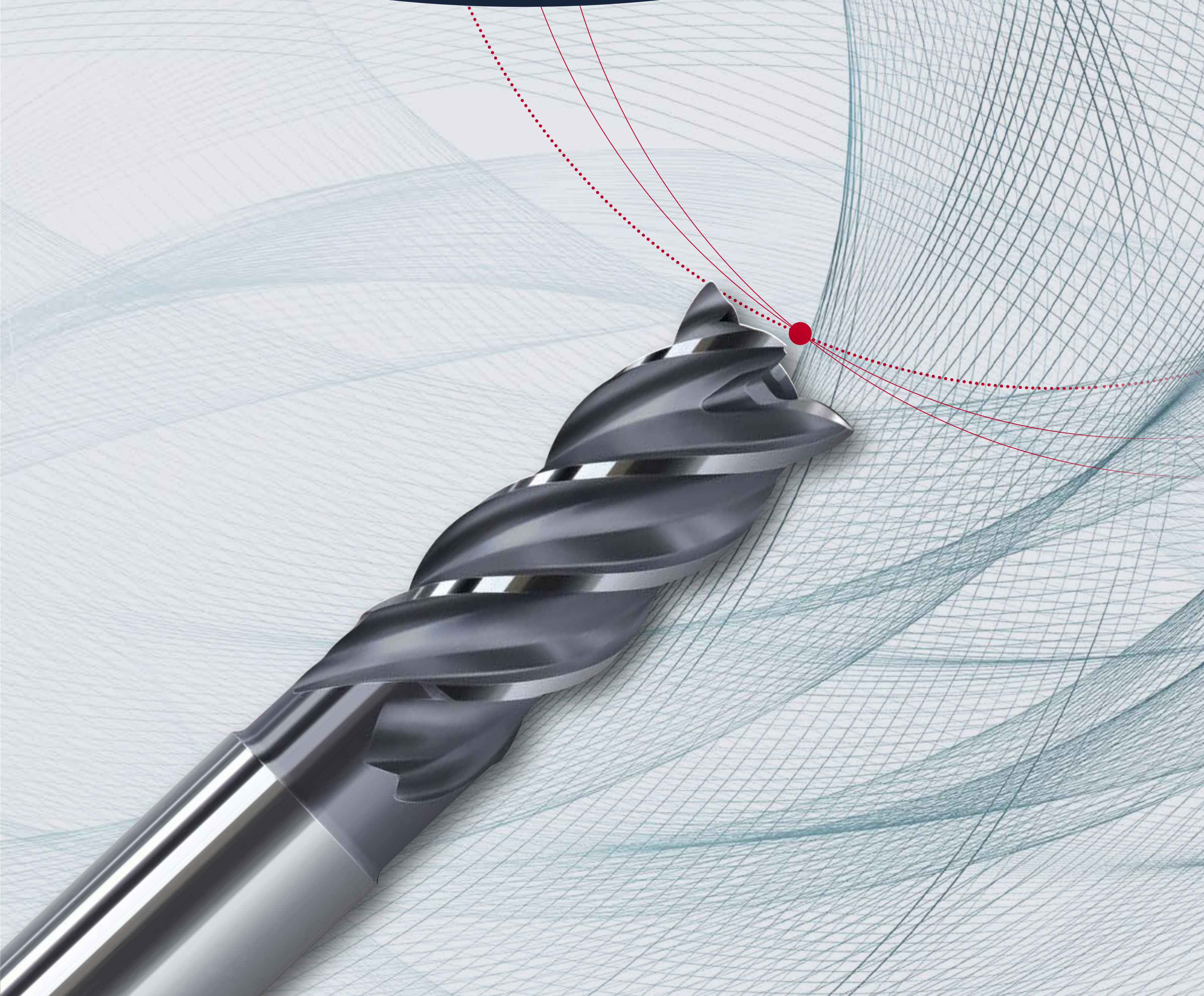
passion
for precision

fraisa

NVS – The new standard in universal machining



NVS cylindrical mills
The standard in universal machining

With its **NVS** mills, FRAISA is launching a new standard in **universal machining.**

NVS is an "easy-cut" tool and as such, **suitable for soft and stainless steels, hardened steels, titanium, annealed tool steels, non-ferrous metals and cast iron.** Applications range from **HPC milling** through small lateral infeed to **slot milling.**
The penetration edge allows extra-large angles during penetration using **helical interpolation or ramping.**

The **15° cutting angle, cutting-edge reconditioning,** and **variable helix angle** facilitate this universality. The reconditioning of the edges strengthens the sharp cutting blade, which in turn improves **tool life, performance and process reliability.**

The new NVS standard features the FRAISA **high-performance penetration edge** and a **short shank** to further enhance machining options and productivity.

This combination of application options is new and unique!

The extensive **range of diameters from 2 to 20 mm** completes the universal NVS technology.

NVS tools are reconditioned by **FRAISA ReTool®** so that they are as good as new. **This saves on raw materials and improves overall cost effectiveness.**

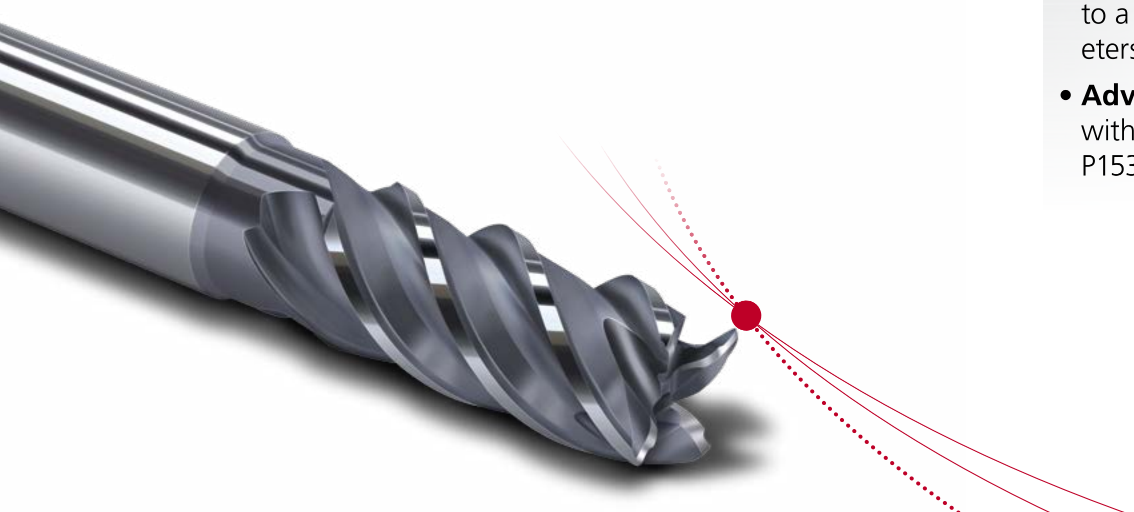
NVS is made of a combination of carbides (HM). While the cutting part of the tool is made of virgin carbide, the shaft section comprises **recycled MG10 carbide.**

Thanks to **FRAISA ReTool®** and the combination of carbides, the **environmental friendliness and economics** of NVS technology are further improved upon.

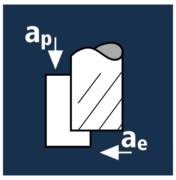
Maximum overall cost effectiveness is obtained through the use of suitable cutting data and machining strategies. The necessary information is available under **FRAISA ToolExpert®** and **FRAISA ToolExpert® HelixRamp.**

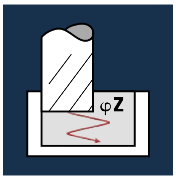
The advantages:

- **Simplification of stock-keeping and reduction of tool costs** through the extremely high level of universality of NVS technology
- Improved **tool life, performance** and **process reliability** thanks to edge reconditioning and variable helix angle
- **Extreme productivity increase during penetration**
- **Short shanks** for a wider range of applications
- Greater **sustainability,** improved **green credentials** and a better **price/performance ratio** by using carbide resources more sparingly and tapping the benefits of **FRAISA ReTool®** tool reconditioning
- **Greater flexibility** thanks to a large range of diameters from 2 to 20 mm
- **Advancement** compared with P5340/P5240 and P15327/P15227



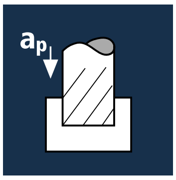
Application / Material

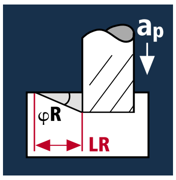




Material	d1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φZ [°]
Steel < 850 N/mm²	3.00	4	150	0.018	4.500	1.200	15915	1145	6.2	16°
	4.00	4	150	0.022	6.000	1.600	11935	1050	10.1	16°
	5.00	4	150	0.028	7.500	2.000	9550	1070	16.0	16°
	6.00	4	150	0.035	9.000	2.400	7960	1115	24.1	16°
	8.00	4	150	0.045	12.000	3.200	5970	1075	41.3	16°
	10.00	4	150	0.060	15.000	4.000	4775	1145	68.8	16°
	12.00	4	150	0.065	18.000	4.800	3980	1035	89.4	16°
	16.00	4	150	0.075	24.000	6.400	2985	895	137.5	16°
	20.00	4	150	0.090	30.000	8.000	2385	860	206.3	16°
Steel 850 - 1100 N/mm²	3.00	4	125	0.015	4.500	1.200	13265	795	4.3	15°
	4.00	4	125	0.018	6.000	1.600	9945	715	6.9	15°
	5.00	4	125	0.024	7.500	2.000	7960	765	11.5	15°
	6.00	4	125	0.030	9.000	2.400	6630	795	17.2	15°
	8.00	4	125	0.040	12.000	3.200	4975	795	30.6	15°
	10.00	4	125	0.055	15.000	4.000	3980	875	52.5	15°
	12.00	4	125	0.060	18.000	4.800	3315	795	68.8	15°
	16.00	4	125	0.070	24.000	6.400	2485	695	107.0	15°
	20.00	4	125	0.080	30.000	8.000	1990	635	152.8	15°
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	85	0.013	4.500	1.200	9020	470	2.5	9°
	4.00	4	85	0.016	6.000	1.600	6765	435	4.2	9°
	5.00	4	85	0.020	7.500	2.000	5410	435	6.5	9°
	6.00	4	85	0.025	9.000	2.400	4510	450	9.7	9°
	8.00	4	85	0.035	12.000	3.200	3380	475	18.2	9°
	10.00	4	85	0.045	15.000	4.000	2705	485	29.2	9°
	12.00	4	85	0.050	18.000	4.800	2255	450	39.0	9°
	16.00	4	85	0.060	24.000	6.400	1690	405	62.3	9°
	20.00	4	85	0.070	30.000	8.000	1355	380	90.9	9°
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	45	0.013	4.500	1.200	4775	250	1.3	7°
	4.00	4	45	0.016	6.000	1.600	3580	230	2.2	7°
	5.00	4	45	0.020	7.500	2.000	2865	230	3.4	7°
	6.00	4	45	0.025	9.000	2.400	2385	240	5.2	7°
	8.00	4	45	0.035	12.000	3.200	1790	250	9.6	7°
	10.00	4	45	0.045	15.000	4.000	1430	260	15.5	7°
	12.00	4	45	0.050	18.000	4.800	1195	240	20.6	7°
	16.00	4	45	0.060	24.000	6.400	895	215	33.0	7°
	20.00	4	45	0.070	30.000	8.000	715	200	48.1	7°

Application / Material





Material	d1 [mm]	z	v_c [m/min]	f_z [mm]	a_p [mm]	a_e [mm]	n [min⁻¹]	v_f [mm/min]	Q [cm³/min]	φR [°]	LR [mm]
Steel < 850 N/mm²	3.00	4	120	0.014	1.800	3.000	12730	715	3.9	26°	3.7
	4.00	4	120	0.018	2.800	4.000	9550	690	7.7	26°	5.7
	5.00	4	120	0.022	4.000	5.000	7640	670	13.4	26°	8.2
	6.00	4	120	0.028	6.000	6.000	6365	715	25.7	26°	12.3
	8.00	4	120	0.036	8.000	8.000	4775	690	44.0	26°	16.4
	10.00	4	120	0.048	10.000	10.000	3820	735	73.3	26°	20.5
	12.00	4	120	0.052	12.000	12.000	3185	660	95.3	26°	24.6
	16.00	4	120	0.060	16.000	16.000	2385	575	146.7	26°	32.8
	20.00	4	120	0.072	20.000	20.000	1910	550	220.0	26°	41.0
Steel 850 - 1100 N/mm²	3.00	4	100	0.011	1.800	3.000	10610	465	2.5	24°	4.0
	4.00	4	100	0.014	2.800	4.000	7960	445	5.0	24°	6.3
	5.00	4	100	0.020	4.000	5.000	6365	510	10.2	24°	9.0
	6.00	4	100	0.024	6.000	6.000	5305	510	18.3	24°	13.5
	8.00	4	100	0.032	8.000	8.000	3980	510	32.6	24°	18.0
	10.00	4	100	0.044	10.000	10.000	3185	560	56.0	24°	22.5
	12.00	4	100	0.048	12.000	12.000	2655	510	73.3	24°	27.0
	16.00	4	100	0.056	16.000	16.000	1990	445	114.1	24°	35.9
	20.00	4	100	0.064	20.000	20.000	1590	405	163.0	24°	44.9
Inox normal [Cr-Ni/1.4301] [Cr-Ni-Mo/1.4571]	3.00	4	70	0.010	1.800	3.000	7425	295	1.6	11°	9.3
	4.00	4	70	0.013	2.800	4.000	5570	290	3.2	11°	14.4
	5.00	4	70	0.016	4.000	5.000	4455	285	5.7	11°	20.6
	6.00	4	70	0.020	6.000	6.000	3715	295	10.7	11°	30.9
	8.00	4	70	0.028	8.000	8.000	2785	310	20.0	11°	41.2
	10.00	4	70	0.036	10.000	10.000	2230	320	32.1	11°	51.4
	12.00	4	70	0.040	12.000	12.000	1855	295	42.8	11°	61.7
	16.00	4	70	0.048	16.000	16.000	1395	265	68.4	11°	82.3
	20.00	4	70	0.056	20.000	20.000	1115	250	99.8	11°	102.9
Inox difficult [Cr-Ni-Mo++/1.4529] Heat resistant steel [1.4841]	3.00	4	35	0.010	1.800	3.000	3715	150	0.8	10°	10.2
	4.00	4	35	0.013	2.800	4.000	2785	145	1.6	10°	15.9
	5.00	4	35	0.016	4.000	5.000	2230	145	2.9	10°	22.7
	6.00	4	35	0.020	6.000	6.000	1855	150	5.3	10°	34.0
	8.00	4	35	0.028	8.000	8.000	1395	155	10.0	10°	45.4
	10.00	4	35	0.036	10.000	10.000	1115	160	16.0	10°	56.7
	12.00	4	35	0.040	12.000	12.000	930	150	21.4	10°	68.1
	16.00	4	35	0.048	16.000	16.000	695	135	34.2	10°	90.7
	20.00	4	35	0.056	20.000	20.000	555	125	49.9	10°	113.4

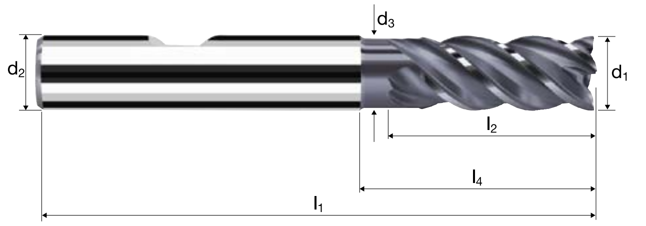
The above tables contain the basic data for two different lateral infeed rates a_e.
More cutting data and materials can be found under FRAISA ToolExpert® and FRAISA ToolExpert® HelixRamp.

Cylindrical end mills NVS (NB-NVS)

Smooth-edged, normal version with short neck
High-performance penetration edge

Base-X **B**

HM MG10	λ 45° γ 15°
r	
Vario	



Roughing

Finishing

Rm < 850	Rm 850-1100	Rm 1100-1300					Inox Stainless	Ti Titanium	GG(G) Copper Tool Steel

Example: **Order-N°.** Coating **P** Article-N° **8404** ø-Code **140**

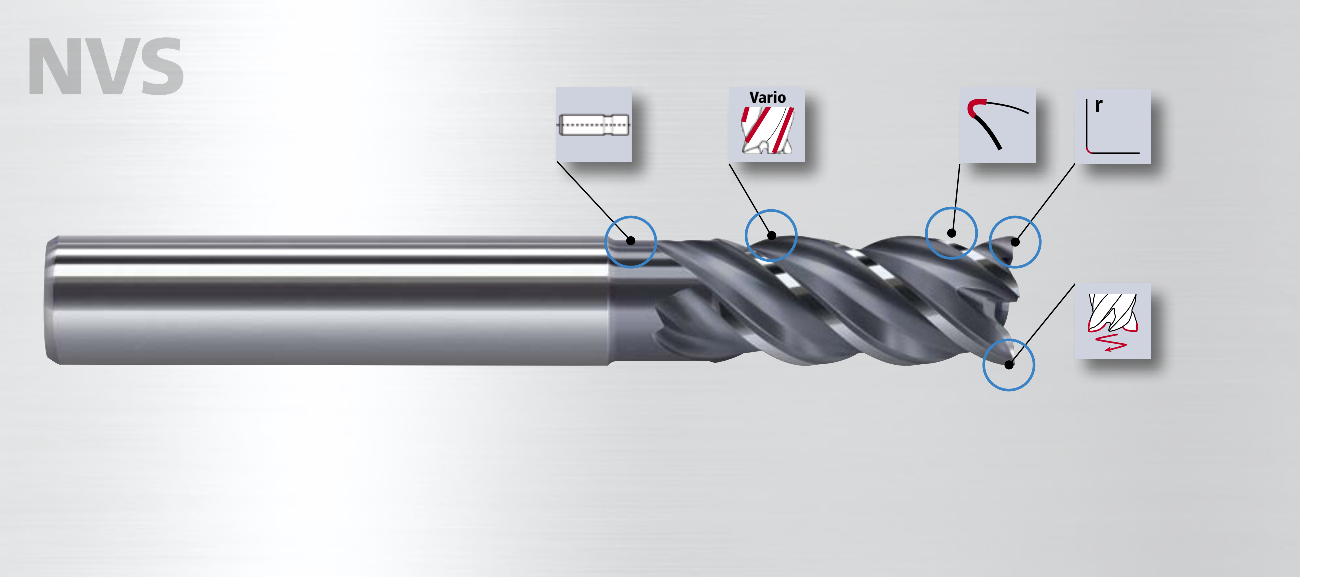
Ø Code	d_1 e8	d_2 h6	d_3	l_1	l_2	l_3	l_4	r	α	z		POLYCHROM P8404 / P8304
140	2.00	6.00	1.90	57	7.00	10.00	18.31	0.050	7.0°	4		●
160	2.50	6.00	2.30	57	8.00	10.00	17.56	0.050	6.5°	4		●
178*	3.00	3.00	2.80	45	8.00	13.56	14.00	0.050	0.0°	4		●
180	3.00	6.00	2.80	57	8.00	14.00	20.63	0.050	4.5°	4		●
200	3.50	6.00	3.20	57	8.00	14.00	19.88	0.050	4.0°	4		●
218*	4.00	4.00	3.70	50	11.00	15.47	16.00	0.100	0.0°	4		●
220	4.00	6.00	3.70	57	11.00	16.00	20.95	0.100	3.0°	4		●
240	4.50	6.00	4.10	57	12.00	16.00	20.20	0.100	2.5°	4		●
258*	5.00	5.00	4.60	50	13.00	15.40	16.00	0.100	0.0°	4		●
260	5.00	6.00	4.60	57	13.00	18.00	21.27	0.100	1.5°	4		●
280	5.50	6.00	5.00	57	13.00	20.00	22.52	0.100	1.0°	4		●
300	6.00	6.00	5.50	57	13.00	19.34	20.00	0.100	0.0°	4		●
331	7.00	8.00	6.40	63	16.00	24.00	27.64	0.100	1.5°	4		●
391	8.00	8.00	7.40	63	19.00	25.29	26.00	0.150	0.0°	4		●
420	9.00	10.00	8.20	72	19.00	26.00	30.02	0.200	1.5°	4		●
450	10.00	10.00	9.20	72	22.00	30.20	31.00	0.200	0.0°	4		●
501	12.00	12.00	11.00	83	26.00	36.13	37.00	0.200	0.0°	4		●
610	16.00	16.00	15.00	92	32.00	42.13	43.00	0.200	0.0°	4		●
682	20.00	20.00	19.00	104	38.00	52.13	53.00	0.200	0.0°	4		●

* without clamping flat only

NVS is an **enhancement** of our previous P15327/ P15227 and P5340/P5240 product lines. Compared with these, NVS offers a much wider range of applications with respect to milling strategies and materials. At the same time, NVS offers an improved **price/performance ratio** compared with the previous technology.

The ToolSchool used in this catalog shows you which of the old products have been superseded by these new ones.

NVS – The new universal technology



Smaller corner radius

- The cylindrical tool has a smaller corner radius that strengthens the cutting edge
- Higher thermal and mechanical resistance for more performance

Milling tool with edge reconditioning

- Reconditioning of the main cutting edge for greater cutting-edge stability
- Increased mechanical and thermal loading of the cutting edge
- Overall lengthening of tool life

Milling tool with variable helix angle

- Minimization of oscillation and vibration
- Increased material removal rate and tool life

High-performance penetration edge

- Easy-cut, high-performance penetration edge for high penetration angles
- Better performance, longer tool life and greater process reliability during penetration
- High functionality with FRAISA ToolExpert® HelixRamp cutting data

Tools with a short shank

- Tools with release feature from the end of the cutting edge to the shaft neck
- Enables repositioning for deeper infeeds beyond the length of the cutting edge
- Expansion of the tool's range of applications

NVS tools with a cutting angle of 15° are ideally suitable for use in soft and hardened steels, in stainless steels, non-ferrous metals, annealed tool steel, cast iron and titanium.

Rm < 850	**Rm** 850-1100	**Rm** 1100-1300					**Inox** Stainless	**Ti** Titanium	**GG(G) Copper Tool Steel**

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passion for precision

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