



FRESATURA

MILLING / FRÄSEN / FRAISAGE / FRESADO



	FRESE INTEGRALI IN METALLO DURO	  
	SOLID CARBIDE MILLING CUTTERS	
	HM FRÄSER	
	FRAISES EN CARBURE MONOBLOC	
	FRESAS INTEGRALES EN METAL DURO	

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	FRESE PER SPIANATURA E SMUSSI	  
	FACE AND CHAMFERRING MILLING CUTTERS	
	FRÄSER ZUM PLANEN UND ZUM FASEN	
	FRAISES À SURFACER ET ARRONDIR	
	FRESAS PARA PLANEAR Y BISELES	

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	FRESE PER SPALLAMENTI	  
	SHOULDER MILLING CUTTERS	
	ECKFRAESER	
	FRAISES À DRESSER	
	FRESAS PARA ESCUADRAR	

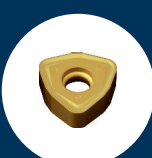
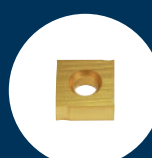
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	ELIFRESE-FRESE PER SCANALATURA FRESE FORANTI	  
	HELICAL END MILLS-GROOVING END MILLS DRILLING END MILLS	
	SCHAFTSCHRUPPFÄSER ZUM NUTENFRÄSEN BORHNUTENFRÄSER, SCHEIBENFRÄSER	
	FRAISES HÉLICOÏDALES-FRAISES À CANNELER FRAISES À PERCER	
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	COPY MILLING CUTTERS	
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	WENDEPLATTEN ZUM FRÄSEN	
	PLAQUÉTTES DE FRAISAGE	
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- 1 = NUMERO TAGLIENTI E ANGOLO ELICA
- 2 = CARATTERISTICHE TECNICHE (PAG. 237)
- 3 = TOLLERANZE COSTRUTTIVE
- 4 = ELENCO ARTICOLI
- 5 = MISURE E DATI
- 6 = ULTERIORI DATI TECNICI E CONSIGLIO D'USO
- 1B = LAVORAZIONI ESEGUIBILI
- 2B = GRUPPI MATERIALI
- 3B = INDICAZIONE MATERIALI LAVORABILI E CAMPI D'IMPIEGO
- 4B = PARAMETRI DI LAVORO
- 5B = NOTA PER PARAMETRI EVENTUALI ALTRE LAVORAZIONI
- 6B = FORMULE E PARAMETRI



- 1 = NUMBER OF FLUTES AND HELIX ANGLE
- 2 = TECHNICAL FEATURES (PAG. 237)
- 3 = CONSTRUCTIVE TOLERANCE
- 4 = ITEM
- 5 = MEASURES AND DATA
- 6 = FURTHER TECHNICAL DATA AND SUGGESTIONS
- 1B = POSSIBLE MACHINING OPERATIONS
- 2B = MATERIAL GROUPS
- 3B = INFORMATION ON WORKABLE MATERIALS AND FIELDS OF APPLICATION
- 4B = MACHINING PARAMETERS
- 5B = NOTE ON PARAMETERS FOR POSSIBLE ADDITIONAL APPLICATIONS
- 6B = FORMULAS AND PARAMETERS



- 1 = ANZAHL SCHNEIDEN UND SPIRALWINKEL
- 2 = TECHNISCHE HAUPTMERKMALE (PAG. 237)
- 3 = KONSTRUKTIONSTOLERANZEN
- 4 = ARTIKEL
- 5 = ABMESSUNGEN UND DATEN
- 6 = WEITERE TECHNISCHE DATEN UND TIPPS
- 1B = MÖGLICHE BEARBEITUNGEN
- 2B = MATERIALGRUPPEN
- 3B = ANGABE DER BEARBEITBAREN MATERIALIEN UND ANWENDUNGSGEBIETE
- 4B = SCHNITTDATEN
- 5B = ANMERKUNG ZU DEN PARAMETERN FÜR EVENTUELLE WEITERE BEARBEITUNGEN
- 6B = FORMELN UND PARAMETER



- 1 = NOMBRE TRANCHANTS ET ANGLE HELICE
- 2 = CARACTERISTIQUES TECHNIQUES (PAG. 237)
- 3 = TOLERANCE CONSTRUCTIVES
- 4 = ARTICLES
- 5 = DIMENSIONS ET DONNÉES
- 6 = ULTÉRIEURES DONNÉES TECHNIQUE ET CONSEILLE D'USAGE
- 1B = USINAGES A EXECUTER
- 2B = GROUPES DE MATERIAUX
- 3B = INDICATION MATERIAUX A USINER ET PLACES D'APPLICATION
- 4B = PARAMÈTRES DE TRAVAIL
- 5B = NOTE POUR PARAMÈTRES EVENTUELS D'AUTRES USINAGES
- 6B = FORMULES ET PARAMÈTRES



- 1 = ANGOLI COSTRUTTIVI
- 2 = INSERTI CONSIGLIATI
- 3 = ELENCO ARTICOLI
- 4 = MISURE, DATI, INDICAZIONI
- 5 = ACCESSORI IN DOTAZIONE
- 6 = ACCESSORI E RICAMBI OPZIONALI A RICHIESTA
- 7 = GRANDEZZA INSERTO
- 8 = DATI TECNICI E CONSIGLI D'USO
- 9 = LAVORAZIONI POSSIBILI
- 10 = ANGOLO DI PENETR. OBLIQUA
- 1B = ELENCO INSERTI
- 2B = INDICAZIONE MATERIALI LAVORABILI E CAMPI D'IMPIEGO
- 3B = DISPONIBILITÀ GRADI
- 4B = MISURE E DATI
- 5B = USO DEL REFRIGERANTE
- 6B = SCELTA DEL GRADO (QUICK PICK)
- 7B = GRUPPI MATERIALI
- 8B = AVANZAMENTO DI BASE f_{z0}
- 9B = VELOCITÀ DI TAGLIO V_c
- 10B = FORMULE E PARAMETRI
- 11B = CORREZIONE AVANZAMENTO f_{z0}
- 12B = INTERPRETAZIONE VELOCITÀ DI TAGLIO SECONDO LA LAVORAZIONE
- 13B = INDICAZIONI ULTERIORI



- 1 = CONSTRUCTIVE ANGLES
- 2 = RECOMMENDED INSERTS
- 3 = ITEM
- 4 = MEASURES, DATA, INDICATIONS
- 5 = ACCESSORIES EQUIPMENT
- 6 = OPTIONAL ACCESSORIES AND SPARE PARTS ON REQUEST
- 7 = INSERT SIZE
- 8 = TECHNICAL DATA AND SUGGESTIONS
- 9 = POSSIBLE TYPES OF MACHINING
- 10 = OBLIQUE PENETRATION ANGLE
- 1B = AVAILABLE INSERTS
- 2B = RECOMMENDED MACHINING MATERIALS AND FIELDS OF APPLICATION
- 3B = AVAILABLE GRADES
- 4B = MEASURES AND DATA
- 5B = USE OF COOLANT
- 6B = GRADE CHOICE (QUICK PICK)
- 7B = MATERIAL GROUPS
- 8B = BASIC FEED RATE f_{z0}
- 9B = CUTTING SPEED V_c
- 10B = FORMULAS AND PARAMETERS
- 11B = FEED RATE CORRECTION f_{z0}
- 12B = CUTTING SPEED INTERPRETATION ACCORDING TO MACHINING
- 13B = FURTHER INDICATIONS



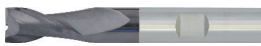
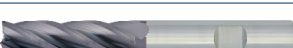
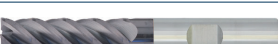
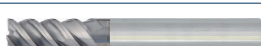
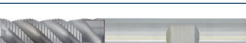
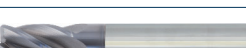
- 1 = KONSTRUKTIONSWINKEL
- 2 = EMPFOHLENE WENDESCHNEIDPLATTEN
- 3 = ARTIKEL
- 4 = ABMESSUNGEN, DATEN, HINWEISE
- 5 = ZUBEHÖRAUSSTATTUNG
- 6 = OPTIONALZUBEHÖR UND -ERSATZTEILE AUF ANFRAGE
- 7 = WENDEPLATTENGROSSE
- 8 = TECHNISCHE DATEN UND TIPPS
- 9 = MÖGLICHE BEARBEITUNGSARTEN
- 10 = EINTAUCHWINKEL
- 1B = LIEFERBARE WENDEPLATTEN
- 2B = EMPFOHLENE WERKSTOFFE UND EINSATZBEREICHE
- 3B = LIEFERBARE HM-QUALITÄTEN
- 4B = ABMESSUNGEN UND DATEN
- 5B = KÜHLMITTELVERWENDUNG
- 6B = SORTENAUSWAHL (QUICK PICK)
- 7B = MATERIALGRUPPEN
- 8B = GRUNDVORSCHUB f_{z0}
- 9B = SCHNITTGESCHWINDIGKEIT V_c
- 10B = FORMELN UND PARAMETER
- 11B = VORSCHUBKORREKTUR f_{z0}
- 12B = INTERPRETATION DER SCHNITTGESCHWINDIGKEIT NACH BEARBEITUNG
- 13B = WEITERE HINWEISE



- 1 = ANGLES CONSTRUCTIVES
- 2 = PLAQUETTES CONSEILLÉES
- 3 = ARTICLES
- 4 = DIMENSIONS, DONNÉES, INDICATIONS
- 5 = ACCESSOIRES EN DOTATION
- 6 = ACCESSOIRES ET RECHANGE OPTIONNEL SUR DEMANDE
- 7 = DIMENSION DE LA PLAQUETTE
- 8 = DONNÉES TECHNIQUES ET CONSEILLES D'USAGE
- 9 = USINAGES POSSIBLES
- 10 = ANGLE DE PÉNÉTRATION OBLIQUE
- 1B = PLAQUETTES DISPONIBLES
- 2B = INDICATIONS SUR LES MATERIAUX USINABLE ET CHAMPS D'USINAGE
- 3B = DISPONIBILITÉ DE DEGRÉS
- 4B = DIMENSIONS ET PARAMÈTRES
- 5B = UTILISATION DU RÉFRIGÉRANTE
- 6B = CHOIX DU DEGRÉ (QUICK PICK)
- 7B = GROUPES DE MATERIAUX
- 8B = DÉPLACEMENT f_{z0}
- 9B = VITESSE DE COUPE V_c
- 10B = FORMULES ET PARAMÈTRES
- 11B = CORRECTION DÉPLACEMENT f_{z0}
- 12B = INTERPRÉTATION VITESSE DE COUPE SELON L'USINAGE
- 13B = INDICATIONS ULTÉRIEURES

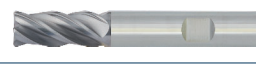
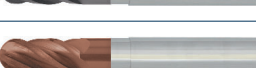
			ART.	LUNGHEZZA FRESA MILLING CUTTER LENGTH	SPIGOLO FRESA CORNER SHAPE	ØD	Z	ANGOLO ELICA ANGLE FLUTES	Materiali - Materials Pag. 1119							Pag.					
									P	M	K	N	S	H	G						
MICROFRESE - MICRO-MILLS																					
		BLACK		ST2201		90°	0,4-3	2	30°	●	○	●	●			240					
				STN2201		90°	0,4-3	2	30°	●	○	●	●			242					
		BLACK		ST2205		R	0,4-3	2	30°	●	○	●	○			244					
				STN2205		R	0,4-3	2	30°	●	○	●	○			246					
FRESE PER ALLUMINIO - MILLING CUTTERS FOR ALUMINIUM																					
				SM1200		90°	1-6	1	30°				●			250					
				SM1300		90°	2-16	1	30°				●			252					
		SILVER		SMW2317		90°	4-20	2	55°				●			254					
				SMW2317..N01		90°	3-20	2	55°				●			256					
				SM2315..N01		R	8-25	2	30°				●			258					
		SILVER		SM2417		R	4-12	2	40°				●			260					
				SM2417..01		R	3-12	2	40°				●			262					
				SM3315..N01		R	6-16	3	43°-45°				●			264					
		SILVER		SM3417		90°	6-25	3	45°				●			266					
				SM3417..N01		90°	6-25	3	45°				●			268					
		GOLD		SMW3414		90°	8-25	3	40°				●			270					
				SMW3414..N01		90°	8-25	3	40°				●			272					
HSC		GOLD		SM3510		45°	4-20	3	43°-45°				●			274					
HSC				SM3510..N01		45°	4-20	3	43°-45°				●			276					



			ART.	LUNGHEZZA FRESE MILLING CUTTER LENGTH	SPIGOLO FRESE CORNER SHAPE	ØD	Z	ANGOLO ELICA ANGLE FLUTES	Materiali - Materials Pag. 1119							Pag.							
																P	M	K	N	S	H	G	
2 TAGLI - 2 CUTTINGS																							
		BLACK		SMW2200		90°	2-20	2	30°	●	●	●				○	280						
		BLACK		SMW2300		90°	2-20	2	30°	●	●	●				○	282						
		BLACK		SMW2203		R	2,5-20	2	30°	●	●	●				○	284						
		BLACK		SM2203		R	2,5-20	2	30°	●	●	●				○	286						
HSC		GRAY		SM2424		R	2-12	2	30°	●		●		●	●	○	288						
3 TAGLI - 3 CUTTINGS																							
		BLACK		SMW3100		90°	2-20	3	30°	●	●	●				○	292						
		RED		SMW3231		90°	2-20	3	30°	●	●	●				○	294						
		BLACK		SMW3300		90°	2-20	3	30°	●	●	●				○	296						
4/6/8 TAGLI - 4/6/8 CUTTINGS																							
		BLACK		SMW4300		90°	5,5-20	4	30°	●	●	●				○	300						
		BLACK		SM4300		90°	2-20	4	30°	●	●	●				○	302						
		BLACK		SMW4400		90°	3-20	4	30°	●	●	●				○	304						
		BLACK		SMW4402		45°	2-20	4	45°	●	●	●				○	306						
HSC		GRAY		SM4330		45°	4-20	4	52°	●	●	●			●	○	308						
		GRAY		SMW4304		90°	3-20	4	25°	●	●	●					310						
		GRAY		SMW3304		90°	4-25	3-4 5-6	45°	●	●			●			312						
		GRAY		SMW4404		90°	6-20	4	45°	●	●	●		●			314						
		GRAY		SM4325		R	3-20	4	30°	●	○	○			●	○	316						
HSC		GRAY		SM4215		R	2-16	4	30°	●	○	○			●	○	318						



			ART.	LUNGHEZZA FRESE MILLING CUTTER LENGTH	SPIGOLO FRESE CORNER SHAPE	ØD	Z	ANGOLO ELICA ANGLE FLUTES	Materiali - Materials Pag. 1119							Pag.
									P	M	K	N	S	H	G	
4/6/8 TAGLI - 4/6/8 CUTTINGS																
	GRAY		SM4525			3-20	4	30°	●	○	○			●	○	320
	BLACK		SMW4403			3-20	4	30°	●	●	●				○	322
	GRAY		SM6402			4-20	6-8	45°	●	●	●	●	●		○	324
	GRAY		SM6502			4-20	6-8	45°	●	●	●	●	●		○	326
	GRAY		SM6432			4-20	6-8	52°	●					●	○	328
	GRAY		SM6532			6-20	6-8	52°	●					●	○	330
	ORANGE		SM7215..TI			6-16	5-9	38°	○	●			●	○		332
ELICA CON ANGOLO VARIABILE - HELIX WITH VARIABLE ANGLE																
HSC	GRAY		SMW3400			3-20	3	45°-48°	●	○	●			○	○	336
	ORANGE		SMW3400..TI			3-20	3	45°-48°	○	●			●	○		338
HSC	GRAY		SM3415			3-20	3	45°-48°	●	○	●			○	○	340
	ORANGE		SM3415..TI			3-20	3	45°-48°	○	●			●	○		342
	GRAY		SM3515			4-10	3	35°-38°	●	○	●			○	○	344
	ORANGE		SM3515..TI			4-10	3	35°-38°	○	●			●	○		346
	GRAY		SM3525			4-10	3	35°-38°	●	○	●			○	○	348
	ORANGE		SM3525..TI			4-10	3	35°-38°	○	●			●	○		350
	BLACK		SMW4501			5-20	4	35°-38°	●	○	●			○	○	352
	ORANGE		SMW4501..TI			5-20	4	35°-38°	○	●			●	○		354
	BLACK		SMW4401			3-25	4	35°-38°	●	○	●			○	○	356
	ORANGE		SMW4401..TI			3-25	4	35°-38°	○	●			●	○		358
	BLACK		SM4415			3-25	4	35°-38°	●	○	●			○	○	360
	ORANGE		SM4415..TI			3-25	4	35°-38°	○	●			●	○		362

			ART.	LUNGHEZZA FRESA MILLING CUTTER LENGTH	SPIGOLO FRESA CORNER SHAPE	ØD	Z	ANGOLO ELICA ANGLE FLUTES	Materiali - Materials Pag. 1119							Pag.
P	M	K							N	S	H	G				
ELICA CON ANGOLO VARIABILE - HELIX WITH VARIABLE ANGLE																
	GRAY		SMW4305			4-20	4	35°-38°	●	○	●	○	○	○	364	
	ORANGE		SMW4305..TI			4-20	4	35°-38°	○	●	○	○	●	○	366	
	GRAY		SM4315			4-20	4	35°-38°	●	○	●	○	○	○	368	
	ORANGE		SM4315..TI			4-20	4	35°-38°	○	●	○	○	●	○	370	
	GRAY		SM4313			2,5-16	4	35°-38°	●	○	●	○	○	○	372	
	ORANGE		SM4313..TI			2,5-16	4	35°-38°	○	●	○	○	●	○	374	
	GRAY		SM4413..LX			3-16	4	35°-38°	●	○	●	○	○	○	376	
	NEW		SM5215..TI			6-16	5	36°-37°	●	●	○	○	●	○	378	
	NEW		SMW5405..TI			8-16	5	36°-37°	●	●	○	○	●	○	380	
SEDI CHIAVETTE - KEYSLOTS																
	BLACK		SMW3301			1,8-15,7	3	30°	●	●	●	○	○	○	384	
SVASATORI/SMUSSATORI - COUNTERSINK AND CHAMFER MILLS																
	BLACK		SCR0183			4-20	4-6	0°	●	●	●	○	○	○	388	
	BLACK		SCR0187			4-20	4-5-6	0°	●	●	●	○	○	○	390	
	BLACK		SMR0110			4-16	4	0°	●	●	●	○	○	○	392	
			SS230			3-20	2	30°				●			394	
	BLACK		SM4701			6-10	4	0°	●	●	●	○	○	○	396	

SIMBOLOGIA - SYMBOL - SYMBOLE - SYMBOLES

RIVESTIMENTI - COATED - BESCHICHTUNG - RECOUVREMENT

RIVESTIM. COATED BLACK	BLACK: L'elevata durezza del rivestimento offre una protezione eccellente contro l'usura abrasiva e l'erosione BLACK: The high hardness of the coating offers an excellent protection against abrasive wear and erosion	RIVESTIM. COATED GRAY	GRAY: Le notevoli migliorie di resistenza all'usura, così come la resistenza all'ossidazione e la durezza a caldo, rendono questo rivestimento la scelta naturale per le frese GRAY: A considerably improved resistance to wear, as well as good oxidation stability and hot hardness make this coating ideally suitable for the milling cutters
RIVESTIM. COATED GOLD	GOLD: Rivestimento molto adatto alla lavorazione dell'alluminio e le sue leghe. Permette di utilizzare parametri di taglio più elevati. GOLD: This coating is particularly suitable for aluminum and relevant alloys. It enables the use of higher cutting parameters	RIVESTIM. COATED SILVER	SILVER: Particolarmente indicato per lavorazioni di alluminio, bronzo, ottone e rame. SILVER: Particularly suitable to machining aluminum, bronze and copper.
RIVESTIM. COATED RED	RED: Lavorazione ad alta velocità di materiali difficilmente lavorabili. RED: High speed machining of hardly machinable materials.	RIVESTIM. COATED ORANGE	ORANGE: Rivestimento multistrato ottimizzato per la lavorazione di acciai inossidabili, Titanio, Inconel e superleghe. ORANGE: Optimized multi-layer coating for stainless steel, titanium, inconel and super alloys.

DIREZIONE DI LAVORAZIONE - WORKING DIRECTION - ARBEITSRICHTUNG - ORENTATION D'EXECUTION

	- N2 Direzioni di utilizzo possibili - 2 Possible usage orientation - 2 Mögliche vorschubrichtung - N2 orientations d'usage possibles		- N3 Direzioni di utilizzo possibili - 3 Possible usage orientation - 3 Mögliche vorschubrichtung - N3 orientations d'usage possibles
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SPIGOLO FRESA - CORNER SHAPE - FRÄSERKANTE - ARETE FRAISE

	- 90°		- Angolo di testa 90° - 90° Head angle - Kopfwinkel 90° - Angle en tete 90°		- Angolo di testa 60° - 60° Head angle - Kopfwinkel 60° - Angle en tete 60°		- Spigolo a 45° - 45° Corner shape - Ecke 45° - Arête 45°
	- Sferico - Spherical - Kugelförmig - Sphérique		- Torico - Toric - Torisch - Torique		- Raggiato - Radius - Mit eckenradius - Radiaire		

DUREZZA MATERIALE - HARDNESS MATERIAL - MATERIALHÄRTE - DURETE MATERIAU

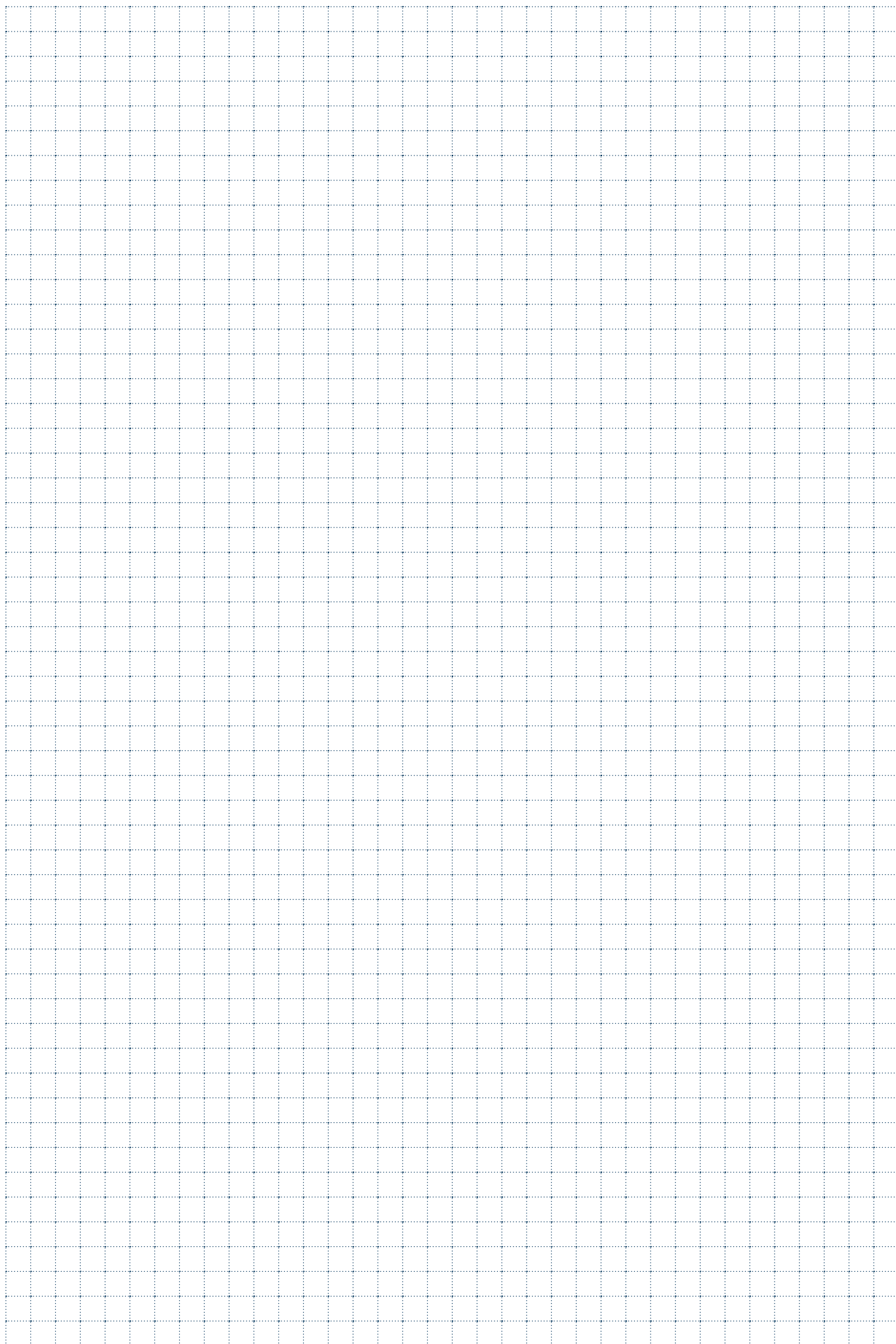
42 HRC	- 42 HRC	52 HRC	- 52 HRC	58 HRC	- 58 HRC	60 HRC	- 60 HRC
62 HRC	- 62 HRC	64 HRC	- 64 HRC	ALU ≤ 5% Si	- Alluminio con Silicio ≤ 5% - Aluminium with silicon ≤ 5% - Aluminium avec silicium ≤ 5% - Aluminium mit Siliziumgehalt ≤ 5%	ALU > 5% Si	- Alluminio con Silicio > 5% - Aluminium with silicon > 5% - Aluminium avec silicium > 5% - Aluminium mit Siliziumgehalt > 5%

LUNGHEZZA FRESA - MILLING CUTTER LENGHT - FRÄSERLÄNGE - LONGUEUR DE LA FRAISE

	- Corta - Short - Kurz - Courte		- Media - Medium - Mittel - Moyenne		- Lunga - Long - Lang - Longue
--	--	--	--	--	---

SIMBOLI GENERALI - GENERAL SYMBOLS - ALLGEMEINE SYMBOLE - SYMBOLES GÉNÉRAUX

	- Per lavorazioni ad alta velocità - For high speed machining - Für hochgeschwindigkeitsbearbeitungen geeignet - Pour usinage à haute vitesse		- Lavorazioni a secco - Dry machining - Trockenbearbeitung - Usinage a sec		- Lavorazioni con refrigerante - Machining operations with coolant - Bearbeitungen mit Kühlmittel - Usinages avec réfrigérant		- Basse vibrazioni - Low vibrations - Vibrationsarm - Faibles vibrations
	- Divisione irregolare - Irregular helix angles - Unregelmäßige Teilung der Schneiden - Division Irrégulière		- Tagliente con romptuciolo speciale - Cutting edge with special chipbreaker - Schneide mit speziellem Spanbrecher - Tranchant avec brise-copeau spécial		- Fresatura Trocoidale - Trochoidal Milling - Trochoides Fräsen - Fraisage Trochoidal		





MICROFRESE

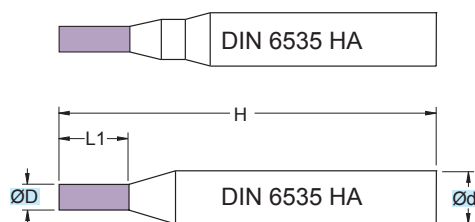
MICRO-MILLS / MIKROFRAESER / MICRO-FRAISES / MICROFRESAS

ST2201

$\varnothing D = 0,4 - 3$



Fino a diametro 0,8
 Up to diameter 0,8

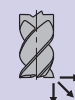


**Microfresa in M.D.I. Micrograno
 Gambo Cilindrico HA**

Micrograin HM Micro-mill
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
 COATED
BLACK



90°

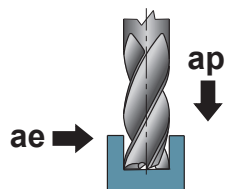
**42
 HRC**



ART.	(mm)				
	$\varnothing D$	$\varnothing d$	L1	H	z
ST2201.040.N00	0,4	3,0	1,5	38	2
ST2201.050.N00	0,5	3,0	1,5	38	2
ST2201.060.N00	0,6	3,0	2,0	38	2
ST2201.070.N00	0,7	3,0	3,0	38	2
ST2201.080.N00	0,8	3,0	3,0	38	2
ST2201.090.N00	0,9	3,0	3,0	38	2
ST2201.100.N00	1,0	3,0	4,0	38	2
ST2201.110.N00	1,1	3,0	4,0	38	2
ST2201.120.N00	1,2	3,0	4,0	38	2
ST2201.130.N00	1,3	3,0	4,0	38	2
ST2201.140.N00	1,4	3,0	4,0	38	2
ST2201.150.N00	1,5	3,0	5,0	38	2
ST2201.160.N00	1,6	3,0	5,0	38	2
ST2201.180.N00	1,8	3,0	5,0	38	2
ST2201.200.N00	2,0	3,0	6,0	38	2
ST2201.250.N00	2,5	3,0	7,0	38	2
ST2201.300.N00	3,0	3,0	8,0	38	2

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS															Pag. 1119							
P				M	K			N			S	H	G									
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae			
		●														0,4+0,6	65-100	0,003-0,011	0,5xD	1xD		
		●														0,6+0,8	65-100	0,003-0,015	0,5xD	1xD		
		●														0,8+1,0	65-100	0,002-0,017	0,5xD	1xD		
		●														1,0+1,2	65-100	0,005-0,020	0,5xD	1xD		
		●														1,2+1,4	65-100	0,007-0,022	0,5xD	1xD		
		●														1,4+1,6	65-100	0,010-0,025	0,5xD	1xD		
		●														1,6+2,0	65-100	0,012-0,027	0,5xD	1xD		
		●														2,0+3,0	65-100	0,015-0,030	0,5xD	1xD		
				○												0,4+0,6	35-55	0,003-0,011	0,5xD	1xD		
				○												0,6+0,8	35-55	0,003-0,015	0,5xD	1xD		
				○												0,8+1,0	35-55	0,002-0,017	0,5xD	1xD		
				○												1,0+1,2	35-55	0,005-0,020	0,5xD	1xD		
				○												1,2+1,4	35-55	0,007-0,022	0,5xD	1xD		
				○												1,4+1,6	35-55	0,010-0,025	0,5xD	1xD		
				○												1,6+2,0	35-55	0,012-0,027	0,5xD	1xD		
				○												2,0+3,0	35-55	0,015-0,030	0,5xD	1xD		
					●											0,4+0,6	80-120	0,003-0,011	0,5xD	1xD		
					●											0,6+0,8	80-120	0,003-0,015	0,5xD	1xD		
					●											0,8+1,0	80-120	0,002-0,017	0,5xD	1xD		
					●											1,0+1,2	80-120	0,005-0,020	0,5xD	1xD		
					●											1,2+1,4	80-120	0,007-0,022	0,5xD	1xD		
					●											1,4+1,6	80-120	0,010-0,025	0,5xD	1xD		
					●											1,6+2,0	80-120	0,012-0,027	0,5xD	1xD		
					●											2,0+3,0	80-120	0,015-0,030	0,5xD	1xD		
								●								0,4+0,6	160-400	0,003-0,012	0,5xD	1xD		
								●								0,6+0,8	160-400	0,005-0,020	0,5xD	1xD		
								●								0,8+1,0	160-400	0,007-0,022	0,5xD	1xD		
								●								1,0+1,2	160-400	0,010-0,025	0,5xD	1xD		
								●								1,2+1,4	160-400	0,012-0,027	0,5xD	1xD		
								●								1,4+1,6	160-400	0,020-0,035	0,5xD	1xD		
								●								1,6+2,0	160-400	0,022-0,037	0,5xD	1xD		
								●								2,0+3,0	160-400	0,025-0,040	0,5xD	1xD		

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{Vc \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

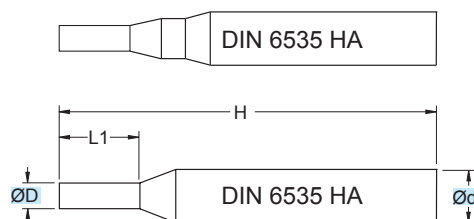
$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

STN2201

$\varnothing D = 0,4 - 3$



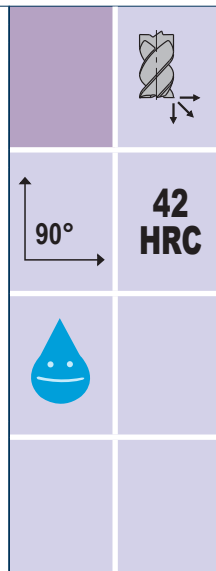
Fino a diametro 0,8
 Up to diameter 0,8



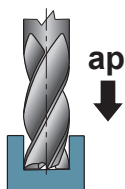
Microfresa in M.D.I. Micrograno
Gambo Cilindrico HA

Micrograin HM Micro-mill
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6



ART.	(mm)				
	$\varnothing D$	$\varnothing d$	L1	H	z
STN2201.040.N00	0,4	3,0	1,5	38	2
STN2201.050.N00	0,5	3,0	1,5	38	2
STN2201.060.N00	0,6	3,0	2,0	38	2
STN2201.070.N00	0,7	3,0	3,0	38	2
STN2201.080.N00	0,8	3,0	3,0	38	2
STN2201.090.N00	0,9	3,0	3,0	38	2
STN2201.100.N00	1,0	3,0	4,0	38	2
STN2201.110.N00	1,1	3,0	4,0	38	2
STN2201.120.N00	1,2	3,0	4,0	38	2
STN2201.130.N00	1,3	3,0	4,0	38	2
STN2201.140.N00	1,4	3,0	4,0	38	2
STN2201.150.N00	1,5	3,0	5,0	38	2
STN2201.160.N00	1,6	3,0	5,0	38	2
STN2201.180.N00	1,8	3,0	5,0	38	2
STN2201.200.N00	2,0	3,0	6,0	38	2
STN2201.250.N00	2,5	3,0	7,0	38	2
STN2201.300.N00	3,0	3,0	8,0	38	2

[illegible]

- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

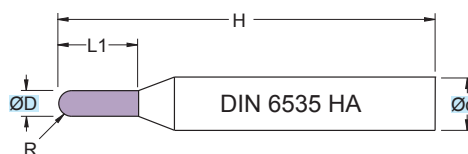
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

ST2205

$\varnothing D = 0,4 - 3$



Microfresa in M.D.I. Micrograno Gambo cilindrico HA

Micrograin HM Micro-mill
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
COATED

BLACK



R

**42
HRC**



ART.	(mm)					
	ØD	Ød	L1	H	R	z
ST2205.040.S020	0,4	3,0	1,5	38	0,20	2
ST2205.050.S025	0,5	3,0	1,5	38	0,25	2
ST2205.060.S030	0,6	3,0	2,0	38	0,30	2
ST2205.070.S035	0,7	3,0	3,0	38	0,35	2
ST2205.080.S040	0,8	3,0	3,0	38	0,40	2
ST2205.090.S045	0,9	3,0	3,0	38	0,45	2
ST2205.100.S050	1,0	3,0	4,0	38	0,50	2
ST2205.110.S055	1,1	3,0	4,0	38	0,55	2
ST2205.120.S060	1,2	3,0	4,0	38	0,60	2
ST2205.130.S065	1,3	3,0	4,0	38	0,65	2
ST2205.140.S070	1,4	3,0	4,0	38	0,70	2
ST2205.150.S075	1,5	3,0	5,0	38	0,75	2
ST2205.160.S080	1,6	3,0	5,0	38	0,80	2
ST2205.180.S090	1,8	3,0	5,0	38	0,90	2
ST2205.200.S100	2,0	3,0	6,0	38	1,00	2
ST2205.250.S125	2,5	3,0	7,0	38	1,25	2
ST2205.300.S150	3,0	3,0	8,0	38	1,50	2

[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE


DATI TECNICI LAVORAZIONI PAG. 1072 - 1073
 **MACHINING TECHNICAL DATA PAGE 1072 - 1073**
 **BEARBEITUNGSSCHNITTDATEN S. 1072 - 1073**
 **DONNEES TECHNIQUES USINAGES PAGES 1072 - 1073**

øD = mm DIAMETRO - DIAMETER

øDe = mm DIAMETRO EFFETTIVO - EFFECTIVE DIAMETER

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

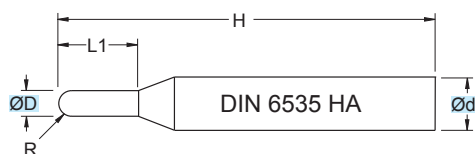
$$n = \frac{V_c \cdot 1000}{\varnothing De \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

STN2205

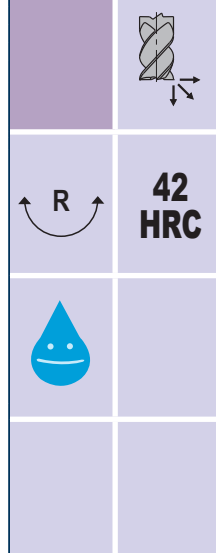
ØD = 0,4 - 3



Microfresa in M.D.I. Micrograno Gambo cilindrico HA

Micrograin HM Micro-mill
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6



**42
HRC**

ART.	ØD	Ød	L1	H	R	z
STN2205.040.S040.01	0,4	3,0	1,5	38	0,20	2
STN2205.050.S050.01	0,5	3,0	1,5	38	0,25	2
STN2205.060.S060.01	0,6	3,0	2,0	38	0,30	2
STN2205.070.S070.01	0,7	3,0	3,0	38	0,35	2
STN2205.080.S080.01	0,8	3,0	3,0	38	0,40	2
STN2205.090.S090.01	0,9	3,0	3,0	38	0,45	2
STN2205.100.S100.01	1,0	3,0	4,0	38	0,50	2
STN2205.110.S110.01	1,1	3,0	4,0	38	0,55	2
STN2205.120.S120.01	1,2	3,0	4,0	38	0,60	2
STN2205.130.S130.01	1,3	3,0	4,0	38	0,65	2
STN2205.140.S140.01	1,4	3,0	4,0	38	0,70	2
STN2205.150.S150.01	1,5	3,0	5,0	38	0,75	2
STN2205.160.S160.01	1,6	3,0	5,0	38	0,80	2
STN2205.180.S180.01	1,8	3,0	5,0	38	0,90	2
STN2205.200.S200.01	2,0	3,0	6,0	38	1,00	2
STN2205.250.S250.01	2,5	3,0	7,0	38	1,25	2
STN2205.300.S300.01	3,0	3,0	8,0	38	1,50	2

[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE


DATI TECNICI LAVORAZIONI PAG. 1072 - 1073
MACHINING TECHNICAL DATA PAGE 1072 - 1073
BEARBEITUNGSSCHNITTDATEN S. 1072 - 1073
DONNEES TECHNIQUES USINAGES PAGES 1072 - 1073

øD = mm DIAMETRO - DIAMETER

ϕDe = mm DIAMETRO EFFETTIVO - EFFECTIVE DIAMETER

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

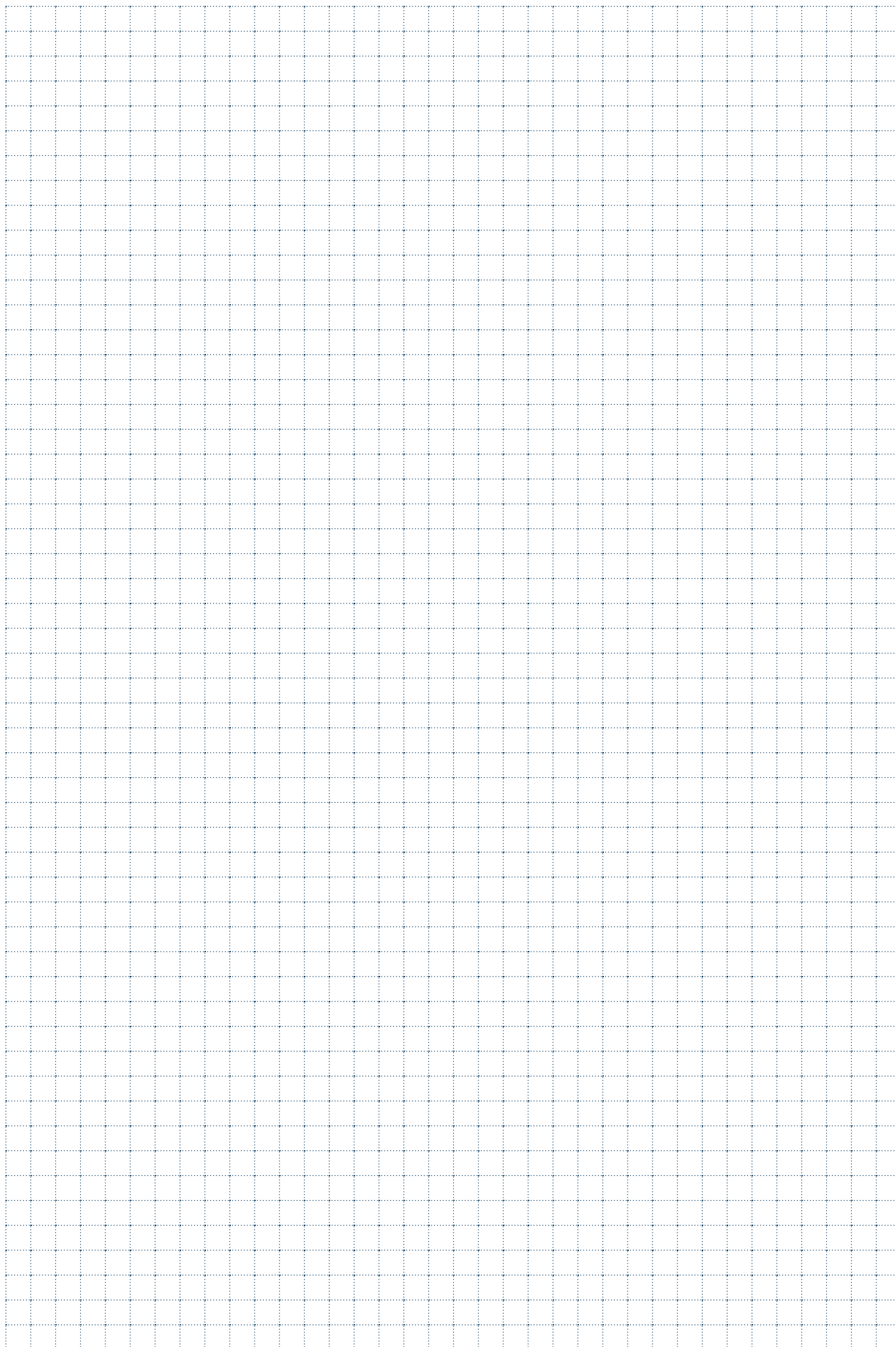
fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing De \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

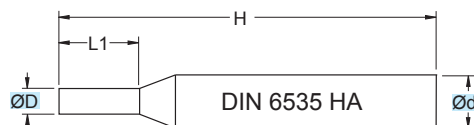
$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$





FRESE PER ALLUMINIO

MILLING CUTTERS FOR ALUMINIUM / FRAESER FÜR ALUMINIUM /
FRAISES POUR ALUMINIUM / FRESAS PARA ALUMINIO

$$\varnothing D = 1 - 6$$


Micrograin HM minimills
Cylindrical Shank HA

TOLLERANZE	D	d
TOLLERANCE RANGE	h10	h6

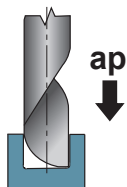
(mm)					
ART.	ØD	Ød	L1	H	z
SM1200.010.N00	1,0	6,0	5	40	1
SM1200.015.N00	1,5	6,0	7	40	1
SM1200.020.N00	2,0	6,0	7	40	1
SM1200.025.N00	2,5	6,0	8	40	1
SM1200.030.N00	3,0	6,0	8	40	1
SM1200.035.N00	3,5	6,0	10	40	1
SM1200.040.N00	4,0	6,0	10	40	1
SM1200.045.N00	4,5	6,0	12	50	1
SM1200.050.N00	5,0	6,0	12	50	1
SM1200.055.N00	5,5	6,0	14	50	1
SM1200.060.N00	6,0	6,0	14	50	1



90°

ALU
≤ 5% Si



[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

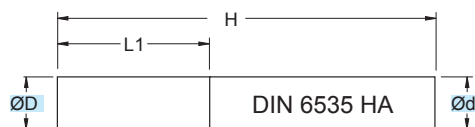
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM1300

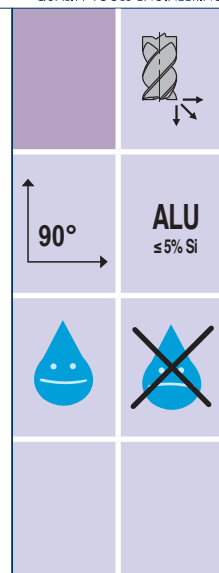
ØD = 2 - 16



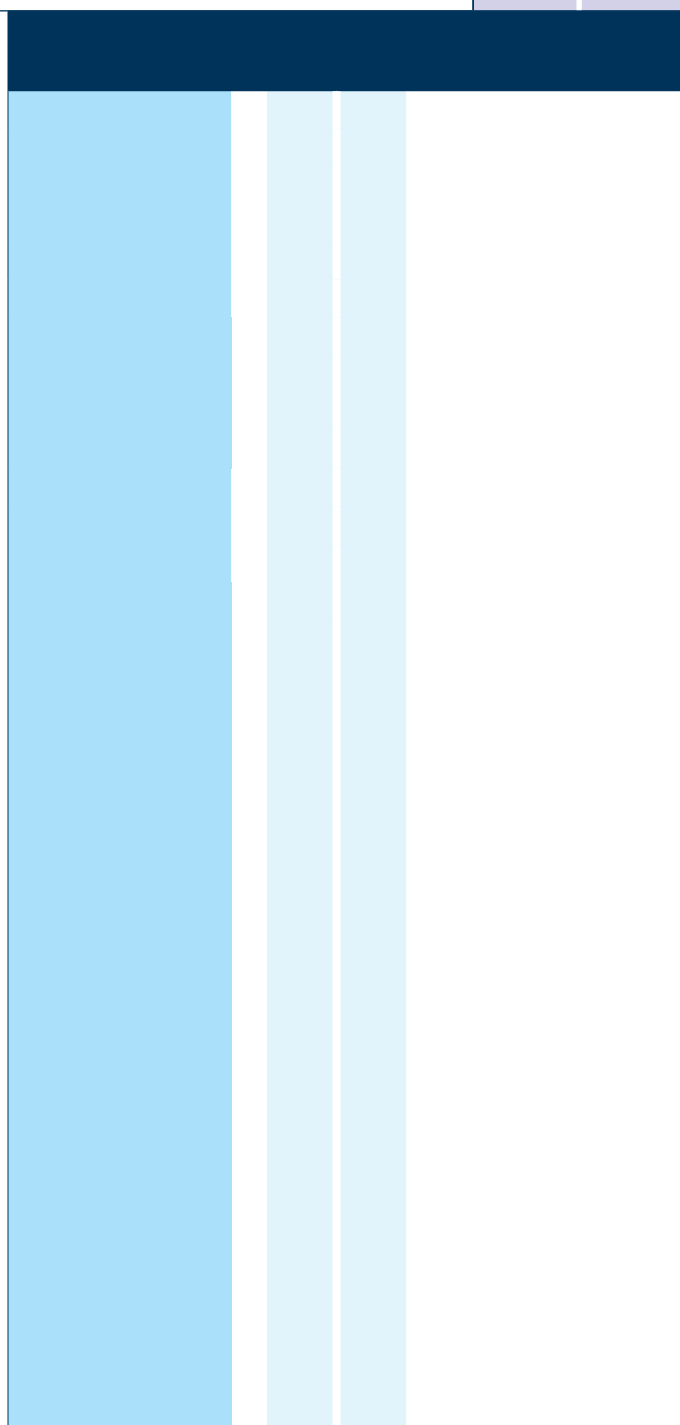
Fresa in M.D.I. Micrograno
Gambo cilindrico HA

Micrograin HM minimills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6



(mm)					
ART.	ØD	Ød	L1	H	z
SM1300.020.N00	2,0	3,0	10	38	1
SM1300.025.N00	2,5	3,0	12	38	1
SM1300.030.N00	3,0	3,0	12	38	1
SM1300.040.N00	4,0	4,0	15	40	1
SM1300.050.N00	5,0	5,0	16	50	1
SM1300.061.N00	6,0	6,0	18	50	1
SM1300.062.N00	6,0	6,0	25	60	1
SM1300.081.N00	8,0	8,0	22	63	1
SM1300.082.N00	8,0	8,0	40	80	1
SM1300.100.N00	10,0	10,0	30	72	1
SM1300.120.N00	12,0	12,0	30	73	1
SM1300.140.N00	14,0	14,0	30	75	1
SM1300.160.N00	16,0	16,0	35	82	1



[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

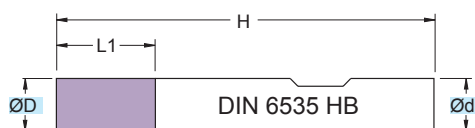
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SMW2317

ØD = 4 - 20



RIVESTIM.
COATED
SILVER



90°

ALU
>5% Si



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW2317.040.N00	4	6	11	57	2
SMW2317.050.N00	5	6	13	57	2
SMW2317.060.N00	6	6	13	57	2
SMW2317.080.N00	8	8	19	63	2
SMW2317.100.N00	10	10	22	72	2
SMW2317.120.N00	12	12	26	83	2
SMW2317.140.N00	14	14	26	83	2
SMW2317.160.N00	16	16	32	92	2
SMW2317.180.N00	18	18	32	92	2
SMW2317.200.N00	20	20	38	104	2

Applicazione - Application		MATERIALI - MATERIALS														Pag. 1119						
		P				M	K			N		S	H	G	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae			
		ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO Si ≤ 12% ALUMINIUM 12 ≤ 12%	ALLUMINIO Si > 12% ALUMINIUM 12 > 12%	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE						
										●							4÷6	250-350	0,015-0,030	0,5xD	1xD	
										●								6÷8	250-350	0,030-0,045	0,5xD	1xD
										●								8÷10	250-350	0,040-0,055	0,5xD	1xD
										●								10÷12	250-350	0,050-0,065	0,5xD	1xD
										●								12÷14	250-350	0,090-0,105	0,5xD	1xD
										●								14÷16	250-350	0,110-0,125	0,5xD	1xD
										●								16÷18	250-350	0,130-0,145	0,5xD	1xD
										●								18÷20	250-350	0,150-0,165	0,5xD	1xD
										●							4÷6	130-160	0,015-0,030	0,5xD	1xD	
										●							6÷8	130-160	0,030-0,045	0,5xD	1xD	
										●							8÷10	130-160	0,040-0,055	0,5xD	1xD	
										●							10÷12	130-160	0,050-0,065	0,5xD	1xD	
										●							12÷14	130-160	0,090-0,105	0,5xD	1xD	
										●							14÷16	130-160	0,110-0,125	0,5xD	1xD	
										●							16÷18	130-160	0,130-0,145	0,5xD	1xD	
										●							18÷20	130-160	0,150-0,165	0,5xD	1xD	
												●					4÷6	80-110	0,030-0,045	0,5xD	1xD	
												●					6÷8	80-110	0,045-0,060	0,5xD	1xD	
												●					8÷10	80-110	0,060-0,075	0,5xD	1xD	
												●					10÷12	80-110	0,080-0,095	0,5xD	1xD	
												●					12÷14	80-110	0,100-0,115	0,5xD	1xD	
												●					14÷16	80-110	0,130-0,145	0,5xD	1xD	
												●					16÷18	80-110	0,150-0,165	0,5xD	1xD	
												●					18÷20	80-110	0,170-0,185	0,5xD	1xD	

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

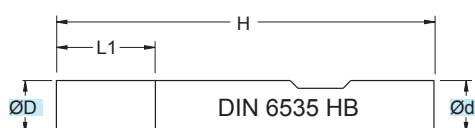
- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED
n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS
fz = mm AVANZAMENTO AL DENTE -TOOTH FEED
fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

$$\varnothing D = 3 - 20$$


Micrograin HM mills
DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

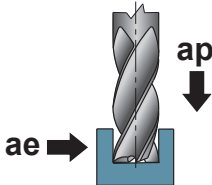
(mm)					
ART.	ØD	Ød	L1	H	z
SMW2317.030.N01	3	6	8	57	2
SMW2317.040.N01	4	6	11	57	2
SMW2317.050.N01	5	6	13	57	2
SMW2317.060.N01	6	6	13	57	2
SMW2317.080.N01	8	8	19	63	2
SMW2317.100.N01	10	10	22	72	2
SMW2317.120.N01	12	12	26	83	2
SMW2317.140.N01	14	14	26	83	2
SMW2317.160.N01	16	16	32	92	2
SMW2317.180.N01	18	18	32	92	2
SMW2317.200.N01	20	20	38	104	2



90°

ALU
≤ 5% Si



Applicazione - Application		MATERIALI - MATERIALS															Pag. 1119				
		P				M	K			N			S	H	G						
		ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO Si ≤ 12% ALUMINIUM 12 ≤ 12%	ALLUMINIO Si > 12% ALUMINIUM 12 > 12%	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
									●								3	250-350	0,005-0,020	0,5xD	1xD
									●								4+6	250-350	0,015-0,030	0,5xD	1xD
									●								6+8	250-350	0,030-0,045	0,5xD	1xD
									●								8+10	250-350	0,040-0,055	0,5xD	1xD
									●								10+12	250-350	0,050-0,065	0,5xD	1xD
									●								12+14	250-350	0,090-0,105	0,5xD	1xD
									●								14+16	250-350	0,110-0,125	0,5xD	1xD
									●								16+18	250-350	0,130-0,145	0,5xD	1xD
									●								18+20	250-350	0,150-0,165	0,5xD	1xD
									●								3	130-160	0,005-0,020	0,5xD	1xD
									●								4+6	130-160	0,015-0,030	0,5xD	1xD
									●								6+8	130-160	0,030-0,045	0,5xD	1xD
									●								8+10	130-160	0,040-0,055	0,5xD	1xD
									●								10+12	130-160	0,050-0,065	0,5xD	1xD
									●								12+14	130-160	0,090-0,105	0,5xD	1xD
									●								14+16	130-160	0,110-0,125	0,5xD	1xD
									●								16+18	130-160	0,130-0,145	0,5xD	1xD
									●								18+20	130-160	0,150-0,165	0,5xD	1xD
											●						3	80-110	0,015-0,030	0,5xD	1xD
									●								4+6	80-110	0,030-0,045	0,5xD	1xD
									●								6+8	80-110	0,045-0,060	0,5xD	1xD
									●								8+10	80-110	0,060-0,075	0,5xD	1xD
									●								10+12	80-110	0,080-0,095	0,5xD	1xD
									●								12+14	80-110	0,100-0,115	0,5xD	1xD
									●								14+16	80-110	0,130-0,145	0,5xD	1xD
									●								16+18	80-110	0,150-0,165	0,5xD	1xD
									●								18+20	80-110	0,170-0,185	0,5xD	1xD

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFÖHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

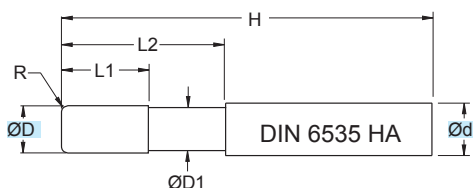
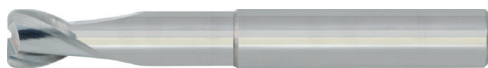
$$n = \frac{Vc \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SM2315..N01

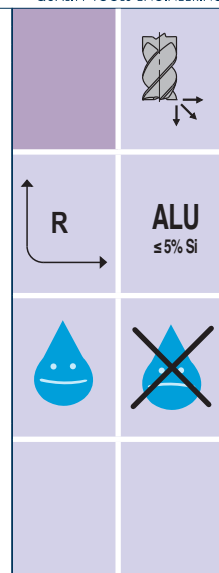
ØD = 8 - 25



Fresa in M.D.I. Micrograno
Gambo cilindrico HA

Micrograin HM mills
Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6



ART.	ØD	Ød	ØD1	L1	L2	H	R	z
SM2315.0801.R050.N01	8	8	7	8	27	64	0,5	2
SM2315.0802.R250.N01	8	8	7	8	27	64	2,5	2
SM2315.0811.R300.N01	8	8	7	8	27	64	3,0	2
SM2315.0803.R400.N01	8	8	7	8	27	64	4,0	2
SM2315.0813.R050.N01	8	8	7	8	32	70	0,5	2
SM2315.0814.R250.N01	8	8	7	8	32	70	2,5	2
SM2315.0815.R300.N01	8	8	7	8	32	70	3,0	2
SM2315.0816.R400.N01	8	8	7	8	32	70	4,0	2
SM2315.0804.R050.N01	8	8	7	8	38	74	0,5	2
SM2315.0805.R250.N01	8	8	7	8	38	74	2,5	2
SM2315.0855.R300.N01	8	8	7	8	38	74	3,0	2
SM2315.0806.R400.N01	8	8	7	8	38	74	4,0	2
SM2315.1001.R050.N01	10	10	9	10	32	70	0,5	2
SM2315.1002.R250.N01	10	10	9	10	32	70	2,5	2
SM2315.1003.R300.N01	10	10	9	10	32	70	3,0	2
SM2315.1004.R400.N01	10	10	9	10	32	70	4,0	2
SM2315.1005.R050.N01	10	10	9	10	43	80	0,5	2
SM2315.1006.R250.N01	10	10	9	10	43	80	2,5	2
SM2315.1007.R300.N01	10	10	9	10	43	80	3,0	2
SM2315.1008.R400.N01	10	10	9	10	43	80	4,0	2
SM2315.1201.R050.N01	12	12	11	12	30	70	0,5	2
SM2315.1202.R250.N01	12	12	11	12	30	70	2,5	2
SM2315.1203.R300.N01	12	12	11	12	30	70	3,0	2
SM2315.1204.R400.N01	12	12	11	12	30	70	4,0	2
SM2315.1205.R050.N01	12	12	11	12	40	80	0,5	2
SM2315.1206.R250.N01	12	12	11	12	40	80	2,5	2
SM2315.1207.R300.N01	12	12	11	12	40	80	3,0	2
SM2315.1208.R400.N01	12	12	11	12	40	80	4,0	2
SM2315.1209.R050.N01	12	12	11	12	55	95	0,5	2
SM2315.1210.R250.N01	12	12	11	12	55	95	2,5	2
SM2315.1211.R300.N01	12	12	11	12	55	95	3,0	2
SM2315.1212.R400.N01	12	12	11	12	55	95	4,0	2
SM2315.1601.R050.N01	16	16	15	16	41	85	0,5	2
SM2315.1602.R250.N01	16	16	15	16	41	85	2,5	2
SM2315.1603.R300.N01	16	16	15	16	41	85	3,0	2
SM2315.1604.R400.N01	16	16	15	16	41	85	4,0	2
SM2315.1605.R050.N01	16	16	15	16	50	94	0,5	2
SM2315.1606.R250.N01	16	16	15	16	50	94	2,5	2
SM2315.1607.R300.N01	16	16	15	16	50	94	3,0	2
SM2315.1608.R400.N01	16	16	15	16	50	94	4,0	2

ART.	ØD	Ød	ØD1	L1	L2	H	R	z
SM2315.1609.R050.N01	16	16	15	16	62	106	0,5	2
SM2315.1610.R250.N01	16	16	15	16	62	106	2,5	2
SM2315.1611.R300.N01	16	16	15	16	62	106	3,0	2
SM2315.1612.R400.N01	16	16	15	16	62	106	4,0	2
SM2315.2001.R050.N01	20	20	19	20	45	92	0,5	2
SM2315.2002.R250.N01	20	20	19	20	45	92	2,5	2
SM2315.2003.R300.N01	20	20	19	20	45	92	3,0	2
SM2315.2004.R400.N01	20	20	19	20	45	92	4,0	2
SM2315.2005.R050.N01	20	20	19	20	60	108	0,5	2
SM2315.2006.R250.N01	20	20	19	20	60	108	2,5	2
SM2315.2007.R300.N01	20	20	19	20	60	108	3,0	2
SM2315.2008.R400.N01	20	20	19	20	60	108	4,0	2
SM2315.2009.R050.N01	20	20	19	20	75	123	0,5	2
SM2315.2010.R250.N01	20	20	19	20	75	123	2,5	2
SM2315.2011.R300.N01	20	20	19	20	75	123	3,0	2
SM2315.2012.R400.N01	20	20	19	20	75	123	4,0	2
SM2315.2501.R050.N01	25	25	24	25	55	105	0,5	2
SM2315.2502.R250.N01	25	25	24	25	55	105	2,5	2
SM2315.2503.R300.N01	25	25	24	25	55	105	3,0	2
SM2315.2504.R400.N01	25	25	24	25	55	105	4,0	2
SM2315.2570.R050.N01	25	25	24	25	75	125	0,5	2
SM2315.2592.R250.N01	25	25	24	25	75	125	2,5	2
SM2315.2573.R300.N01	25	25	24	25	75	125	3,0	2
SM2315.2549.R400.N01	25	25	24	25	75	125	4,0	2
SM2315.2548.R050.N01	25	25	24	25	90	140	0,5	2
SM2315.2545.R250.N01	25	25	24	25	90	140	2,5	2
SM2315.2508.R300.N01	25	25	24	25	90	140	3,0	2
SM2315.2538.R400.N01	25	25	24	25	90	140	4,0	2
SM2315.2576.R050.N01	25	25	24	25	110	160	0,5	2
SM2315.2571.R250.N01	25	25	24	25	110	160	2,5	2
SM2315.2559.R300.N01	25	25	24	25	110	160	3,0	2
SM2315.2578.R400.N01	25	25	24	25	110	160	4,0	2
SM2315.2587.R050.N01	25	25	24	25	130	180	0,5	2
SM2315.2593.R250.N01	25	25	24	25	130	180	2,5	2
SM2315.2521.R300.N01	25	25	24	25	130	180	3,0	2
SM2315.2584.R400.N01	25	25	24	25	130	180	4,0	2

[illegible]

- **APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION**
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- **APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION**
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED
n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS
fz = mm AVANZAMENTO AL DENTE -TOOTH FEED
fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

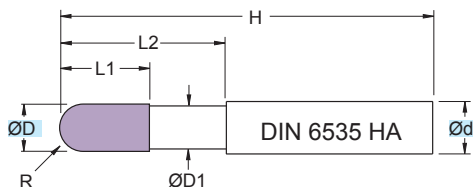
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM2417

ØD = 4 - 12



Fresa in M.D.I. Micrograno
Gambo cilindrico HA

Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
 COATED
SILVER



R

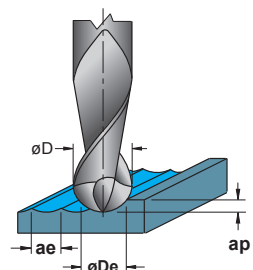
ALU
 >5% Si



ART.	ØD	Ød	ØD1	L1	L2	H	R	z
SM2417.040.S200	4	6	3,7	8	25	70	2,0	2
SM2417.050.S250	5	6	4,6	10	25	70	2,5	2
SM2417.060.S300	6	6	5,5	12	35	80	3,0	2
SM2417.080.S400	8	8	7,4	16	35	80	4,0	2
SM2417.100.S500	10	10	9,2	20	45	90	5,0	2
SM2417.120.S600	12	12	11,0	24	50	100	6,0	2

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



P	M	K	N	S	H	G	(mm) ØDe	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
ACCIAIO NON LEGATO NOT ALLOY STEEL							4	250-350	0,050-0,065	0,20	0,4
ACCIAIO POCO LEGATO LOW ALLOY STEEL							5	250-350	0,060-0,075	0,25	0,5
ACCIAIO ALTO LEGATO ALLOY STEEL							6	250-350	0,070-0,085	0,30	0,6
INOX MARTENSITICO STAINLESS STEEL MART.							8	250-350	0,080-0,095	0,40	0,8
INOX AUST. DUPLEX STAINLESS STEEL AUST.							10	250-350	0,090-0,105	0,50	1,0
GHISA GRIGIA GREY CAST IRON							12	250-350	0,110-0,125	0,60	1,2
GHISA SFEROIDALE SPHEROIDAL GRAPHITE											
GHISA MALLEABILE MALLEABLE CAST IRON											
ALLUMINIO Si ≤ 12% ALUMINIUM Si ≤ 12%											
ALLUMINIO Si > 12% ALUMINIUM Si > 12%											
NON METALLICI PLASTICS											
LEGHE RESIST. CALORE HIGH TEMP. ALLOY											
TITANIO E SUE LEGHE TITANIUM											
ACCIAIO TEMPRATO HARDENED STEEL											
GRAFITE GRAPHITE											

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

DATI TECNICI LAVORAZIONI PAG. 1072 - 1073
 MACHINING TECHNICAL DATA PAGE 1072 - 1073
 BEARBEITUNGSSCHNITTDATEN S. 1072 - 1073
 DONNEES TECHNIQUES USINAGES PAGES 1072 - 1073

ØD = mm DIAMETRO - DIAMETER

ØDe = mm DIAMETRO EFFETTIVO - EFFECTIVE DIAMETER

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

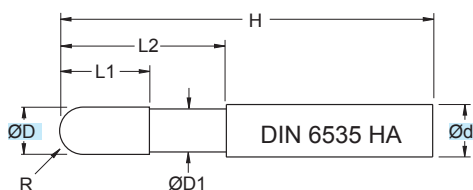
$$n = \frac{Vc \cdot 1000}{\text{ØDe} \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SM2417..01

ØD = 3 - 12



Fresa in M.D.I. Micrograno
Gambo cilindrico HA

Micrograin HM mills
 Cylindrical Shank HA

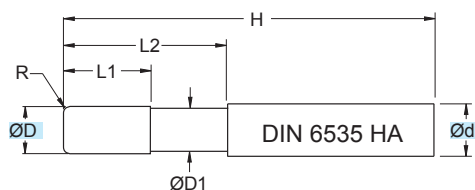
TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

ALU
 ≤5% Si

(mm)								
ART.	ØD	Ød	ØD1	L1	L2	H	R	z
SM2417.030.S150.01	3	6	2,8	6	25	70	1,5	2
SM2417.040.S200.01	4	6	3,7	8	25	70	2,0	2
SM2417.050.S250.01	5	6	4,6	10	25	70	2,5	2
SM2417.060.S300.01	6	6	5,5	12	35	80	3,0	2
SM2417.080.S400.01	8	8	7,4	16	35	80	4,0	2
SM2417.100.S500.01	10	10	9,2	20	45	90	5,0	2
SM2417.120.S600.01	12	12	11,0	24	50	100	6,0	2

SM3315..N01

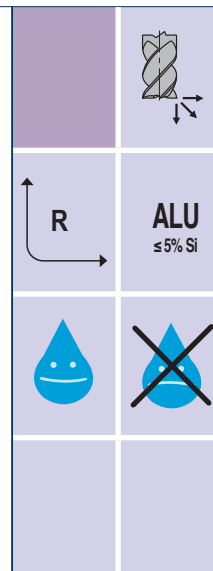
ØD = 6 - 16



Fresa in M.D.I. Micrograno
 Gambo cilindrico HA

Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6



(mm)								
ART.	ØD	Ød	ØD1	L1	L2	H	R	z
SM3315.060.R050.N01	6	6	5,5	12	27	63	0,50	3
SM3315.060.R100.N01	6	6	5,5	12	27	63	1,00	3
SM3315.060.R150.N01	6	6	5,5	12	27	63	1,50	3
SM3315.080.R050.N01	8	8	7,4	16	33	70	0,50	3
SM3315.080.R100.N01	8	8	7,4	16	33	70	1,00	3
SM3315.080.R200.N01	8	8	7,4	16	33	70	2,00	3
SM3315.100.R050.N01	10	10	9,2	20	35	75	0,50	3
SM3315.100.R150.N01	10	10	9,2	20	35	75	1,50	3
SM3315.100.R250.N01	10	10	9,2	20	35	75	2,50	3
SM3315.100.R300.N01	10	10	9,2	20	35	75	3,00	3
SM3315.100.R400.N01	10	10	9,2	20	35	75	4,00	3
SM3315.120.R050.N01	12	12	11,0	24	39	84	0,50	3
SM3315.120.R150.N01	12	12	11,0	24	39	84	1,50	3
SM3315.120.R250.N01	12	12	11,0	24	39	84	2,50	3
SM3315.120.R300.N01	12	12	11,0	24	39	84	3,00	3
SM3315.120.R400.N01	12	12	11,0	24	39	84	4,00	3
SM3315.160.R050.N01	16	16	15,0	32	50	100	0,50	3
SM3315.160.R200.N01	16	16	15,0	32	50	100	2,00	3
SM3315.160.R250.N01	16	16	15,0	32	50	100	2,50	3
SM3315.160.R300.N01	16	16	15,0	32	50	100	3,00	3
SM3315.160.R400.N01	16	16	15,0	32	50	100	4,00	3

[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED
n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS
fz = mm AVANZAMENTO AL DENTE -TOOTH FEED
fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

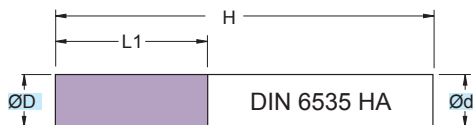
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM3417

ØD = 6 - 25



Fresa in M.D.I. Micrograno Gambo cilindrico HA

Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
COATED
SILVER



90°

ALU
 >5% Si



ART.	ØD	Ød	L1	H	z
SM3417.060.N00	6	6	16	60	3
SM3417.080.N00	8	8	25	78	3
SM3417.100.N00	10	10	28	78	3
SM3417.120.N00	12	12	32	89	3
SM3417.140.N00	14	14	32	89	3
SM3417.160.N00	16	16	36	96	3
SM3417.200.N00	20	20	45	111	3
SM3417.250.N00	25	25	50	126	3

[illegible]

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

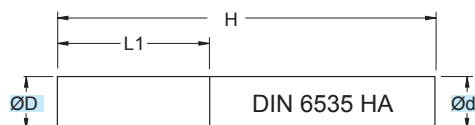
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

$\varnothing D = 6 - 25$



Micrograin HM mills
Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)						
ART.		ØD	Ød	L1	H	z
SM3417.060.N01		6	6	16	60	3
SM3417.080.N01		8	8	25	78	3
SM3417.100.N01		10	10	28	78	3
SM3417.120.N01		12	12	32	89	3
SM3417.140.N01		14	14	32	89	3
SM3417.160.N01		16	16	36	96	3
SM3417.200.N01		20	20	45	111	3
SM3417.250.N01		25	25	50	126	3



90°

ALU
≤ 5% Si



[illegible]

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

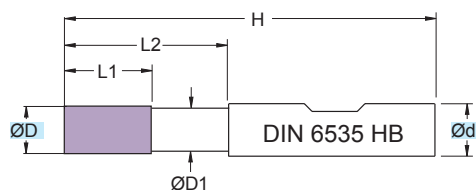
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SMW3414

ØD = 8 - 25



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
COATED
GOLD



90°

ALU
 >5% Si



(mm)							
ART.	ØD	Ød	ØD1	L1	L2	H	z
SMW3414.080.N00	8	8	7,4	19	35	72	3
SMW3414.100.N00	10	10	9,2	22	43	84	3
SMW3414.120.N00	12	12	11,0	26	51	97	3
SMW3414.160.N00	16	16	15,0	32	59	108	3
SMW3414.200.N00	20	20	19,0	38	71	122	3
SMW3414.250.N00	25	25	24,0	45	87	144	3

[illegible]

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

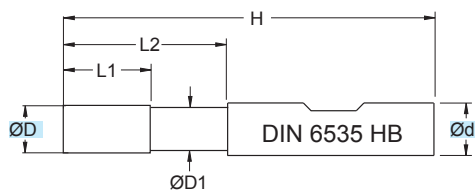
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SMW3414..N01

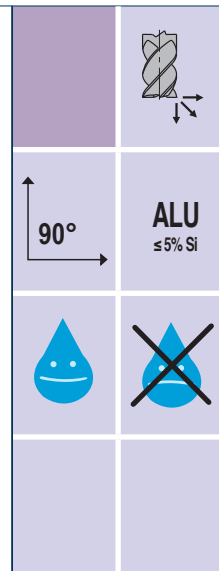
ØD = 8 - 25



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6



ART.	ØD	Ød	ØD1	L1	L2	H	z
SMW3414.080.N01	8	8	7,4	19	35	72	3
SMW3414.100.N01	10	10	9,2	22	43	84	3
SMW3414.120.N01	12	12	11,0	26	51	97	3
SMW3414.160.N01	16	16	15,0	32	59	108	3
SMW3414.200.N01	20	20	19,0	38	71	122	3
SMW3414.250.N01	25	25	24,0	45	87	144	3

[illegible]

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

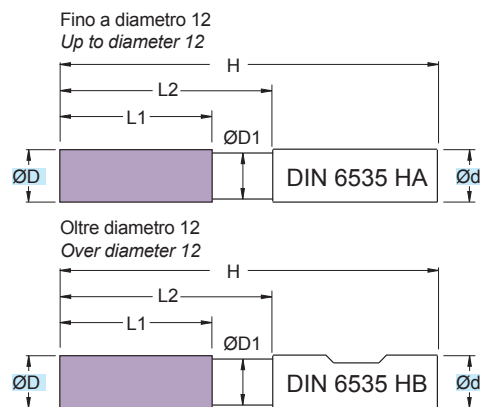
SM3510

ØD = 4 - 20



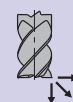
Fresa in M.D.I. Micrograno
 Gambo cilindrico HA/HB

Micrograin HM mills
 Cylindrical Shank HA/HB



TOLLERANZE	D	d
TOLERANCE RANGE	h6	h6

RIVESTIM.
 COATED
GOLD



45°

ALU
 >5% Si



HSC

ART.	ØD	Ød	ØD1	L1	L2	H	z	45°
SM3510.040.N00	4	6	3,7	11	18	57	3	0,1
SM3510.050.N00	5	6	4,7	13	18	57	3	0,1
SM3510.060.N00	6	6	5,7	13	18	57	3	0,2
SM3510.080.N00	8	8	7,4	21	25	63	3	0,2
SM3510.100.N00	10	10	9,2	22	30	72	3	0,2
SM3510.120.N00	12	12	11,0	26	36	83	3	0,2
SM3510.160.N00	16	16	15,0	36	42	92	3	0,2
SM3510.180.N00	18	18	17,0	36	42	92	3	0,2
SM3510.200.N00	20	20	19,0	41	52	104	3	0,2

[illegible]

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED
n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS
fz = mm AVANZAMENTO AL DENTE -TOOTH FEED
fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

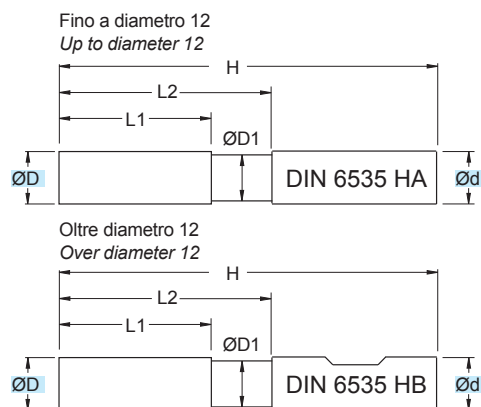
SM3510..N01

ØD = 4 - 20

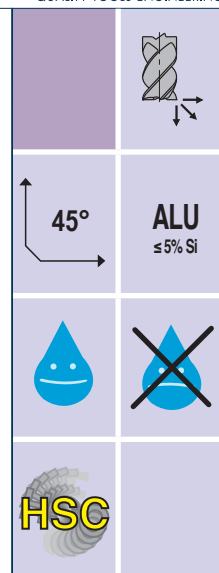


Fresa in M.D.I. Micrograno
 Gambo cilindrico HA/HB

Micrograin HM mills
 Cylindrical Shank HA/HB



TOLLERANZE	D	d
TOLERANCE RANGE	h6	h6



ART.	ØD	Ød	ØD1	L1	L2	H	z	45°
SM3510.040.N01	4	6	3,7	11	18	57	3	0,1
SM3510.050.N01	5	6	4,7	13	18	57	3	0,1
SM3510.060.N01	6	6	5,7	13	18	57	3	0,2
SM3510.080.N01	8	8	7,4	21	25	63	3	0,2
SM3510.100.N01	10	10	9,2	22	30	72	3	0,2
SM3510.120.N01	12	12	11,0	26	36	83	3	0,2
SM3510.160.N01	16	16	15,0	36	42	92	3	0,2
SM3510.180.N01	18	18	17,0	36	42	92	3	0,2
SM3510.200.N01	20	20	19,0	41	52	104	3	0,2

[illegible]

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

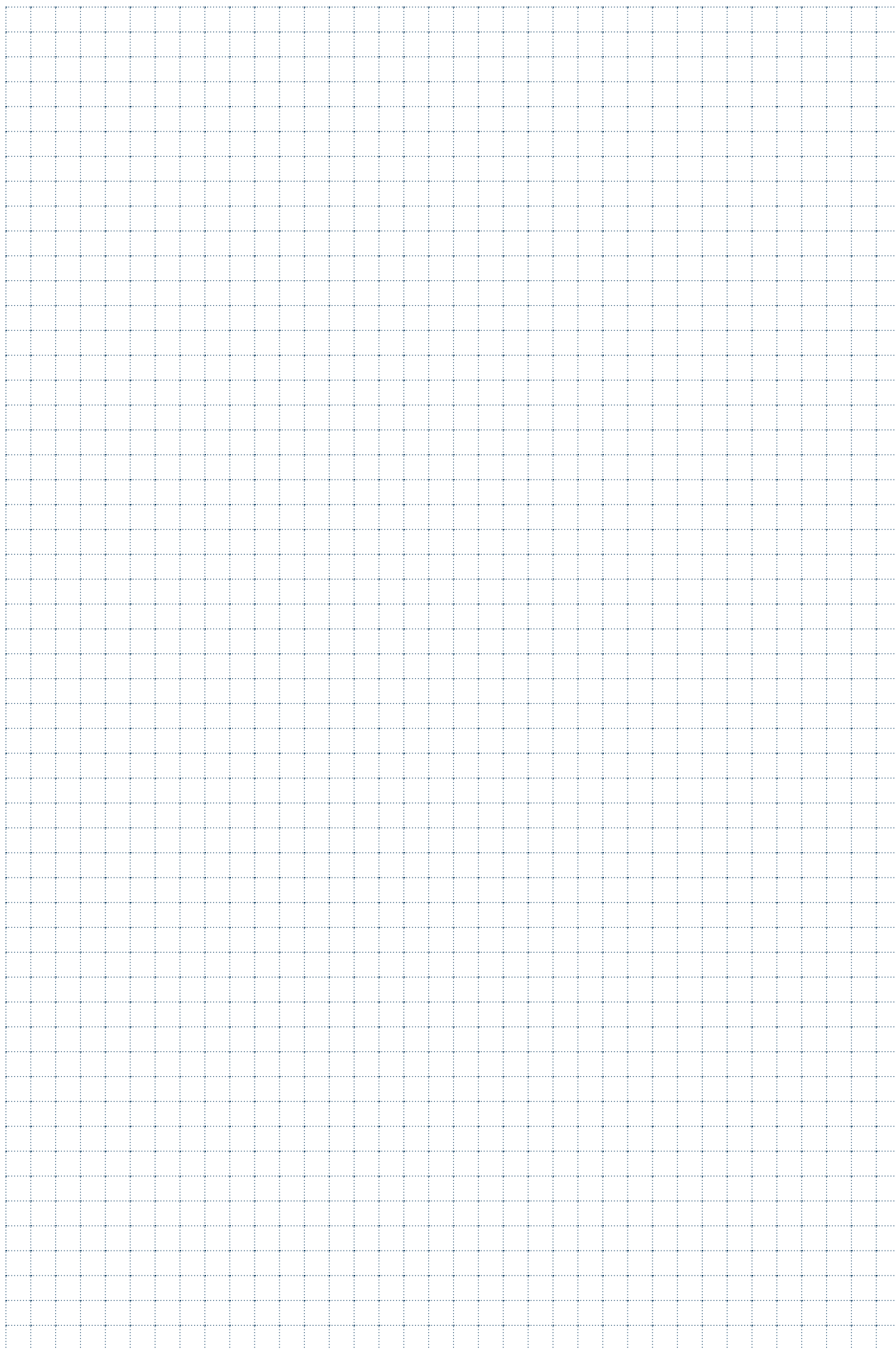
- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED
n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS
fz = mm AVANZAMENTO AL DENTE -TOOTH FEED
fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$



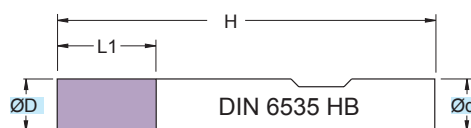


FRESE A 2 TAGLI

MILLING 2 CUTTINGS / ZWEISCHNEIDER / FRAISES A 2 COUPES /
FRESAS DE 2 FILOS

SMW2200

ØD = 2 - 20



RIVESTIM.
COATED
BLACK



90°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

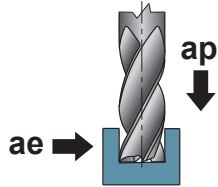
Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW2200.020.N00	2	3	3	38	2
SMW2200.030.N00	3	3	4	38	2
SMW2200.040.N00	4	6	5	54	2
SMW2200.050.N00	5	6	6	54	2
SMW2200.060.N00	6	6	7	54	2
SMW2200.080.N00	8	8	9	58	2
SMW2200.100.N00	10	10	11	66	2
SMW2200.120.N00	12	12	12	73	2
SMW2200.140.N00	14	14	14	75	2
SMW2200.160.N00	16	16	16	82	2
SMW2200.180.N00	18	18	18	84	2
SMW2200.200.N00	20	20	20	92	2

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



	MATERIALI - MATERIALS															
	P	M	K	N	S	H	G									
	ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	
●																2
●																3
●																4
●																5
●																6
●																8
●																10
●																12
●																14
●																16
●																18
●																20
○																2
○																3
○																4
○																5
○																6
○																8
○																10
○																12
○																14
○																16
○																18
○																20
○																2
○																3
○																4
○																5
○																6
○																8
○																10
○																12
○																14
○																16
○																18
○																20
○																2
○																3
○																4
○																5
○																6
○																8
○																10
○																12
○																14
○																16
○																18
○																20

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

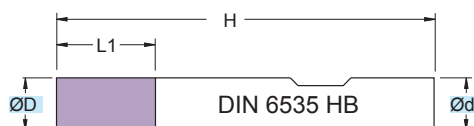
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SMW2300

ØD = 2 - 20



RIVESTIM.
COATED
BLACK



90°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW2300.020.N00	2,0	3	6	38	2
SMW2300.025.N00	2,5	3	6	38	2
SMW2300.030.N00	3,0	3	7	38	2
SMW2300.035.N00	3,5	6	8	57	2
SMW2300.040.N00	4,0	6	8	57	2
SMW2300.045.N00	4,5	6	10	57	2
SMW2300.047.N00	4,7	6	10	57	2
SMW2300.050.N00	5,0	6	10	57	2
SMW2300.055.N00	5,5	6	10	57	2
SMW2300.057.N00	5,7	6	10	57	2
SMW2300.060.N00	6,0	6	10	57	2
SMW2300.070.N00	7,0	8	16	63	2
SMW2300.077.N00	7,7	8	16	63	2
SMW2300.080.N00	8,0	8	16	63	2
SMW2300.097.N00	9,7	10	19	72	2
SMW2300.100.N00	10,0	10	19	72	2
SMW2300.117.N00	11,7	12	22	83	2
SMW2300.120.N00	12,0	12	22	83	2
SMW2300.137.N00	13,7	14	22	83	2
SMW2300.140.N00	14,0	14	22	83	2
SMW2300.157.N00	15,7	16	26	92	2
SMW2300.160.N00	16,0	16	26	92	2
SMW2300.180.N00	18,0	18	26	92	2
SMW2300.200.N00	20,0	20	32	104	2

Applicazione - Application		MATERIALI - MATERIALS												Pag. 1119							
		P				M	K			N		S	H	G							
		ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAMME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
	●																2÷3	80-110	0,003-0,013	0,5xD	1xD
	●																3÷4	80-110	0,003-0,015	0,5xD	1xD
	●																4÷5	80-110	0,005-0,020	0,5xD	1xD
	●																5÷6	80-110	0,008-0,023	0,5xD	1xD
	●																6÷8	80-110	0,010-0,025	0,5xD	1xD
	●																8÷10	80-110	0,015-0,030	0,5xD	1xD
	●																10÷12	80-110	0,020-0,035	0,5xD	1xD
	●																12÷14	80-110	0,025-0,040	0,5xD	1xD
	●																14÷16	80-110	0,030-0,045	0,5xD	1xD
	●																16÷20	80-110	0,035-0,050	0,5xD	1xD
	●																2÷3	50-80	0,003-0,013	0,5xD	1xD
	●																3÷4	50-80	0,003-0,015	0,5xD	1xD
	●																4÷5	50-80	0,005-0,020	0,5xD	1xD
	●																5÷6	50-80	0,008-0,023	0,5xD	1xD
	●																6÷8	50-80	0,010-0,025	0,5xD	1xD
	●																8÷10	50-80	0,012-0,027	0,5xD	1xD
	●																10÷12	50-80	0,015-0,030	0,5xD	1xD
	●																12÷14	50-80	0,020-0,035	0,5xD	1xD
	●																14÷16	50-80	0,025-0,040	0,5xD	1xD
	●																16÷20	50-80	0,030-0,045	0,5xD	1xD
						●											2÷3	25-50	0,003-0,011	0,5xD	1xD
						●											3÷4	25-50	0,003-0,013	0,5xD	1xD
						●											4÷5	25-50	0,003-0,015	0,5xD	1xD
						●											5÷6	25-50	0,002-0,017	0,5xD	

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

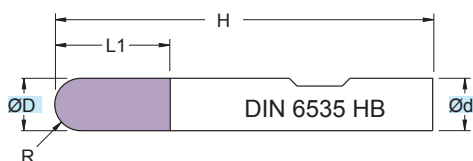
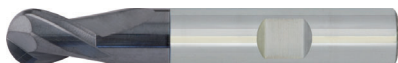
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SMW2203

ØD = 2,5 - 20



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6527 Shank HB

TOLLERANZE	D	d
TOLLERANCE RANGE	h10	h6

RIVESTIM.
 COATED
BLACK

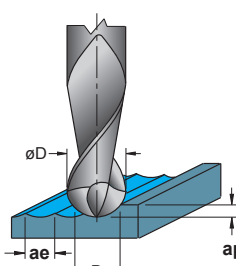


R

**42
 HRC**



ART.	ØD	Ød	L1	H	R	z
SMW2203.025.S012	2,5	6	4	50	1,25	2
SMW2203.030.S015	3,0	6	5	50	1,5	2
SMW2203.035.S017	3,5	6	5	50	1,75	2
SMW2203.040.S020	4,0	6	6	54	2,0	2
SMW2203.045.S022	4,5	6	6	54	2,25	2
SMW2203.050.S025	5,0	6	7	54	2,5	2
SMW2203.060.S030	6,0	6	9	54	3,0	2
SMW2203.080.S040	8,0	8	12	58	4,0	2
SMW2203.100.S050	10,0	10	14	66	5,0	2
SMW2203.120.S060	12,0	12	14	73	6,0	2
SMW2203.140.S070	14,0	14	16	75	7,0	2
SMW2203.160.S080	16,0	16	18	82	8,0	2
SMW2203.180.S090	18,0	18	20	92	9,0	2
SMW2203.200.S100	20,0	20	22	92	10,0	2

Applicazione - Application		MATERIALI - MATERIALS											Pag. 1119									
		P			M	K			N		S	H	G									
		ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØDe	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae	
			●														2,5	140-170	0,020-0,035	0,05xD	0,06xD	
			●															3+4	140-170	0,035-0,050	0,05xD	0,06xD
			●															4+5	140-170	0,035-0,050	0,05xD	0,06xD
			●															5+8	140-170	0,035-0,050	0,05xD	0,06xD
			●															8+12	140-170	0,040-0,055	0,05xD	0,06xD
			●															12+16	140-170	0,070-0,085	0,05xD	0,06xD
			●															16+20	140-170	0,080-0,095	0,05xD	0,06xD
			●															2,5	110-140	0,005-0,020	0,05xD	0,06xD
			●															3+4	110-140	0,020-0,035	0,05xD	0,06xD
			●															4+5	110-140	0,020-0,035	0,05xD	0,06xD
			●															5+8	110-140	0,020-0,035	0,05xD	0,06xD
			●															8+12	110-140	0,030-0,045	0,05xD	0,06xD
			●															12+16	110-140	0,050-0,065	0,05xD	0,06xD
			●															16+20	110-140	0,060-0,075	0,05xD	0,06xD
						●												2,5	50-80	0,003-0,015	0,05xD	0,06xD
						●												3+4	50-80	0,010-0,025	0,05xD	0,06xD
						●												4+5	50-80	0,010-0,025	0,05xD	0,06xD
						●												5+8	50-80	0,010-0,025	0,05xD	0,06xD
						●												8+12	50-80	0,020-0,035	0,05xD	0,06xD
						●												12+16	50-80	0,040-0,055	0,05xD	0,06xD
						●												16+20	50-80	0,050-0,065	0,05xD	0,06xD

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE


DATI TECNICI LAVORAZIONI PAG. 1072 - 1073
MACHINING TECHNICAL DATA PAGE 1072 - 1073
BEARBEITUNGSSCHNITTDATEN S. 1072 - 1073
   **DONNEES TECHNIQUES USINAGES PAGES 1072 - 1073**

øD = mm DIAMETRO - DIAMETER

ϕDe = mm DIAMETRO EFFETTIVO - EFFECTIVE DIAMETER

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

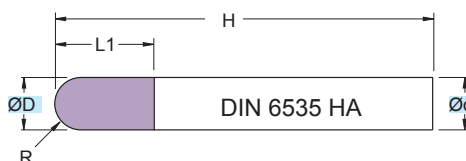
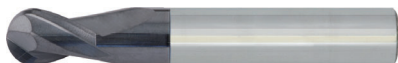
$$n = \frac{V_c \cdot 1000}{\varnothing_{De} \cdot 3.14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM2203

ØD = 2 - 12



RIVESTIM.
COATED
BLACK



R

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

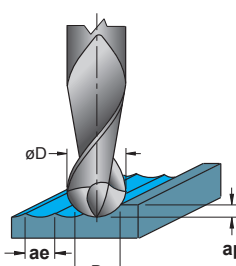
Micrograin HM mills
 DIN 6527 Shank HB

TOLLERANZE

TOLERANCE RANGE

D	d
h10	h6

(mm)						
ART.	ØD	Ød	L1	H	R	z
SM2203.025.S012	2,5	6	4	50	1,25	2
SM2203.030.S015	3,0	6	5	50	1,5	2
SM2203.035.S017	3,5	6	5	50	1,75	2
SM2203.040.S020	4,0	6	6	54	2,0	2
SM2203.045.S022	4,5	6	6	54	2,25	2
SM2203.050.S025	5,0	6	7	54	2,5	2
SM2203.060.S030	6,0	6	9	54	3,0	2
SM2203.080.S040	8,0	8	12	58	4,0	2
SM2203.100.S050	10,0	10	14	66	5,0	2
SM2203.120.S060	12,0	12	14	73	6,0	2
SM2203.140.S070	14,0	14	16	75	7,0	2
SM2203.160.S080	16,0	16	18	82	8,0	2
SM2203.180.S090	18,0	18	20	92	9,0	2
SM2203.200.S100	20,0	20	22	92	10,0	2

Applicazione - Application		MATERIALI - MATERIALS											Pag. 1119									
		P			M	K			N		S	H	G									
		ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØDe	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae	
			●														2,5	140-170	0,020-0,035	0,05xD	0,06xD	
			●															3+4	140-170	0,035-0,050	0,05xD	0,06xD
			●															4+5	140-170	0,035-0,050	0,05xD	0,06xD
			●															5+8	140-170	0,035-0,050	0,05xD	0,06xD
			●															8+12	140-170	0,040-0,055	0,05xD	0,06xD
			●															12+16	140-170	0,070-0,085	0,05xD	0,06xD
			●															16+20	140-170	0,080-0,095	0,05xD	0,06xD
			●															2,5	110-140	0,005-0,020	0,05xD	0,06xD
			●															3+4	110-140	0,020-0,035	0,05xD	0,06xD
			●															4+5	110-140	0,020-0,035	0,05xD	0,06xD
			●															5+8	110-140	0,020-0,035	0,05xD	0,06xD
			●															8+12	110-140	0,030-0,045	0,05xD	0,06xD
			●															12+16	110-140	0,050-0,065	0,05xD	0,06xD
			●															16+20	110-140	0,060-0,075	0,05xD	0,06xD
					●													2,5	50-80	0,003-0,015	0,05xD	0,06xD
					●													3+4	50-80	0,010-0,025	0,05xD	0,06xD
					●													4+5	50-80	0,010-0,025	0,05xD	0,06xD
					●													5+8	50-80	0,010-0,025	0,05xD	0,06xD
					●													8+12	50-80	0,020-0,035	0,05xD	0,06xD
					●													12+16	50-80	0,040-0,055	0,05xD	0,06xD
					●													16+20	50-80	0,050-0,065	0,05xD	0,06xD
</																						

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE


DATI TECNICI LAVORAZIONI PAG. 1072 - 1073
MACHINING TECHNICAL DATA PAGE 1072 - 1073
BEARBEITUNGSSCHNITTDATEN S. 1072 - 1073
DONNEES TECHNIQUES USINAGES PAGES 1072 - 1073

øD = mm DIAMETRO - DIAMETER

øDe = mm DIAMETRO EFFETTIVO - EFFECTIVE DIAMETER

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

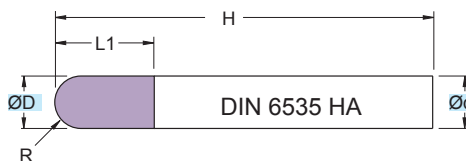
$$n = \frac{V_c \cdot 1000}{\varnothing De \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM2424

ØD = 2 - 12



**Fresa in M.D.I. Micrograno
 Gambo Cilindrico HA**

Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLLERANCE RANGE	h10	h6

RIVESTIM.
 COATED
GRAY



R

**60
 HRC**

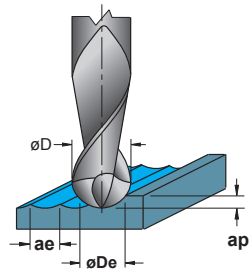
HSC



(mm)						
ART.	ØD	Ød	L1	H	R	z
SM2424.020.S010	2,0	6,0	5	60	1,0	2
SM2424.030.S015	3,0	6,0	7	60	1,5	2
SM2424.040.S020	4,0	6,0	10	75	2,0	2
SM2424.050.S025	5,0	6,0	12	75	2,5	2
SM2424.060.S030	6,0	6,0	12	100	3,0	2
SM2424.080.S040	8,0	8,0	14	100	4,0	2
SM2424.100.S050	10,0	10,0	18	100	5,0	2
SM2424.120.S060	12,0	12,0	22	100	6,0	2

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS															Pag. 1119				
P				M	K			N			S	H	G						
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAMO E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØDe	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
●															2	430-460	0,014-0,029	0,06	0,1
●															3	430-460	0,022-0,037	0,09	0,15
●															4	430-460	0,030-0,045	0,12	0,2
●															6	430-460	0,050-0,065	0,18	0,3
●															8	430-460	0,070-0,085	0,24	0,4
●															10	430-460	0,090-0,105	0,3	0,5
●															12	430-460	0,110-0,125	0,36	0,6
	●														2	250-280	0,008-0,023	0,03	0,08
	●														3	250-280	0,015-0,030	0,045	0,12
	●														4	250-280	0,025-0,040	0,06	0,16
	●														6	250-280	0,040-0,055	0,09	0,24
	●														8	250-280	0,050-0,065	0,12	0,32
	●														10	250-280	0,055-0,070	0,15	0,4
	●														12	250-280	0,060-0,075	0,18	0,48
					●										2	540-575	0,014-0,029	0,06	0,1
					●										3	540-575	0,022-0,037	0,09	0,15
					●										4	540-575	0,030-0,045	0,12	0,2
					●										6	540-575	0,050-0,065	0,18	0,3
					●										8	540-575	0,070-0,085	0,24	0,4
					●										10	540-575	0,090-0,105	0,3	0,5
					●										12	540-575	0,110-0,125	0,36	0,6
						●									2	450-480	0,014-0,029	0,06	0,1
						●									3	450-480	0,022-0,037	0,09	0,15
						●									4	450-480	0,030-0,045	0,12	0,2
						●									6	450-480	0,050-0,065	0,18	0,3
						●									8	450-480	0,070-0,085	0,24	0,4
						●									10	450-480	0,090-0,105	0,3	0,5
						●									12	450-480	0,110-0,125	0,36	0,6
											●				2	30-50	0,008-0,023	0,016	0,04
											●				3	30-50	0,015-0,030	0,024	0,06
											●				4	30-50	0,025-0,040	0,032	0,08
											●				6	30-50	0,040-0,055	0,048	0,12
											●				8	30-50	0,050-0,065	0,064	0,16
											●				10	30-50	0,055-0,070	0,08	0,2
											●				12	30-50	0,060-0,075	0,096	0,24
												●			2	45-65	0,014-0,029	0,06	0,1
												●			3	45-65	0,022-0,037	0,09	0,15
												●			4	45-65	0,030-0,045	0,12	0,2
												●			6	45-65	0,050-0,065	0,18	0,3
												●			8	45-65	0,070-0,085	0,24	0,4
												●			10	45-65	0,090-0,105	0,3	0,5
												●			12	45-65	0,110-0,125	0,36	0,6
													●		2	60-90	0,008-0,023	0,016	0,04
													●		3	60-90	0,015-0,030	0,024	0,06
													●		4	60-90	0,025-0,040	0,032	0,08
													●		6	60-90	0,040-0,055	0,048	0,12
													●		8	60-90	0,050-0,065	0,064	0,16
													●		10	60-90	0,055-0,070	0,08	0,2
													●		12	60-90	0,060-0,075	0,096	0,24

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

øD = mm DIAMETRO - DIAMETER

øDe = mm DIAMETRO EFFETTIVO - EFFECTIVE DIAMETER

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

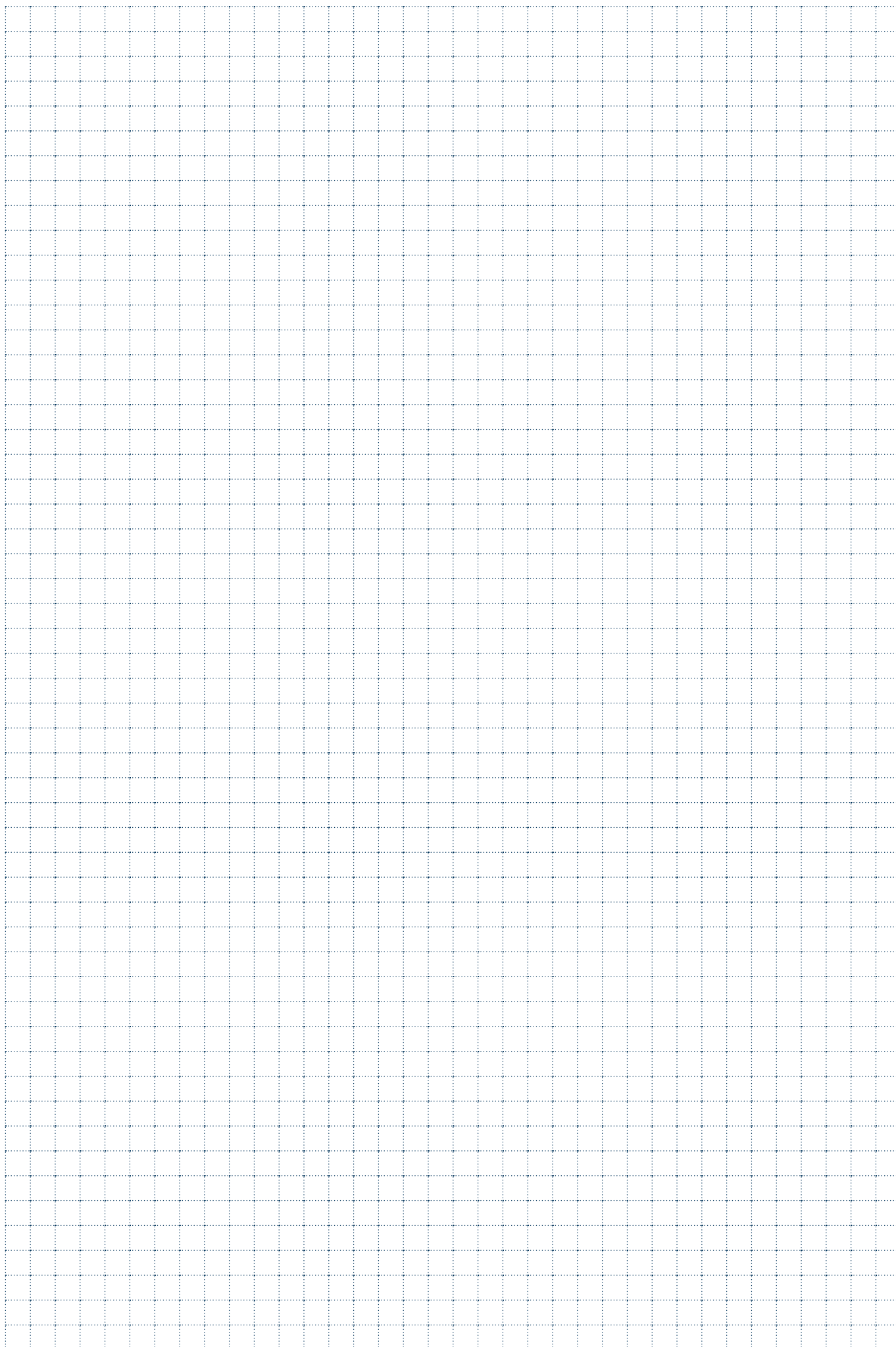
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED


DATI TECNICI LAVORAZIONI PAG. 1072 - 1073
MACHINING TECHNICAL DATA PAGE 1072 - 1073
BEARBEITUNGSSCHNITTDATEN S. 1072 - 1073
DONNÉES TECHNIQUES USINAGES PAGES 1072 - 1073

$$n = \frac{Vc \cdot 1000}{\phi De \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$



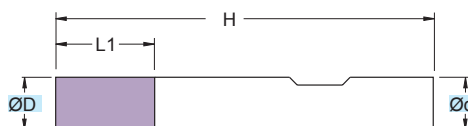


FRESE A 3 TAGLI

MILLING 3 CUTTINGS / DREISCHNEIDER / FRAISES A 3 COUPES /
FRESAS DE 3 FILOS

SMW3100

ØD = 2 - 20



RIVESTIM.
COATED
BLACK



90°

**42
HRC**

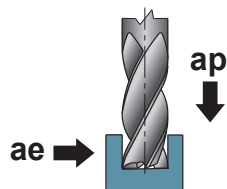


Fresa in M.D.I. Micrograno
Gambo sec. norma di fabbrica

Micrograin HM mills
 Shank according to factory standard

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW3100.020.N00	2	6	4	38	3
SMW3100.030.N00	3	6	5	38	3
SMW3100.040.N00	4	6	7	38	3
SMW3100.050.N00	5	6	8	38	3
SMW3100.060.N00	6	6	8	38	3
SMW3100.080.N00	8	8	11	43	3
SMW3100.100.N00	10	10	13	50	3
SMW3100.120.N00	12	12	15	55	3
SMW3100.160.N00	16	16	18	62	3
SMW3100.200.N00	20	20	22	75	3



MATERIALI - MATERIALS											Pag. 1119								
P				M	K		N			S	H	G							
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAMME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
●															2	100-130	0,003-0,013	1,0	1xD
●															3	100-130	0,003-0,015	1,5	1xD
●															4	100-130	0,005-0,020	2,0	1xD
●															5	100-130	0,008-0,023	2,5	1xD
●															6	100-130	0,010-0,025	3,0	1xD
●															8	100-130	0,015-0,030	4,0	1xD
●															10	100-130	0,020-0,035	5,0	1xD
●															12	100-130	0,025-0,040	6,0	1xD
●															16	100-130	0,030-0,045	8,0	1xD
●															20	100-130	0,035-0,050	10,0	1xD
	●														2	60-90	0,003-0,013	1,0	1xD
	●														3	60-90	0,003-0,015	1,5	1xD
	●														4	60-90	0,005-0,020	2,0	1xD
	●														5	60-90	0,008-0,023	2,5	1xD
	●														6	60-90	0,010-0,025	3,0	1xD
	●														8	60-90	0,015-0,030	4,0	1xD
	●														10	60-90	0,020-0,035	5,0	1xD
	●														12	60-90	0,025-0,040	6,0	1xD
	●														16	60-90	0,030-0,045	8,0	1xD
	●														20	60-90	0,035-0,050	10,0	1xD
		●													2	40-70	0,003-0,013	1,0	1xD
		●													3	40-70	0,003-0,015	1,5	1xD
		●													4	40-70	0,005-0,020	2,0	1xD
		●													5	40-70	0,008-0,023	2,5	1xD
		●													6	40-70	0,010-0,025	3,0	1xD
		●													8	40-70	0,015-0,030	4,0	1xD
		●													10	40-70	0,020-0,035	5,0	1xD
		●													12	40-70	0,025-0,040	6,0	1xD
		●													16	40-70	0,030-0,045	8,0	1xD
		●													20	40-70	0,035-0,050	10,0	1xD
			●												2	30-60	0,003-0,010	1,0	1xD
			●												3	30-60	0,003-0,013	1,5	1xD
			●																

- **APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION**
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- **APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION**
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

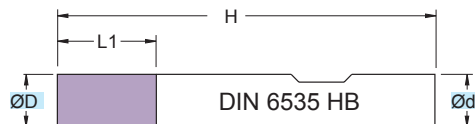
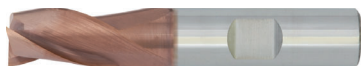
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SMW3231

ØD = 2 - 20



RIVESTIM.
COATED

RED



90°

**58
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE

TOLERANCE RANGE

D

h10

d

h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW3231.020.N00	2	6	4	50	3
SMW3231.030.N00	3	6	5	50	3
SMW3231.040.N00	4	6	7	50	3
SMW3231.050.N00	5	6	8	50	3
SMW3231.060.N00	6	6	8	50	3
SMW3231.070.N00	7	8	11	57	3
SMW3231.080.N00	8	8	11	57	3
SMW3231.090.N00	9	10	15	63	3
SMW3231.100.N00	10	10	15	63	3
SMW3231.120.N00	12	12	21	72	3
SMW3231.160.N00	16	16	26	82	3
SMW3231.200.N00	20	20	32	92	3

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application

P			M	K			N			S	H	G		
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE
●														
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PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- **APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION**
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- **APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION**
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

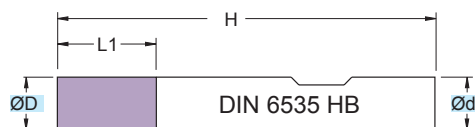
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SMW3300

ØD = 2 - 20



RIVESTIM.
COATED
BLACK



90°

**42
HRC**



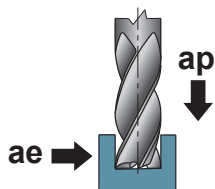
Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW3300.020.N00	2,00	3	7	38	3
SMW3300.025.N00	2,50	3	7	38	3
SMW3300.030.N00	3,00	3	8	38	3
SMW3300.035.N00	3,50	4	11	50	3
SMW3300.040.N00	4,00	4	11	50	3
SMW3300.045.N00	4,50	5	11	50	3
SMW3300.050.N00	5,00	5	10	50	3
SMW3300.055.N00	5,50	6	10	50	3
SMW3300.060.N00	6,00	6	10	57	3
SMW3300.065.N00	6,50	8	13	63	3
SMW3300.070.N00	7,00	8	13	63	3
SMW3300.075.N00	7,50	8	16	63	3
SMW3300.080.N00	8,00	8	16	63	3
SMW3300.085.N00	8,50	10	16	72	3
SMW3300.090.N00	9,00	10	16	72	3
SMW3300.095.N00	9,50	10	19	72	3
SMW3300.100.N00	10,00	10	19	72	3
SMW3300.110.N00	11,00	12	19	72	3
SMW3300.120.N00	12,00	12	22	83	3
SMW3300.130.N00	13,00	14	22	83	3
SMW3300.140.N00	14,00	14	22	83	3
SMW3300.150.N00	15,00	16	26	83	3
SMW3300.160.N00	16,00	16	26	83	3
SMW3300.170.N00	17,00	18	26	92	3
SMW3300.180.N00	18,00	18	26	92	3
SMW3300.190.N00	19,00	20	32	104	3
SMW3300.200.N00	20,00	20	32	104	3



[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

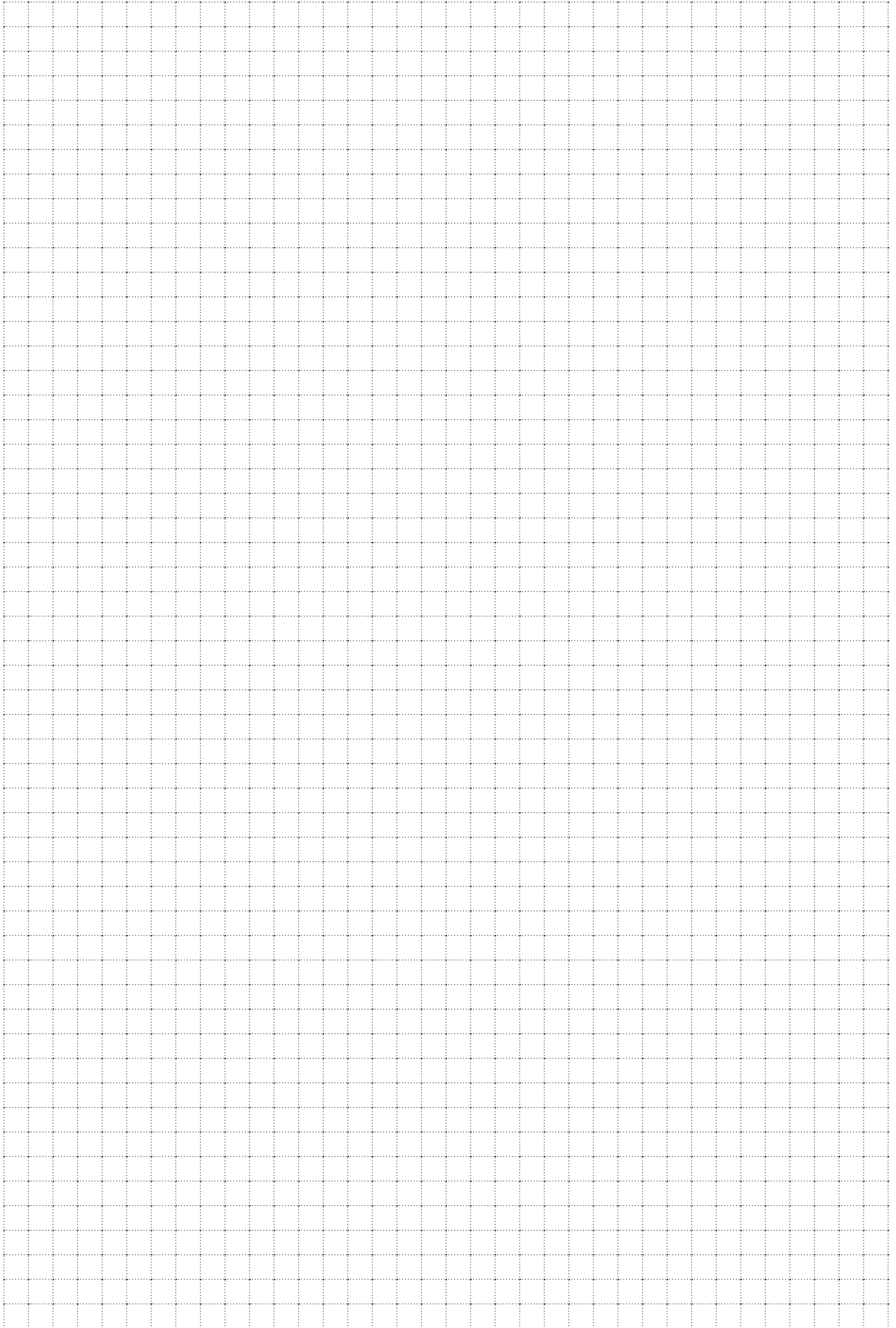
fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$



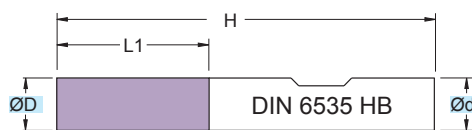


FRESE A 4 TAGLI

MILLING 4 CUTTINGS / VIER SCHNEIDER / FRAISES A 4 COUPES /
FRESAS DE 4 FILOS

SMW4300

$\varnothing D = 5,5 - 20$



RIVESTIM.
COATED
BLACK



90°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

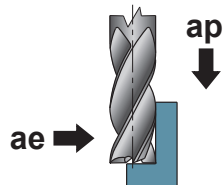
Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW4300.055.N00	5,5	6	10	57	4
SMW4300.060.N00	6,0	6	10	57	4
SMW4300.070.N00	7,0	8	13	63	4
SMW4300.080.N00	8,0	8	16	63	4
SMW4300.090.N00	9,0	10	16	72	4
SMW4300.100.N00	10,0	10	19	72	4
SMW4300.110.N00	11,0	12	19	72	4
SMW4300.120.N00	12,0	12	22	83	4
SMW4300.140.N00	14,0	14	22	83	4
SMW4300.160.N00	16,0	16	26	83	4
SMW4300.180.N00	18,0	18	26	92	4
SMW4300.200.N00	20,0	20	32	104	4

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS												Pag. 1119							
P				M	K			N			S	H	G						
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
	●														2+3	60-90	0,003-0,015	4,5	0,3
	●														3+4	60-90	0,003-0,017	6,0	0,4
	●														4+5	60-90	0,005-0,020	7,5	0,5
	●														5+6	60-90	0,010-0,025	9,0	0,6
	●														6+8	60-90	0,015-0,030	12,0	0,8
	●														8+10	60-90	0,020-0,035	15,0	1,0
	●														10+12	60-90	0,030-0,045	18,0	1,2
	●														12+16	60-90	0,040-0,055	24,0	1,6
	●														16+20	60-90	0,050-0,065	30,0	2,0
		●													2+3	40-70	0,003-0,015	4,5	0,3
		●													3+4	40-70	0,003-0,017	6,0	0,4
		●													4+5	40-70	0,005-0,020	7,5	0,5
		●													5+6	40-70	0,010-0,025	9,0	0,6
		●													6+8	40-70	0,015-0,030	12,0	0,8
		●													8+10	40-70	0,020-0,035	15,0	1,0
		●													10+12	40-70	0,030-0,045	18,0	1,2
		●													12+16	40-70	0,040-0,055	24,0	1,6
		●													16+20	40-70	0,050-0,065	30,0	2,0
				●											2+3	25-55	0,003-0,013	4,5	0,3
				●											3+4	25-55	0,003-0,015	6,0	0,4
				●											4+5	25-55	0,003-0,015	7,5	0,5
				●											5+6	25-55	0,005-0,020	9,0	0,6
				●											6+8	25-55	0,010-0,025	12,0	0,8
				●											8+10	25-55	0,015-0,030	15,0	1,0
				●											10+12	25-55	0,020-0,035	18,0	1,2
				●											12+16	25-55	0,030-0,045	24,0	1,6
				●											16+20	25-55	0,040-0,055	30,0	2,0
						●									2+3	100-130	0,003-0,013	4,5	0,3
						●									3+4	100-130	0,003-0,015	6,0	0,4
						●									4+5	100-130	0,003-0,015	7,5	0,5
						●									5+6	100-130	0,005-0,020	9,0	0,6
						●									6+8	100-130	0,010-0,025	12,0	0,8
						●									8+10	100-130	0,015-0,030	15,0	1,0
						●									10+12	100-130	0,020-0,035	18,0	1,2
						●									12+16	100-130	0,030-0,045	24,0	1,6
						●									16+20	100-130	0,040-0,055	30,0	2,0

PER LAVORAZIONI IN CAVA DIMINUIRE I PARAMETRI DEL 20%
FOR SLOT CUTTING PARAMETERS SHOULD BE REDUCED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

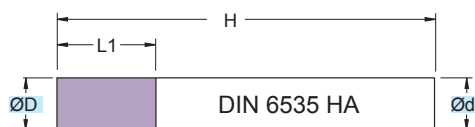
$$n = \frac{Vc \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SM4300

ØD = 2 - 20



RIVESTIM.
COATED
BLACK



90°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo cilindrico HA

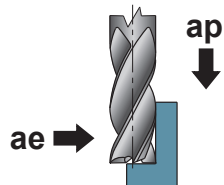
Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SM4300.020.N00	2,0	3	7	38	4
SM4300.025.N00	2,5	3	7	38	4
SM4300.030.N00	3,0	3	8	38	4
SM4300.035.N00	3,5	4	11	50	4
SM4300.040.N00	4,0	4	11	50	4
SM4300.045.N00	4,5	5	11	50	4
SM4300.050.N00	5,0	5	10	50	4
SM4300.055.N00	5,5	6	10	57	4
SM4300.060.N00	6,0	6	10	57	4
SM4300.070.N00	7,0	8	13	63	4
SM4300.080.N00	8,0	8	16	63	4
SM4300.090.N00	9,0	10	16	72	4
SM4300.100.N00	10,0	10	19	72	4
SM4300.110.N00	11,0	12	19	72	4
SM4300.120.N00	12,0	12	22	83	4
SM4300.140.N00	14,0	14	22	83	4
SM4300.160.N00	16,0	16	26	83	4
SM4300.180.N00	18,0	18	26	92	4
SM4300.200.N00	20,0	20	32	104	4

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS															Pag. 1119						
P				M	K			N			S	H	G								
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE							
	●														(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae		
	●														2+3	60-90	0,003-0,015	4,5	0,3		
	●														3+4	60-90	0,003-0,017	6,0	0,4		
	●														4+5	60-90	0,005-0,020	7,5	0,5		
	●														5+6	60-90	0,010-0,025	9,0	0,6		
	●														6+8	60-90	0,015-0,030	12,0	0,8		
	●														8+10	60-90	0,020-0,035	15,0	1,0		
	●														10+12	60-90	0,030-0,045	18,0	1,2		
	●														12+16	60-90	0,040-0,055	24,0	1,6		
	●														16+20	60-90	0,050-0,065	30,0	2,0		
		●													2+3	40-70	0,003-0,015	4,5	0,3		
		●													3+4	40-70	0,003-0,017	6,0	0,4		
		●													4+5	40-70	0,005-0,020	7,5	0,5		
		●													5+6	40-70	0,010-0,025	9,0	0,6		
		●													6+8	40-70	0,015-0,030	12,0	0,8		
		●													8+10	40-70	0,020-0,035	15,0	1,0		
		●													10+12	40-70	0,030-0,045	18,0	1,2		
		●													12+16	40-70	0,040-0,055	24,0	1,6		
		●													16+20	40-70	0,050-0,065	30,0	2,0		
					●										2+3	25-55	0,003-0,013	4,5	0,3		
					●										3+4	25-55	0,003-0,015	6,0	0,4		
					●										4+5	25-55	0,003-0,015	7,5	0,5		
					●										5+6	25-55	0,005-0,020	9,0	0,6		
					●										6+8	25-55	0,010-0,025	12,0	0,8		
					●										8+10	25-55	0,015-0,030	15,0	1,0		
					●										10+12	25-55	0,020-0,035	18,0	1,2		
					●										12+16	25-55	0,030-0,045	24,0	1,6		
					●										16+20	25-55	0,040-0,055	30,0	2,0		
						●									2+3	100-130	0,003-0,013	4,5	0,3		
						●									3+4	100-130	0,003-0,015	6,0	0,4		
						●									4+5	100-130	0,003-0,015	7,5	0,5		
						●									5+6	100-130	0,005-0,020	9,0	0,6		
						●									6+8	100-130	0,010-0,025	12,0	0,8		
						●									8+10	100-130	0,015-0,030	15,0	1,0		
						●									10+12	100-130	0,020-0,035	18,0	1,2		
						●									12+16	100-130	0,030-0,045	24,0	1,6		
						●									16+20	100-130	0,040-0,055	30,0	2,0		

PER LAVORAZIONI IN CAVA DIMINUIRE I PARAMETRI DEL 20%
FOR SLOT CUTTING PARAMETERS SHOULD BE REDUCED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

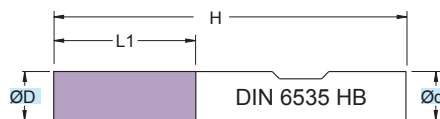
$$n = \frac{Vc \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

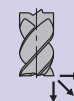
$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SMW4400

ØD = 3 - 20



RIVESTIM.
COATED
BLACK



90°

**42
HRC**

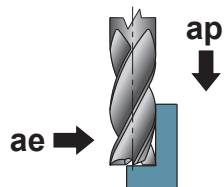


Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

ART.	(mm)				
	ØD	Ød	L1	H	z
SMW4400.030.N00	3	6	20	60	4
SMW4400.040.N00	4	6	25	75	4
SMW4400.050.N00	5	6	25	75	4
SMW4400.060.N00	6	6	30	75	4
SMW4400.080.N00	8	8	45	100	4
SMW4400.100.N00	10	10	45	100	4
SMW4400.120.N00	12	12	45	100	4
SMW4400.120.NL02	12	12	65	150	4
SMW4400.140.N00	14	14	45	100	4
SMW4400.160.N00	16	16	45	100	4
SMW4400.160.NL02	16	16	65	150	4
SMW4400.180.N00	18	18	45	100	4
SMW4400.200.N00	20	20	45	104	4
SMW4400.200.NL02	20	20	65	150	4



● **APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION**
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

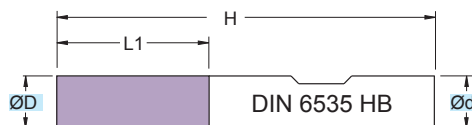
Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SMW4402

$\varnothing D = 2 - 20$



RIVESTIM.
COATED
BLACK



45°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

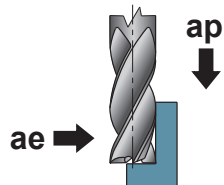
Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)						
ART.	$\varnothing D$	$\varnothing d$	L1	H	45°	z
SMW4402.020.N00	2	6	8	57	0,05	4
SMW4402.030.N00	3	6	14	57	0,05	4
SMW4402.040.N00	4	6	18	57	0,10	4
SMW4402.050.N00	5	6	20	57	0,10	4
SMW4402.060.N00	6	6	22	57	0,10	4
SMW4402.080.N00	8	8	30	63	0,15	4
SMW4402.100.N00	10	10	33	72	0,15	4
SMW4402.120.N00	12	12	34	83	0,20	4
SMW4402.160.N00	16	16	38	92	0,20	4
SMW4402.200.N00	20	20	47	104	0,30	4

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MATERIALI - MATERIALS														Pag. 1119						
P				M	K			N			S		H	G						
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae	
	●															2	60-90	0,003-0,015	1,5xD	0,2xD
	●															3	60-90	0,003-0,015	1,5xD	0,2xD
	●															4	60-90	0,003-0,015	1,5xD	0,2xD
	●															5	60-90	0,003-0,015	1,5xD	0,2xD
	●															6	60-90	0,003-0,015	1,5xD	0,2xD
	●															8	60-90	0,010-0,025	1,5xD	0,2xD
	●															10	60-90	0,010-0,025	1,5xD	0,2xD
	●															12	60-90	0,020-0,035	1,5xD	0,2xD
	●															16	60-90	0,030-0,045	1,5xD	0,2xD
	●															20	60-90	0,030-0,045	1,5xD	0,2xD
		●														2	40-70	0,003-0,015	1,5xD	0,2xD
		●														3	40-70	0,003-0,015	1,5xD	0,2xD
		●														4	40-70	0,003-0,015	1,5xD	0,2xD
		●														5	40-70	0,003-0,015	1,5xD	0,2xD
		●														6	40-70	0,003-0,015	1,5xD	0,2xD
		●														8	40-70	0,010-0,025	1,5xD	0,2xD
		●														10	40-70	0,010-0,025	1,5xD	0,2xD
		●														12	40-70	0,020-0,035	1,5xD	0,2xD
		●														16	40-70	0,030-0,045	1,5xD	0,2xD
		●														20	40-70	0,030-0,045	1,5xD	0,2xD
			●													2	25-55	0,003-0,015	1,5xD	0,2xD
			●													3	25-55	0,003-0,015	1,5xD	0,2xD
			●													4	25-55	0,003-0,015	1,5xD	0,2xD
			●													5	25-55	0,003-0,015	1,5xD	0,2xD
			●													6	25-55	0,003-0,015	1,5xD	0,2xD
			●													8	25-55	0,010-0,025	1,5xD	0,2xD
			●													10	25-55	0,010-0,025	1,5xD	0,2xD
			●													12	25-55	0,020-0,035	1,5xD	0,2xD
			●													16	25-55	0,030-0,045	1,5xD	0,2xD
			●													20	25-55	0,030-0,045	1,5xD	0,2xD
				●		●										2	80-110	0,003-0,015	1,5xD	0,2xD
						●										3	80-110	0,003-0,015	1,5xD	0,2xD
						●										4	80-110	0,010-0,025	1,5xD	0,2xD
						●										5	80-110	0,010-0,025	1,5xD	0,2xD
						●										6	80-110	0,010-0,025	1,5xD	0,2xD
						●										8	80-110	0,030-0,045	1,5xD	0,2xD
						●										10	80-110	0,030-0,045	1,5xD	0,2xD
						●										12	80-110	0,030-0,045	1,5xD	0,2xD
						●										16	80-110	0,040-0,055	1,5xD	0,2xD
						●										20	80-110	0,040-0,055	1,5xD	0,2xD

PER LAVORAZIONI IN CAVA DIMINUIRE I PARAMETRI DEL 20%
FOR SLOT CUTTING PARAMETERS SHOULD BE REDUCED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

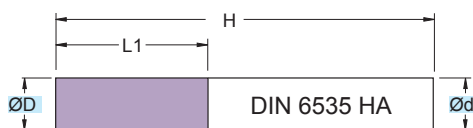
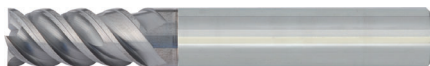
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SM4330

ØD = 4 - 20



RIVESTIM.
COATED
GRAY



45°

**52
HRC**

HSC



Fresa in M.D.I. Micrograno
 Gambo cilindrico HA

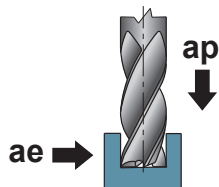
Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)						
ART.	ØD	Ød	L1	H	45°	z
SM4330.040.N00	4	6	11	57	0,10	4
SM4330.050.N00	5	6	13	57	0,10	4
SM4330.060.N00	6	6	13	57	0,10	4
SM4330.080.N00	8	8	19	63	0,15	4
SM4330.100.N00	10	10	22	72	0,15	4
SM4330.120.N00	12	12	26	83	0,20	4
SM4330.140.N00	14	14	26	83	0,20	4
SM4330.160.N00	16	16	32	92	0,20	4
SM4330.180.N00	18	18	32	92	0,30	4
SM4330.200.N00	20	20	38	104	0,30	4

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS											Pag. 1119								
P				M	K			N			S	H						G	
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
		●													4	160-190	0,030-0,045	0,5xD	1xD
		●													5	160-190	0,035-0,050	0,5xD	1xD
		●													6	160-190	0,040-0,055	0,5xD	1xD
		●													8	160-190	0,050-0,065	0,5xD	1xD
		●													10	160-190	0,060-0,075	0,5xD	1xD
		●													12	160-190	0,070-0,085	0,5xD	1xD
		●													14	160-190	0,080-0,095	0,5xD	1xD
		●													16	160-190	0,090-0,105	0,5xD	1xD
		●													18	160-190	0,090-0,105	0,5xD	1xD
		●													20	160-190	0,090-0,105	0,5xD	1xD
				●											4	100-130	0,015-0,030	0,5xD	1xD
				●											5	100-130	0,020-0,035	0,5xD	1xD
				●											6	100-130	0,025-0,040	0,5xD	1xD
				●											8	100-130	0,030-0,045	0,5xD	1xD
				●											10	100-130	0,030-0,045	0,5xD	1xD
				●											12	100-130	0,040-0,055	0,5xD	1xD
				●											14	100-130	0,050-0,065	0,5xD	1xD
				●											16	100-130	0,060-0,075	0,5xD	1xD
				●											18	100-130	0,060-0,075	0,5xD	1xD
				●											20	100-130	0,060-0,075	0,5xD	1xD
					●										4	180-210	0,035-0,050	0,5xD	1xD
					●										5	180-210	0,040-0,055	0,5xD	1xD
					●										6	180-210	0,045-0,060	0,5xD	1xD
					●										8	180-210	0,060-0,075	0,5xD	1xD
					●										10	180-210	0,070-0,085	0,5xD	1xD
					●										12	180-210	0,090-0,105	0,5xD	1xD
					●										14	180-210	0,100-0,115	0,5xD	1xD
					●										16	180-210	0,110-0,125	0,5xD	1xD
					●										18	180-210	0,110-0,125	0,5xD	1xD
					●										20	180-210	0,110-0,125	0,5xD	1xD
						●									4	160-190	0,035-0,050	0,5xD	1xD
						●									5	160-190	0,040-0,055	0,5xD	1xD
						●									6	160-190	0,045-0,060	0,5xD	1xD
						●									8	160-190	0,060-0,075	0,5xD	1xD
						●									10	160-190	0,070-0,085	0,5xD	1xD
						●									12	160-190	0,090-0,105	0,5xD	1xD
						●									14	160-190	0,100-0,115	0,5xD	1xD
						●									16	160-190	0,110-0,125	0,5xD	1xD
						●									18	160-190	0,110-0,125	0,5xD	1xD
						●									20	160-190	0,110-0,125	0,5xD	1xD
													●		4	20-40	0,003-0,011	0,5xD	1xD
													●		5	20-40	0,003-0,012	0,5xD	1xD
													●		6	20-40	0,003-0,013	0,5xD	1xD
													●		8	20-40	0,003-0,015	0,5xD	1xD
													●		10	20-40	0,005-0,020	0,5xD	1xD
													●		12	20-40	0,010-0,025	0,5xD	1xD
													●		14	20-40	0,015-0,030	0,5xD	1xD
													●		16	20-40	0,020-0,035	0,5xD	1xD
													●		18	20-40	0,025-0,040	0,5xD	1xD
													●		20	20-40	0,030-0,045	0,5xD	1xD

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

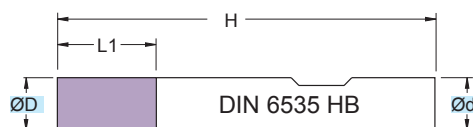
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SMW4304

ØD = 3 - 20



RIVESTIM.
COATED
GRAY



90°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

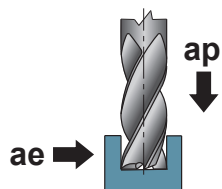
Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SMW4304.030.N00	3	6	6	57	4
SMW4304.040.N00	4	6	8	57	4
SMW4304.050.N00	5	6	10	57	4
SMW4304.060.N00	6	6	13	57	4
SMW4304.080.N00	8	8	16	63	4
SMW4304.100.N00	10	10	22	72	4
SMW4304.120.N00	12	12	26	83	4
SMW4304.160.N00	16	16	32	92	4
SMW4304.200.N00	20	20	38	104	4

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS											Pag. 1119								
P				M	K		N			S	H	G							
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM						ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE
●															(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae
●															3	100-130	0,003-0,015	1xD	1xD
●															4	100-130	0,005-0,020	1xD	1xD
●															5	100-130	0,010-0,025	1xD	1xD
●															6	100-130	0,020-0,035	1xD	1xD
●															8	100-130	0,030-0,045	1xD	1xD
●															10	100-130	0,035-0,050	1xD	1xD
●															12	100-130	0,040-0,055	1xD	1xD
●															16	100-130	0,050-0,065	1xD	1xD
●															20	100-130	0,060-0,075	1xD	1xD
		●													3	50-80	0,003-0,015	1xD	1xD
		●													4	50-80	0,005-0,020	1xD	1xD
		●													5	50-80	0,010-0,025	1xD	1xD
		●													6	50-80	0,015-0,030	1xD	1xD
		●													8	50-80	0,020-0,035	1xD	1xD
		●													10	50-80	0,025-0,040	1xD	1xD
		●													12	50-80	0,030-0,045	1xD	1xD
		●													16	50-80	0,040-0,055	1xD	1xD
		●													20	50-80	0,050-0,065	1xD	1xD
				●											3	30-60	0,003-0,013	1xD	1xD
				●											4	30-60	0,003-0,015	1xD	1xD
				●											5	30-60	0,005-0,020	1xD	1xD
				●											6	30-60	0,005-0,020	1xD	1xD
				●											8	30-60	0,010-0,025	1xD	1xD
				●											10	30-60	0,015-0,030	1xD	1xD
				●											12	30-60	0,020-0,035	1xD	1xD
				●											16	30-60	0,030-0,045	1xD	1xD
				●											20	30-60	0,040-0,055	1xD	1xD
					●										3	125-155	0,005-0,020	1xD	1xD
					●										4	125-155	0,015-0,030	1xD	1xD
					●										5	125-155	0,025-0,040	1xD	1xD
					●										6	125-155	0,035-0,050	1xD	1xD
					●										8	125-155	0,050-0,065	1xD	1xD
					●										10	125-155	0,055-0,070	1xD	1xD
					●										12	125-155	0,060-0,075	1xD	1xD
					●										16	125-155	0,080-0,095	1xD	1xD
					●										20	125-155	0,110-0,125	1xD	1xD
						●									3	100-130	0,005-0,020	1xD	1xD
						●									4	100-130	0,015-0,030	1xD	1xD
						●									5	100-130	0,025-0,040	1xD	1xD
						●									6	100-130	0,035-0,050	1xD	1xD
						●									8	100-130	0,050-0,065	1xD	1xD
						●									10	100-130	0,055-0,070	1xD	1xD
						●									12	100-130	0,060-0,075	1xD	1xD
						●									16	100-130	0,080-0,095	1xD	1xD
						●									20	100-130	0,110-0,125	1xD	1xD

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

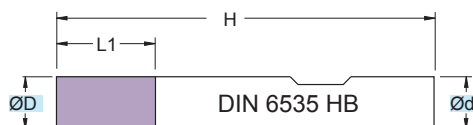
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SMW3304

ØD = 4 - 25



RIVESTIM.
COATED
GRAY



90°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

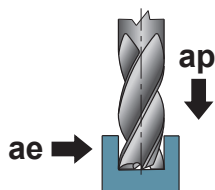
Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

ART.	(mm)				
	ØD	Ød	L1	H	z
SMW3304.040.N00	4	6	11	57	3
SMW3304.050.N00	5	6	13	57	4
SMW3304.060.N00	6	6	16	57	4
SMW3304.070.N00	7	8	16	63	4
SMW3304.080.N00	8	8	16	63	4
SMW3304.090.N00	9	10	19	72	4
SMW3304.100.N00	10	10	22	72	4
SMW3304.120.N00	12	12	26	83	4
SMW3304.140.N00	14	14	26	83	5
SMW3304.160.N00	16	16	32	92	5
SMW3304.200.N00	20	20	38	104	6
SMW3304.250.N00	25	25	45	121	6

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS															Pag. 1119						
P				M	K			N			S	H	G								
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAMME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae		
	●														4	150-180	0,010-0,025	1xD	0,5xD		
	●														5	150-180	0,015-0,030	1xD	0,5xD		
	●														6	150-180	0,020-0,035	1xD	0,5xD		
	●														7	150-180	0,025-0,040	1xD	0,5xD		
	●														8	150-180	0,030-0,045	1xD	0,5xD		
	●														9	150-180	0,040-0,055	1xD	0,5xD		
	●														10	150-180	0,050-0,065	1xD	0,5xD		
	●														12	150-180	0,070-0,085	1xD	0,5xD		
	●														14	150-180	0,090-0,105	1xD	0,5xD		
	●														16	150-180	0,110-0,125	1xD	0,5xD		
	●														20	150-180	0,130-0,145	1xD	0,5xD		
	●														25	150-180	0,150-0,165	1xD	0,5xD		
				●											4	130-160	0,010-0,025	1xD	0,5xD		
				●											5	130-160	0,015-0,030	1xD	0,5xD		
				●											6	130-160	0,020-0,035	1xD	0,5xD		
				●											7	130-160	0,025-0,040	1xD	0,5xD		
				●											8	130-160	0,030-0,045	1xD	0,5xD		
				●											9	130-160	0,040-0,055	1xD	0,5xD		
				●											10	130-160	0,050-0,065	1xD	0,5xD		
				●											12	130-160	0,070-0,085	1xD	0,5xD		
				●											14	130-160	0,090-0,105	1xD	0,5xD		
				●											16	130-160	0,110-0,125	1xD	0,5xD		
				●											20	130-160	0,130-0,145	1xD	0,5xD		
				●											25	130-160	0,150-0,165	1xD	0,5xD		
											●				4	30-60	0,040-0,055	1xD	0,5xD		
											●				5	30-60	0,040-0,055	1xD	0,5xD		
											●				6	30-60	0,050-0,065	1xD	0,5xD		
											●				7	30-60	0,050-0,065	1xD	0,5xD		
											●				8	30-60	0,050-0,065	1xD	0,5xD		
											●				9	30-60	0,060-0,075	1xD	0,5xD		
											●				10	30-60	0,070-0,085	1xD	0,5xD		
											●				12	30-60	0,090-0,105	1xD	0,5xD		
											●				14	30-60	0,110-0,125	1xD	0,5xD		
											●				16	30-60	0,140-0,155	1xD	0,5xD		
											●				20	30-60	0,190-0,205	1xD	0,5xD		
											●				25	30-60	0,190-0,205	1xD	0,5xD		
												●			4	60-90	0,040-0,055	1xD	0,5xD		
												●			5	60-90	0,040-0,055	1xD	0,5xD		
												●			6	60-90	0,050-0,065	1xD	0,5xD		
												●			7	60-90	0,050-0,065	1xD	0,5xD		
												●			8	60-90	0,050-0,065	1xD	0,5xD		
												●			9	60-90	0,060-0,075	1xD	0,5xD		
												●			10	60-90	0,070-0,085	1xD	0,5xD		
												●			12	60-90	0,090-0,105	1xD	0,5xD		
												●			14	60-90	0,110-0,125	1xD	0,5xD		
												●			16	60-90	0,140-0,155	1xD	0,5xD		
												●			20	60-90	0,190-0,205	1xD	0,5xD		
												●			25	60-90	0,190-0,205	1xD	0,5xD		

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

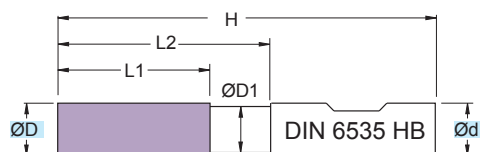
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SMW4404

ØD = 6 - 20



RIVESTIM.
COATED
GRAY



90°

**42
HRC**



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)							
ART.	ØD	Ød	ØD1	L1	L2	H	z
SMW4404.060.N00	6	6	5,8	13	20	57	4
SMW4404.080.N00	8	8	7,7	19	28	63	4
SMW4404.100.N00	10	10	9,5	22	33	72	4
SMW4404.120.N00	12	12	11,5	26	40	83	4
SMW4404.140.N00	14	14	13,5	26	40	83	4
SMW4404.160.N00	16	16	15,5	32	45	92	4
SMW4404.180.N00	18	18	17,5	32	45	92	4
SMW4404.200.N00	20	20	19,5	38	50	104	4



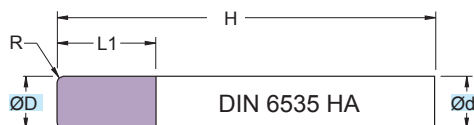
PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3.14} = \text{giri/min (min}^{-1}\text{)}$$
$$f_n = f_z \cdot z = \text{mm}$$
$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$
$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$
$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM4325

ØD = 3 - 20



Fresa in M.D.I. Micrograno
 Gambo cilindrico HA

Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
 COATED
GRAY



R

62 HRC

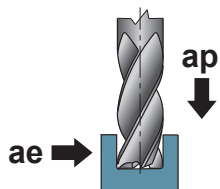


ART.	ØD	Ød	L1	H	R	z
SM4325.030.R030	3	3	6	50	0,3	4
SM4325.030.R050	3	3	6	50	0,5	4
SM4325.040.R030	4	4	8	60	0,3	4
SM4325.040.R050	4	4	8	60	0,5	4
SM4325.040.R100	4	4	8	60	1,0	4
SM4325.040.R150	4	4	8	60	1,5	4
SM4325.050.R030	5	5	10	60	0,3	4
SM4325.050.R050	5	5	10	60	0,5	4
SM4325.050.R100	5	5	10	60	1,0	4
SM4325.050.R150	5	5	10	60	1,5	4
SM4325.050.R200	5	5	10	60	2,0	4
SM4325.060.R030	6	6	12	70	0,3	4
SM4325.060.R050	6	6	12	70	0,5	4
SM4325.060.R100	6	6	12	70	1,0	4
SM4325.060.R150	6	6	12	70	1,5	4
SM4325.060.R200	6	6	12	70	2,0	4
SM4325.060.R250	6	6	12	70	2,5	4
SM4325.080.R030	8	8	16	70	0,3	4
SM4325.080.R050	8	8	16	70	0,5	4
SM4325.080.R100	8	8	16	70	1,0	4
SM4325.080.R150	8	8	16	70	1,5	4
SM4325.080.R200	8	8	16	70	2,0	4
SM4325.080.R250	8	8	16	70	2,5	4
SM4325.080.R300	8	8	16	70	3,0	4
SM4325.100.R030	10	10	20	70	0,3	4
SM4325.100.R050	10	10	20	70	0,5	4

ART.	ØD	Ød	L1	H	R	z
SM4325.100.R100	10	10	20	70	1,0	4
SM4325.100.R150	10	10	20	70	1,5	4
SM4325.100.R200	10	10	20	70	2,0	4
SM4325.100.R250	10	10	20	70	2,5	4
SM4325.100.R300	10	10	20	70	3,0	4
SM4325.120.R030	12	12	24	80	0,3	4
SM4325.120.R050	12	12	24	80	0,5	4
SM4325.120.R100	12	12	24	80	1,0	4
SM4325.120.R150	12	12	24	80	1,5	4
SM4325.120.R200	12	12	24	80	2,0	4
SM4325.120.R250	12	12	24	80	2,5	4
SM4325.120.R300	12	12	24	80	3,0	4
SM4325.140.R050	14	14	28	90	0,5	4
SM4325.140.R100	14	14	28	90	1,0	4
SM4325.140.R150	14	14	28	90	1,5	4
SM4325.140.R200	14	14	28	90	2,0	4
SM4325.140.R250	14	14	28	90	2,5	4
SM4325.140.R300	14	14	28	90	3,0	4
SM4325.160.R100	16	16	32	90	1,0	4
SM4325.160.R200	16	16	32	90	2,0	4
SM4325.160.R300	16	16	32	90	3,0	4
SM4325.200.R100	20	20	40	120	1,0	4
SM4325.200.R200	20	20	40	120	2,0	4
SM4325.200.R300	20	20	40	120	3,0	4

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



MATERIALI - MATERIALS														Pag. 1119						
P				M	K			N			S	H	G							
ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae	
		●														3	130-160	0,020-0,035	1xD	1xD
		●														4	130-160	0,020-0,035	1xD	1xD
		●														5	130-160	0,020-0,035	1xD	1xD
		●														6	130-160	0,030-0,045	1xD	1xD
		●														8	130-160	0,040-0,055	1xD	1xD
		●														10	130-160	0,050-0,065	1xD	1xD
		●														12	130-160	0,060-0,075	1xD	1xD
		●														14	130-160	0,070-0,085	1xD	1xD
		●														16	130-160	0,080-0,095	1xD	1xD
		●														20	130-160	0,100-0,115	1xD	1xD
				○												3	50-80	0,020-0,035	1xD	1xD
				○												4	50-80	0,020-0,035	1xD	1xD
				○												5	50-80	0,020-0,035	1xD	1xD
				○												6	50-80	0,030-0,045	1xD	1xD
				○												8	50-80	0,040-0,055	1xD	1xD
				○												10	50-80	0,050-0,065	1xD	1xD
				○												12	50-80	0,060-0,075	1xD	1xD
				○												14	50-80	0,070-0,085	1xD	1xD
				○												16	50-80	0,080-0,095	1xD	1xD
				○												20	50-80	0,100-0,115	1xD	1xD
						○										3	120-150	0,030-0,045	1xD	1xD
						○										4	120-150	0,030-0,045	1xD	1xD
						○										5	120-150	0,040-0,055	1xD	1xD
						○										6	120-150	0,050-0,065	1xD	1xD
						○										8	120-150	0,060-0,075	1xD	1xD
						○										10	120-150	0,070-0,085	1xD	1xD
						○										12	120-150	0,080-0,095	1xD	1xD
						○										14	120-150	0,090-0,105	1xD	1xD
						○										16	120-150	0,090-0,105	1xD	1xD
						○										20	120-150	0,110-0,125	1xD	1xD
													●			3	160-190	0,010-0,025	0,025xD	0,025xD
													●			4	160-190	0,010-0,025	0,025xD	0,025xD
													●			5	160-190	0,020-0,035	0,025xD	0,025xD
													●			6	160-190	0,020-0,035	0,025xD	0,025xD
													●			8	160-190	0,030-0,045	0,025xD	0,025xD
													●			10	160-190	0,040-0,055	0,025xD	0,025xD
													●			12	160-190	0,050-0,065	0,025xD	0,025xD
													●			14	160-190	0,060-0,075	0,025xD	0,025xD
													●			16	160-190	0,070-0,085	0,025xD	0,025xD
													●			20	160-190	0,080-0,095	0,025xD	0,025xD

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

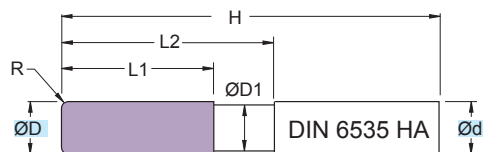
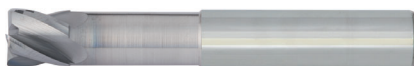
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SM4215

ØD = 2 - 16

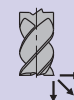


Fresa in M.D.I. Micrograno
Gambo cilindrico HA

Micrograin HM mills
cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
COATED
GRAY



R

52 HRC

HSC



ART.	ØD	Ød	ØD1	L1	L2	H	R	z
SM4215.020.R010	2	6	1,8	4	21	57	0,1	4
SM4215.020.R020	2	6	1,8	4	21	57	0,2	4
SM4215.020.R030	2	6	1,8	4	21	57	0,3	4
SM4215.020.R040	2	6	1,8	4	21	57	0,4	4
SM4215.040.R010	4	6	3,6	6	21	57	0,1	4
SM4215.040.R020	4	6	3,6	6	21	57	0,2	4
SM4215.040.R030	4	6	3,6	6	21	57	0,3	4
SM4215.040.R040	4	6	3,6	6	21	57	0,4	4
SM4215.040.R050	4	6	3,6	6	21	57	0,5	4
SM4215.040.R060	4	6	3,6	6	21	57	0,6	4
SM4215.040.R070	4	6	3,6	6	21	57	0,7	4
SM4215.040.R080	4	6	3,6	6	21	57	0,8	4
SM4215.040.R090	4	6	3,6	6	21	57	0,9	4
SM4215.040.R100	4	6	3,6	6	21	57	1,0	4
SM4215.040.R110	4	6	3,6	6	21	57	1,1	4
SM4215.040.R120	4	6	3,6	6	21	57	1,2	4
SM4215.040.R130	4	6	3,6	6	21	57	1,3	4
SM4215.040.R140	4	6	3,6	6	21	57	1,4	4
SM4215.040.R150	4	6	3,6	6	21	57	1,5	4
SM4215.060.R010	6	6	5,5	7	21	57	0,1	4
SM4215.060.R020	6	6	5,5	7	21	57	0,2	4
SM4215.060.R030	6	6	5,5	7	21	57	0,3	4
SM4215.060.R040	6	6	5,5	7	21	57	0,4	4
SM4215.060.R050	6	6	5,5	7	21	57	0,5	4
SM4215.060.R060	6	6	5,5	7	21	57	0,6	4
SM4215.060.R070	6	6	5,5	7	21	57	0,7	4
SM4215.060.R080	6	6	5,5	7	21	57	0,8	4
SM4215.060.R090	6	6	5,5	7	21	57	0,9	4
SM4215.060.R100	6	6	5,5	7	21	57	1,0	4
SM4215.060.R110	6	6	5,5	7	21	57	1,1	4
SM4215.060.R120	6	6	5,5	7	21	57	1,2	4

ART.	ØD	Ød	ØD1	L1	L2	H	R	z
SM4215.060.R130	6	6	5,5	7	21	57	1,3	4
SM4215.060.R140	6	6	5,5	7	21	57	1,4	4
SM4215.060.R150	6	6	5,5	7	21	57	1,5	4
SM4215.060.R160	6	6	5,5	7	21	57	1,6	4
SM4215.060.R170	6	6	5,5	7	21	57	1,7	4
SM4215.060.R180	6	6	5,5	7	21	57	1,8	4
SM4215.060.R190	6	6	5,5	7	21	57	1,9	4
SM4215.060.R200	6	6	5,5	7	21	57	2,0	4
SM4215.060.R210	6	6	5,5	7	21	57	2,1	4
SM4215.060.R220	6	6	5,5	7	21	57	2,2	4
SM4215.060.R230	6	6	5,5	7	21	57	2,3	4
SM4215.060.R240	6	6	5,5	7	21	57	2,4	4
SM4215.060.R250	6	6	5,5	7	21	57	2,5	4
SM4215.080.R050	8	8	7,4	9	27	63	0,5	4
SM4215.080.R100	8	8	7,4	9	27	63	1,0	4
SM4215.080.R150	8	8	7,4	9	27	63	1,5	4
SM4215.080.R200	8	8	7,4	9	27	63	2,0	4
SM4215.100.R050	10	10	9,2	11	32	72	0,5	4
SM4215.100.R100	10	10	9,2	11	32	72	1,0	4
SM4215.100.R150	10	10	9,2	11	32	72	1,5	4
SM4215.100.R200	10	10	9,2	11	32	72	2,0	4
SM4215.120.R050	12	12	11,0	12	38	83	0,5	4
SM4215.120.R100	12	12	11,0	12	38	83	1,0	4
SM4215.120.R150	12	12	11,0	12	38	83	1,5	4
SM4215.120.R200	12	12	11,0	12	38	83	2,0	4
SM4215.160.R050	16	16	15,0	16	44	92	0,5	4
SM4215.160.R100	16	16	15,0	16	44	92	1,0	4
SM4215.160.R150	16	16	15,0	16	44	92	1,5	4
SM4215.160.R200	16	16	15,0	16	44	92	2,0	4

[illegible]

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

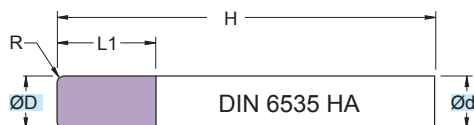
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3.14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM4525

ØD = 3 - 20



Fresa in M.D.I. Micrograno
 Gambo cilindrico HA

Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
COATED
GRAY



R

**62
HRC**

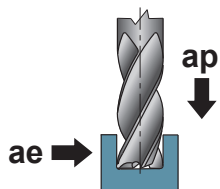


ART.	(mm)					
	ØD	Ød	L1	H	R	z
SM4525.030.R030	3	3	6	70	0,3	4
SM4525.030.R050	3	3	6	70	0,5	4
SM4525.040.R030	4	4	8	80	0,3	4
SM4525.040.R050	4	4	8	80	0,5	4
SM4525.040.R100	4	4	8	80	1,0	4
SM4525.040.R150	4	4	8	80	1,5	4
SM4525.050.R030	5	5	10	100	0,3	4
SM4525.050.R050	5	5	10	100	0,5	4
SM4525.050.R100	5	5	10	100	1,0	4
SM4525.050.R150	5	5	10	100	1,5	4
SM4525.050.R200	5	5	10	100	2,0	4
SM4525.060.R030	6	6	12	100	0,3	4
SM4525.060.R050	6	6	12	100	0,5	4
SM4525.060.R100	6	6	12	100	1,0	4
SM4525.060.R150	6	6	12	100	1,5	4
SM4525.060.R200	6	6	12	100	2,0	4
SM4525.060.R250	6	6	12	100	2,5	4
SM4525.080.R030	8	8	16	100	0,3	4
SM4525.080.R050	8	8	16	100	0,5	4
SM4525.080.R100	8	8	16	100	1,0	4
SM4525.080.R150	8	8	16	100	1,5	4
SM4525.080.R200	8	8	16	100	2,0	4
SM4525.080.R250	8	8	16	100	2,5	4
SM4525.080.R300	8	8	16	100	3,0	4
SM4525.100.R030	10	10	20	120	0,3	4

ART.	(mm)					
	ØD	Ød	L1	H	R	z
SM4525.100.R050	10	10	20	120	0,5	4
SM4525.100.R100	10	10	20	120	1,0	4
SM4525.100.R150	10	10	20	120	1,5	4
SM4525.100.R200	10	10	20	120	2,0	4
SM4525.100.R250	10	10	20	120	2,5	4
SM4525.100.R300	10	10	20	120	3,0	4
SM4525.120.R030	12	12	24	120	0,3	4
SM4525.120.R050	12	12	24	120	0,5	4
SM4525.120.R100	12	12	24	120	1,0	4
SM4525.120.R150	12	12	24	120	1,5	4
SM4525.120.R200	12	12	24	120	2,0	4
SM4525.120.R250	12	12	24	120	2,5	4
SM4525.120.R300	12	12	24	120	3,0	4
SM4525.140.R050	14	14	28	120	0,5	4
SM4525.140.R100	14	14	28	120	1,0	4
SM4525.140.R150	14	14	28	120	1,5	4
SM4525.140.R200	14	14	28	120	2,0	4
SM4525.140.R250	14	14	28	120	2,5	4
SM4525.140.R300	14	14	28	120	3,0	4
SM4525.160.R100	16	16	32	120	1,0	4
SM4525.160.R200	16	16	32	120	2,0	4
SM4525.160.R300	16	16	32	120	3,0	4
SM4525.200.R100	20	20	40	160	1,0	4
SM4525.200.R200	20	20	40	160	2,0	4
SM4525.200.R300	20	20	40	160	3,0	4

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



	MATERIALI - MATERIALS											(mm) ØD	(m/min) Vc	(mm) fz	(mm) ap	(mm) ae				
	P	M	K	N	S	H	G													
● ○	ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE	3	130-160	0,020-0,035	1xD	1xD
			●													4	130-160	0,020-0,035	1xD	1xD
			●													5	130-160	0,020-0,035	1xD	1xD
			●													6	130-160	0,030-0,045	1xD	1xD
			●													8	130-160	0,040-0,055	1xD	1xD
			●													10	130-160	0,050-0,065	1xD	1xD
			●													12	130-160	0,060-0,075	1xD	1xD
			●													14	130-160	0,070-0,085	1xD	1xD
			●													16	130-160	0,080-0,095	1xD	1xD
			●													20	130-160	0,100-0,115	1xD	1xD
					○											3	50-80	0,020-0,035	1xD	1xD
					○											4	50-80	0,020-0,035	1xD	1xD
					○											5	50-80	0,020-0,035	1xD	1xD
					○											6	50-80	0,030-0,045	1xD	1xD
					○											8	50-80	0,040-0,055	1xD	1xD
					○											10	50-80	0,050-0,065	1xD	1xD
					○											12	50-80	0,060-0,075	1xD	1xD
					○											14	50-80	0,070-0,085	1xD	1xD
					○											16	50-80	0,080-0,095	1xD	1xD
					○											20	50-80	0,100-0,115	1xD	1xD
						○										3	120-150	0,030-0,045	1xD	1xD
						○										4	120-150	0,030-0,045	1xD	1xD
						○										5	120-150	0,040-0,055	1xD	1xD
						○										6	120-150	0,050-0,065	1xD	1xD
						○										8	120-150	0,060-0,075	1xD	1xD
						○										10	120-150	0,070-0,085	1xD	1xD
						○										12	120-150	0,080-0,095	1xD	1xD
						○										14	120-150	0,090-0,105	1xD	1xD
						○										16	120-150	0,090-0,105	1xD	1xD
						○										20	120-150	0,110-0,125	1xD	1xD
														●		3	160-190	0,010-0,025	0,025xD	0,025xD
														●		4	160-190	0,010-0,025	0,025xD	0,025xD
														●		5	160-190	0,020-0,035	0,025xD	0,025xD
														●		6	160-190	0,020-0,035	0,025xD	0,025xD
														●		8	160-190	0,030-0,045	0,025xD	0,025xD
														●		10	160-190	0,040-0,055	0,025xD	0,025xD
														●		12	160-190	0,050-0,065	0,025xD	0,025xD
														●		14	160-190	0,060-0,075	0,025xD	0,025xD
														●		16	160-190	0,070-0,085	0,025xD	0,025xD
														●		20	160-190	0,080-0,095	0,025xD	0,025xD

PER LAVORAZIONI A SPALLAMENTO AUMENTARE I PARAMETRI DEL 20%
FOR SHOULDER MILLING PARAMETERS SHOULD BE INCREASED BY 20%

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

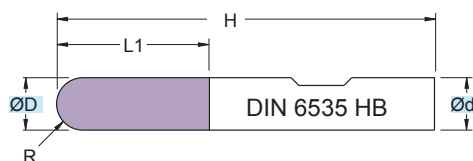
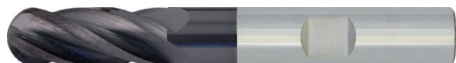
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SMW4403

ØD = 3 - 20



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HB

Micrograin HM mills
 DIN 6535 HB Shank

TOLLERANZE	D	d
TOLLERANCE RANGE	h10	h6

RIVESTIM.
 COATED
BLACK



R

**42
 HRC**



(mm)						
ART.	ØD	Ød	L1	H	R	z
SMW4403.030.S015	3	3	7	38	1,5	4
SMW4403.040.S020	4	4	14	50	2,0	4
SMW4403.050.S025	5	6	16	50	2,5	4
SMW4403.060.S030	6	6	19	60	3,0	4
SMW4403.080.S040	8	8	20	60	4,0	4
SMW4403.100.S050	10	10	21	70	5,0	4
SMW4403.120.S060	12	12	25	75	6,0	4
SMW4403.160.S080	16	16	32	88	8,0	4
SMW4403.200.S100	20	20	38	104	10,0	4

[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE


DATI TECNICI LAVORAZIONI PAG. 1072 - 1073
MACHINING TECHNICAL DATA PAGE 1072 - 1073
BEARBEITUNGSSCHNITTDATEN S. 1072 - 1073
DONNEES TECHNIQUES USINAGES PAGES 1072 - 1073

øD = mm DIAMETRO - DIAMETER

øDe = mm DIAMETRO EFFETTIVO - EFFECTIVE DIAMETER

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

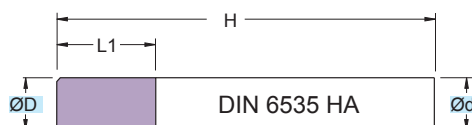
$$n = \frac{V_c \cdot 1000}{\varnothing De \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM6402

$\varnothing D = 4 - 20$



RIVESTIM.
COATED
GRAY



45°

**42
HRC**

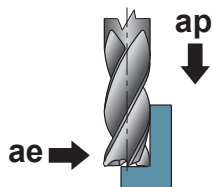


Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HA

Micrograin HM mills
 DIN 6535 HA Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)						
ART.	ØD	Ød	L1	H	45°	z
SM6402.040.N00	4	6	11	57	0,1	6
SM6402.050.N00	5	6	13	57	0,1	6
SM6402.060.N00	6	6	13	57	0,1	6
SM6402.080.N00	8	8	19	63	0,1	6
SM6402.100.N00	10	10	22	72	0,1	6
SM6402.120.N00	12	12	26	83	0,1	6
SM6402.160.N00	16	16	32	92	0,1	6
SM6402.200.N00	20	20	38	104	0,1	8

[illegible]

- APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE
- APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min^{-1}) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

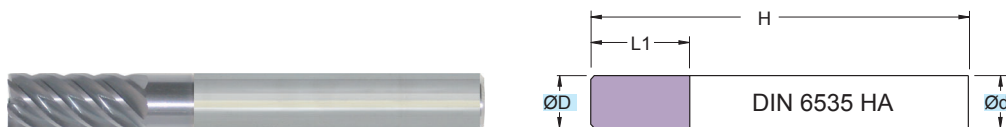
$$n = \frac{V_c \cdot 1000}{\varnothing D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$f_n = f_z \cdot z = \text{mm}$$

$$V_f = f_z \cdot z \cdot n = \text{mm/min}$$

SM6502

ØD = 4 - 20



Fresa in M.D.I. Micrograno
 Gambo sec. DIN 6535 HA

Micrograin HM mills
 DIN 6535 HA Shank

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

RIVESTIM.
COATED
GRAY



45°

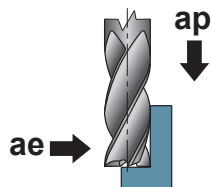
**42
HRC**



(mm)						
ART.	ØD	Ød	L1	H	45°	z
SM6502.040.N00	4	6	16	62	0,1	6
SM6502.050.N00	5	6	18	62	0,1	6
SM6502.060.N00	6	6	18	62	0,1	6
SM6502.080.N00	8	8	24	68	0,1	6
SM6502.100.N00	10	10	30	80	0,1	6
SM6502.120.N00	12	12	36	93	0,1	6
SM6502.160.N00	16	16	48	108	0,1	6
SM6502.200.N00	20	20	60	126	0,1	8

MATERIALI - MATERIALS Pag. 1119

Applicazione - Application



	MATERIALI - MATERIALS																			
	P	M	K	N	S	H	G													
	ACCIAIO NON LEGATO NOT ALLOY STEEL	ACCIAIO POCO LEGATO LOW ALLOY STEEL	ACCIAIO ALTO LEGATO ALLOY STEEL	INOX MARTENSITICO STAINLESS STEEL MART.	INOX AUST. DUPLEX STAINLESS STEEL AUST.	GHISA GRIGIA GREY CAST IRON	GHISA SFEROIDALE SPHEROIDAL GRAPHITE	GHISA MALLEABILE MALLEABLE CAST IRON	ALLUMINIO E SUE LEGHE ALUMINIUM	RAME E SUE LEGHE COPPER	NON METALLICI PLASTICS	LEGHE RESIST. CALORE HIGH TEMP. ALLOY	TITANIO E SUE LEGHE TITANIUM	ACCIAIO TEMPRATO HARDENED STEEL	GRAFITE GRAPHITE					
●																6	100-130	0,005-0,020	15	0,18
●																8	100-130	0,010-0,025	20	0,24
●																10	100-130	0,015-0,030	25	0,30
●																12	100-130	0,020-0,035	30	0,36
●																16	100-130	0,030-0,045	40	0,48
●																20	100-130	0,035-0,050	50	0,60
																6	50-80	0,003-0,015	15	0,18
																8	50-80	0,005-0,020	20	0,24
																10	50-80	0,010-0,025	25	0,30
																12	50-80	0,020-0,035	30	0,36
																16	50-80	0,025-0,040	40	0,48
																20	50-80	0,030-0,045	50	0,60
																6	40-70	0,003-0,015	15	0,18
																8	40-70	0,005-0,020	20	0,24
																10	40-70	0,010-0,025	25	0,30
																12	40-70	0,020-0,035	30	0,36
																16	40-70	0,025-0,040	40	0,48
																20	40-70	0,030-0,045	50	0,60
																6	20-40	0,003-0,015	15	0,1
																8	20-40	0,005-0,020	20	0,1
																10	20-40	0,010-0,025	25	0,1
																12	20-40	0,020-0,035	30	0,1
																16	20-40	0,025-0,040	40	0,1
																20	20-40	0,030-0,045	50	0,1
																6	140-170	0,003-0,015	15	0,18
																8	140-170	0,005-0,020	20	0,24
																10	140-170	0,010-0,025	25	0,30
																12	140-170	0,020-0,035	30	0,36
																16	140-170	0,025-0,040	40	0,48
																20	140-170	0,030-0,045	50	0,60
																6	120-150	0,003-0,015	15	0,18
																8	120-151	0,005-0,020	20	0,24
																10	120-152	0,010-0,025	25	0,30
																12	120-153	0,020-0,035	30	0,36
																16	120-154	0,025-0,040	40	0,48
																20	120-155	0,030-0,045	50	0,60
																6	110-140	0,003-0,015	15	0,1
																8	110-140	0,005-0,020	20	0,1
																10	110-140	0,010-0,025	25	0,1
																12	110-140	0,020-0,035	30	0,1
																16	110-140	0,025-0,040	40	0,1
																20	110-140	0,030-0,045	50	0,1
																6	15-30	0,003-0,015	15	0,1
																8	15-30	0,005-0,020	20	0,1
																10	15-30	0,010-0,025	25	0,1
																12	15-30	0,020-0,035	30	0,1
																16	15-30	0,025-0,040	40	0,1
																20	15-30	0,030-0,045	50	0,1
																6	35-50	0,003-0,015	15	0,1
																8	35-50	0,005-0,020	20	0,1
																10	35-50	0,010-0,025	25	0,1
																12	35-50	0,020-0,035	30	0,1
																16	35-50	0,025-0,040	40	0,1
																20	35-50	0,030-0,045	50	0,1

● APPLICAZIONE CONSIGLIATA-RECOMMENDED APPLICATION
EMPFOHLENER EINSATZ - APPLICATION CONSEILLÉE

○ APPLICAZIONE POSSIBILE - POSSIBLE APPLICATION
MÖGLICHE ANWENDUNG - APPLICATION POSSIBLE

Vc = m/min VELOCITÀ DI TAGLIO - CUTTING SPEED

n = giri/min (min⁻¹) NUMERO DI GIRI - NUMBER OF REVOLUTIONS

fz = mm AVANZAMENTO AL DENTE -TOOTH FEED

fn = mm AVANZAMENTO AL GIRO - FEED / REVOLUTION

Vf = mm/min VELOCITÀ DI AVANZAMENTO - FEED SPEED

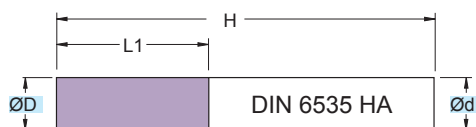
$$n = \frac{Vc \cdot 1000}{\phi D \cdot 3,14} = \text{giri/min (min}^{-1}\text{)}$$

$$fn = fz \cdot z = \text{mm}$$

$$Vf = fz \cdot z \cdot n = \text{mm/min}$$

SM6432

ØD = 6 - 20



RIVESTIM.
COATED
GRAY



90°

**64
HRC**



Fresa in M.D.I. Micrograno
Gambo cilindrico HA

Micrograin HM mills
 Cylindrical Shank HA

TOLLERANZE	D	d
TOLERANCE RANGE	h10	h6

(mm)					
ART.	ØD	Ød	L1	H	z
SM6432.040.N00	4	6	11	57	6
SM6432.050.N00	5	6	13	57	6
SM6432.060.N00	6	6	13	57	6
SM6432.080.N00	8	8	19	63	6
SM6432.100.N00	10	10	22	72	6
SM6432.120.N00	12	12	26	83	6
SM6432.140.N00	14	14	26	83	6
SM6432.160.N00	16	16	32	92	8
SM6432.180.N00	18	18	32	92	8
SM6432.200.N00	20	20	38	104	8