NS TOOL

Frese 4 tagli scaricate per acciai temprati con gambo corto ed elevata precisione rivestite 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

MHRSH430RSF

La geometria wiper senza segni di giunzione migliora la rugosità
La tolleranza R ±0.003 mm migliora la finitura degli acciai temprati

Wiper and seamless shape improve surface roughness
Corner R accuracy ±0.003 mm enhances finishing performance on hardened steels

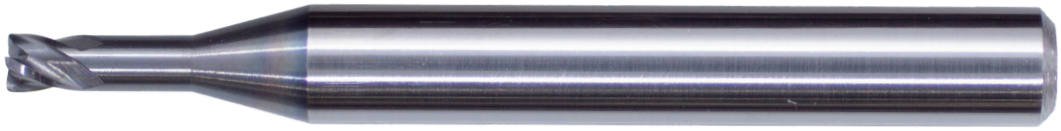
Frese 4 tagli toriche scaricate per acciai temprati con gambo corto ed elevata precisione rivestite MUGEN PREMIUM Plus

MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill
with short shank for Hardened Steel and High accuracy cutting

MHRSH430RSF

Ø0.1×R0.01 ~ Ø6×R1

205 misure disponibili
Total 205 sizes



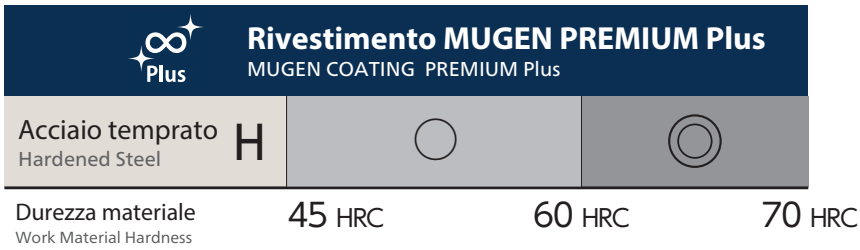
Caratteristiche

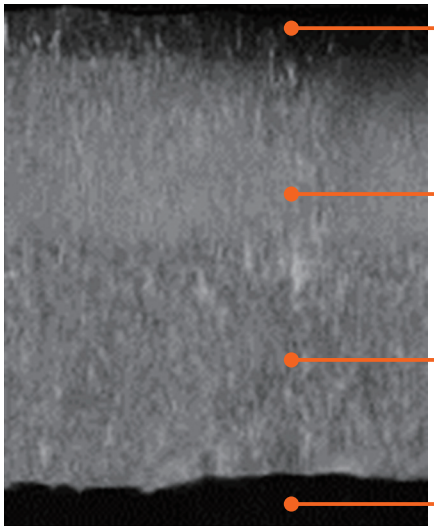
Features

Caratteristiche 1	Lunga vita utensile Long tool life	MUGEN PREMIUM PLUS MUGEN COATING PREMIUM Plus

Il rivestimento MUGEN PREMIUM Plus grazie alla sua elevata resistenza all'ossidazione e resistenza all'abrasione è adatto per lavorazioni superiori a 60 HRC.
Dimostra le stesse prestazioni del rivestimento MUGEN PREMIUM anche su lavorazioni tra i 45 ~ 60 HRC.

High oxidation resistance and abrasion resistance is suitable for machining above 60HRC
Demonstrates same performance with MUGEN COATING PREMIUM even on machining 45 ~ 60HRC





Strato resistente all'ossidazione
Oxidation resistant layer

Previene l'ossidazione causata dalla generazione del calore durante il taglio
Prevents oxidation due to heat generated during cutting

Strato di rivestimento duro
Hard coating layer

L'usura dell'utensile può essere ridotta durante la lavorazione di acciaio ad elevata durezza
Tool wear can be reduced when machining on high hardened steel

Strato di rivestimento ad alta adesione
High adhesion coating layer

Struttura dalla difficile formazione e propagazione di crepe per la forza di impatto
Structure that is difficult to crack and propagate when impact forced

Metallo duro super micro grana
Super Micro Grain Carbide

Caratteristiche 2

Eccellente precisione e rugosità
Excellent accuracy and surface roughness

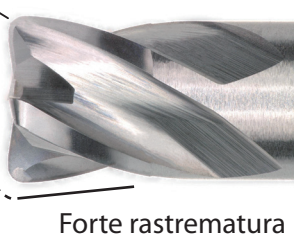
Elevata precisione e wiper
High accuracy corner R and wiper

Fresa torica per incrementare la precisione e la rugosità superficiale
Corner radius end mill to pursue accuracyand surface roughness

Tagliente di testa - senza taglio al centro
End tooth profile no center tooth
Ø0.1×R0.01 ~ Ø2×R0.5

Tagliente di testa - con taglio al centro
End tooth profile with center tooth
Ø3×R0.05 ~ Ø6×R1

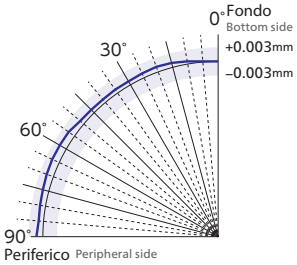
Elevata precisione del raggio
High accuracy corner R



WIPER
Wiper

Forte rastrematura posteriore
Strong back taper

Migliora la finitura dei piani e delle pareti grazie alla precisione del raggio e l'assenza di giunzioni
Enhances surface roughness and accuracy on side machining
High accuracy corner R and Seamless

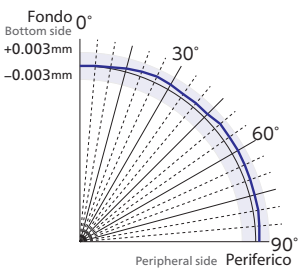


Ø0.1×R0.01 ~ Ø2×R0.5

Raggio R ±0.003 mm
Corner Radius

Ø3×R0.05 ~ Ø6×R1

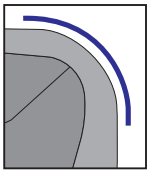
Raggio R ±0.005 mm
Corner Radius



Il raggio e il tagliente periferico sono collegati senza segni di giunzione, il tagliente liscio migliora la rugosità superficiale nella lavorazione delle pareti (D ≧ Ø0.4)
Corner R and peripheral cutting edge are seamlessly connected, and the smooth cutting edge improves the surface roughness on side machining

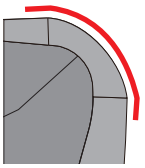
MHRSH430RSF

Senza giunzione
Seamless



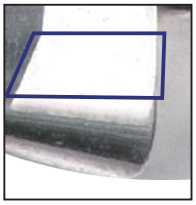
Senza giunzione
Seamless

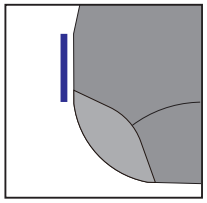
Torica generica
General Corner Radius



Con giunzione
Seam

Migliora la finitura dei piani grazie al wiper
Improves surface roughness on bottom by wiper
(D ≧ Ø0.4)





La fase wiper alla fine del tagliente migliora la rugosità superficiale nella lavorazione dei piani

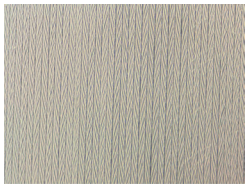
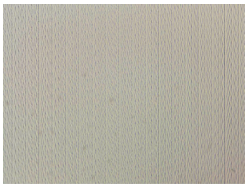
By adopting wiper at the end tooth, improves the surface roughness on bottom surface machining

Comparazione della rugosità dopo la finitura del piano
Surface roughness comparison after bottom surface finishing

Materiale
Work material
HAP40 (64HRC)

Dimensioni utensile
Tool size
Ø2×R0.2×6

Ingrandimento 400x
Magnification rate

MHRSH430RSF	Convenzionale Conventional	Competitore A Other tool brand A	Competitore B Other tool brand B
			
Ra 0.010µm	Ra 0.028µm	Ra 0.029µm	Ra 0.026µm

La geometria wiper senza segni di giunzione migliora la rugosità
La tolleranza R ±0.003 mm migliora la finitura degli acciai temprati

Wiper and seamless shape improve surface roughness
Corner R accuracy ±0.003 mm enhances finishing performance on hardened steels

Caratteristiche 3

Precisione migliorata
Improved cutting accuracy

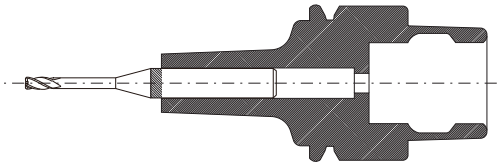
Sporgenza ottimale grazie al gambo ridotto e preciso
Optimal overhung length by high accuracy short shank

Elevata rigidità e lavorazioni ad elevata precisione
Realized high rigidity and high precision machining

MHRSH430RSF

Gambo ridotto ad alta precisione
Elevata rigidità con mandrino a calettamento

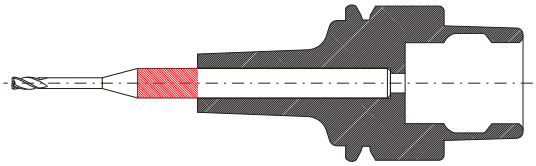
High precision short shank
High rigidity with shrink fit chuck



Convenzionale
Conventional

Ampio range di tolleranza del gambo
La lunga sporgenza causa una minore rigidità

Shank tolerance with wide range
long overhung caused lower tool rigidity



Rugosità e usura dopo 60 min
Surface roughness and wear after 60 mins machining

Utensile: MHRSH430RSF Ø2×R0.2×6
Tool

Materiale: HAP40 (64HRC)
Work material

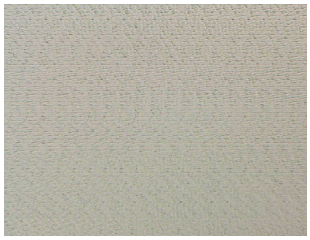
Giri: 12,000 g/min
Spindle speed

Avanzamento: 1,000 mm/min
Feed

Profondità di taglio: ap 0.02×ae 0.05 mm
Depth of cut

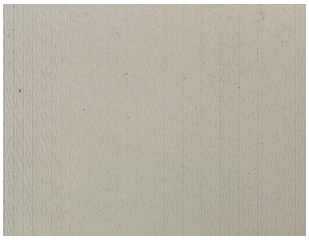
Rugosità
Surface roughness

1 Parete 0°
Wall



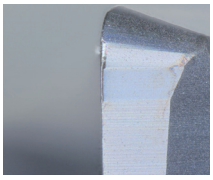
Ra 0.052µm

2 Piano
Bottom



Ra 0.010µm

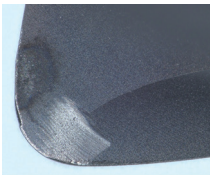
Usura
Tool wear



Fine tagliente
End tooth

Larghezza usura
Frank wear width

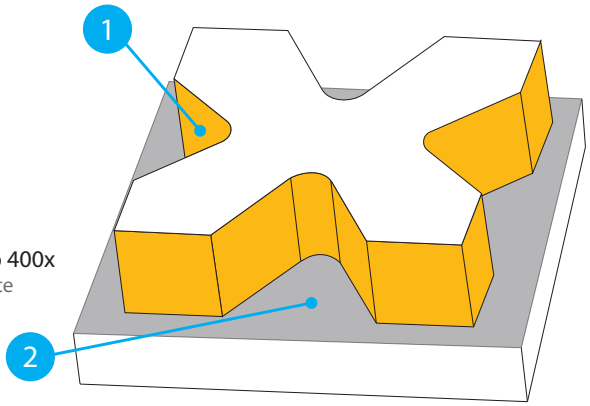
0.023mm



Raggio R
Corner R

Riduzione sul raggio
R retreat amount

0.003mm



Ingrandimento 400x
Magnification rate

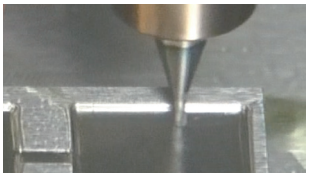
Ti porta a varie informazioni sull'utensile
Leads to various tool information

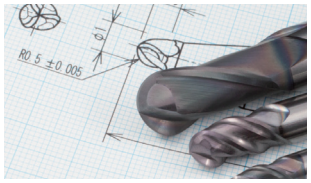
Dal barcode 2D sul retro della confezione
From 2D barcode on back of product case

Frese 4 tagli scaricate per acciai temprati con gambo corto ed elevata precisione rivestite 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

Esempio per la fresa
MHRSH430RSF
Example for MHRSH430RSF

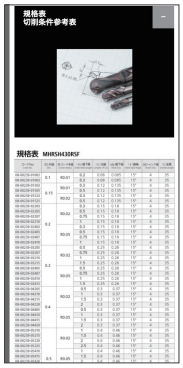




Puoi consultare queste informazioni
You can check disclosure information

Caratteristiche
Features

Dimensioni e condizioni di fresatura
Size and Milling conditions



Video, ecc..
Video etc

Altro
Others

Sito web
Corporate Web Site

Contattaci
Contact us

Cataloghi
Product Leaflet

Contattaci tel.
Contact us by phone

Twitter

Facebook

Espanderemo maggiormente il servizio NS Tool connect con i futuri prodotti
We will expand NS Tool Connect web service widely for future products

MHRSH430RSF

Dimensioni
Size

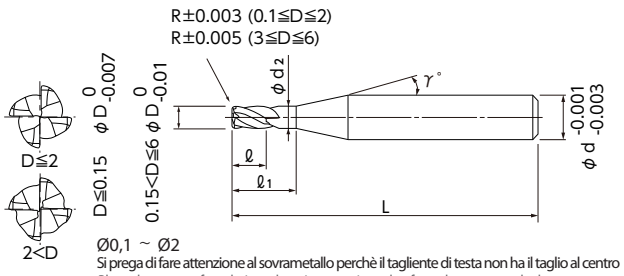
Ø0.1×R0.01 ∽ Ø6×R1

MUGEN PREMIUM Plus
Frese 4 tagli toriche scaricate per acciai temprati con gambo corto ed elevata precisione
MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with short shank for Hardened Steel and High accuracy cutting

205 misure disponibili
Total 131 sizes

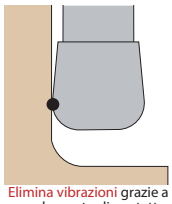
Gamma estesa fino al Ø6, la combinazione tra lo speciale design dell'utensile e l'elevata precisione del raggio migliora le prestazioni di finitura su acciai temprati

Lineup extended up to φ6, combining specialized tool design and high accuracy corner R enhance finishing performance on hardened steels

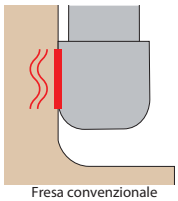


Si prega di fare attenzione al sovrametallo perchè il tagliente di testa non ha il taglio al centro
Please be aware of stock since there is no cutting edge from the center to the bottom.

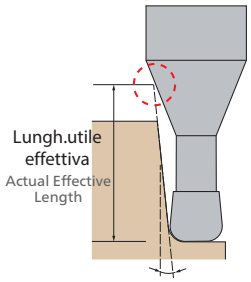
- Il rivestimento MUGEN PREMIUM Plus per acciai temprati e l'elevata rastremazione posteriore del tagliente per la riduzione delle vibrazioni consentono di ottenere una lunga durata utensile e un eccelente finitura
- Fresa a 4 taglienti per lavorazioni ad elevata efficienza
- Fresa a 4 taglienti dal 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 φ0.1 to φ6.



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



Fresa convenzionale
General End Mill



Angolo di inclinazione
Inclined Angle

Materiale Work Material

Acciaio temprato Hardened Steel	H
45 ∽ 60HRC	60 ∽ 70HRC
○	◎

Unità di misura: mm
Unit [Size : mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ1) Lungh. scarico Under Neck Length	(ℓ) Lungh. tagl. Length of Cut	(d2) Dia. scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Dia. gambo Shank Dia.	(L) Lungh. totale Overall Length	La lungh. utile effettiva dipende dall'angolo d'inclinazione del pezzo Actual effective length depending on inclined angle of workpiece				
									30'	1°	1°30'	2°	3°
08-00239-01002	0.1	R0.01	0.2	0.08	0.085	15°	4	35	0.23	0.24	0.25	0.26	0.28
08-00239-01003			0.3	0.08	0.085	15°	4	35	0.33	0.35	0.36	0.37	0.4
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
08-00239-01505			0.5	0.12	0.135	15°	4	35	0.54	0.56	0.58	0.6	0.65
08-00239-01523		R0.02	0.3	0.12	0.135	15°	4	35	0.33	0.34	0.36	0.37	0.4
08-00239-01525			0.5	0.12	0.135	15°	4	35	0.54	0.56	0.58	0.6	0.65
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
08-00239-02205			0.5	0.15	0.18	15°	4	35	0.55	0.57	0.59	0.61	0.66
08-00239-02207			0.75	0.15	0.18	15°	4	35	0.81	0.84	0.87	0.9	0.97
08-00239-02210			1	0.15	0.18	15°	4	35	1.07	1.1	1.14	1.18	1.28
08-00239-02403		R0.05	0.3	0.15	0.18	15°	4	35	0.34	0.35	0.36	0.38	0.4
08-00239-02405			0.5	0.15	0.18	15°	4	35	0.55	0.57	0.59	0.61	0.65
08-00239-02407			0.75	0.15	0.18	15°	4	35	0.81	0.83	0.86	0.89	0.96
08-00239-02410			1	0.15	0.18	15°	4	35	1.07	1.1	1.14	1.18	1.27
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
08-00239-03207			0.75	0.25	0.28	15°	4	35	0.81	0.84	0.87	0.9	0.97
08-00239-03210			1	0.25	0.28	15°	4	35	1.07	1.1	1.14	1.18	1.28
08-00239-03215			1.5	0.25	0.28	15°	4	35	1.58	1.64	1.7	1.76	1.9
08-00239-03405		R0.05	0.5	0.25	0.28	15°	4	35	0.55	0.57	0.59	0.61	0.65
08-00239-03407			0.75	0.25	0.28	15°	4	35	0.81	0.83	0.86	0.89	0.96
08-00239-03410			1	0.25	0.28	15°	4	35	1.07	1.1	1.14	1.18	1.27
08-00239-03415			1.5	0.25	0.28	15°	4	35	1.58	1.64	1.69	1.76	1.89

Come ordinare
How to Order

Quando ordinate, indicate MHRSH430RSF Ø(D)×(R)×(ℓ1)
When you order, indicate MHRSH430RSF (D)×(R)×(ℓ1).

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

MUGEN PREMIUM Plus

Frese 4 tagli toriche scaricate per acciai temprati con gambo corto ed elevata precisione

MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with short shank for Hardened Steel and High accuracy cutting

Unità di misura: mm
Unit [Size : mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ1) Lungh. scarico Under Neck Length	(ℓ) Lungh. tagl. Length of Cut	(d2) Dia. scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Dia. gambo Shank Dia.	(L) Lungh. totale Overall Length	La lungh. utile effettiva dipende dall'angolo d'inclinazione del pezzo Actual effective length depending on inclined angle of workpiece				
									30'	1°	1°30'	2°	3°
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
08-00239-04210			1	0.3	0.37	15°	4	35	1.09	1.12	1.16	1.21	1.3
08-00239-04215			1.5	0.3	0.37	15°	4	35	1.6	1.66	1.72	1.78	1.92
08-00239-04220			2	0.3	0.37	15°	4	35	2.12	2.19	2.27	2.36	2.55
08-00239-04405		R0.05	0.5	0.3	0.37	15°	4	35	0.57	0.59	0.61	0.63	0.67
08-00239-04410			1	0.3	0.37	15°	4	35	1.08	1.12	1.16	1.2	1.3
08-00239-04415			1.5	0.3	0.37	15°	4	35	1.6	1.66	1.71	1.78	1.92
08-00239-04420			2	0.3	0.37	15°	4	35	2.12	2.19	2.27	2.35	2.54
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
08-00239-05215			1.5	0.4	0.46	15°	4	35	1.62	1.68	1.74	1.8	1.95
08-00239-05220			2	0.4	0.46	15°	4	35	2.14	2.21	2.29	2.38	2.57
08-00239-05225			2.5	0.4	0.46	15°	4	35	2.66	2.75	2.85	2.95	3.19
08-00239-05410		R0.05	1	0.4	0.46	15°	4	35	1.1	1.14	1.18	1.22	1.32
08-00239-05415			1.5	0.4	0.46	15°	4	35	1.62	1.68	1.73	1.8	1.94
08-00239-05420			2	0.4	0.46	15°	4	35	2.14	2.21	2.29	2.37	2.56
08-00239-05425			2.5	0.4	0.46	15°	4	35	2.65	2.75	2.84	2.95	3.18
08-00239-05510		R0.1	1	0.4	0.46	15°	4	35	1.1	1.14	1.18	1.22	1.31
08-00239-05515			1.5	0.4	0.46	15°	4	35	1.62	1.67	1.73	1.79	1.93
08-00239-05520			2	0.4	0.46	15°	4	35	2.14	2.21	2.28	2.37	2.55
08-00239-05525			2.5	0.4	0.46	15°	4	35	2.65	2.74	2.84	2.94	3.17
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
08-00239-06220			2	0.5	0.56	15°	4	35	2.14	2.21	2.29	2.38	2.57
08-00239-06230			3	0.5	0.56	15°	4	35	3.17	3.28	3.4	3.53	3.81
08-00239-06410		R0.05	1	0.5	0.56	15°	4	35	1.1	1.14	1.18	1.22	1.32
08-00239-06420			2	0.5	0.56	15°	4	35	2.14	2.21	2.29	2.37	2.56
08-00239-06430			3	0.5	0.56	15°	4	35	3.17	3.28	3.4	3.52	3.81
08-00239-06510		R0.1	1	0.5	0.56	15°	4	35	1.1	1.14	1.18	1.22	1.31
08-00239-06520			2	0.5	0.56	15°	4	35	2.14	2.21	2.28	2.37	2.55
08-00239-06530			3	0.5	0.56	15°	4	35	3.17	3.28	3.39	3.52	3.79
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
08-00239-08203			3	0.65	0.76	15°	4	35	3.17	3.28	3.4	3.53	3.81
08-00239-08204			4	0.65	0.76	15°	4	35	4.21	4.35	4.51	4.68	5.06
08-00239-08402		R0.05	2	0.65	0.76	15°	4	35	2.14	2.21	2.29	2.37	2.56
08-00239-08403			3	0.65	0.76	15°	4	35	3.17	3.28	3.4	3.52	3.81
08-00239-08404			4	0.65	0.76	15°	4	35	4.21	4.35	4.51	4.67	5.05
08-00239-08502		R0.1	2	0.65	0.76	15°	4	35	2.14	2.21	2.28	2.37	2.55
08-00239-08503			3	0.65	0.76	15°	4	35	3.17	3.28	3.39	3.52	3.79
08-00239-08504			4	0.65	0.76	15°	4	35	4.2	4.35	4.5	4.67	5.04
08-00239-08602		R0.2	2	0.65	0.76	15°	4	35	2.13	2.2	2.27	2.35	2.53
08-00239-08603			3	0.65	0.76	15°	4	35	3.17	3.27	3.38	3.5	3.77
08-00239-08604			4	0.65	0.76	15°	4	35	4.2	4.34	4.49	4.65	5.01
08-00239-10202	1	R0.02	2	0.8	0.95	15°	4	35	2.16	2.23	2.31	2.4	2.59
08-00239-10203			3	0.8	0.95	15°	4	35	3.19	3.3	3.42	3.55	3.84
08-00239-10204			4	0.8	0.95	15°	4	35	4.23	4.37	4.53	4.7	5.08
08-00239-10205			5	0.8	0.95	15°	4	40	5.26	5.44	5.64	5.85	6.32
08-00239-10402		R0.05	2	0.8	0.95	15°	4	35	2.16	2.23	2.31	2.39	2.59
08-00239-10403			3	0.8	0.95	15°	4	35	3.19	3.3	3.42	3.54	3.83
08-00239-10404			4	0.8	0.95	15°	4	35	4.22	4.37	4.53	4.69	5.07
08-00239-10405			5	0.8	0.95	15°	4	40	5.26	5.44	5.63	5.84	6.31
08-00239-10502		R0.1	2	0.8	0.95	15°	4	35	2.16	2.23	2.3	2.39	2.57
08-00239-10503			3	0.8	0.95	15°	4	35	3.19	3.3	3.41	3.54	3.82
08-00239-10504			4	0.8	0.95	15°	4	35	4.22	4.37	4.52	4.69	5.06
08-00239-10505			5	0.8	0.95	15°	4	40	5.26	5.44	5.63	5.84	6.3
08-00239-10602		R0.2	2	0.8	0.95	15°	4	35	2.15	2.22	2.29	2.37	2.55
08-00239-10603			3	0.8	0.95	15°	4	35	3.19	3.29	3.4	3.52	3.79
08-00239-10604			4	0.8	0.95	15°	4	35	4.22	4.36	4.51	4.67	5.04
08-00239-10605			5	0.8	0.95	15°	4	40	5.25	5.43	5.62	5.82	6.28

MHRSH430RSF

MUGEN PREMIUM Plus
Frese 4 tagli toriche scaricate per acciai temprati con gambo corto ed elevata precisione
MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with short shank for Hardened Steel and High accuracy cutting

Unità di misura: mm
Unit [Size : mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ1) Lungh. scarico Under Neck Length	(ℓ) Lungh. tagl. Length of Cut	(d2) Dia. scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Dia. gambo Shank Dia.	(L) Lungh. totale Overall Length	La lungh. utile effettiva dipende dall'angolo d'inclinazione del pezzo Actual effective length depending on inclined angle of workpiece				
									30'	1°	1°30'	2°	3°
08-00239-10702	1	R0.3	2	0.8	0.95	15°	4	35	2.15	2.21	2.28	2.36	2.53
08-00239-10703			3	0.8	0.95	15°	4	35	3.18	3.28	3.39	3.51	3.77
08-00239-10704			4	0.8	0.95	15°	4	35	4.22	4.35	4.5	4.66	5.01
08-00239-10705			5	0.8	0.95	15°	4	40	5.25	5.42	5.61	5.81	6.26
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
08-00239-15204			4	1.2	1.43	15°	4	35	4.26	4.41	4.57	4.74	5.13
08-00239-15206			6	1.2	1.43	15°	4	40	6.33	6.55	6.79	7.04	7.61
08-00239-15208			8	1.2	1.43	15°	4	40	8.4	8.69	9	9.34	10.1
08-00239-15403		R0.05	3	1.2	1.43	15°	4	35	3.23	3.34	3.46	3.59	3.87
08-00239-15404			4	1.2	1.43	15°	4	35	4.26	4.41	4.57	4.74	5.12
08-00239-15406			6	1.2	1.43	15°	4	40	6.33	6.55	6.78	7.04	7.6
08-00239-15408			8	1.2	1.43	15°	4	40	8.4	8.69	9	9.34	10.09
08-00239-15503		R0.1	3	1.2	1.43	15°	4	35	3.23	3.34	3.45	3.58	3.86
08-00239-15504			4	1.2	1.43	15°	4	35	4.26	4.41	4.56	4.73	5.11
08-00239-15506			6	1.2	1.43	15°	4	40	6.33	6.55	6.78	7.03	7.59
08-00239-15508			8	1.2	1.43	15°	4	40	8.4	8.69	9	9.33	10.08
08-00239-15603		R0.2	3	1.2	1.43	15°	4	35	3.22	3.33	3.44	3.57	3.84
08-00239-15604			4	1.2	1.43	15°	4	35	4.26	4.4	4.55	4.72	5.08
08-00239-15606			6	1.2	1.43	15°	4	40	6.33	6.54	6.77	7.01	7.57
08-00239-15608			8	1.2	1.43	15°	4	40	8.39	8.68	8.98	9.31	10.06
08-00239-15703		R0.3	3	1.2	1.43	15°	4	35	3.22	3.32	3.43	3.55	3.82
08-00239-15704			4	1.2	1.43	15°	4	35	4.25	4.39	4.54	4.7	5.06
08-00239-15706			6	1.2	1.43	15°	4	40	6.32	6.53	6.76	7	7.55
08-00239-15708			8	1.2	1.43	15°	4	40	8.39	8.67	8.97	9.3	10.03
08-00239-15803		R0.5	3	1.2	1.43	15°	4	35	3.21	3.31	3.41	3.52	3.77
08-00239-15804			4	1.2	1.43	15°	4	35	4.25	4.38	4.52	4.67	5.01
08-00239-15806			6	1.2	1.43	15°	4	40	6.32	6.52	6.74	6.97	7.5
08-00239-15808			8	1.2	1.43	15°	4	40	8.38	8.66	8.95	9.27	9.98
08-00239-20204	2	R0.02	4	1.6	1.91	15°	4	35	4.3	4.45	4.61	4.78	5.17
08-00239-20206			6	1.6	1.91	15°	4	35	6.37	6.59	6.83	7.08	7.66
08-00239-20208			8	1.6	1.91	15°	4	40	8.44	8.73	9.05	9.38	10.14
08-00239-20210			10	1.6	1.91	15°	4	40	10.5	10.87	11.26	11.68	12.63
08-00239-20404		R0.05	4	1.6	1.91	15°	4	35	4.3	4.45	4.61	4.78	5.16
08-00239-20406			6	1.6	1.91	15°	4	35	6.37	6.59	6.83	7.08	7.65
08-00239-20408			8	1.6	1.91	15°	4	40	8.44	8.73	9.04	9.38	10.14
08-00239-20410			10	1.6	1.91	15°	4	40	10.5	10.87	11.26	11.68	12.62
08-00239-20504		R0.1	4	1.6	1.91	15°	4	35	4.3	4.45	4.6	4.77	5.15
08-00239-20506			6	1.6	1.91	15°	4	35	6.37	6.59	6.82	7.07	7.64
08-00239-20508			8	1.6	1.91	15°	4	40	8.43	8.73	9.04	9.37	10.13
08-00239-20510			10	1.6	1.91	15°	4	40	10.5	10.86	11.25	11.67	12.61
08-00239-20604		R0.2	4	1.6	1.91	15°	4	35	4.3	4.44	4.59	4.76	5.13
08-00239-20606			6	1.6	1.91	15°	4	35	6.36	6.58	6.81	7.06	7.62
08-00239-20608			8	1.6	1.91	15°	4	40	8.43	8.72	9.03	9.36	10.1
08-00239-20610			10	1.6	1.91	15°	4	40	10.5	10.86	11.24	11.66	12.59
08-00239-20704		R0.3	4	1.6	1.91	15°	4	35	4.29	4.43	4.58	4.74	5.11
08-00239-20706			6	1.6	1.91	15°	4	35	6.36	6.57	6.8	7.04	7.59
08-00239-20708			8	1.6	1.91	15°	4	40	8.43	8.71	9.02	9.34	10.08
08-00239-20710			10	1.6	1.91	15°	4	40	10.5	10.85	11.23	11.64	12.56
08-00239-20804		R0.5	4	1.6	1.91	15°	4	35	4.29	4.42	4.56	4.71	5.06
08-00239-20806			6	1.6	1.91	15°	4	35	6.35	6.56	6.78	7.01	7.54
08-00239-20808			8	1.6	1.91	15°	4	40	8.42	8.7	8.99	9.31	10.03
08-00239-20810			10	1.6	1.91	15°	4	40	10.49	10.84	11.21	11.61	12.52

Come ordinare
How to Order

Quando ordinate, indicate MHRSH430RSF Ø(D)×(R)×(ℓ1)
When you order, indicate MHRSH430RSF (D)×(R)×(ℓ1).

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

MUGEN PREMIUM Plus

Frese 4 tagli toriche scaricate per acciai temprati con gambo corto ed elevata precisione

MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with short shank for Hardened Steel and High accuracy cutting

Unità di misura: mm
Unit [Size : mm]

Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ1) Lungh. scarico Under Neck Length	(ℓ) Lungh. tagl. Length of Cut	(d2) Dia. scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Dia. gambo Shank Dia.	(L) Lungh. totale Overall Length	La lungh. utile effettiva dipende dall'angolo d'inclinazione del pezzo Actual effective length depending on inclined angle of workpiece				
									30'	1°	1°30'	2°	3°
08-00239-30404	3	R0.05	4	2.5	2.85	15°	6	45	4.42	4.57	4.73	4.91	5.30
08-00239-30406			6	2.5	2.85	15°	6	45	6.48	6.71	6.95	7.21	7.79
08-00239-30408			8	2.5	2.85	15°	6	45	8.55	8.85	9.17	9.51	10.28
08-00239-30410			10	2.5	2.85	15°	6	50	10.62	10.99	11.38	11.81	12.76
08-00239-30412			12	2.5	2.85	15°	6	50	12.69	13.13	13.60	14.11	15.25
08-00239-30415			15	2.5	2.85	15°	6	55	15.79	16.34	16.92	17.56	18.98
08-00239-30504		R0.1	4	2.5	2.85	15°	6	45	4.42	4.57	4.73	4.90	5.29
08-00239-30506			6	2.5	2.85	15°	6	45	6.48	6.71	6.94	7.20	7.78
08-00239-30508			8	2.5	2.85	15°	6	45	8.55	8.84	9.16	9.50	10.26
08-00239-30510			10	2.5	2.85	15°	6	50	10.62	10.98	11.38	11.80	12.75
08-00239-30512			12	2.5	2.85	15°	6	50	12.68	13.12	13.59	14.10	15.24
08-00239-30515			15	2.5	2.85	15°	6	55	15.79	16.33	16.92	17.55	18.97
08-00239-30604		R0.2	4	2.5	2.85	15°	6	45	4.41	4.56	4.72	4.89	5.27
08-00239-30606			6	2.5	2.85	15°	6	45	6.48	6.70	6.93	7.19	7.75
08-00239-30608			8	2.5	2.85	15°	6	45	8.55	8.84	9.15	9.49	10.24
08-00239-30610			10	2.5	2.85	15°	6	50	10.61	10.98	11.37	11.79	12.73
08-00239-30612			12	2.5	2.85	15°	6	50	12.68	13.12	13.58	14.09	15.21
08-00239-30615			15	2.5	2.85	15°	6	55	15.78	16.33	16.91	17.54	18.94
08-00239-30704		R0.3	4	2.5	2.85	15°	6	45	4.41	4.55	4.71	4.87	5.24
08-00239-30706			6	2.5	2.85	15°	6	45	6.48	6.69	6.92	7.17	7.73
08-00239-30708			8	2.5	2.85	15°	6	45	8.54	8.83	9.14	9.47	10.22
08-00239-30710			10	2.5	2.85	15°	6	50	10.61	10.97	11.36	11.77	12.70
08-00239-30712			12	2.5	2.85	15°	6	50	12.68	13.11	13.57	14.07	15.19
08-00239-30715			15	2.5	2.85	15°	6	55	15.78	16.32	16.90	17.52	18.92
08-00239-30804		R0.5	4	2.5	2.85	15°	6	45	4.40	4.54	4.69	4.84	5.20
08-00239-30806			6	2.5	2.85	15°	6	45	6.47	6.68	6.90	7.14	7.68
08-00239-30808			8	2.5	2.85	15°	6	45	8.54	8.82	9.12	9.44	10.17
08-00239-30810			10	2.5	2.85	15°	6	50	10.60	10.96	11.33	11.74	12.66
08-00239-30812			12	2.5	2.85	15°	6	50	12.67	13.10	13.55	14.04	15.14
08-00239-30815			15	2.5	2.85	15°	6	55	15.77	16.31	16.88	17.49	18.87
08-00239-40508	4	R0.1	8	3.2	3.8	15°	6	45	8.65	8.94	9.26	9.61	10.38
08-00239-40512			12	3.2	3.8	15°	6	50	12.78	13.22	13.70	14.21	15.35
08-00239-40516			16	3.2	3.8	15°	6	55	16.92	17.50	18.13	18.81	Free
08-00239-40520			20	3.2	3.8	15°	6	55	21.05	21.78	22.56	23.41	Free
08-00239-40608		R0.2	8	3.2	3.8	15°	6	45	8.64	8.94	9.25	9.59	10.36
08-00239-40612			12	3.2	3.8	15°	6	50	12.78	13.22	13.69	14.19	15.33
08-00239-40616			16	3.2	3.8	15°	6	55	16.91	17.50	18.12	18.79	Free
08-00239-40620			20	3.2	3.8	15°	6	55	21.05	21.77	22.55	23.39	Free
08-00239-40708		R0.3	8	3.2	3.8	15°	6	45	8.64	8.93	9.24	9.58	10.33
08-00239-40712			12	3.2	3.8	15°	6	50	12.77	13.21	13.68	14.18	15.31
08-00239-40716			16	3.2	3.8	15°	6	55	16.91	17.49	18.11	18.78	Free
08-00239-40720			20	3.2	3.8	15°	6	55	21.04	21.77	22.54	23.38	Free
08-00239-40808		R0.5	8	3.2	3.8	15°	6	45	8.63	8.92	9.22	9.55	10.29
08-00239-40812			12	3.2	3.8	15°	6	50	12.77	13.20	13.65	14.15	15.26
08-00239-40816			16	3.2	3.8	15°	6	55	16.90	17.47	18.09	18.75	Free
08-00239-40820			20	3.2	3.8	15°	6	55	21.04	21.75	22.52	23.35	Free
08-00239-50515	5	R0.1	15	4	4.75	15°	6	50	15.98	16.53	17.13	Free	Free
08-00239-50520			20	4	4.75	15°	6	55	21.15	21.88	Free	Free	Free
08-00239-50615		R0.2	15	4	4.75	15°	6	50	15.98	16.53	17.12	Free	Free
08-00239-50620			20	4	4.75	15°	6	55	21.14	21.87	Free	Free	Free
08-00239-50715		R0.3	15	4	4.75	15°	6	50	15.97	16.52	17.10	Free	Free
08-00239-50720			20	4	4.75	15°	6	55	21.14	21.87	Free	Free	Free
08-00239-50815		R0.5	15	4	4.75	15°	6	50	15.97	16.50	17.08	Free	Free
08-00239-50820			20	4	4.75	15°	6	55	21.13	21.85	Free	Free	Free

MHRSH430RSF

MUGEN PREMIUM Plus
Frese 4 tagli toriche scaricate per acciai temprati con gambo corto ed elevata precisione
MUGEN COATING PREMIUM Plus 4-Flute Long Neck Corner Radius End Mill with short shank for Hardened Steel and High accuracy cutting

Unità di misura: mm
Unit [Size : mm]

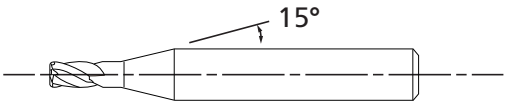
Codice Code No.	(D) Diametro Dia.	(R) Raggio Corner Radius	(ℓ1) Lungh. scarico Under Neck Length	(ℓ) Lungh. tagl. Length of Cut	(d2) Dia. scarico Neck Dia.	(γ) Angolo Neck Taper Angle	(d) Dia. gambo Shank Dia.	(L) Lungh. totale Overall Length	La lungh. utile effettiva dipende dall'angolo d'inclinazione del pezzo Actual effective length depending on inclined angle of workpiece				
									30'	1°	1°30'	2°	3°
08-00239-60512	6	R0.1	12	5	5.7	-	6	45	Free	Free	Free	Free	Free
08-00239-60518			18	5	5.7	-	6	50	Free	Free	Free	Free	Free
08-00239-60524			24	5	5.7	-	6	60	Free	Free	Free	Free	Free
08-00239-60530			30	5	5.7	-	6	65	Free	Free	Free	Free	Free
08-00239-60612		R0.2	12	5	5.7	-	6	45	Free	Free	Free	Free	Free
08-00239-60618			18	5	5.7	-	6	50	Free	Free	Free	Free	Free
08-00239-60624			24	5	5.7	-	6	60	Free	Free	Free	Free	Free
08-00239-60630			30	5	5.7	-	6	65	Free	Free	Free	Free	Free
08-00239-60712		R0.3	12	5	5.7	-	6	45	Free	Free	Free	Free	Free
08-00239-60718			18	5	5.7	-	6	50	Free	Free	Free	Free	Free
08-00239-60724			24	5	5.7	-	6	60	Free	Free	Free	Free	Free
08-00239-60730			30	5	5.7	-	6	65	Free	Free	Free	Free	Free
08-00239-60812		R0.5	12	5	5.7	-	6	45	Free	Free	Free	Free	Free
08-00239-60818			18	5	5.7	-	6	50	Free	Free	Free	Free	Free
08-00239-60824			24	5	5.7	-	6	60	Free	Free	Free	Free	Free
08-00239-60830			30	5	5.7	-	6	65	Free	Free	Free	Free	Free
08-00239-60912		R1	12	5	5.7	-	6	45	Free	Free	Free	Free	Free
08-00239-60918			18	5	5.7	-	6	50	Free	Free	Free	Free	Free
08-00239-60924			24	5	5.7	-	6	60	Free	Free	Free	Free	Free
08-00239-60930			30	5	5.7	-	6	65	Free	Free	Free	Free	Free

Come ordinare
How to Order

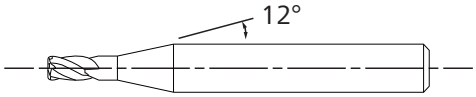
Quando ordinate, indicate MHRSH430RSF Ø(D)×(R)×(ℓ1)
When you order, indicate MHRSH430RSF (D)×(R)×(ℓ1).

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

L'angolo di sformo (γ) della fresa MHRSH430RSF è di 15 °. Gli altri nostri prodotti hanno un angolo (γ) di 12 °.
Neck taper angle (γ) of MHRSH430RSF is 15°. Our other products have a neck taper angle (γ) of 12°.



MHRSH430RSF



Gli altri nostri prodotti hanno un angolo di sformo (γ) di 12°
Our other products have a neck taper angle (γ) of 12°

Parametri di taglio raccomandati
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.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto diametro lunghezza L/D	Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità 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
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
		0.3	3	40,000	160	0.002	0.01	40,000	120	0.002	0.01	40,000	90	0.002	0.01
0.15	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
		0.5	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	0.3	2	40,000	240	0.002	0.015	40,000	180	0.002	0.01	40,000	140	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
0.2	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
		0.5	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
		0.5	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
0.3	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
		0.75	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
		1.5	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
		0.75	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
		1.5	5	30,000	320	0.003	0.04	30,000	240	0.003	0.03	30,000	180	0.003	0.03
0.4	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
		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
		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
0.5	0.02	1	2	23,000	900	0.006	0.1	20,000	800	0.004	0.08	18,000	600	0.004	0.08
		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
	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
		2.5	5	23,000	680	0.006	0.1	20,000	580	0.004	0.08	18,000	420	0.004	0.08
	0.1	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	0.02	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
		2	3.3	23,000	800	0.006	0.15	20,000	640	0.004	0.1	17,000	480	0.004	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
	0.05	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
		2	3.3	23,000	800	0.01	0.15	20,000	640	0.007	0.1	17,000	480	0.006	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
	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
		2	3.3	23,000	800	0.01	0.15	20,000	640	0.007	0.1	17,000	480	0.006	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

Parametri di taglio raccomandati
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.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto diametro lunghezza L/D	Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità 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
0.8	0.02	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
		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
		4	5	23,000	1,200	0.005	0.16	20,000	800	0.003	0.14	17,000	600	0.003	0.14
	0.05	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
		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
		4	5	23,000	1,200	0.015	0.16	20,000	800	0.01	0.14	17,000	600	0.006	0.14
	0.1	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
		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
		4	5	23,000	1,200	0.015	0.16	20,000	800	0.01	0.14	17,000	600	0.006	0.14
	0.2	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
		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
		4	5	23,000	1,200	0.015	0.16	20,000	800	0.01	0.14	17,000	600	0.006	0.14
1	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
	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

Parametri di taglio raccomandati
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.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto diametro lunghezza L/D	Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità 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
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
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
		15	5	9,000	1,200	0.03	0.7	7,000	900	0.03	0.6	5,500	650	0.018	0.6
	0.1	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
		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
	0.2	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
		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
	0.3	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
		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
	0.5	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
		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

Parametri di taglio raccomandati
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.	Raggio Corner Radius	Lungh. scarico Under Neck Length	Rapporto diametro lunghezza L/D	Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità di taglio Depth of Cut		Giri Spindle Speed	Avanz. Feed	Profondità 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
4	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
	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
	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
	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
	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
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 ap indica la profondità di taglio assiale, ae indica l'impegno 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 a rampa o elicoidale, per entrare nel pezzo in maniera assiale.
※6 Per cave 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 minimale.

※1 Depth of Cut a_p = Axial Depth of Cut / a_e = 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 & a_p 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.

Esempio di lavorazione 1

SKH55 (64HRC) Tasche a due sezioni

SKH55 (64HRC) Two-stage pocket model

Precisione di lavorazione stabile su acciai temprati dall'inizio alla fine grazie alla lunga durata dell'utensile

Achieved stable machining accuracy on hardened steels from the beginning to the end by long tool life

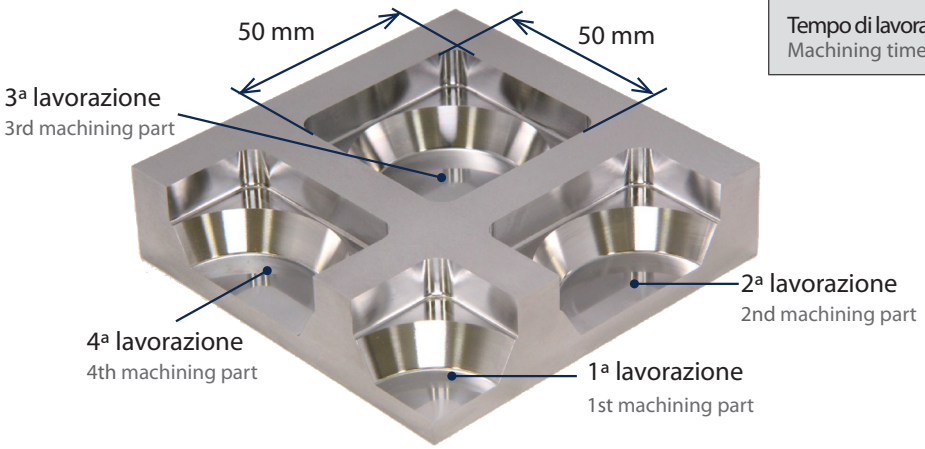
Materiale: SKH55 (64HRC)
Work material

Dimensione pezzo: 100 × 100 × 25 mm (profondità 19 mm)
Work size
Machining depth

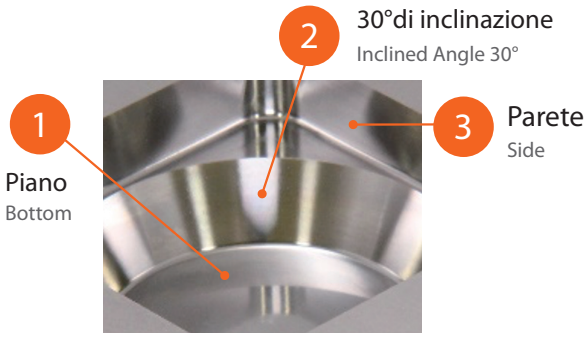
Refrigerante: Minimale
Coolant : Oil mist

Tempo di lavorazione: 2 ore 59 min (solo finitura)
Machining time : 2 hr 59 min (Finishing Only)

Processo Process	Finitura parete Finishing (Side)	Finitura piano Finishing (Bottom)
Utensile Tool	MHRSH430RSF φ6 × R1 × 24	
Giri [g/min] Spindle speed	4,000	
Avanz. [mm/min] Feed	600	
Prof. di taglio [mm] Depth of cut	pf 0.1	pf 0.2
Sovrametallo [mm] Stock	0.03	
Tempo di lavorazione Machining time	2 ore 59 min 2 hr 59 min	

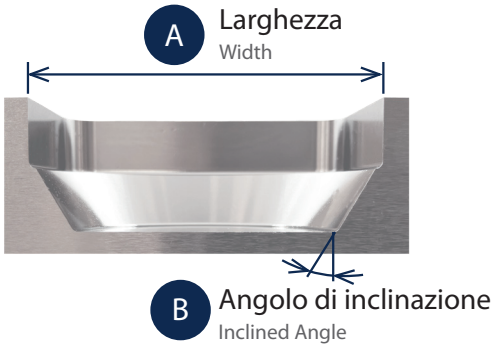


Rugosità superficiale
Surface Roughness



Punto rilevato Measuring position		1	2	3
2ª 2nd	Ra [µm]	0.05	0.35	0.42
4ª 4th		0.06	0.49	0.28

Precisone
Accuracy



Punto rilevato Measuring position		A	B
Target Target		50.000 mm	30° 0' 0"
2ª 2nd	Attuale Actual	49.990 mm	30° 0'43"
4ª 4th	Attuale Actual	49.983 mm	30° 0'23"

Esempio di lavorazione 2 Machining case 2

VANADIS23 (63HRC) Stampo sigillo — VANADIS23 (63HRC) Sealed mold

Precisione dimensionale stabile nella lavorazione di acciai temprati. Grazie al wiper sul tagliente si ottiene una rugosità superficiale di alta precisione nella lavorazione dei piani.

Realized stable dimension accuracy on machining hardened steels
By adopting wiper at the end cutting edge achieves high precision surface roughness on plane machining

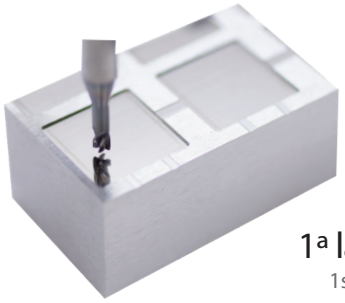
Materiale: VANADIS23 (63HRC)
Work material

Dimensione pezzo: 20 × 90 × 15 mm (profondità 0.3 mm)
Work size — Machining depth

Refrigerante: Minimale
Coolant : Oil mist

Tempo di lavorazione Tot: 1 ore 44 min
Total machining time : 1 hr 44 min

Lavorazione della presa d'aria
Machining at air vent
Comparazione tra la 1ª e la 12ª
Comparison between 1st and 12th places



Rugosità superficiale Surface Roughness

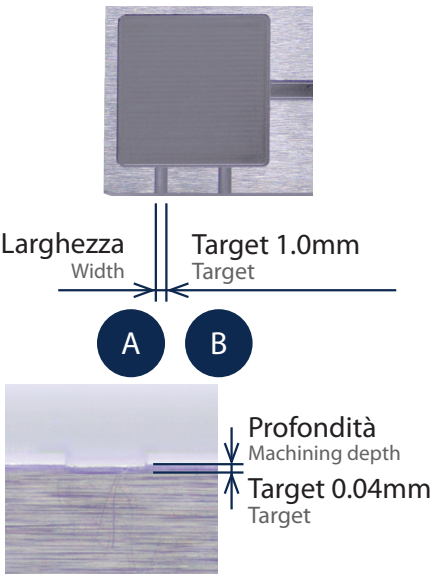
Punto rilevato Measuring position	1	2
Ra [µm]	0.055	0.066
Rz [µm]	0.387	0.445

Precisone Accuracy

Unità [mm] Unit

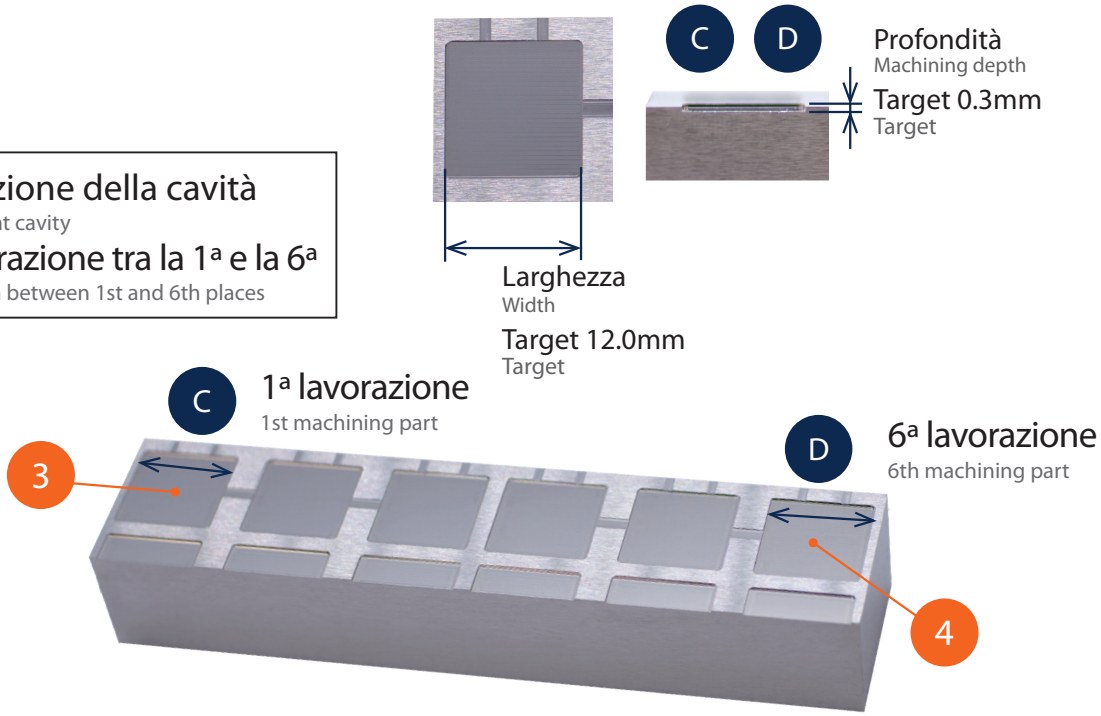
Punto rilevato Measuring position	Cava Groove A		Cava Groove B	
	Larghezza Width	Profondità Depth	Larghezza Width	Profondità Depth
Dopo lav. After machining	1.001	0.039	0.999	0.041

Processo Process	Cava Groove	
	Sgrossatura Roughing	Finitura Finishing
Utensile Tool	MHRSH430RSF φ0.8 × R0.02 × 2	MHRSH430RSF φ0.8 × R0.02 × 2
Giri [g/min] Spindle speed	11,000	11,000
Avanz. [mm/min] Feed	500	300
Prof. di taglio ap × ae Depth of cut [mm]	0.003×0.18	0.005×0.01 Parete Side 0.003×0.2 Piano Bottom
Sovrametallo [mm] Stock	0.01 Parete Side 0.003 Piano Bottom	-
Tempo di lavorazione Machining time	3 min 3 min	4 min 4 min



Lavorazione della cavità
Machining at cavity

Comparazione tra la 1ª e la 6ª
Comparison between 1st and 6th places



Rugosità superficiale
Surface Roughness

Punto rilevato Measuring position	3	4
Ra [µm]	0.053	0.051
Rz [µm]	0.370	0.336

Precisone
Accuracy

Unità [mm]
Unit

Punto rilevato Measuring position	Cavità Cavity C		Cavità Cavity D	
	Larghezza Width	Profondità Depth	Larghezza Width	Profondità Depth
Dopo lavorazione After machining	11.999	0.298	11.998	0.296

Processo Process	Cavità Cavity				
	Sgrossatura Roughing	Ripresa Stock removal	Semifinitura piano Bottom Semi-finishing	Finitura Finishing	Finitura angolo Corner finishing
Utensile Tool	MHRSH430RSF φ1.5 × R0.1 × 4	MHRSH430RSF φ1 × R0.05 × 2		MHRSH430RSF φ1 × R0.05 × 2	
Giri [g/min] Spindle speed	11,000	11,000		11,000	
Avanz. [mm/min] Feed	800	800		800	800
Prof. di taglio ap × ae Depth of cut [mm]	0.06 × 0.3	0.01×0.12	ae 0.2	0.01 ×0.01Parete Side 0.004×0.2 Piano Bottom	0.01×0.05
Sovrametallo [mm] Stock	0.01 Parete Side 0.004 Piano Bottom	0.01 Parete Side 0.004 Piano Bottom	0.004 Piano Bottom	-	-
Tempo di lavorazione Machining time	40 min 40 min	14 min 14 min	8 min 8 min	26 min 26 min	9 min 9 min

Esempio di lavorazione 3 Machining case 3

HAP40 (64HRC) Ingranaggio — HAP40 (64HRC) Gear model

Il design ad alta precisione combinato al rivestimento MUGEN COATING PREMIUM Plus aumenta le durata dell'utensile mantenendo un'elevata precisione e qualità della superficie anche dopo lunghi tempi di lavorazione

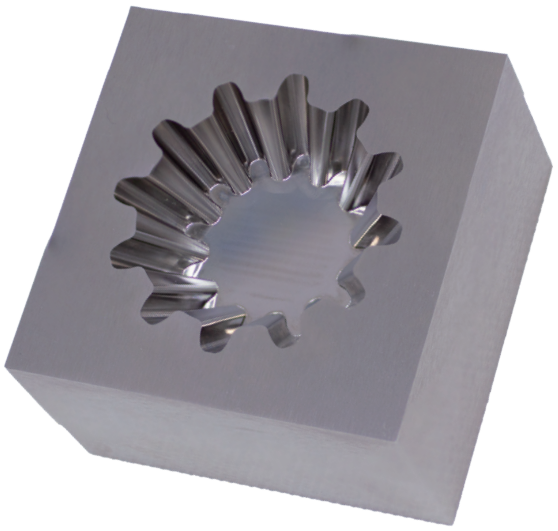
High precision tool design combines MUGEN COATING PREMIUM Plus extends tool life maintain high surface quality and accuracy even after long time machining

Materiale: HAP40 (64HRC)
Work material

Dimensione pezzo: 50 × 50 mm (profondità 10 mm)
Work size — Machining depth

Refrigerante: Minimale
Coolant : Oil mist

Tempo di lavorazione Tot: 7 ore 26 min
Total machining time : 7 hr 26 min

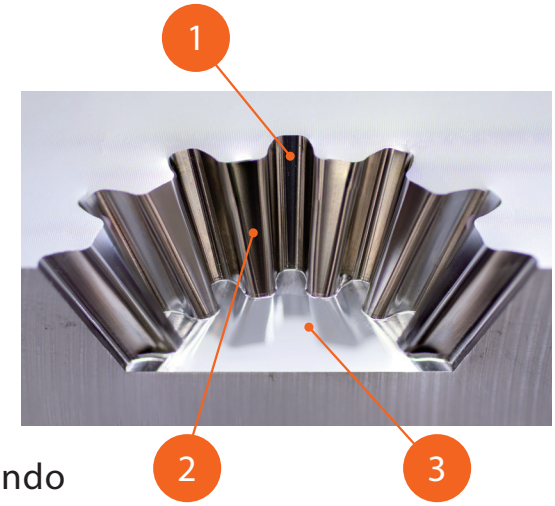


Processo Process	Sgrossatura Roughing	Semifinitura Semi-finishing		Finitura Finishing	
		Piano Bottom	Parete Side	Piano Bottom	Parete Side
Utensile Tool	MHRSH430RSF φ2 × R0.2 × 6	MHRSH430RSF φ2 × R0.2 × 6		MHRSH430RSF φ2 × R0.2 × 6	
Giri [g/min] Spindle speed	12,000	12,000		12,000	
Avanz. [mm/min] Feed	1,300	650	1,300	650	1,300
Prof. di taglio ap × ae Depth of cut [mm]	0.04 × 0.5	Step 0.1	Step 0.08	Step 0.05	Step 0.04
Sovrametallo [mm] Stock	0.03	0.01		-	
Tempo di lavorazione Machining time	4 ore 25 min 4 hr 25 min	1 ore 5 min 1 hr 5 min		1 ore 56 min 1 hr 56 min	

※ Utilizzati 2 utensili per la sgrossatura
※ Using 2 tools for roughing

Rugosità superficiale
Surface Roughness

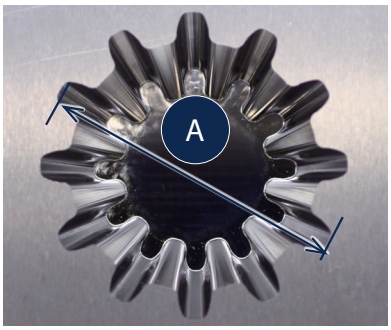
Punto rilevato Measuring position	1	2	3
Ra [µm]	0.189	0.228	0.036
Rz [µm]	1.169	1.131	0.352



Precisione
Accuracy

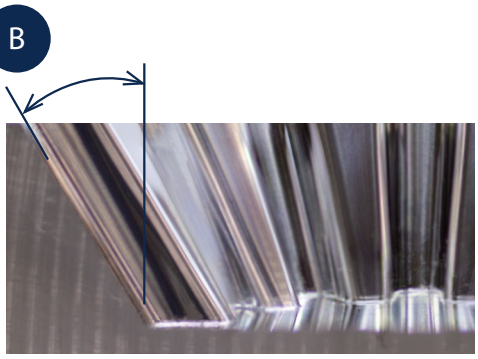
Punto rilevato Measuring position	A
Target Target	37.100 mm
Attuale Actual	37.099 mm
Errore Error	0.001 mm

Diametro fondo
Tip circle diameter

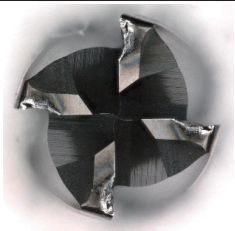
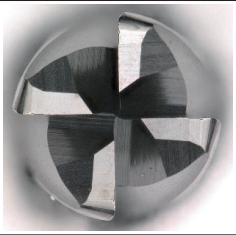
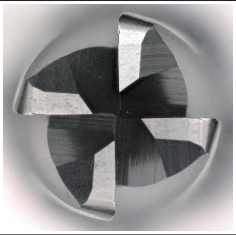
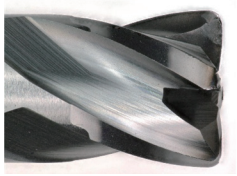
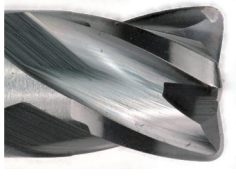


Punto rilevato Measuring position	B
Target Target	30°45'
Attuale Actual	30°44'48"
Errore Error	0°0′ 12"

Angolo
Angle



Condizione del tagliente dopo la lavorazione
Cutting edge condition after machining

	Sgrossatura Roughing	Semifinitura Semi-finishing	Finitura Finishing
Tagliente fondo Bottom edge			
Spoglia tagliente periferico Peripheral cutting edge Rake face			

Lavorazione stabile su HAP40 (64HRC) dopo circa 2 ore
Mantiene un'elevata precisione con una minore usura anche dopo la semifinitura e la finitura
Realized stable machining on HAP40 (64HRC) for about 2 hours
Maintain high accuracy with less wear even after semi-finishing and finishing