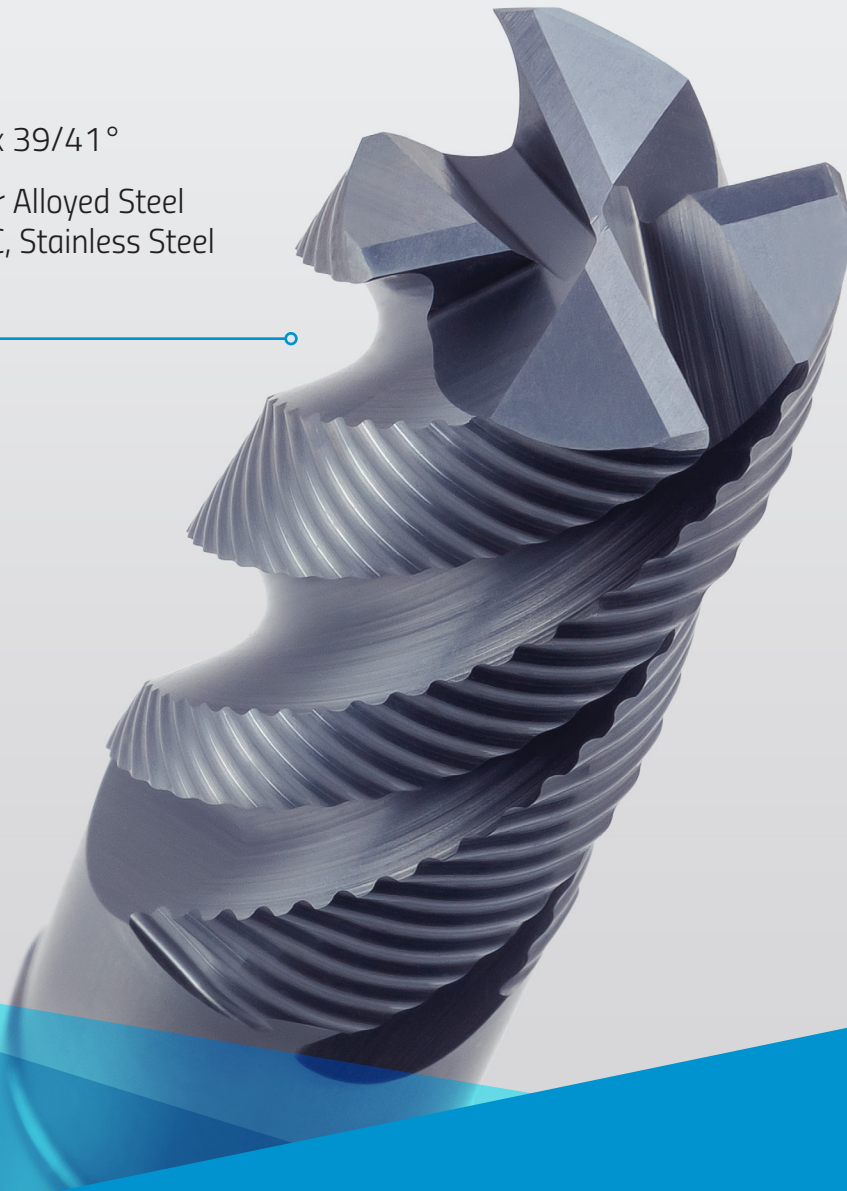


HARMONY VA-R

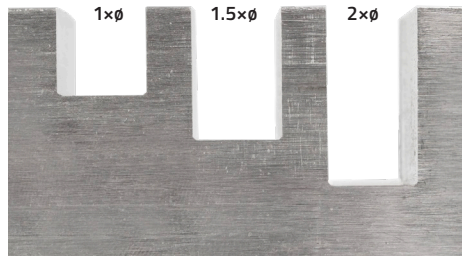
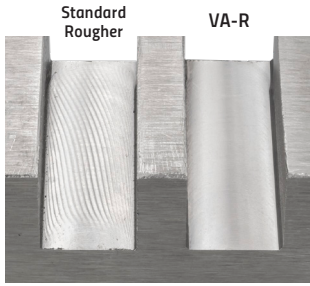
HIGH PERFORMANCE ROUGHERS

- Variable Helix 39/41°
 - Optimised for Alloyed Steel up to 38 HRC, Stainless Steel & Titanium
-



***sutton*tools**

Application Guide Speeds & Feeds



Check it out on Instagram

- Superior surface finish and burr free
- Material: SS316



Catalogue Code
Type of Cut: **Slotting Roughing**
Material
Surface Finish
Sutton Designation
Standard
Shank Tolerance

E488	
•	•
VHM-ULTRA	
AICrN	
VA-R	
DIN 6527L	
h6	

ISO	VDI [^] ₃₃₂₃	Material	Condition	HB	N/mm ²	Vc	Feed #	Vc	Feed #	
P	1	Steel - Non-alloy, cast & free cutting	~ 0.15 %C	A	125	440	100	12-13	150	12-13
	2		~ 0.45 %C	A	190	640	100	12-13	150	12-13
	3			QT	250	840	100	12-13	150	12-13
	4		~ 0.75 %C	A	270	910	100	12-13	150	12-13
	5			QT	300	1010	100	12-13	150	12-13
	6	Steel - Low alloy & cast < 5% of alloying elements		A	180	610	100	12-13	150	12-13
	7			QT	275	930	60	12-13	90	12-13
	8			QT	300	1010	60	12-13	90	12-13
	9			QT	350	1180	60	12-13	90	12-13
	10	Steel - High alloy, cast & tool		A	200	680	100	12-13	150	12-13
	11			HT	325	1100	60	12-13	90	12-13
12	Steel - Corrosion resistant & cast	Ferritic / Martensitic	A	200	680	100	12-13	150	12-13	
13		Martensitic	QT	240	810	100	12-13	150	12-13	
M	14.1	Stainless Steel	Austenitic	AH	180	610	100	11	150	11
	14.2		Duplex		250	840	65	11	100	11
	14.3		Precipitation Hardening		250	840	65	9-10	100	9-10
S	37.1	Titanium & Ti alloys	Alpha alloys		860 MPa		55	9-10	80	9-10
	37.2		Alpha / Beta alloys	A	960 MPa		55	9-10	80	9-10
	37.3			AH	1170 MPa		40	9-10	60	9-10
	37.4		Beta alloys	A	830 MPa		55	9-10	80	9-10
	37.5			AH	1400 MPa		40	9-10	60	9-10

Condition: A (Annealed), AH (Age Hardened), C (Cast), HT (Hardened & Tempered), QT (Quenched & Tempered)

Condition: A (Annealed), AH (Age Hardened), C (Cast), HT (Hardened & Tempered), QT (Quenched & Tempered)

Bold = Optimal | Regular = Effective

Notes on Milling

- Above values are guidelines for the size and type of cut nominated.
- For long series tools, reduce speed by 40% and feed by 20%.

METRIC ENDMILLS (mm size)

Ø	= nominal tool diameter (mm)	$n = \frac{v_c \times 1000}{\phi \times \pi} \approx \frac{v_c}{\phi} \times 318$
n	= Spindel speed (RPM)	
v _c	= Cutting speed (m/min)	$v_c = \frac{n \times \phi \times \pi}{1000} \approx \frac{n \times \phi}{318}$
f _t	= Feed rate per tooth (mm/tooth)	
v _f	= Feed rate (mm/min)	$f_z = \frac{v_f}{z \times n}$ $v_f = f_t \times z \times n$
z	= No. cutting edges	
Q	= Metal removal rate (cm ³ /min)	$Q = \frac{a_p \times a_e \times v_f}{1000}$
a _p	= Cutting depth (mm)	
a _e	= Cutting width (mm)	

Feed Table (fz) (mm/tooth)

Ø	Feed #																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2	0.001	0.002	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.010	0.011	0.013	0.014	0.016	0.018	0.020	0.022	0.024	0.026	0.030
3	0.002	0.003	0.004	0.005	0.006	0.008	0.009	0.010	0.012	0.014	0.016	0.018	0.020	0.023	0.025	0.028	0.032	0.034	0.038	0.042
4	0.004	0.005	0.006	0.007	0.009	0.010	0.012	0.014	0.016	0.018	0.021	0.023	0.026	0.030	0.032	0.036	0.040	0.044	0.045	0.050
5	0.005	0.006	0.008	0.009	0.011	0.013	0.015	0.017	0.020	0.023	0.025	0.030	0.032	0.036	0.040	0.044	0.050	0.055	0.060	0.065
6	0.006	0.008	0.009	0.011	0.013	0.016	0.018	0.021	0.024	0.028	0.030	0.034	0.038	0.042	0.045	0.050	0.055	0.060	0.070	0.075
8	0.010	0.012	0.014	0.017	0.019	0.022	0.025	0.028	0.032	0.036	0.040	0.045	0.050	0.055	0.060	0.065	0.075	0.080	0.085	0.095
10	0.013	0.015	0.018	0.021	0.024	0.028	0.032	0.036	0.040	0.045	0.050	0.055	0.060	0.070	0.075	0.085	0.090	0.100	0.11	0.12
12	0.016	0.019	0.022	0.026	0.030	0.034	0.038	0.044	0.050	0.055	0.060	0.065	0.075	0.080	0.090	0.100	0.11	0.12	0.13	0.14
16	0.020	0.024	0.028	0.034	0.038	0.044	0.050	0.055	0.060	0.070	0.080	0.085	0.095	0.11	0.12	0.13	0.14	0.16	0.17	0.18
20	0.022	0.028	0.032	0.038	0.044	0.050	0.060	0.065	0.075	0.085	0.095	0.11	0.12	0.13	0.15	0.16	0.18	0.19	0.21	0.23
25	0.025	0.032	0.038	0.045	0.055	0.060	0.070	0.080	0.090	0.10	0.12	0.13	0.15	0.16	0.18	0.20	0.22	0.24	0.26	0.29



- Variable Helix minimizes vibrations for stable machining
- Heavy duty core structure, enables highest metal removal rates
- Sinusoidal profile provides easy evacuation in heavy cutting
- AlCrN coating provides outstanding heat resistance & minimizes tool wear
- Necked for extra reach



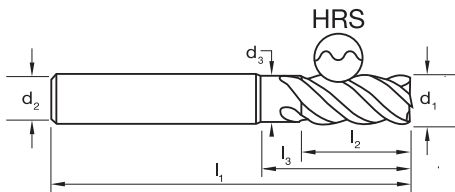
Fraise d'ébauche carbure hélice variable 39°/41° VA DIN6527L HARMONY

- Hélice variable pour la suppression des vibrations
- Structure renforcé pour le gros débit copeaux
- Profil sinusoidal pour une évacuation parfaite des copeaux
- Revêtement AlCrN pour une meilleure résistance
- Micro protection d'arête pour une meilleure stabilité



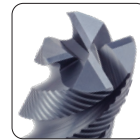
Sgrossatura Metallo duro, R39/41 VA-R DIN6527L Harmony

- Elica variabile per minimizzare le vibrazioni e avere una lavorazione stabile
- Nocciolo fresa irrobustito, adatto per i più alti volumi di asportazione truciolo
- Profilo sinusoidale per fornire una facile evquazione truciolo nelle alte asportazioni
- Micro protezione dello spigolo tagliente per aumentarne stabilità AlCrN per Ottimizzare vita utensile



Fresa de desbaste en Carburo, R39/41 VA-R, DIN6527L Harmony

- La Hélice Variable minimiza la vibración para un mecanizado estable
- Núcleo reforzado para evitar flexión, permite volúmenes alto de arranque de viruta
- Perfil sinusoidal que permite una fácil evacuación en corte pesado
- Filo con microgeometría para una mayor estabilidad



Catalogue Code	E488
Discount Group	B0210
Material	VHM-ULTRA
Surface Finish	AlCrN
Sutton Designation	VA-R
Geometry	R39/41
Shank Form (DIN 6535)	HA
Shank Tolerance	h6

Size Ref.	d ₁ (e8)	l ₁	l ₂	l ₃	d ₂	d ₃	z	Item #
0400	4.0	57	11	17	6	3.8	4	E488 0400
0500	5.0	57	13	19	6	4.8	4	E488 0500
0600	6.0	57	13	21	6	5.8	4	E488 0600
0800	8.0	63	19	27	8	7.8	4	E488 0800
1000	10.0	72	22	32	10	9.8	4	E488 1000
1200	12.0	83	26	38	12	11.8	4	E488 1200
1600	16.0	92	32	44	16	15.8	4	E488 1600
2000	20.0	104	38	54	20	19.8	4	E488 2000
2500	25.0	121	45	65	25	24.8	4	E488 2500

ISO	P								M					K					N					S					H																					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14.1	14.2	14.3	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37.1	37.2	37.3	37.4	37.5	38.1	38.2	39.1	39.2	40	41	
E488	●	●	●	●	●	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Sutton Tools Pty Ltd ABN 12 004 175 731

Australia (Head Office)

378 Settlement Road, Thomastown 3074, Victoria Australia

T +61 3 9280 0800 **F** +61 3 9464 0015

Customer Service

T 1800 335 350 **F** 1800 333 127 **E** cservice@sutton.com.au

Special Sales

T 1800 035 010 **F** 1800 804 084 **E** specsales@sutton.com.au

Regrinds

382 Settlement Road, Thomastown 3074, Victoria Australia

T (03) 9466 3315 **F** (03) 9464 4871 **E** regrind@sutton.com.au

Global Offices

Australasia Australia (Head Office) New Zealand

Europe France The Netherlands

www.suttontools.com

499980588 0120

