	1.2
	0.5	15	3	7,000	1,700	0.08	1.6	5,500	1,300	0.06	1.2	4,400	900	0.036	1.2
		20	4	6,000	1,400	0.07	1.6	5,000	1,100	0.05	1.2	4,000	750	0.03	1.2
		25	5	4,800	1,100	0.06	1.6	4,000	900	0.05	1.2	3,200	550	0.03	1.2
6	0.1	12	2	5,500	1,800	0.08	2	4,500	1,400	0.06	1.5	3,600	1,000	0.036	1.5
		18	3	5,000	1,500	0.08	2	4,000	1,100	0.06	1.5	3,000	800	0.036	1.5
		24	4	4,500	1,300	0.07	2	3,500	900	0.05	1.5	2,700	700	0.036	1.5
		30	5	3,000	800	0.07	2	3,000	650	0.05	1.5	2,300	500	0.03	1.5
	0.2	12	2	5,500	1,800	0.08	2	4,500	1,400	0.06	1.5	3,600	1,000	0.036	1.5
		18	3	5,000	1,500	0.08	2	4,000	1,100	0.06	1.5	3,000	800	0.036	1.5
		24	4	4,500	1,300	0.07	2	3,500	900	0.05	1.5	2,700	700	0.036	1.5
		30	5	3,000	800	0.07	2	3,000	650	0.05	1.5	2,300	500	0.03	1.5
	0.3	12	2	5,500	1,800	0.08	2	4,500	1,400	0.06	1.5	3,600	1,000	0.036	1.5
		18	3	5,000	1,500	0.08	2	4,000	1,100	0.06	1.5	3,000	800	0.036	1.5
		24	4	4,500	1,300	0.07	2	3,500	900	0.05	1.5	2,700	700	0.036	1.5
		30	5	3,000	800	0.07	2	3,000	650	0.05	1.5	2,300	500	0.03	1.5
	0.5	12	2	5,500	1,800	0.08	2	4,500	1,400	0.06	1.5	3,600	1,000	0.036	1.5
		18	3	5,000	1,500	0.08	2	4,000	1,100	0.06	1.5	3,000	800	0.036	1.5
		24	4	4,500	1,300	0.07	2	3,500	900	0.05	1.5	2,700	700	0.036	1.5
		30	5	3,000	800	0.07	2	3,000	650	0.05	1.5	2,300	500	0.03	1.5
1	12	2	5,500	1,800	0.08	2	4,500	1,400	0.06	1.5	3,600	1,000	0.036	1.5	
	18	3	5,000	1,500	0.08	2	4,000	1,100	0.06	1.5	3,000	800	0.036	1.5	
	24	4	4,500	1,300	0.07	2	3,500	900	0.05	1.5	2,700	700	0.036	1.5	
	30	5	3,000	800	0.07	2	3,000	650	0.05	1.5	2,300	500	0.03	1.5	

Note
Notes

- *1 Profondità di taglio: ap=Profondità di taglio assiale / ae=profondità di taglio radiale
- *2 Regolare le condizioni di taglio in base alla rigidità della macchina e allo staffaggio del pezzo
- *3 In caso di vibrazioni, ecc., regolare le condizioni di taglio se necessario
- *4 Nelle zone in cui il carico di taglio è elevato (es. gli angoli) prestare attenzione alle condizioni di taglio e dei percorsi utensile.
- *5 Raccomandiamo l'approccio in rampa o elicoidale, per entrare nel pezzo in maniera assiale.
- *6 Per Contornatura consigliamo la fresatura bidirezionale e la riduzione di avanzamento e profondità di taglio assiale (ap) del 50%.
- *7 Aggiustare il numero di giri e l'avanzamento della stessa proporzione
- *8 Si consiglia l'utilizzo di mandrini a calettamento a caldo. Se si utilizza la pinza o altro, attenersi alla lunghezza di presa minima.
- *9 Si raccomanda l'utilizzo della lubrificazione minima
- *1 Depth of Cut : ap = Axial Depth of Cut / ae = Radial Depth of Cut.
- *2 Adjust milling condition according to machine rigidity and clamp condition of work material.
- *3 In case of chattering etc., please adjust cutting conditions if necessary.
- *4 At point where cutting load is high such as at corners, pay attention to setting cutting conditions and tool paths particularly.
- *5 Recommend to apply helical or ramping for approaching into axial direction.
- *6 For slotting, recommend reciprocating milling by adjusting feed & ap in below 50% of recommended milling condition.
- *7 Adjust both spindle speed and feed at the same rate.
- *8 A shrink fit type is recommended for tool holder. When using collet type or others, strictly adhere to minimum gripping length.
- *9 We recommend using oil mist coolant.

Scaricata
Long Neck



Rivestita
Coating

Toriche
Corner
Radius

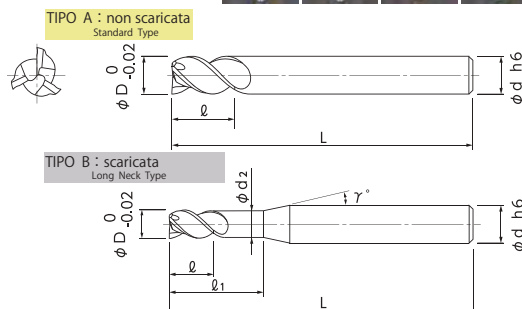
H ~65 Temprato
HRC Hardened Steel

H ~70 Temprato
HRC Hardened Steel

Rivestimento
MUGEN PREMIUM Plus
Regular Line
MUGEN PREMIUM Plus

Per lavorazioni su leghe di alluminio. Lavorazione continua dal plunging alla cava da pieno senza necessità di preforo

For machining on aluminium alloy. Continuous machining from plunging without guide-hole and stepping to slotting



- Le frese serie AL realizzano fresature efficienti e stabili.
- Capacità forante incrementata.
- Elevate prestazioni grazie all'ottima evacuazione del truciolo.
- AL-series realized a stable and high efficient machining.
- Improved plunging capacity!
- High performance with better chip disposal.

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(ℓ_1) Lungh. scarico Under neck Length	(ℓ) Lungh. tagliente Length of Cut	Tipo Type	(d_2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	PROMO €
01-00636-00100	1	3	1.5	B	0.95	12°	4	45	37,00
01-00636-00102	1	5	1.5		0.95	12°	4	60	39,40
01-00636-00150	1.5	4.5	2.3		1.45	12°	4	45	37,00
01-00636-00200	2	6	3		1.94	12°	4	45	37,00
01-00636-00202	2	10	3		1.94	12°	4	60	39,40
01-00636-00250	2.5	7.5	3.8		2.4	12°	4	45	37,00
01-00636-00300	3	9	4.5		2.85	12°	6	55	51,50
01-00636-00302	3	15	4.5		2.85	12°	6	60	59,40
01-00636-00350	3.5	10.5	5.3		3.35	12°	6	55	65,40
01-00636-00400	4	12	6		3.8	12°	6	55	52,80
01-00636-00402	4	20	6		3.8	12°	6	70	66,70
01-00636-00450	4.5	13.5	6.8		4.3	12°	6	55	66,70
01-00636-00500	5	15	7.5		4.8	12°	6	55	58,10
01-00636-00502	5	25	7.5		4.8	12°	6	80	72,60
01-00636-00550	5.5	16.5	8.3		5.3	12°	6	55	72,00
01-00636-00603	6	—	9	A	—	—	6	110	91,10
01-00636-00600	6	18	9	B	5.8	—	6	60	60,10
01-00636-00602	6	30	9		5.8	—	6	80	76,60
01-00636-00700	7	21	10.5	A	6.8	12°	8	70	104,30
01-00636-00803	8	—	12		—	—	8	120	155,10
01-00636-00800	8	24	12	B	7.8	—	8	70	103,70
01-00636-00802	8	40	12		7.8	—	8	90	134,00
01-00636-00900	9	27	13.5	A	8.8	12°	10	75	130,10
01-00636-01003	10	—	15		—	—	10	130	226,40
01-00636-01000	10	30	15	B	9.8	—	10	75	130,10
01-00636-01002	10	50	15		9.8	—	10	100	170,30
01-00636-01100	11	33	16.5	A	10.8	12°	12	80	190,10
01-00636-01203	12	—	18		—	—	12	150	292,40
01-00636-01200	12	36	18	B	11.8	—	12	80	196,10
01-00636-01202	12	60	18		11.8	—	12	110	251,50

Attenzione
How to Order

Quando ordinate, indicate ALZ345 (D) [x (ℓ)]. Indicare (L) per tipo A
When you order, indicate ALZ345 (D) [x (ℓ_1)]. Indicate (L) for Type A.

※(γ) è un valore di riferimento
※(γ) is reference value.

Lega di alluminio
Aluminium Alloy **N**
 Rame
Copper **N**
 Resina
Resin **O**

Fresatura
Alluminio
Aluminium Milling

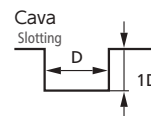
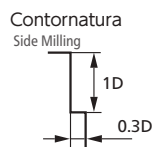
Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material		Alluminio Aluminium A1070				Leghe di alluminio Aluminium Alloy A2017 · A5052 · A7075				Fusione di alluminio Aluminium Cast AC8C			
Velocità di taglio Cutting Speed		310m/min				350m/min				230m/min			
Dia. Dia.	Lungh. scarico Under neck Length	N. di giri Spindle Speed	Avanzamento Feed			N. di giri Spindle Speed	Avanzamento Feed			N. di giri Spindle Speed	Avanzamento Feed		
			Plung. Plunging	Cava Slotting	Cont. Side Milling		Plung. Plunging	Cava Slotting	Cont. Side Milling		Plung. Plunging	Cava Slotting	Cont. Side Milling
		g/min	mm/min			g/min	mm/min			g/min	mm/min		
1	3	20,000	200	600	1,100	20,000	200	600	1,100	20,000	150	600	1,100
	5	16,000	160	500	900	16,000	160	500	900	16,000	120	500	900
2	6	20,000	300	900	1,500	20,000	300	900	1,500	20,000	250	900	1,500
	10	16,000	240	800	1,200	16,000	240	800	1,200	16,000	200	800	1,200
3	9	20,000	300	1,200	2,000	20,000	300	1,400	2,200	20,000	250	1,200	2,200
	15	16,000	240	1,000	1,600	16,000	240	1,200	1,800	16,000	200	1,000	1,800
4	12	20,000	300	1,400	2,200	20,000	400	1,800	2,500	18,300	200	1,400	2,300
	20	16,000	240	1,200	1,800	16,000	320	1,500	2,000	14,600	160	1,200	1,900
5	15	19,700	300	1,500	2,500	20,000	400	2,200	3,100	14,600	150	1,400	2,100
	25	15,700	240	1,200	2,000	16,000	320	1,800	2,500	11,700	120	1,200	1,700
6	–	16,500	300	1,600	2,500	18,600	400	2,500	3,500	12,200	150	1,400	2,100
	18	16,500	300	1,600	2,500	18,600	400	2,500	3,500	12,200	150	1,400	2,100
	30	13,200	240	1,300	2,000	14,800	320	2,000	2,800	9,700	120	1,200	1,700
7	21	14,100	200	1,600	2,500	15,900	400	2,500	3,500	10,500	140	1,400	2,100
8	–	12,300	200	1,700	2,500	13,900	400	2,600	3,500	9,200	120	1,400	2,200
	24	12,300	200	1,700	2,500	13,900	400	2,600	3,500	9,200	120	1,400	2,200
	40	9,800	160	1,400	2,000	11,100	320	2,100	2,800	7,300	100	1,200	1,800
9	27	11,000	200	1,700	2,500	12,400	300	2,600	3,500	8,100	120	1,400	2,200
10	–	9,900	100	1,700	2,500	11,100	300	2,600	3,800	7,300	80	1,400	2,200
	30	9,900	100	1,700	2,500	11,100	300	2,600	3,800	7,300	80	1,400	2,200
	50	7,900	80	1,400	2,000	8,800	240	2,100	3,000	5,800	70	1,200	1,800
11	33	9,000	100	1,800	2,600	10,100	300	2,600	4,100	6,700	80	1,400	2,200
12	–	8,200	100	1,900	2,700	9,300	300	2,600	4,100	6,100	60	1,500	2,200
	36	8,200	100	1,900	2,700	9,300	300	2,600	4,100	6,100	60	1,500	2,200
	60	6,500	80	1,500	2,200	7,400	240	2,100	3,200	4,800	50	1,200	1,800

Prof. di taglio
Depth of Cut

(D:Diametro Dia.)



Note
Notes

- ※1 Regolare con la stessa proporzione giri ed avanzamento.
(Quando utilizzate velocità pari o superiori a 20.000 giri, stessa proporzione)
- ※2 TIPO A: Le condizioni di fresatura consigliate per il tipo standard sono a sporgenza 3xD. Regolare la velocità del mandrino e la velocità di avanzamento all'80% per sporgenza 5xD e 50% per 7xD.
- ※3 Usare un mandrino rigido e preciso.
- ※4 Regolare le condizioni di taglio quando si producono vibrazioni o suoni anomali; questo dipende dalla rigidità della macchina, del mandrino e dello staffaggio.
- ※5 Quando si ha la tendenza all'intasamento del truciolo nella foratura, si consiglia la lavorazione di fresatura a step.
- ※6 Si consiglia l'utilizzo di lubrificante.
- ※1 Adjust both spindle speed and feed at the same rate.
(When using spindle speed 20,000 or more, the same adjustment is required.)
- ※2 TYPE A: Recommended milling conditions for standard type are at overhang 3D. Adjust spindle speed and feed rate at 80% for overhang 5D, and 50% for 7D.
- ※3 Use a rigid and precise machine and chuck holder.
- ※4 Adjust milling conditions when vibration and abnormal sounds occur by the conditions of the machine, chuck holder and work clamping.
- ※5 When tending to have chip packing during plunging, step milling is recommended.
- ※6 Water-soluble fluid is recommended.

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Fresatura
Alluminio
Aluminium Milling

**DHR237**Misura
Size $\varnothing 0.1 \sim \varnothing 6$ **DLC**

Frese piane scaricate per elettrodi di rame

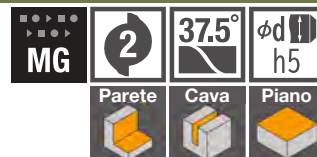
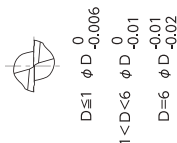
Long Neck Square End Mill for Copper Electrode

Totale 74 misure

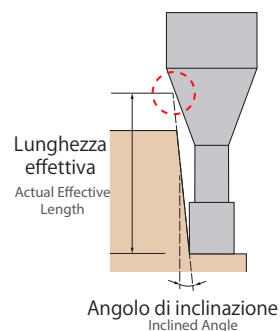
Total 74 sizes

Fresa piana scaricata specifica per la lavorazione di leghe di rame.
Il tagliente affilato produce bave ridotte e un'elevata qualità della superficie

Long neck square end mill specialized for machining copper alloy
Sharpe cutting edge makes less burr and high quality surface



- Frese piane scaricate specifiche per lavorazione di leghe di rame
- L'angolo d'elica di 37,5° consente di ottenere finiture accurate ad elevata qualità superficiale e di prevenire la rigatura delle superfici.
- La capacità di taglio netta e il rivestimento DLC consentono di ottenere un'elevata qualità della lavorazione e una lunga durata utensile.
- E' anche possibile la lavorazione degli elettrodi in rame tungsteno
- Long neck square end mill specialized for machining copper electrode.
- Helix angle 37.5 degrees to achieve both sharpness and finished surface quality that prevents scratches on cutting surface.
- High quality and stable milling performance with long tool life by optimized design and DLC COATING.
- Machining copper tungsten electrodes is also effective.



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
07-00100-01003	0.1	0.3	0.2	0.085	12°	4	45	0.34	0.36	0.38	0.40	0.44	106,00
07-00100-01005		0.5	0.2	0.085	12°	4	45	0.55	0.58	0.61	0.64	0.71	111,00
07-00100-01007		0.75	0.2	0.085	12°	4	45	0.81	0.85	0.89	0.93	1.04	117,00
07-00100-01010		1	0.2	0.085	12°	4	45	1.07	1.12	1.18	1.23	1.37	123,00
07-00100-02005	0.2	0.5	0.4	0.18	12°	4	45	0.57	0.59	0.62	0.65	0.72	79,00
07-00100-02010		1	0.4	0.18	12°	4	45	1.09	1.14	1.19	1.25	1.38	84,00
07-00100-02015		1.5	0.4	0.18	12°	4	45	1.61	1.68	1.76	1.85	2.05	88,00
07-00100-02020		2	0.4	0.18	12°	4	45	2.13	2.23	2.33	2.44	2.71	92,00
07-00100-03010	0.3	1	0.6	0.28	12°	4	45	1.09	1.14	1.19	1.25	1.38	84,00
07-00100-03015		1.5	0.6	0.28	12°	4	45	1.61	1.68	1.76	1.85	2.05	88,00
07-00100-03020		2	0.6	0.28	12°	4	45	2.13	2.23	2.33	2.44	2.71	92,00
07-00100-03030		3	0.6	0.28	12°	4	45	3.17	3.31	3.47	3.64	4.04	97,00
07-00100-04010	0.4	1	0.8	0.37	12°	4	45	1.11	1.16	1.22	1.28	1.42	73,00
07-00100-04020		2	0.8	0.37	12°	4	45	2.15	2.25	2.36	2.47	2.74	74,00
07-00100-04030		3	0.8	0.37	12°	4	45	3.20	3.34	3.50	3.67	4.07	76,00
07-00100-04040		4	0.8	0.37	12°	4	45	4.24	4.43	4.64	4.87	5.40	78,00
07-00100-05015	0.5	1.5	1	0.46	12°	4	45	1.66	1.73	1.81	1.90	2.11	71,00
07-00100-05020		2	1	0.46	12°	4	45	2.18	2.28	2.38	2.50	2.77	73,00
07-00100-05030		3	1	0.46	12°	4	45	3.22	3.37	3.52	3.70	4.10	74,00
07-00100-05040		4	1	0.46	12°	4	45	4.26	4.46	4.66	4.89	5.43	76,00
07-00100-05060	0.6	6	1	0.46	12°	4	45	6.35	6.63	6.95	7.29	8.08	79,00
07-00100-06020		2	1.2	0.56	12°	4	45	2.18	2.28	2.38	2.50	2.77	79,00
07-00100-06030		3	1.2	0.56	12°	4	45	3.22	3.37	3.52	3.70	4.10	80,00
07-00100-06040		4	1.2	0.56	12°	4	45	4.26	4.46	4.66	4.89	5.43	82,00
07-00100-06060		6	1.2	0.56	12°	4	45	6.35	6.63	6.95	7.29	8.08	84,00

Attenzione
How to Order

Quando ordinate, indicate DHR237 (D)×(L1).
When you order, indicate DHR237 (D)×(L1).

※(γ) è un valore di riferimento.
※(γ) is reference value.

○ Lega di alluminio
Aluminium Alloy

● Rame
Copper

○ Resina
Resin

Fresatura
Elettrodi Rame
Copper Electrode
Milling



Frese piane scaricate per elettrodi di rame

Long Neck Square End Mill for Copper Electrode

Unità [misura: mm]

Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(L ₁) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d ₂) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
								30°	1°	1°30'	2°	3°	
07-00100-08030	0.8	3	1.6	0.76	12°	4	45	3.22	3.37	3.52	3.70	4.10	80,00
07-00100-08040		4	1.6	0.76	12°	4	45	4.26	4.46	4.66	4.89	5.43	82,00
07-00100-08060		6	1.6	0.76	12°	4	45	6.35	6.63	6.95	7.29	8.08	84,00
07-00100-08080		8	1.6	0.76	12°	4	50	8.44	8.81	9.23	9.68	10.74	86,00
07-00100-10030	1	3	2	0.95	12°	4	45	3.25	3.39	3.55	3.73	4.13	76,00
07-00100-10040		4	2	0.95	12°	4	45	4.29	4.48	4.69	4.92	5.46	77,00
07-00100-10050		5	2	0.95	12°	4	45	5.33	5.57	5.83	6.12	6.79	79,00
07-00100-10060		6	2	0.95	12°	4	45	6.37	6.66	6.97	7.32	8.11	80,00
07-00100-10080		8	2	0.95	12°	4	50	8.46	8.84	9.25	9.71	10.77	82,00
07-00100-10100		10	2	0.95	12°	4	50	10.55	11.02	11.53	12.10	13.42	84,00
07-00100-10120		12	2	0.95	12°	4	50	12.63	13.20	13.82	14.49	16.08	84,00
07-00100-15040	1.5	4	3	1.45	12°	4	45	4.29	4.48	4.69	4.92	5.46	79,00
07-00100-15060		6	3	1.45	12°	4	50	6.37	6.66	6.97	7.32	8.11	79,00
07-00100-15080		8	3	1.45	12°	4	50	8.46	8.84	9.25	9.71	10.77	80,00
07-00100-15100		10	3	1.45	12°	4	50	10.55	11.02	11.53	12.10	13.42	83,00
07-00100-15120		12	3	1.45	12°	4	50	12.63	13.20	13.82	14.49	16.08	83,00
07-00100-15160		16	3	1.45	12°	4	60	16.80	17.55	18.38	19.28	21.39	85,00
07-00100-20060	2	6	4	1.94	12°	4	50	6.40	6.69	7.00	7.34	8.15	77,00
07-00100-20080		8	4	1.94	12°	4	50	8.48	8.86	9.28	9.74	10.80	77,00
07-00100-20100		10	4	1.94	12°	4	50	10.57	11.04	11.56	12.13	13.45	78,00
07-00100-20120		12	4	1.94	12°	4	50	12.66	13.22	13.84	14.52	16.11	78,00
07-00100-20140		14	4	1.94	12°	4	50	14.74	15.40	16.12	16.92	18.76	78,00
07-00100-20160		16	4	1.94	12°	4	60	16.83	17.58	18.40	19.31	Free	79,00
07-00100-20200		20	4	1.94	12°	4	60	21.00	21.94	22.97	24.10	Free	79,00
07-00100-25060	2.5	6	5	2.4	12°	4	45	6.50	6.79	7.11	7.46	8.27	79,00
07-00100-25080		8	5	2.4	12°	4	50	8.58	8.97	9.39	9.85	10.93	79,00
07-00100-25100		10	5	2.4	12°	4	50	10.67	11.15	11.67	12.24	13.58	80,00
07-00100-25120		12	5	2.4	12°	4	50	12.75	13.32	13.95	14.64	Free	84,00
07-00100-25140		14	5	2.4	12°	4	50	14.84	15.50	16.23	17.03	Free	84,00
07-00100-25160		16	5	2.4	12°	4	50	16.93	17.68	18.51	19.42	Free	85,00
07-00100-25200		20	5	2.4	12°	4	60	21.10	22.04	23.07	Free	Free	90,00
07-00100-30080	3	8	6	2.85	12°	6	50	8.71	9.10	9.52	9.99	11.08	87,70
07-00100-30100		10	6	2.85	12°	6	50	10.79	11.27	11.80	12.38	13.74	90,00
07-00100-30150		15	6	2.85	12°	6	60	16.01	16.72	17.50	18.37	20.37	93,30
07-00100-30200		20	6	2.85	12°	6	60	21.22	22.17	23.21	24.35	27.01	97,70
07-00100-30250		25	6	2.85	12°	6	70	26.43	27.62	28.91	30.33	Free	106,60
07-00100-40100	4	10	8	3.8	12°	6	50	10.91	11.40	11.94	12.52	13.89	82,20
07-00100-40150		15	8	3.8	12°	6	60	16.13	16.85	17.64	18.51	Free	83,30
07-00100-40200		20	8	3.8	12°	6	60	21.34	22.30	23.34	24.49	Free	88,80
07-00100-40250		25	8	3.8	12°	6	70	26.56	27.74	29.04	Free	Free	98,80
07-00100-40300		30	8	3.8	12°	6	70	31.77	33.19	34.75	Free	Free	103,30
07-00100-50150	5	15	10	4.8	12°	6	50	16.13	16.85	17.64	Free	Free	83,30
07-00100-50200		20	10	4.8	12°	6	60	21.34	22.30	Free	Free	Free	88,80
07-00100-50250		25	10	4.8	12°	6	60	26.56	27.74	Free	Free	Free	98,80
07-00100-50300		30	10	4.8	12°	6	70	31.77	Free	Free	Free	Free	103,30
07-00100-60150	6	15	12	5.8	–	6	50	Free	Free	Free	Free	Free	88,80
07-00100-60200		20	12	5.8	–	6	60	Free	Free	Free	Free	Free	102,20
07-00100-60300		30	12	5.8	–	6	70	Free	Free	Free	Free	Free	111,00
07-00100-60500		50	12	5.8	–	6	90	Free	Free	Free	Free	Free	166,50

N Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinFresatura
Elettrodi Rame
Copper Electrode
Milling

Materiale Work Material			Rame Copper							Rame Tungsteno (W70%-Cu30%) Copper Tungsten (W70%-Cu30%)						
Dia Dia.	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Contornatura Side Milling				Cava Slotting			Contornatura Side Milling				Cava Slotting		
			N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm
0.1	0.3	3	40,000	180	0.1	0.006	40,000	170	0.01	30,000	120	0.05	0.004	30,000	110	0.006
	0.5	5	40,000	140	0.1	0.004	40,000	130	0.007	30,000	80	0.05	0.003	30,000	70	0.00
	0.75	7.5	40,000	100	0.1	0.003	40,000	90	0.005	30,000	50	0.05	0.003	30,000	45	0.003
	1	10	40,000	80	0.1	0.003	40,000	70	0.003	30,000	40	0.05	0.003	30,000	35	0.002
0.2	0.5	2.5	40,000	400	0.2	0.008	40,000	380	0.02	30,000	260	0.1	0.006	30,000	250	0.01
	1	5	40,000	350	0.2	0.006	40,000	320	0.015	30,000	220	0.1	0.004	30,000	200	0.008
	1.5	7.5	40,000	300	0.2	0.004	40,000	250	0.01	30,000	200	0.1	0.003	30,000	130	0.005
	2	10	40,000	250	0.2	0.003	40,000	180	0.005	30,000	150	0.1	0.003	30,000	90	0.003
0.3	1	3.3	40,000	500	0.3	0.01	40,000	450	0.035	30,000	350	0.15	0.008	30,000	280	0.014
	1.5	5	40,000	450	0.3	0.008	40,000	400	0.025	30,000	300	0.15	0.006	30,000	250	0.012
	2	6.7	40,000	380	0.3	0.006	40,000	350	0.017	30,000	250	0.15	0.004	30,000	220	0.008
	3	10	35,000	300	0.3	0.004	35,000	250	0.01	30,000	200	0.15	0.003	30,000	150	0.005
0.4	1	2.5	40,000	700	0.4	0.02	40,000	650	0.045	30,000	500	0.2	0.014	30,000	450	0.025
	2	5	40,000	600	0.4	0.015	40,000	550	0.03	30,000	450	0.2	0.01	30,000	400	0.02
	3	7.5	35,000	500	0.4	0.01	35,000	450	0.02	26,000	350	0.2	0.007	26,000	300	0.015
	4	10	28,000	350	0.4	0.006	28,000	300	0.015	24,000	220	0.2	0.004	22,000	200	0.01
0.5	1.5	3	40,000	900	0.5	0.025	40,000	800	0.07	30,000	650	0.3	0.02	30,000	550	0.05
	2	4	38,000	800	0.5	0.02	35,000	700	0.055	28,000	550	0.3	0.016	26,000	450	0.04
	3	6	35,000	700	0.5	0.015	32,000	600	0.04	26,000	500	0.3	0.012	25,000	400	0.03
	4	8	28,000	550	0.5	0.008	26,000	500	0.03	24,000	400	0.3	0.005	22,000	300	0.02
	6	12	18,000	350	0.5	0.005	18,000	300	0.015	15,000	220	0.3	0.003	15,000	180	0.01
0.6	2	3.3	38,000	1,000	0.6	0.025	35,000	850	0.1	28,000	700	0.4	0.018	26,000	650	0.08
	3	5	32,000	800	0.6	0.02	30,000	700	0.08	24,000	550	0.4	0.014	22,000	500	0.06
	4	6.7	28,000	700	0.6	0.015	26,000	600	0.06	22,000	500	0.4	0.012	20,000	400	0.04
	6	10	20,000	450	0.6	0.01	20,000	400	0.03	18,000	350	0.4	0.008	16,000	300	0.02
0.8	3	3.8	30,000	1,300	0.8	0.04	28,000	1,200	0.15	24,000	1,000	0.6	0.03	22,000	900	0.1
	4	5	26,000	1,100	0.8	0.03	24,000	1,000	0.12	22,000	850	0.6	0.02	18,000	650	0.08
	6	7.5	22,000	900	0.8	0.02	18,000	650	0.08	16,000	600	0.6	0.014	14,000	500	0.06
	8	10	16,000	600	0.8	0.01	16,000	500	0.05	14,000	450	0.6	0.01	13,000	350	0.03
1	3	3	24,000	2,200	1	0.06	24,000	2,000	0.22	20,000	1,600	0.8	0.04	20,000	1,400	0.16
	4	4	24,000	2,000	1	0.05	22,000	1,800	0.2	20,000	1,400	0.8	0.035	18,000	1,100	0.14
	5	5	22,000	1,700	1	0.04	20,000	1,500	0.16	18,000	1,200	0.8	0.028	16,000	950	0.12
	6	6	20,000	1,500	1	0.03	18,000	1,200	0.14	16,000	1,000	0.8	0.02	14,000	800	0.1
	8	8	16,000	1,200	1	0.025	15,000	1,000	0.1	14,000	800	0.8	0.018	12,000	650	0.08
	10	10	14,000	1,000	1	0.02	12,000	800	0.07	12,000	650	0.8	0.014	11,000	550	0.05
	12	12	10,000	700	1	0.01	10,000	650	0.05	9,000	450	0.8	0.007	8,000	400	0.035
1.5	4	2.7	20,000	2,500	1.5	0.08	18,000	2,000	0.35	17,000	1,850	1	0.06	15,000	1,300	0.22
	6	4	18,000	2,200	1.5	0.08	16,000	1,800	0.3	15,000	1,600	1	0.05	14,000	1,200	0.2
	8	5.3	16,000	1,700	1.5	0.06	14,000	1,400	0.25	13,000	1,200	1	0.04	12,000	950	0.18
	10	6.7	14,000	1,450	1.5	0.05	12,000	1,150	0.2	11,000	950	1	0.035	10,000	750	0.15
	12	8	12,000	1,200	1.5	0.04	11,000	1,000	0.15	10,000	800	1	0.03	9,000	650	0.1
	16	10.7	10,000	900	1.5	0.02	10,000	800	0.08	8,000	600	1	0.015	7,000	500	0.06



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material			Rame Copper							Rame Tungsteno (W70%-Cu30%) Copper Tungsten (W70%-Cu30%)							
Dia Dia.	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Contornatura Side Milling				Cava Slotting			Contornatura Side Milling				Cava Slotting			
			N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
			g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	
2	6	3	18,000	2,500	2	0.1	16,000	2,200	0.45	14,000	1,800	1.5	0.08	12,000	1,500	0.3	
	8	4	16,000	2,200	2	0.09	14,000	1,900	0.4	12,000	1,500	1.5	0.07	12,000	1,400	0.28	
	10	5	14,000	1,900	2	0.08	12,000	1,600	0.35	10,000	1,200	1.5	0.06	10,000	1,000	0.24	
	12	6	12,000	1,600	2	0.07	11,000	1,400	0.28	10,000	1,100	1.5	0.05	9,000	900	0.2	
	14	7	11,000	1,400	2	0.06	10,000	1,200	0.24	9,000	950	1.5	0.04	8,000	800	0.16	
	16	8	10,000	1,200	2	0.045	9,000	1,000	0.18	8,000	800	1.5	0.03	7,000	650	0.12	
	20	10	9,000	1,000	2	0.03	8,000	850	0.12	7,000	700	1.5	0.02	6,000	550	0.08	
2.5	6	2.4	17,000	2,450	2.5	0.13	15,000	2,100	0.55	13,000	1,800	2	0.1	12,000	1,600	0.4	
	8	3.2	16,000	2,300	2.5	0.12	14,000	1,950	0.5	12,000	1,650	2	0.09	11,000	1,450	0.35	
	10	4	15,000	2,100	2.5	0.1	13,000	1,700	0.4	11,000	1,500	2	0.07	10,000	1,300	0.3	
	12	4.8	14,000	1,900	2.5	0.08	12,000	1,550	0.35	10,000	1,300	2	0.065	9,000	1,100	0.25	
	14	5.6	13,000	1,700	2.5	0.07	11,000	1,350	0.3	10,000	1250	2	0.06	9,000	1050	0.2	
	16	6.4	11,000	1,400	2.5	0.06	10,000	1,200	0.25	9,000	1100	2	0.05	8,000	850	0.15	
	20	8	10,000	1,250	2.5	0.05	9,000	1000	0.2	8,000	950	2	0.04	7,000	700	0.12	
3	8	2.7	16,000	2,400	3	0.15	14,000	2,000	0.75	12,000	1,800	2.4	0.11	11,000	1500	0.55	
	10	3.3	16,000	2,400	3	0.12	14,000	2,000	0.7	12,000	1,800	2.4	0.08	11,000	1,500	0.5	
	15	5	14,000	2,100	3	0.1	12,000	1,600	0.6	11,000	1,600	2.4	0.07	9,000	1,100	0.4	
	20	6.7	11,000	1,500	3	0.07	10,000	1,200	0.4	9,000	1,100	2.4	0.05	8,000	900	0.3	
	25	8.3	10,000	1,300	3	0.05	9,000	1,000	0.2	8,000	900	2.4	0.03	7,000	700	0.15	
4	10	2.5	12,000	2,400	4	0.2	10,000	2,000	1	9,000	1,600	3	0.15	8,000	1,400	0.8	
	15	3.8	12,000	2,400	4	0.2	10,000	2,000	0.9	9,000	1,600	3	0.15	8,000	1,400	0.7	
	20	5	10,000	2,000	4	0.15	8,000	1,600	0.7	8,000	1,400	3	0.1	6,000	1,000	0.5	
	25	6.3	9,000	1,700	4	0.1	8,000	1,500	0.5	7,000	1,200	3	0.07	6,000	1,000	0.3	
	30	7.5	8,000	1,500	4	0.07	7,000	1,300	0.3	6,000	1,000	3	0.05	5,000	800	0.2	
5	15	3	9,500	2,600	5	0.25	8,500	2,200	1.1	7,000	1,800	3.5	0.18	6,000	1,400	0.8	
	20	4	8,000	2,150	5	0.2	7,000	1,750	1	6,500	1,650	3.5	0.15	5,500	1,150	0.6	
	25	5	7,000	1,800	5	0.15	6,000	1,400	0.9	5,800	1,300	3.5	0.12	4,800	1,000	0.5	
	30	6	6,000	1,500	5	0.1	5,000	1,100	0.7	5,000	1,000	3.5	0.1	4,000	830	0.4	
6	15	2.5	8,000	2,750	6	0.3	7,000	2,350	1.2	6,000	1,950	4	0.2	5,000	1400	0.9	
	20	3.3	7,000	2,400	6	0.3	6,000	2,000	1.2	5,000	1,600	4	0.2	4,500	1,200	0.8	
	30	5	5,000	1,600	6	0.2	4,000	1,200	1	4,000	1,100	4	0.15	3,500	900	0.6	
	50	8.3	3,500	800	6	0.1	3,000	650	0.4	3,000	600	4	0.07	3,000	500	0.25	
Note Notes			※1 I parametri di taglio consigliati sono solo di riferimento e devono essere regolati secondo il tipo di macchina ed il pezzo da lavorare. ※2 Profondità di taglio: ap=Profondità di taglio assiale / ae=Profondità di taglio radiale ※3 Ridurre la velocità e l'avanzamento nello stesso rapporto per eliminare vibrazioni o in caso di limitato numero di giri della macchina ※4 Si consiglia l'uso di lubrificante refrigerante ※1 Recommend to use the milling condition as just reference. Adjust milling conditions according to machining shape and machine status. ※2 Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut. ※3 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine. ※4 Water-insoluble fluid is recommended.														

N Lega di alluminio
Aluminum AlloyN Rame
CopperO Resina
Resin

Frese sferiche scaricate per elettrodi in rame

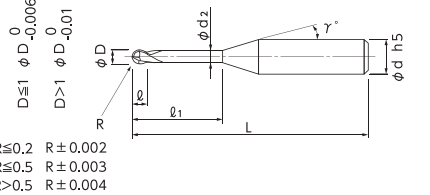
Long Neck Ball End Mill for Copper Electrode

Totale 94 misure

Total 94 sizes

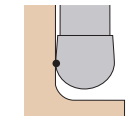
Fresa sferica scaricata specifica per la lavorazione di leghe di rame.
Il tagliente affilato produce bave ridotte e un'elevata qualità della superficie

Long neck ball end mill specialized for machining copper alloy
Sharpe cutting edge makes less burr and high quality surface

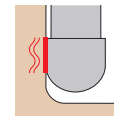


※ La tolleranza del raggio R della fresa DRB230 è riferita alla metà del valore reale del diametro
R accuracy of DRB230 is based on a half value.

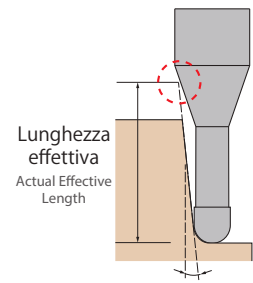
- Frese sferiche scaricate specifiche per lavorazione di leghe di rame
- La capacità di taglio netta e il rivestimento DLC consentono di ottenere un'elevata qualità della lavorazione e una lunga durata utensile
- E' anche possibile la lavorazione degli elettrodi in rame tungsteno
- Long neck ball end mill specialized for machining copper electrode.
- Sharp edge shearing ability and DLC coating realized high quality and stable a long life machining.
- Machining copper tungsten electrodes is also effective.



Elimina le vibrazioni grazie a un solo punto di contatto
Suppress chattering by point milling



Fresa convenzionale
General End mill



Lunghezza effettiva
Actual Effective Length

Angolo di inclinazione
Inclined Angle

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(ℓ ₁) Lungh. scarico Under Neck Length	(ℓ) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d ₂) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
07-00530-00503	R0.05	0.3	0.07	0.1	0.085	12°	4	45	0.34	0.36	0.37	0.39	0.42	116,00
07-00530-00505		0.5	0.07	0.1	0.085	12°	4	45	0.55	0.57	0.60	0.63	0.69	121,00
07-00530-00703	R0.075	0.3	0.1	0.15	0.13	12°	4	45	0.35	0.37	0.38	0.40	0.43	117,00
07-00530-00705		0.5	0.1	0.15	0.13	12°	4	45	0.56	0.58	0.61	0.64	0.70	120,00
07-00530-00710	R0.1	1	0.1	0.15	0.13	12°	4	45	1.08	1.13	1.18	1.23	1.36	125,00
07-00530-01005		0.5	0.15	0.2	0.18	12°	4	45	0.56	0.58	0.61	0.63	0.69	93,00
07-00530-01007	R0.1	0.75	0.15	0.2	0.18	12°	4	45	0.82	0.85	0.89	0.93	1.02	95,00
07-00530-01010		1	0.15	0.2	0.18	12°	4	45	1.08	1.13	1.18	1.23	1.35	97,00
07-00530-01015	R0.15	1.5	0.15	0.2	0.18	12°	4	45	1.60	1.67	1.75	1.83	2.02	101,00
07-00530-01020		2	0.15	0.2	0.18	12°	4	45	2.13	2.22	2.32	2.43	2.68	105,00
07-00530-01505	R0.15	0.5	0.2	0.3	0.28	12°	4	45	0.56	0.58	0.60	0.62	0.67	93,00
07-00530-01510		1	0.2	0.3	0.28	12°	4	45	1.08	1.12	1.17	1.22	1.34	97,00
07-00530-01515	R0.2	1.5	0.2	0.3	0.28	12°	4	45	1.60	1.67	1.74	1.82	2.00	101,00
07-00530-01520		2	0.2	0.3	0.28	12°	4	45	2.12	2.21	2.31	2.42	2.66	105,00
07-00530-02005	R0.2	0.5	0.3	0.4	0.37	12°	4	45	0.58	0.60	0.62	0.64	0.69	84,00
07-00530-02010		1	0.3	0.4	0.37	12°	4	45	1.10	1.14	1.19	1.24	1.35	84,00
07-00530-02015	R0.2	1.5	0.3	0.4	0.37	12°	4	45	1.62	1.69	1.76	1.84	2.02	86,00
07-00530-02020		2	0.3	0.4	0.37	12°	4	45	2.15	2.23	2.33	2.43	2.68	86,00
07-00530-02030	R0.2	3	0.3	0.4	0.37	12°	4	45	3.19	3.32	3.47	3.63	4.01	88,00
07-00530-02040		4	0.3	0.4	0.37	12°	4	45	4.23	4.41	4.61	4.83	5.33	89,00
07-00530-02050	R0.2	5	0.3	0.4	0.37	12°	4	45	5.27	5.50	5.75	6.02	6.66	91,00
07-00530-02060		6	0.3	0.4	0.37	12°	4	45	6.32	6.59	6.89	7.22	7.99	93,00

Attenzione
How to Order

Quando ordinate, indicate DRB230 (R) × (ℓ 1)
When you order, indicate DRB230 (R) × (ℓ 1).

※ (γ) è un valore di riferimento
※ (γ) is reference value.

Sferiche
Ball

Scaricata
Long Neck

Rivestita
Coating

Leghe di alluminio
Aluminium Alloy

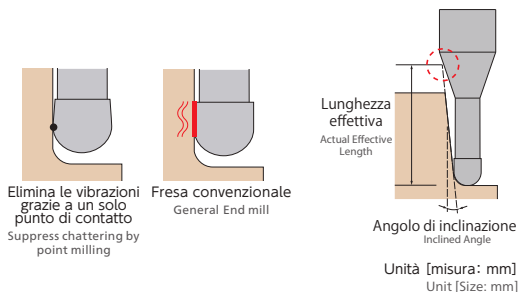
Rame
Copper

Resina
Resin

Fresatura
Elettrodi Rame
Copper Electrode
Milling

Frese sferiche scaricate per elettrodi in rame

Long Neck Ball End Mill for Copper Electrode

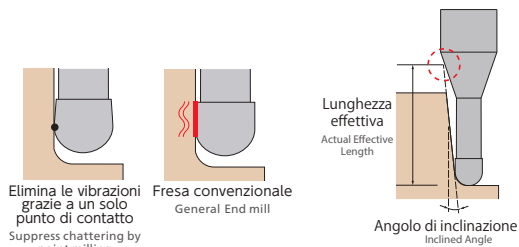
Scaricata
Long NeckRivestita
CoatingSferiche
Ball

Codice Code No.	(R) Raggio Radius	(d ₁) Lungh. scarico Under Neck Length	(d ₂) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d ₂) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
07-00530-02510	R0.25	1	0.35	0.5	0.46	12°	4	45	1.13	1.16	1.21	1.26	1.37	82,00
07-00530-02515		1.5	0.35	0.5	0.46	12°	4	45	1.65	1.71	1.78	1.85	2.03	82,00
07-00530-02520		2	0.35	0.5	0.46	12°	4	45	2.17	2.25	2.35	2.45	2.69	83,00
07-00530-02530		3	0.35	0.5	0.46	12°	4	45	3.21	3.34	3.49	3.65	4.02	84,00
07-00530-02540		4	0.35	0.5	0.46	12°	4	45	4.25	4.43	4.63	4.85	5.35	86,00
07-00530-02550		5	0.35	0.5	0.46	12°	4	45	5.30	5.52	5.77	6.04	6.68	88,00
07-00530-02560	R0.3	6	0.35	0.5	0.46	12°	4	45	6.34	6.61	6.91	7.24	8.00	89,00
07-00530-03010		1	0.45	0.6	0.56	12°	4	45	1.12	1.16	1.20	1.25	1.35	63,00
07-00530-03015		1.5	0.45	0.6	0.56	12°	4	45	1.64	1.71	1.77	1.84	2.02	64,00
07-00530-03020		2	0.45	0.6	0.56	12°	4	45	2.17	2.25	2.34	2.44	2.68	64,00
07-00530-03030		3	0.45	0.6	0.56	12°	4	45	3.21	3.34	3.48	3.64	4.01	66,00
07-00530-03040		4	0.45	0.6	0.56	12°	4	45	4.25	4.43	4.62	4.84	5.33	68,00
07-00530-03050		5	0.45	0.6	0.56	12°	4	45	5.29	5.52	5.76	6.03	6.66	69,00
07-00530-03060		6	0.45	0.6	0.56	12°	4	45	6.34	6.61	6.90	7.23	7.99	71,00
07-00530-03080		8	0.45	0.6	0.56	12°	4	45	8.42	8.79	9.18	9.62	10.64	75,00
07-00530-03100		10	0.45	0.6	0.56	12°	4	50	10.51	10.97	11.47	12.02	13.30	79,00
07-00530-04015	R0.4	1.5	0.6	0.8	0.76	12°	4	45	1.64	1.70	1.76	1.83	1.98	64,00
07-00530-04020		2	0.6	0.8	0.76	12°	4	45	2.16	2.24	2.33	2.42	2.65	64,00
07-00530-04030		3	0.6	0.8	0.76	12°	4	45	3.20	3.33	3.47	3.62	3.97	66,00
07-00530-04040		4	0.6	0.8	0.76	12°	4	45	4.25	4.42	4.61	4.82	5.30	68,00
07-00530-04050		5	0.6	0.8	0.76	12°	4	45	5.29	5.51	5.75	6.01	6.63	69,00
07-00530-04060		6	0.6	0.8	0.76	12°	4	45	6.33	6.60	6.89	7.21	7.96	69,00
07-00530-04080		8	0.6	0.8	0.76	12°	4	45	8.42	8.78	9.17	9.60	10.61	71,00
07-00530-04100		10	0.6	0.8	0.76	12°	4	50	10.50	10.96	11.45	12.00	13.26	75,00
07-00530-05020	R0.5	2	0.75	1	0.95	12°	4	45	2.18	2.26	2.34	2.43	2.65	62,00
07-00530-05030		3	0.75	1	0.95	12°	4	45	3.22	3.35	3.48	3.63	3.97	63,00
07-00530-05040		4	0.75	1	0.95	12°	4	45	4.27	4.44	4.62	4.83	5.30	63,00
07-00530-05050		5	0.75	1	0.95	12°	4	45	5.31	5.53	5.76	6.02	6.63	64,00
07-00530-05060		6	0.75	1	0.95	12°	4	45	6.35	6.62	6.90	7.22	7.96	64,00
07-00530-05080		8	0.75	1	0.95	12°	4	45	8.44	8.79	9.18	9.61	10.61	68,00
07-00530-05100		10	0.75	1	0.95	12°	4	45	10.52	10.97	11.46	12.01	13.26	68,00
07-00530-05120		12	0.75	1	0.95	12°	4	45	12.61	13.15	13.75	14.40	15.92	68,00
07-00530-05140	R0.75	14	0.75	1	0.95	12°	4	50	14.70	15.33	16.03	16.79	18.57	71,00
07-00530-05160		16	0.75	1	0.95	12°	4	50	16.78	17.51	18.31	19.18	21.23	71,00
07-00530-07504		4	1.1	1.5	1.45	12°	4	50	4.26	4.41	4.59	4.78	5.22	64,00
07-00530-07506		6	1.1	1.5	1.45	12°	4	50	6.34	6.59	6.87	7.17	7.88	64,00
07-00530-07508		8	1.1	1.5	1.45	12°	4	50	8.43	8.77	9.15	9.56	10.53	69,00
07-00530-07510		10	1.1	1.5	1.45	12°	4	50	10.51	10.95	11.43	11.96	13.18	69,00
07-00530-07512		12	1.1	1.5	1.45	12°	4	50	12.60	13.13	13.71	14.35	15.84	73,00
07-00530-07514		14	1.1	1.5	1.45	12°	4	50	14.69	15.31	15.99	16.74	18.49	73,00
07-00530-07516	R0.75	16	1.1	1.5	1.45	12°	4	50	16.77	17.49	18.27	19.14	21.15	78,00
07-00530-07518		18	1.1	1.5	1.45	12°	4	50	18.86	19.67	20.55	21.53	23.80	81,00

N Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinFresatura
Elettrodi Rame
Copper Electrode
Milling

Frese sferiche scaricate per elettrodi in rame

Long Neck Ball End Mill for Copper Electrode

Sferiche
BallScaricata
Long NeckRivestita
CoatingUnità [misura: mm]
Unit [Size: mm]

Codice Code No.	(R) Raggio Radius	(d ₁) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(D) Diametro Dia.	(d ₂) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
07-00530-10030	R1	3	1.5	2	1.94	12°	4	50	3.23	3.33	3.44	3.56	3.85	66,00
07-00530-10040		4	1.5	2	1.94	12°	4	50	4.27	4.42	4.58	4.76	5.17	66,00
07-00530-10060		6	1.5	2	1.94	12°	4	50	6.36	6.60	6.86	7.15	7.83	66,00
07-00530-10080		8	1.5	2	1.94	12°	4	50	8.44	8.78	9.14	9.54	10.48	68,00
07-00530-10100		10	1.5	2	1.94	12°	4	50	10.53	10.95	11.42	11.94	13.14	68,00
07-00530-10120		12	1.5	2	1.94	12°	4	50	12.61	13.13	13.70	14.33	15.79	68,00
07-00530-10140		14	1.5	2	1.94	12°	4	50	14.70	15.31	15.98	16.72	18.45	68,00
07-00530-10160		16	1.5	2	1.94	12°	4	50	16.78	17.49	18.27	19.12	Free	68,00
07-00530-10200		20	1.5	2	1.94	12°	4	60	20.96	21.85	22.83	23.90	Free	75,00
07-00530-10250		25	1.5	2	1.94	12°	4	60	26.17	27.30	28.53	Free	Free	84,00
07-00530-15060	R1.5	6	2.5	3	2.85	12°	6	60	6.56	6.78	7.03	7.31	7.95	93,30
07-00530-15080		8	2.5	3	2.85	12°	6	60	8.64	8.96	9.31	9.70	10.60	95,50
07-00530-15100		10	2.5	3	2.85	12°	6	60	10.73	11.14	11.59	12.09	13.26	95,50
07-00530-15120		12	2.5	3	2.85	12°	6	60	12.81	13.32	13.88	14.49	15.91	95,50
07-00530-15150		15	2.5	3	2.85	12°	6	70	15.94	16.59	17.30	18.08	19.89	97,70
07-00530-15200		20	2.5	3	2.85	12°	6	70	21.16	22.04	23.00	24.06	26.53	102,20
07-00530-15250		25	2.5	3	2.85	12°	6	70	26.37	27.48	28.70	30.04	Free	102,20
07-00530-15300		30	2.5	3	2.85	12°	6	70	31.58	32.93	34.40	36.03	Free	111,00
07-00530-20100	R2	10	3	4	3.8	12°	6	60	10.83	11.22	11.66	12.14	13.25	87,70
07-00530-20120		12	3	4	3.8	12°	6	60	12.91	13.40	13.94	14.53	15.91	87,70
07-00530-20150		15	3	4	3.8	12°	6	60	16.04	16.67	17.36	18.12	19.89	87,70
07-00530-20200		20	3	4	3.8	12°	6	60	21.26	22.12	23.06	24.10	Free	104,40
07-00530-20250		25	3	4	3.8	12°	6	70	26.47	27.57	28.77	30.09	Free	111,00
07-00530-20300		30	3	4	3.8	12°	6	70	31.68	33.01	34.47	Free	Free	115,50
07-00530-20400		40	3	4	3.8	12°	6	80	42.11	43.91	Free	Free	Free	125,50
07-00530-30200	R3	20	6	6	5.7	—	6	70	Free	Free	Free	Free	Free	115,50
07-00530-30250		25	6	6	5.7	—	6	70	Free	Free	Free	Free	Free	117,70
07-00530-30300		30	6	6	5.7	—	6	80	Free	Free	Free	Free	Free	121,00
07-00530-30400		40	6	6	5.7	—	6	80	Free	Free	Free	Free	Free	129,90
07-00530-30500		50	6	6	5.7	—	6	100	Free	Free	Free	Free	Free	146,10

Attenzione
How to OrderQuando ordinate, indicate DRB230 (R) × (L)
When you order, indicate DRB230 (R) × (L).※ (γ) è un valore di riferimento
※ (γ) is reference value.Lega di alluminio
Aluminium Alloy

N

Rame
Copper

N

Resina
Resin

O



Scaricata
Long Neck



Rivestita
Coating

Sferiche
Ball

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

**Fresatura
Elettrodi Rame**
Copper Electrode
Milling

Condizioni di taglio raccomandate

Recommended Milling Conditions

Sferiche
BallScaricata
Long NeckRivestita
Coating

Materiale Work Material			Rame Copper				Rame Tungsteno (W70 - Cu30) Copper Tungsten (W70% - Cu30%)			
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min
0.05	0.3	3	0.01	0.01	200	40,000	0.008	0.008	150	30,000
	0.5	5	0.007	0.007	150	40,000	0.005	0.005	100	30,000
0.075	0.3	2	0.015	0.02	250	40,000	0.01	0.015	180	30,000
	0.5	3.3	0.015	0.02	200	40,000	0.008	0.015	150	30,000
	1	6.7	0.007	0.01	150	40,000	0.005	0.008	100	30,000
0.1	0.5	2.5	0.025	0.05	500	40,000	0.02	0.04	350	30,000
	0.75	3.75	0.025	0.05	450	40,000	0.02	0.04	300	30,000
	1	5	0.02	0.04	400	40,000	0.015	0.03	250	30,000
	1.5	7.5	0.015	0.03	300	40,000	0.008	0.02	150	30,000
	2	10	0.008	0.015	200	40,000	0.005	0.01	100	30,000
0.15	0.5	1.7	0.03	0.07	700	40,000	0.03	0.07	500	30,000
	1	3.3	0.03	0.07	700	40,000	0.03	0.07	500	30,000
	1.5	5	0.025	0.05	500	40,000	0.02	0.05	300	30,000
	2	6.7	0.015	0.03	400	40,000	0.01	0.02	200	30,000
0.2	0.5	1.3	0.05	0.1	1,000	40,000	0.04	0.08	700	30,000
	1	2.5	0.05	0.1	1,000	40,000	0.04	0.08	700	30,000
	1.5	3.8	0.04	0.08	1,000	40,000	0.03	0.06	700	30,000
	2	5	0.035	0.06	600	40,000	0.02	0.05	350	30,000
	3	7.5	0.02	0.04	400	30,000	0.01	0.03	200	25,000
	4	10	0.008	0.015	250	25,000	0.005	0.01	100	18,000
	5	12.5	0.005	0.015	200	25,000	0.005	0.01	80	16,000
0.25	6	15	0.005	0.015	150	22,000	0.005	0.01	70	14,000
	1	2	0.08	0.15	800	40,000	0.08	0.15	500	30,000
	1.5	3	0.08	0.15	800	40,000	0.08	0.15	500	30,000
	2	4	0.08	0.15	800	40,000	0.08	0.15	500	30,000
	3	6	0.06	0.1	600	35,000	0.06	0.08	400	27,000
	4	8	0.04	0.08	400	30,000	0.025	0.05	200	22,000
	5	10	0.02	0.04	300	25,000	0.01	0.02	150	18,000
0.3	6	12	0.015	0.03	250	22,000	0.005	0.01	120	16,000
	1	1.7	0.12	0.2	1,600	40,000	0.12	0.2	1,200	30,000
	1.5	2.5	0.12	0.2	1,600	40,000	0.12	0.2	1,200	30,000
	2	3.3	0.12	0.2	1,600	40,000	0.12	0.2	1,200	30,000
	3	5	0.1	0.14	1,000	40,000	0.08	0.1	700	30,000
	4	6.7	0.07	0.1	700	30,000	0.04	0.06	400	25,000
	5	8.3	0.05	0.08	600	27,000	0.02	0.04	300	22,000
	6	10	0.04	0.06	500	25,000	0.01	0.03	200	20,000
	8	13.3	0.015	0.05	400	22,000	0.005	0.02	150	18,000
0.4	10	16.7	0.015	0.03	350	20,000	0.005	0.01	120	16,000
	1.5	1.9	0.15	0.3	2,000	40,000	0.15	0.3	1,400	30,000
	2	2.5	0.15	0.3	2,000	40,000	0.15	0.3	1,400	30,000
	3	3.8	0.15	0.3	2,000	40,000	0.15	0.3	1,400	30,000
	4	5	0.12	0.2	1,600	35,000	0.1	0.16	1,000	27,000
	5	6.3	0.1	0.18	1,200	32,000	0.08	0.12	750	24,000
	6	7.5	0.08	0.15	1,000	30,000	0.05	0.1	500	20,000
	8	10	0.05	0.06	700	22,000	0.02	0.025	300	16,000
0.5	10	12.5	0.02	0.05	600	20,000	0.01	0.02	200	14,000
	2	2	0.25	0.4	2,800	40,000	0.25	0.4	2,000	30,000
	3	3	0.25	0.4	2,800	40,000	0.25	0.4	2,000	30,000
	4	4	0.2	0.4	2,400	40,000	0.2	0.4	1,600	30,000
	5	5	0.16	0.3	2,000	35,000	0.12	0.25	1,400	27,000
	6	6	0.14	0.3	1,600	30,000	0.1	0.25	1,000	25,000

Lega di alluminio
Aluminium AlloyRame
CopperResina
ResinFresatura
Elettrodi Rame
Copper Electrode
Milling

Condizioni di taglio raccomandate

Recommended Milling Conditions

 Scaricata
Long Neck

 Sferiche
Ball

 Rivestita
Coating

Materiale Work Material			Rame Copper			Rame Tungsteno (W70 - Cu30) Copper Tungsten (W70% - Cu30%)				
Raggio Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed	Prof. di taglio Depth of Cut		Avanz. Feed	N. di giri Spindle Speed
			ap mm	ae mm	mm/min	g/min	ap mm	ae mm	mm/min	g/min
0.5	8	8	0.12	0.2	1,000	25,000	0.06	0.1	500	18,000
	10	10	0.08	0.15	800	20,000	0.03	0.05	300	16,000
	12	12	0.06	0.1	600	16,000	0.015	0.04	200	12,000
	14	14	0.04	0.08	500	14,000	0.01	0.04	160	10,000
	16	16	0.02	0.06	400	12,000	0.005	0.03	120	8,000
0.75	4	2.7	0.3	0.6	2,800	35,000	0.3	0.6	2,200	30,000
	6	4	0.3	0.6	2,400	30,000	0.3	0.6	1,800	25,000
	8	5.3	0.25	0.5	1,800	25,000	0.2	0.4	1,200	20,000
	10	6.7	0.2	0.4	1,400	20,000	0.15	0.3	800	16,000
	12	8	0.15	0.3	1,000	16,000	0.1	0.2	500	12,000
	14	9.3	0.12	0.2	800	14,000	0.08	0.1	350	10,000
	16	10.7	0.1	0.15	650	12,000	0.05	0.08	280	9,000
	18	12	0.08	0.12	500	10,000	0.02	0.06	200	8,000
1	3	1.5	0.45	0.8	4,000	30,000	0.45	0.8	2,400	25,000
	4	2	0.45	0.8	4,000	30,000	0.45	0.8	2,400	22,000
	6	3	0.45	0.8	3,000	27,000	0.45	0.8	1,800	20,000
	8	4	0.4	0.8	2,400	25,000	0.4	0.8	1,600	18,000
	10	5	0.3	0.6	2,000	22,000	0.25	0.5	1,400	16,000
	12	6	0.3	0.6	1,400	16,000	0.25	0.5	900	12,000
	14	7	0.25	0.6	1,200	14,000	0.2	0.5	700	10,000
	16	8	0.25	0.5	1,000	12,000	0.12	0.25	500	9,000
	20	10	0.15	0.3	800	10,000	0.06	0.1	350	8,000
	25	12.5	0.08	0.15	600	8,000	0.03	0.05	200	6,000
1.5	6	2	0.7	1.5	3,400	20,000	0.6	1.2	2,400	16,000
	8	2.7	0.7	1.5	3,400	20,000	0.6	1.2	2,400	16,000
	10	3.3	0.7	1.5	3,400	20,000	0.6	1.2	2,400	16,000
	12	4	0.6	1.2	3,400	20,000	0.6	1	2,400	16,000
	15	5	0.6	1	3,000	18,000	0.5	0.8	2,000	14,000
	20	6.7	0.5	0.8	2,400	16,000	0.4	0.6	1,400	12,000
	25	8.3	0.4	0.6	1,800	12,000	0.2	0.3	900	10,000
	30	10	0.2	0.4	1,200	8,000	0.08	0.15	500	6,000
2	10	2.5	1	1.6	4,000	16,000	0.8	1.6	2,800	12,000
	12	3	1	1.6	3,600	16,000	0.8	1.6	2,800	12,000
	15	3.8	0.8	1.6	3,400	16,000	0.8	1.6	2,400	12,000
	20	5	0.8	1.6	3,000	14,000	0.8	1.6	2,000	10,000
	25	6.3	0.6	1.2	3,000	14,000	0.5	1	2,000	10,000
	30	7.5	0.5	1	2,400	12,000	0.3	0.5	1,200	7,000
	40	10	0.4	0.8	1,200	8,000	0.15	0.3	500	5,000
3	20	3.3	1	2	3,600	12,000	1	2	2,400	9,000
	25	4.2	1	1.8	3,300	11,000	0.8	1.2	2,100	8,000
	30	5	0.8	1.6	3,000	10,000	0.4	0.8	1,800	7,000
	40	6.7	0.6	1.2	2,400	8,000	0.3	0.6	1,250	5,500
	50	8.3	0.5	1	1,800	6,000	0.25	0.5	800	4,000
Note Notes			※1 I parametri di taglio consigliati sono solo di riferimento e devono essere regolati secondo il tipo di macchina ed il pezzo da lavorare. ※2 Profondità di taglio: ap=Profondità di taglio assiale / ae=Profondità di taglio radiale ※3 Ridurre la velocità e l'avanzamento nello stesso rapporto per eliminare vibrazioni o in caso di limitato numero di giri della macchina ※4 Si consiglia l'uso di lubrorefrigerante ※1 These recommended cutting conditions indicate just reference. It should be adjusted according to milling shape and machine type. ※2 Depth of Cut: ap=Axial Depth of Cut / ae=Radial Depth of Cut. ※3 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine. ※4 Water-insoluble fluid is recommended.							

 N Lega di alluminio
Aluminium Alloy

 N Rame
Copper

 O Resina
Resin

 Fresatura
Elettrodi Rame
Copper Electrode
Milling

Frese toriche scaricate per elettrodi di rame

Long Neck Corner Radius End Mill for Copper Electrode

Totale 153 misure

Total 153 sizes

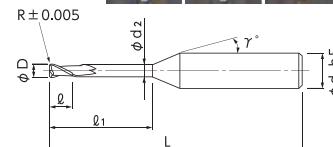
Fresa piana scaricata specifica per la lavorazione di leghe di rame. Il tagliente affilato produce bave ridotte e un' elevata qualità della superficie



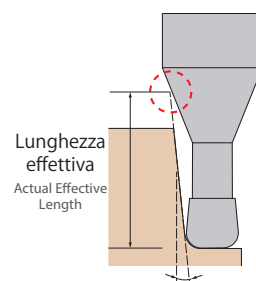
Long neck corner radius end mill specialized for machining copper alloy
Sharpe cutting edge makes less burr and high quality surface



$D \leq 1$
 $0 \leq D \leq 0.006$
 $1 < D < 6$
 $0 \leq D \leq 0.01$
 $-0.01 \leq D \leq 0.02$
 $D = 6$
 $0 \leq D \leq 0.02$



- Frese toriche scaricate specifiche per la lavorazione di elettrodi di rame
- L'angolo d'elica di 37,5° consente di ottenere finiture accurate e elevata qualità superficiale e di prevenire la rigatura delle superfici.
- La capacità di taglio netta e il rivestimento DLC consentono di ottenere un'elevata qualità della lavorazione e una lunga durata utensile.
- E' anche possibile la lavorazione degli elettrodi in rame tungsteno
- Long neck radius end mill specialized for machining copper electrode.
- 37.5° helix angle provides both sharpness shearing ability and finishing surface quality, combining the most suitable cutting edge design realizes the higher quality of finishing surface.
- High quality and stable milling performance with long tool life by optimized design and DLC COATING.
- Machining copper tungsten electrodes is also effective.



Angolo di inclinazione
Inclined Angle

Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(l1) Lungh. scario Under Neck Length	(l) Lungh. tagliente Length of Cut	(d2) Diametro scario Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
07-00110-02021	0.2	R0.02	0.5	0.4	0.18	12°	4	45	0.56	0.59	0.62	0.65	0.71	96,00
07-00110-02023			1	0.4	0.18	12°	4	45	1.09	1.13	1.19	1.24	1.38	100,00
07-00110-02025			1.5	0.4	0.18	12°	4	45	1.61	1.68	1.76	1.84	2.04	103,00
07-00110-02051		R0.05	0.5	0.4	0.18	12°	4	45	0.56	0.59	0.61	0.64	0.71	96,00
07-00110-02053			1	0.4	0.18	12°	4	45	1.08	1.13	1.18	1.24	1.37	100,00
07-00110-02055			1.5	0.4	0.18	12°	4	45	1.61	1.68	1.75	1.84	2.03	103,00
07-00110-03021	0.3	R0.02	1	0.6	0.28	12°	4	45	1.09	1.13	1.19	1.24	1.38	100,00
07-00110-03022			1.5	0.6	0.28	12°	4	45	1.61	1.68	1.76	1.84	2.04	103,00
07-00110-03023			2	0.6	0.28	12°	4	45	2.13	2.22	2.33	2.44	2.71	104,00
07-00110-03051		R0.05	1	0.6	0.28	12°	4	45	1.08	1.13	1.18	1.24	1.37	100,00
07-00110-03052			1.5	0.6	0.28	12°	4	45	1.61	1.68	1.75	1.84	2.03	103,00
07-00110-03053			2	0.6	0.28	12°	4	45	2.13	2.22	2.32	2.43	2.70	104,00
07-00110-04021	0.4	R0.02	1	0.8	0.37	12°	4	45	1.11	1.16	1.21	1.27	1.41	88,00
07-00110-04023			2	0.8	0.37	12°	4	45	2.15	2.25	2.35	2.47	2.74	89,00
07-00110-04025			3	0.8	0.37	12°	4	45	3.20	3.34	3.49	3.67	4.06	91,00
07-00110-04027		R0.05	1	0.8	0.37	12°	4	45	1.11	1.16	1.21	1.27	1.40	88,00
07-00110-04051			2	0.8	0.37	12°	4	45	2.15	2.25	2.35	2.46	2.73	89,00
07-00110-04053			3	0.8	0.37	12°	4	45	3.19	3.34	3.49	3.66	4.05	91,00
07-00110-04055		R0.1	1	0.8	0.37	12°	4	45	1.11	1.15	1.20	1.26	1.38	88,00
07-00110-04057			2	0.8	0.37	12°	4	45	2.15	2.24	2.34	2.45	2.71	89,00
07-00110-04101			3	0.8	0.37	12°	4	45	3.19	3.33	3.48	3.65	4.04	91,00
07-00110-04103		R0.1	1	0.8	0.37	12°	4	45	1.11	1.15	1.20	1.26	1.38	88,00
07-00110-04105			2	0.8	0.37	12°	4	45	2.15	2.24	2.34	2.45	2.71	89,00
07-00110-04107			3	0.8	0.37	12°	4	45	3.19	3.33	3.48	3.65	4.04	91,00

Attenzione
How to Order

Quando ordinate, indicate DHR237R (D) × (R) × (l1).
When you order, indicate DHR237R (D) × (R) × (l1).

※(γ) è un valore di riferimento.
※(γ) is reference value.

○ Lega di alluminio
Aluminium Alloy

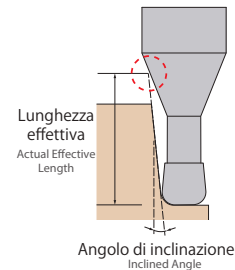
● Rame
Copper

○ Resina
Resin

Fresatura
Elettrodi Rame
Copper Electrode
Milling

Frese toriche scaricate per elettrodi di rame

Long Neck Corner Radius End Mill for Copper Electrode



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
07-00110-05022	0.5	R0.02	2	1	0.46	12°	4	45	2.18	2.27	2.38	2.50	2.77	87,00
07-00110-05023			3	1	0.46	12°	4	45	3.22	3.36	3.52	3.69	4.10	89,00
07-00110-05024			4	1	0.46	12°	4	45	4.26	4.45	4.66	4.89	5.42	90,00
07-00110-05025		R0.05	5	1	0.46	12°	4	45	5.31	5.54	5.80	6.09	6.75	92,00
07-00110-05052			2	1	0.46	12°	4	45	2.18	2.27	2.38	2.49	2.76	87,00
07-00110-05053			3	1	0.46	12°	4	45	3.22	3.36	3.52	3.69	4.09	89,00
07-00110-05054			4	1	0.46	12°	4	45	4.26	4.45	4.66	4.88	5.41	90,00
07-00110-05055		R0.1	5	1	0.46	12°	4	45	5.31	5.54	5.80	6.08	6.74	92,00
07-00110-05102			2	1	0.46	12°	4	45	2.17	2.27	2.37	2.48	2.74	87,00
07-00110-05103			3	1	0.46	12°	4	45	3.22	3.36	3.51	3.68	4.07	89,00
07-00110-05104			4	1	0.46	12°	4	45	4.26	4.45	4.65	4.87	5.40	90,00
07-00110-05105			5	1	0.46	12°	4	45	5.30	5.54	5.79	6.07	6.72	92,00
07-00110-06022	0.6	R0.02	2	1.2	0.56	12°	4	45	2.18	2.27	2.38	2.50	2.77	94,00
07-00110-06024			4	1.2	0.56	12°	4	45	4.26	4.45	4.66	4.89	5.42	98,00
07-00110-06026		R0.05	6	1.2	0.56	12°	4	45	6.35	6.63	6.94	7.28	8.08	101,00
07-00110-06052			2	1.2	0.56	12°	4	45	2.18	2.27	2.38	2.49	2.76	94,00
07-00110-06054			4	1.2	0.56	12°	4	45	4.26	4.45	4.66	4.88	5.41	98,00
07-00110-06056		R0.1	6	1.2	0.56	12°	4	45	6.35	6.63	6.94	7.28	8.07	101,00
07-00110-06102			2	1.2	0.56	12°	4	45	2.17	2.27	2.37	2.48	2.74	94,00
07-00110-06104			4	1.2	0.56	12°	4	45	4.26	4.45	4.65	4.87	5.40	98,00
07-00110-06106			6	1.2	0.56	12°	4	45	6.35	6.63	6.93	7.27	8.05	101,00
07-00110-08024	0.8	R0.02	4	1.6	0.76	12°	4	45	4.26	4.45	4.66	4.89	5.42	98,00
07-00110-08026			6	1.6	0.76	12°	4	45	6.35	6.63	6.94	7.28	8.08	101,00
07-00110-08028			8	1.6	0.76	12°	4	50	8.43	8.81	9.22	9.68	10.73	103,00
07-00110-08054		R0.05	4	1.6	0.76	12°	4	45	4.26	4.45	4.66	4.88	5.41	98,00
07-00110-08056			6	1.6	0.76	12°	4	45	6.35	6.63	6.94	7.28	8.07	101,00
07-00110-08058			8	1.6	0.76	12°	4	50	8.43	8.81	9.22	9.67	10.72	103,00
07-00110-08104		R0.1	4	1.6	0.76	12°	4	45	4.26	4.45	4.65	4.87	5.40	98,00
07-00110-08106			6	1.6	0.76	12°	4	45	6.35	6.63	6.93	7.27	8.05	101,00
07-00110-08108			8	1.6	0.76	12°	4	50	8.43	8.80	9.21	9.66	10.71	103,00
07-00110-10053	1	R0.05	3	2	0.95	12°	4	45	3.24	3.39	3.54	3.72	4.12	91,00
07-00110-10054			4	2	0.95	12°	4	45	4.29	4.48	4.68	4.91	5.44	92,00
07-00110-10055			5	2	0.95	12°	4	45	5.33	5.57	5.82	6.11	6.77	94,00
07-00110-10056			6	2	0.95	12°	4	45	6.37	6.66	6.97	7.31	8.10	96,00
07-00110-10058			8	2	0.95	12°	4	50	8.46	8.83	9.25	9.70	10.75	98,00
07-00110-10060		R0.1	10	2	0.95	12°	4	50	10.54	11.01	11.53	12.09	13.41	100,00
07-00110-10103			3	2	0.95	12°	4	45	3.24	3.38	3.54	3.71	4.10	91,00
07-00110-10104			4	2	0.95	12°	4	45	4.28	4.47	4.68	4.90	5.43	92,00
07-00110-10105			5	2	0.95	12°	4	45	5.33	5.56	5.82	6.10	6.76	94,00
07-00110-10106			6	2	0.95	12°	4	45	6.37	6.65	6.96	7.30	8.08	96,00
07-00110-10108			8	2	0.95	12°	4	50	8.46	8.83	9.24	9.69	10.74	98,00
07-00110-10110			10	2	0.95	12°	4	50	10.54	11.01	11.52	12.08	13.39	100,00
07-00110-10203		R0.2	3	2	0.95	12°	4	45	3.24	3.37	3.52	3.69	4.07	91,00
07-00110-10204			4	2	0.95	12°	4	45	4.28	4.46	4.66	4.88	5.40	92,00
07-00110-10205			5	2	0.95	12°	4	45	5.32	5.55	5.80	6.08	6.72	94,00
07-00110-10206			6	2	0.95	12°	4	45	6.37	6.64	6.94	7.28	8.05	96,00
07-00110-10208			8	2	0.95	12°	4	50	8.45	8.82	9.23	9.67	10.71	98,00
07-00110-10210			10	2	0.95	12°	4	50	10.54	11.00	11.51	12.06	13.36	100,00

Scaricata
Long Neck

Rivestita
Coating

Toriche
Corner
Radius

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

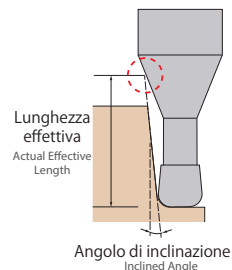
O Resina
Resin

Fresatura
Elettrodi Rame
Copper Electrode
Milling

DHR237R

Frese toriche scaricate per elettrodi di rame

Long Neck Corner Radius End Mill for Copper Electrode



Unità [misura: mm]
Unit [Size: mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(Ø1) Lungh. scarico Under Neck Length	(Ø) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
07-00110-15105	1.5	R0.1	5	3	1.45	12°	4	45	5.33	5.56	5.82	6.10	6.76	95,00
07-00110-15110			10	3	1.45	12°	4	50	10.54	11.01	11.52	12.08	13.39	96,00
07-00110-15115			15	3	1.45	12°	4	50	15.76	16.46	17.22	18.07	20.03	97,00
07-00110-15205		R0.2	5	3	1.45	12°	4	45	5.32	5.55	5.80	6.08	6.72	95,00
07-00110-15210			10	3	1.45	12°	4	50	10.54	11.00	11.51	12.06	13.36	96,00
07-00110-15215			15	3	1.45	12°	4	50	15.75	16.45	17.21	18.05	20.00	97,00
07-00110-15305		R0.3	5	3	1.45	12°	4	45	5.32	5.54	5.79	6.06	6.69	91,00
07-00110-15310			10	3	1.45	12°	4	50	10.53	10.99	11.49	12.04	13.33	96,00
07-00110-15315			15	3	1.45	12°	4	50	15.75	16.44	17.20	18.03	19.96	97,00
07-00110-15505		R0.5	5	3	1.45	12°	4	45	5.31	5.53	5.76	6.02	6.63	92,00
07-00110-15510			10	3	1.45	12°	4	50	10.52	10.97	11.46	12.01	13.26	96,00
07-00110-15515			15	3	1.45	12°	4	50	15.74	16.42	17.17	17.99	19.90	97,00
07-00110-15520			20	3	1.45	12°	4	60	20.95	21.87	22.87	23.97	Free	99,00
07-00110-20105	2	R0.1	5	4	1.94	12°	4	45	5.35	5.59	5.84	6.13	6.79	89,00
07-00110-20108			8	4	1.94	12°	4	50	8.48	8.86	9.27	9.72	10.77	92,00
07-00110-20110			10	4	1.94	12°	4	50	10.57	11.03	11.55	12.11	13.42	93,00
07-00110-20115			15	4	1.94	12°	4	50	15.78	16.48	17.25	18.09	Free	94,00
07-00110-20120			20	4	1.94	12°	4	60	20.99	21.93	22.95	24.08	Free	95,00
07-00110-20205		R0.2	5	4	1.94	12°	4	45	5.35	5.58	5.83	6.11	6.75	89,00
07-00110-20208			8	4	1.94	12°	4	50	8.48	8.85	9.25	9.70	10.74	92,00
07-00110-20210			10	4	1.94	12°	4	50	10.56	11.03	11.53	12.09	13.39	93,00
07-00110-20215			15	4	1.94	12°	4	50	15.78	16.47	17.24	18.07	Free	94,00
07-00110-20220			20	4	1.94	12°	4	60	20.99	21.92	22.94	24.06	Free	95,00
07-00110-20305		R0.3	5	4	1.94	12°	4	45	5.34	5.57	5.82	6.09	6.72	89,00
07-00110-20308			8	4	1.94	12°	4	50	8.47	8.84	9.24	9.68	10.70	92,00
07-00110-20310			10	4	1.94	12°	4	50	10.56	11.02	11.52	12.07	13.36	93,00
07-00110-20315			15	4	1.94	12°	4	50	15.77	16.46	17.22	18.05	Free	94,00
07-00110-20320			20	4	1.94	12°	4	60	20.99	21.91	22.92	24.04	Free	95,00
07-00110-20505		R0.5	5	4	1.94	12°	4	45	5.33	5.55	5.79	6.05	6.66	89,00
07-00110-20508			8	4	1.94	12°	4	50	8.46	8.82	9.21	9.64	10.64	92,00
07-00110-20510			10	4	1.94	12°	4	50	10.55	11.00	11.49	12.03	13.30	93,00
07-00110-20515			15	4	1.94	12°	4	50	15.76	16.45	17.19	18.02	Free	94,00
07-00110-20520			20	4	1.94	12°	4	60	20.98	21.89	22.90	24.00	Free	95,00
07-00110-25208	2.5	R0.2	8	5	2.4	12°	4	50	8.57	8.95	9.36	9.81	10.86	92,00
07-00110-25214			14	5	2.4	12°	4	50	14.83	15.49	16.20	16.99	Free	94,00
07-00110-25220			20	5	2.4	12°	4	60	21.09	22.02	23.05	Free	Free	95,00
07-00110-25508		R0.5	8	5	2.4	12°	4	50	8.56	8.92	9.32	9.75	10.77	92,00
07-00110-25514			14	5	2.4	12°	4	50	14.82	15.46	16.16	16.93	Free	94,00
07-00110-25520			20	5	2.4	12°	4	60	21.08	22.00	23.00	Free	Free	95,00

Attenzione
How to Order

Quando ordinate, indicate DHR237R (D)×(R)×(Ø 1).
When you order, indicate DHR237R (D)×(R)×(Ø 1).

※(γ) è un valore di riferimento.
※(γ) is reference value.

Toriche
Corner
Radius

Scaricata
Long Neck



Rivestita
Coating

Lega di alluminio
Aluminium Alloy

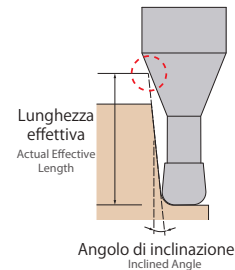
Rame
Copper

Resina
Resin

Fresatura
Elettrodi Rame
Copper Electrode
Milling

Frese toriche scaricate per elettrodi di rame

Long Neck Corner Radius End Mill for Copper Electrode

Unità [misura: mm]
Unit [Size: mm]

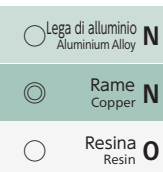
Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(d1) Lungh. scarico Under Neck Length	(L) Lungh. tagliente Length of Cut	(d2) Diametro scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Diametro gambo Shank Dia.	(L) Lungh. totale Overall Length	Lunghezza effettiva in base all'angolo del pezzo Actual effective length depending on inclined angle of workpiece					PROMO €
									30°	1°	1°30'	2°	3°	
07-00110-30112	3	R0.1	12	6	2.85	12°	6	50	12.87	13.44	14.07	14.76	16.36	111,00
07-00110-30118			18	6	2.85	12°	6	60	19.13	19.98	20.91	21.94	24.32	114,40
07-00110-30124			24	6	2.85	12°	6	70	25.39	26.52	27.76	29.12	Free	119,90
07-00110-30212		R0.2	12	6	2.85	12°	6	50	12.87	13.44	14.06	14.74	16.33	111,00
07-00110-30218			18	6	2.85	12°	6	60	19.13	19.97	20.90	21.92	24.29	114,40
07-00110-30224			24	6	2.85	12°	6	70	25.38	26.51	27.74	29.10	Free	119,90
07-00110-30312		R0.3	12	6	2.85	12°	6	50	12.86	13.43	14.04	14.72	16.29	111,00
07-00110-30318			18	6	2.85	12°	6	60	19.12	19.96	20.88	21.90	24.26	114,40
07-00110-30324			24	6	2.85	12°	6	70	25.38	26.50	27.73	29.08	Free	119,90
07-00110-30512		R0.5	12	6	2.85	12°	6	50	12.86	13.41	14.01	14.68	16.23	111,00
07-00110-30515			15	6	2.85	12°	6	60	15.98	16.68	17.44	18.27	20.21	113,30
07-00110-30518			18	6	2.85	12°	6	60	19.11	19.95	20.86	21.86	24.19	114,40
07-00110-30524			24	6	2.85	12°	6	70	25.37	26.48	27.70	29.04	Free	127,70
07-00110-30530			30	6	2.85	12°	6	70	31.63	33.02	34.54	36.22	Free	131,00
07-00110-40116	4	R0.1	16	8	3.8	12°	6	60	17.17	17.93	18.77	19.68	Free	111,00
07-00110-40124			24	8	3.8	12°	6	60	25.51	26.65	27.89	Free	Free	114,40
07-00110-40132			32	8	3.8	12°	6	70	33.85	35.36	37.01	Free	Free	119,90
07-00110-40216		R0.2	16	8	3.8	12°	6	60	17.16	17.92	18.75	19.66	Free	111,00
07-00110-40224			24	8	3.8	12°	6	60	25.50	26.64	27.88	Free	Free	114,40
07-00110-40232			32	8	3.8	12°	6	70	33.85	35.35	37.00	Free	Free	119,90
07-00110-40316		R0.3	16	8	3.8	12°	6	60	17.16	17.91	18.74	19.65	Free	111,00
07-00110-40324			24	8	3.8	12°	6	60	25.50	26.63	27.86	Free	Free	114,40
07-00110-40332			32	8	3.8	12°	6	70	33.84	35.34	36.99	Free	Free	119,90
07-00110-40516		R0.5	16	8	3.8	12°	6	60	17.15	17.89	18.71	19.61	Free	111,00
07-00110-40524			24	8	3.8	12°	6	60	25.49	26.61	27.83	Free	Free	114,40
07-00110-40532			32	8	3.8	12°	6	70	33.83	35.33	36.96	Free	Free	127,70
07-00110-41016		R1	16	8	3.8	12°	6	60	17.13	17.85	18.64	19.51	Free	111,00
07-00110-41024			24	8	3.8	12°	6	60	25.47	26.57	27.77	29.08	Free	114,40
07-00110-41032			32	8	3.8	12°	6	70	33.81	35.28	36.89	Free	Free	127,70
07-00110-50120		R0.1	20	10	4.8	12°	6	60	21.34	22.29	Free	Free	Free	113,30
07-00110-50140			40	10	4.8	12°	6	80	42.19	Free	Free	Free	Free	164,30
07-00110-60124	6	R0.1	24	12	5.8	—	6	60	Free	Free	Free	Free	Free	127,70
07-00110-60148			48	12	5.8	—	6	90	Free	Free	Free	Free	Free	199,80
07-00110-60224		R0.2	24	12	5.8	—	6	60	Free	Free	Free	Free	Free	127,70
07-00110-60248			48	12	5.8	—	6	90	Free	Free	Free	Free	Free	199,80
07-00110-60324		R0.3	24	12	5.8	—	6	60	Free	Free	Free	Free	Free	127,70
07-00110-60348			48	12	5.8	—	6	90	Free	Free	Free	Free	Free	199,80
07-00110-60524		R0.5	24	12	5.8	—	6	60	Free	Free	Free	Free	Free	127,70
07-00110-60530			30	12	5.8	—	6	70	Free	Free	Free	Free	Free	134,40
07-00110-60548			48	12	5.8	—	6	90	Free	Free	Free	Free	Free	199,80
07-00110-61024		R1	24	12	5.8	—	6	60	Free	Free	Free	Free	Free	127,70
07-00110-61048			48	12	5.8	—	6	90	Free	Free	Free	Free	Free	199,80

Scaricata
Long NeckRivestita
CoatingToriche
Corner
RadiusN Lega di alluminio
Aluminium AlloyN Rame
CopperO Resina
ResinFresatura
Elettrodi Rame
Copper Electrode
Milling

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Rame Copper				Rame Tungsteno (W70%-Cu30%) Copper Tungsten (W70%-Cu30%)			
Diametro Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
0.2	0.02	0.5	2.5	40,000	400	0.01	0.1	36,000	360	0.009	0.09
		1	5	40,000	320	0.008	0.1	36,000	280	0.007	0.09
		1.5	7.5	30,000	180	0.005	0.1	27,000	160	0.005	0.09
	0.05	0.5	2.5	40,000	400	0.03	0.1	36,000	360	0.027	0.09
		1	5	40,000	320	0.02	0.1	36,000	280	0.018	0.09
		1.5	7.5	30,000	180	0.01	0.1	27,000	160	0.009	0.09
0.3	0.02	1	3.3	40,000	480	0.01	0.15	36,000	420	0.009	0.14
		1.5	5	40,000	360	0.008	0.15	36,000	320	0.007	0.14
		2	6.7	30,000	240	0.005	0.15	27,000	210	0.005	0.14
	0.05	1	3.3	40,000	480	0.03	0.15	36,000	420	0.027	0.14
		1.5	5	40,000	360	0.024	0.15	36,000	320	0.022	0.14
		2	6.7	30,000	240	0.018	0.15	27,000	210	0.016	0.14
0.4	0.02	1	2.5	40,000	640	0.01	0.2	36,000	580	0.009	0.18
		2	5	40,000	560	0.01	0.2	36,000	500	0.009	0.18
		3	7.5	30,000	420	0.008	0.2	27,000	380	0.007	0.18
		4	10	30,000	360	0.005	0.2	27,000	320	0.005	0.18
	0.05	1	2.5	40,000	640	0.03	0.2	36,000	580	0.027	0.18
		2	5	40,000	560	0.024	0.2	36,000	500	0.022	0.18
		3	7.5	30,000	420	0.018	0.2	27,000	380	0.016	0.18
		4	10	30,000	360	0.012	0.2	27,000	320	0.01	0.18
	0.1	1	2.5	40,000	640	0.06	0.2	36,000	580	0.054	0.18
		2	5	40,000	560	0.05	0.2	36,000	500	0.045	0.18
		3	7.5	30,000	420	0.036	0.2	27,000	380	0.032	0.18
		4	10	30,000	360	0.024	0.2	27,000	320	0.022	0.18
0.5	0.02	2	4	40,000	800	0.01	0.25	36,000	720	0.009	0.23
		3	6	35,000	640	0.01	0.25	32,000	580	0.009	0.23
		4	8	30,000	480	0.008	0.25	27,000	420	0.007	0.23
		5	10	25,000	400	0.005	0.25	23,000	360	0.005	0.23
	0.05	2	4	40,000	800	0.03	0.25	36,000	720	0.027	0.23
		3	6	35,000	640	0.024	0.25	32,000	580	0.022	0.23
		4	8	30,000	480	0.018	0.25	27,000	420	0.016	0.23
		5	10	25,000	400	0.012	0.25	23,000	360	0.01	0.23
	0.1	2	4	40,000	800	0.06	0.25	36,000	720	0.054	0.23
		3	6	35,000	640	0.05	0.25	32,000	580	0.045	0.23
		4	8	30,000	480	0.036	0.25	27,000	420	0.032	0.23
		5	10	25,000	400	0.024	0.25	23,000	360	0.022	0.23
0.6	0.02	2	3.3	30,000	1,000	0.01	0.3	27,000	900	0.009	0.27
		4	6.7	25,000	800	0.01	0.3	23,000	720	0.009	0.27
		6	10	20,000	600	0.008	0.3	18,000	540	0.007	0.27
	0.05	2	3.3	30,000	1,000	0.03	0.3	27,000	900	0.027	0.27
		4	6.7	25,000	800	0.02	0.3	23,000	720	0.018	0.27
		6	10	20,000	600	0.012	0.3	18,000	540	0.01	0.27
	0.1	2	3.3	30,000	1,000	0.06	0.3	27,000	900	0.054	0.27
		4	6.7	25,000	800	0.05	0.3	23,000	720	0.045	0.27
		6	10	20,000	600	0.036	0.3	18,000	540	0.032	0.27



Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Rame Copper				Rame Tungsteno (W70%-Cu30%) Copper Tungsten (W70%-Cu30%)			
Diametro Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
0.8	0.02	4	5	25,000	1,600	0.01	0.4	23,000	1,400	0.009	0.36
		6	7.5	20,000	1,200	0.01	0.4	18,000	1,100	0.009	0.36
		8	10	16,000	800	0.01	0.4	14,000	720	0.009	0.36
	0.05	4	5	25,000	1,600	0.03	0.4	23,000	1,400	0.027	0.36
		6	7.5	20,000	1,200	0.024	0.4	18,000	1,100	0.022	0.36
		8	10	16,000	800	0.02	0.4	14,000	720	0.018	0.36
	0.1	4	5	25,000	1,600	0.06	0.4	23,000	1,400	0.054	0.36
		6	7.5	20,000	1,200	0.05	0.4	18,000	1,100	0.045	0.36
		8	10	16,000	800	0.04	0.4	14,000	720	0.036	0.36
1	0.05	3	3	25,000	2,400	0.03	0.6	23,000	2,200	0.027	0.55
		4	4	25,000	2,200	0.03	0.6	23,000	2,000	0.027	0.55
		5	5	22,000	2,000	0.024	0.6	20,000	1,800	0.022	0.55
		6	6	20,000	1,800	0.024	0.6	18,000	1,600	0.022	0.55
		8	8	16,000	1,400	0.02	0.6	14,000	1,200	0.018	0.55
		10	10	12,000	1,000	0.02	0.6	11,000	900	0.018	0.55
	0.1	3	3	25,000	2,400	0.06	0.6	23,000	2,200	0.054	0.55
		4	4	25,000	2,200	0.055	0.6	23,000	2,000	0.05	0.55
		5	5	22,000	2,000	0.05	0.6	20,000	1,800	0.045	0.55
		6	6	20,000	1,800	0.045	0.6	18,000	1,600	0.04	0.55
		8	8	16,000	1,400	0.04	0.6	14,000	1,200	0.036	0.55
		10	10	12,000	1,000	0.03	0.6	11,000	900	0.027	0.55
	0.2	3	3	25,000	2,400	0.12	0.6	23,000	2,200	0.11	0.55
		4	4	25,000	2,200	0.11	0.6	23,000	2,000	0.1	0.55
		5	5	22,000	2,000	0.1	0.6	20,000	1,800	0.09	0.55
		6	6	20,000	1,800	0.09	0.6	18,000	1,600	0.08	0.55
		8	8	16,000	1,400	0.08	0.6	14,000	1,200	0.07	0.55
		10	10	12,000	1,000	0.06	0.6	11,000	900	0.054	0.55
1.5	0.1	5	3.3	20,000	2,400	0.06	0.9	18,000	2,200	0.054	0.8
		10	6.6	16,000	1,600	0.05	0.9	14,000	1,400	0.045	0.8
		15	10	12,000	1,000	0.04	0.9	11,000	900	0.036	0.8
	0.2	5	3.3	20,000	2,400	0.12	0.9	18,000	2,200	0.11	0.8
		10	6.6	16,000	1,600	0.1	0.9	14,000	1,400	0.09	0.8
		15	10	12,000	1,000	0.08	0.9	11,000	900	0.07	0.8
	0.3	5	3.3	20,000	2,400	0.18	0.9	18,000	2,200	0.16	0.8
		10	6.6	16,000	1,600	0.15	0.9	14,000	1,400	0.14	0.8
		15	10	12,000	1,000	0.12	0.9	11,000	900	0.11	0.8
	0.5	5	3.3	20,000	2,400	0.25	0.5	18,000	2,200	0.23	0.8
		10	6.6	16,000	1,600	0.2	0.5	14,000	1,400	0.18	0.8
		15	10	12,000	1,000	0.12	0.5	11,000	900	0.11	0.8
		20	13.3	8,000	600	0.06	0.5	7,000	540	0.054	0.8

Scaricata
Long Neck



Rivestita
Coating

Torche
Corner
Radius

N Lega di alluminio
Aluminium Alloy

N Rame
Copper

O Resina
Resin

Fresatura
Elettrodi Rame
Copper Electrode
Milling

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Rame Copper				Rame Tungsteno (W70%-Cu30%) Copper Tungsten (W70%-Cu30%)			
Diametro Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
2	0.1	5	2.5	16,000	3,000	0.06	1.2	14,000	2,700	0.054	1.1
		8	4	14,000	2,600	0.06	1.2	13,000	2,400	0.054	1.1
		10	5	12,000	2,000	0.06	1.2	11,000	1,800	0.054	1.1
		15	7.5	10,000	1,600	0.05	1.2	9,000	1,400	0.045	1.1
		20	10	8,000	1,200	0.04	1.2	7,000	1,100	0.036	1.1
	0.2	5	2.5	16,000	3,000	0.12	1.2	14,000	2,700	0.11	1.1
		8	4	14,000	2,600	0.12	1.2	13,000	2,400	0.11	1.1
		10	5	12,000	2,000	0.12	1.2	11,000	1,800	0.11	1.1
		15	7.5	10,000	1,600	0.1	1.2	9,000	1,400	0.09	1.1
		20	10	8,000	1,200	0.08	1.2	7,000	1,100	0.07	1.1
	0.3	5	2.5	16,000	3,000	0.18	1.2	14,000	2,700	0.16	1.1
		8	4	14,000	2,600	0.18	1.2	13,000	2,400	0.16	1.1
		10	5	12,000	2,000	0.18	1.2	11,000	1,800	0.16	1.1
		15	7.5	10,000	1,600	0.14	1.2	9,000	1,400	0.13	1.1
		20	10	8,000	1,200	0.1	1.2	7,000	1,100	0.09	1.1
	0.5	5	2.5	16,000	3,000	0.3	1.2	14,000	2,700	0.27	1.1
		8	4	14,000	2,600	0.3	1.2	13,000	2,400	0.27	1.1
		10	5	12,000	2,000	0.3	1.2	11,000	1,800	0.27	1.1
		15	7.5	10,000	1,600	0.2	1.2	9,000	1,400	0.18	1.1
		20	10	8,000	1,200	0.15	1.2	7,000	1,100	0.14	1.1
2.5	0.2	8	3.2	15,000	3,000	0.12	1.5	13,500	2,700	0.11	1.4
		14	5.6	12,000	2,200	0.1	1.5	11,000	2,000	0.09	1.4
		20	8	10,000	1,600	0.08	1.5	9,000	1,400	0.04	1.4
	0.5	8	3.2	15,000	3,000	0.3	1.5	13,500	2,700	0.027	1.4
		14	5.6	12,000	2,200	0.25	1.5	11,000	2,000	0.23	1.4
		20	8	10,000	1,600	0.2	1.5	9,000	1,400	0.18	1.4
3	0.1	12	4	14,000	3,000	0.06	1.8	13,000	2,700	0.054	1.6
		18	6	12,000	2,400	0.05	1.8	11,000	2,200	0.045	1.6
		24	8	10,000	1,800	0.04	1.8	9,000	1,600	0.036	1.6
	0.2	12	4	14,000	3,000	0.12	1.8	13,000	2,700	0.11	1.6
		18	6	12,000	2,400	0.1	1.8	11,000	2,200	0.09	1.6
		24	8	10,000	1,800	0.08	1.8	9,000	1,600	0.07	1.6
	0.3	12	4	14,000	3,000	0.18	1.8	13,000	2,700	0.16	1.6
		18	6	12,000	2,400	0.15	1.8	11,000	2,200	0.14	1.6
		24	8	10,000	1,800	0.12	1.8	9,000	1,600	0.11	1.6
	0.5	12	4	14,000	3,000	0.3	1.8	13,000	2,700	0.27	1.6
		15	5	13,000	2,600	0.3	1.8	12,000	2,400	0.27	1.6
		18	6	12,000	2,400	0.25	1.8	11,000	2,200	0.23	1.6
		24	8	10,000	1,800	0.2	1.8	9,000	1,600	0.18	1.6
		30	10	8,000	1,400	0.16	1.8	7,000	1,200	0.14	1.6

Toriche
Corner
Radius

Scaricata
Long Neck

Rivestita
Coating

○ Lega di alluminio
Aluminium Alloy

● Rame
Copper

○ Resina
Resin

Fresatura
Elettrodi Rame
Copper Electrode
Milling

Condizioni di taglio raccomandate

Recommended Milling Conditions

Materiale Work Material				Rame Copper				Rame Tungsteno (W70%-Cu30%) Copper Tungsten (W70%-Cu30%)			
Diametro Dia.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto L/D L/D	N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut		N. di giri Spindle Speed	Avanz. Feed	Prof. di taglio Depth of Cut	
				g/min	mm/min	ap mm	ae mm	g/min	mm/min	ap mm	ae mm
4	0.1	16	4	10,000	2,800	0.06	2.8	9,000	2,500	0.054	2.5
		24	6	8,000	2,200	0.05	2.8	7,000	1,900	0.045	2.5
		32	8	6,000	1,600	0.04	2.8	5,500	1,400	0.036	2.5
	0.2	16	4	10,000	2,800	0.14	2.8	9,000	2,500	0.13	2.5
		24	6	8,000	2,200	0.12	2.8	7,000	1,900	0.11	2.5
		32	8	6,000	1,600	0.1	2.8	5,500	1,400	0.09	2.5
	0.3	16	4	10,000	2,800	0.18	2.8	9,000	2,500	0.16	2.5
		24	6	8,000	2,200	0.15	2.8	7,000	1,900	0.14	2.5
		32	8	6,000	1,600	0.12	2.8	5,500	1,400	0.11	2.5
	0.5	16	4	10,000	2,800	0.3	2.4	9,000	2,500	0.27	2.2
		24	6	8,000	2,200	0.24	2.4	7,000	1,900	0.22	2.2
		32	8	6,000	1,600	0.18	2.4	5,500	1,400	0.16	2.2
5	0.1	16	4	10,000	2,800	0.6	2	9,000	2,500	0.54	1.8
		24	6	8,000	2,200	0.48	2	7,000	1,900	0.43	1.8
		32	8	6,000	1,600	0.36	2	5,500	1,400	0.32	1.8
6	0.1	20	4	8,000	2,700	0.06	3.5	7,000	2,400	0.054	3.2
		40	8	5,000	1,600	0.04	3.5	4,500	1,400	0.036	3.2
		48	8	4,000	1,600	0.03	4.2	3,500	1,400	0.027	3.8
	0.2	24	4	6,000	2,600	0.12	4.2	5,500	2,300	0.11	3.8
		48	8	4,000	1,600	0.06	4.2	3,500	1,400	0.054	3.8
		48	8	4,000	1,600	0.06	4.2	3,500	1,400	0.054	3.8
	0.3	24	4	6,000	2,600	0.18	4.2	5,500	2,300	0.16	3.8
		48	8	4,000	1,600	0.09	4.2	3,500	1,400	0.08	3.8
		48	8	4,000	1,600	0.09	4.2	3,500	1,400	0.08	3.8
	0.5	24	4	6,000	2,600	0.3	3.6	5,500	2,300	0.27	3.2
		30	5	5,000	2,200	0.24	3.6	4,500	1,900	0.22	3.2
		48	8	4,000	1,600	0.16	3.6	3,500	1,400	0.14	3.2
1	1	24	4	6,000	2,600	0.6	3	5,500	2,300	0.54	2.7
		48	8	4,000	1,600	0.3	3	3,500	1,400	0.27	2.7

Note Notes

- ※1 I parametri di taglio consigliati sono solo di riferimento e devono essere regolati secondo il tipo di macchina ed il pezzo da lavorare.
- ※2 Profondità di taglio: ap=Profondità di taglio assiale / ae=Profondità di taglio radiale
- ※3 Si consiglia di utilizzare la rampa o l'interpolazione elicoidale per l'approccio assiale del pezzo
- ※4 Per l'esecuzione di cave da pieno è consigliata la fresatura bidirezionale regolando l'avanzamento all' 60% delle condizioni di fresatura consigliate
- ※5 Ridurre la velocità e l'avanzamento nello stesso rapporto per eliminare vibrazioni o in caso di limitato numero di giri della macchina
- ※6 Si consiglia l'uso di lubrificante
- ※1 Recommend to use the milling condition as just reference. Adjust milling conditions according to machining shape and machine status.
- ※2 Depth of Cut : ap=Axial Depth of Cut / ae=Radial Depth of Cut.
- ※3 Recommend to apply helical or ramping for approaching into axial direction.
- ※4 For slotting, recommend reciprocating milling by adjusting feed & ap in below 60% of recommended milling condition.
- ※5 Reduce both spindle speed and feed at same rate for chattering and also for insufficient spindle speed of a machine.
- ※6 Water-insoluble fluid is recommended.

Scaricata
Long Neck



Rivestita
Coating

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N Lega di alluminio
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O Resina
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