



Solid carbide tools

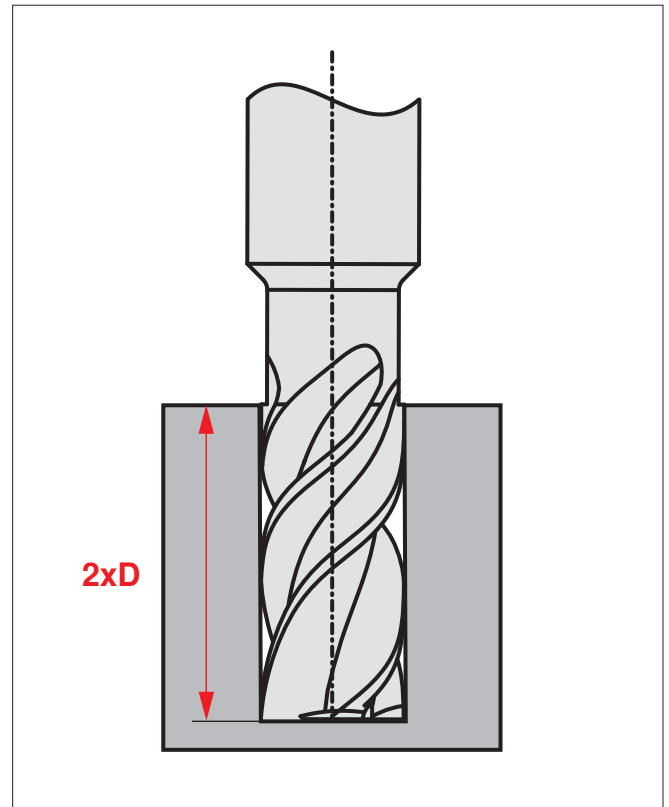
Extended product range

High performance x 2

A new generation of end mills

HPC2 W4420 - for universal application:

HPC milling cutters reach higher metal removal rates than conventional end mills. The development of our new HPC2 W4420 end mill has set new standards in the field of HPC machining. Maximum metal removal rates are achieved thanks to high feed rates and at large depths of cut. The geometry of the tool was specially designed for the requirements of this type of machining. Excellent cutting action together with reduced vibration during the milling operation ensures good surface quality.



Your advantages

- ▲ Excellent chip evacuation also when full-slot milling
- ▲ Excellent cutting action due to very positive rake angle
- ▲ Milling operation with reduced vibration and large depths of cut for improved process security
- ▲ Low stress on the spindle – protection of the machine
- ▲ Long tool life and cutting parameters thanks to grade SCPP225 and special micro-geometries
- ▲ Ground neck for large depths of cut




Your benefits

- ▲ Maximum productivity due to high metal removal rates
- ▲ Longer tool life with the same metal removal rates for reduced tooling costs
- ▲ Secure production processes through increased process security

HPC2 W4420 end mills

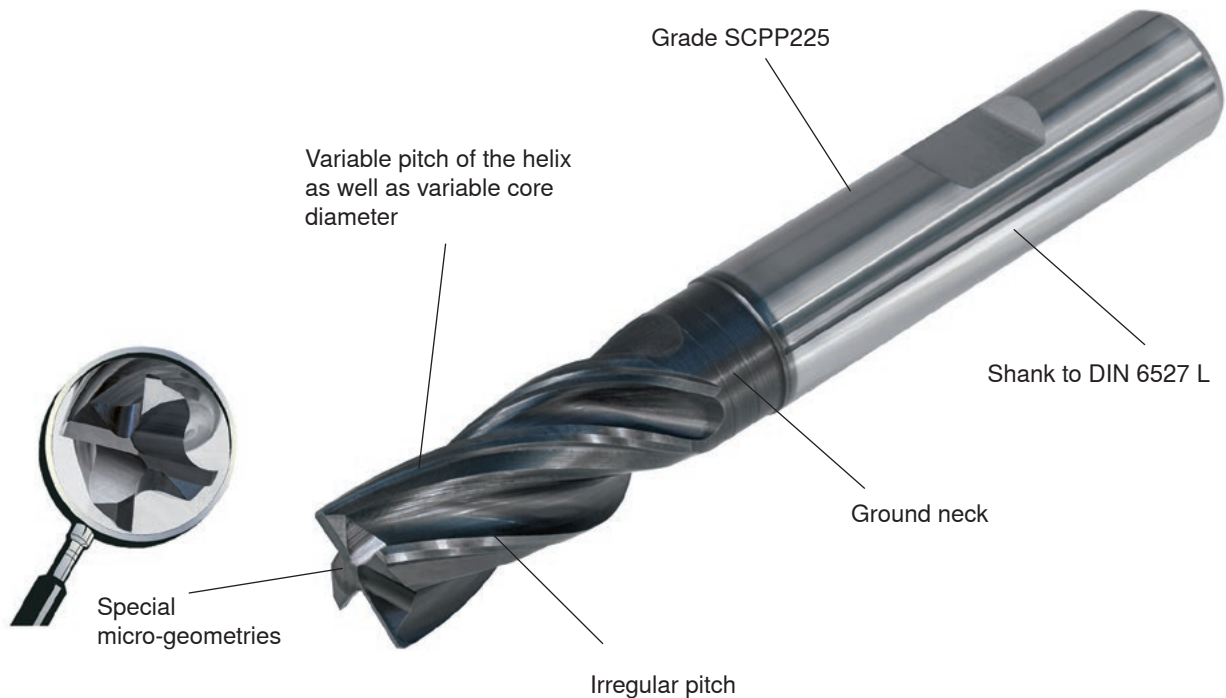
We offer the new solid carbide cutting tool with 4 cutting edges in diameters from 3 mm to 20 mm for common steel materials, stainless steels, cast iron and non-ferrous metals. The geometries specially created for this milling cutter combine the

advantages of small and large rake angles as well as variable core diameters for deep chip pockets in one tool.

HPC2-SF	Ø ranges		Through-coolant	Tolerances	Helix angle	Rake angle	Grade
 W4420	3 – 20	4		$d_1 = f_8 / d_A = h_6$	$\lambda_s = \begin{matrix} 22-42^\circ \\ 17-40^\circ \end{matrix}$	$\gamma_s = 14^\circ$	SCPP225

The universal tool for very high metal removal rates

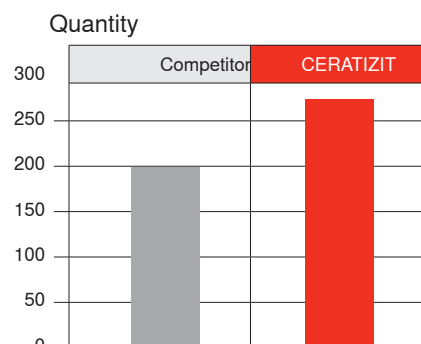
The HPC2 W4420 end mill combines various characteristics for maximum metal removal rates: the SCPP225 grade, together with the special micro-geometry on the front and peripheral cutting edges, provides long tool life and high cutting parameters. Also possible are great depths of cut $> 1.5xD$ with very high feed rates. Thanks to the ground neck, deep pockets can be machined. Furthermore, the irregular pitch of the tool reduces vibration and guarantees low cutting noise. The variable core diameter and the variable helix increase stability providing quick and secure chip evacuation.



A practical example

Material: non-alloyed steel, annealed
0.15 % - 0.45 % C (VDI 3323 group 2)

	Competitor	CERATIZIT
Cutter Ø [mm]	16	16
a_e [mm]	16	16
a_p [mm]	32 (2xD)	32 (2xD)
V_c [m/min]	90	90
n [min ⁻¹]	1800	1800
f_z [mm]	0,05	0,05
V_f [mm/min]	360	360
Quantity	200	280



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Extended product range

HPC2 W4420 - with different variable rake angles

Increasing helix angle

The continuously increasing helix angle of 17° or 22° to 40° or 42°, unites the advantages of a small and a large helix angle.

Low cutting forces and quicker chip evacuation and formation make for low cutting noise and reduced vibration ensuring good surface quality with high cutting parameters.

Variable core diameter

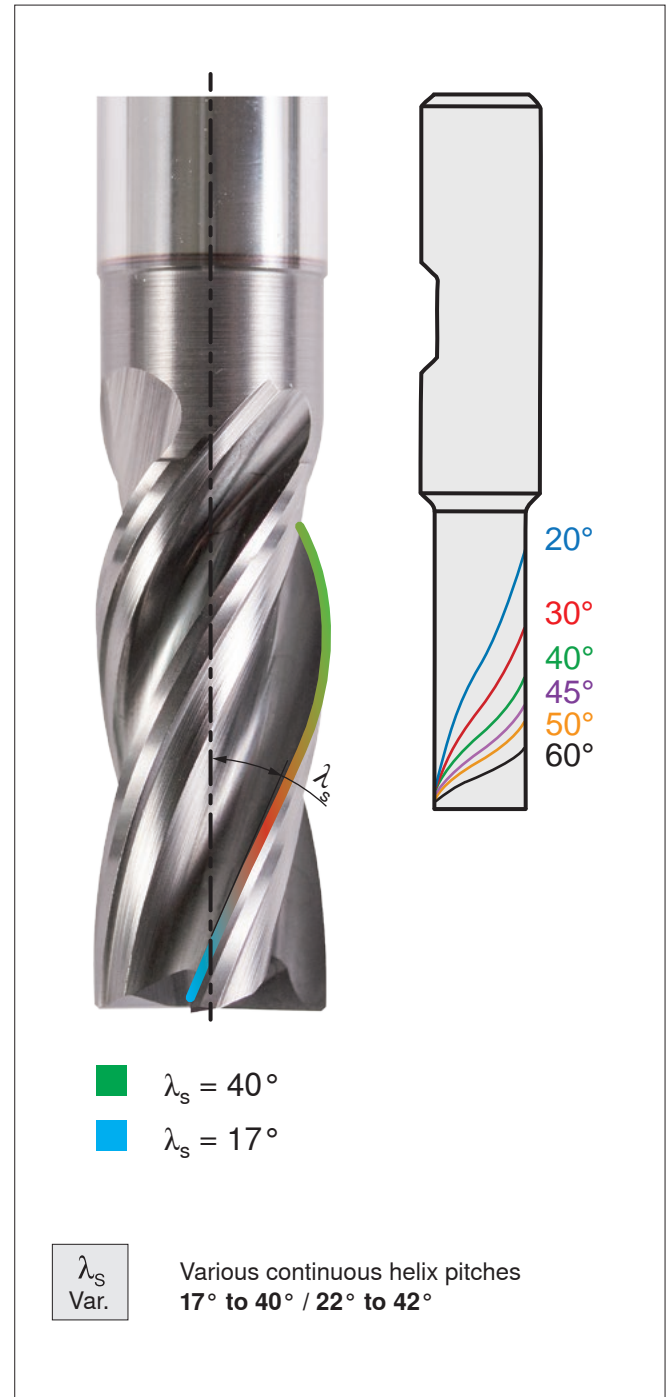
Due to the gradually increasing helix angle, the core diameter has been adapted to optimise chip evacuation. The HPC2 W4420 end mill thus ensures consistent metal removal rates thanks to the deeper helical flutes.

To guarantee sufficient stability of the HPC2 W4420, however, the core diameter was reduced variably and implemented with only two flutes.

Irregular pitch

The irregular pitch ensures smooth cutting action even with substantial depths of cut, making for low cutting noise and low vibration.

"Excellent stability combined with optimal chip evacuation."

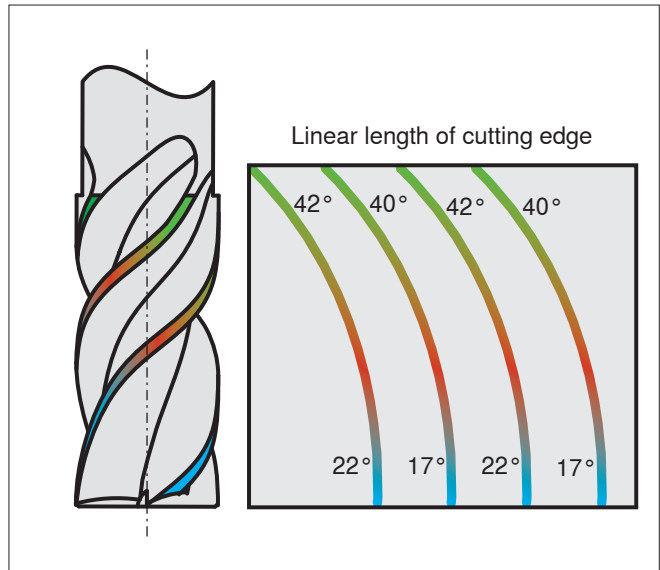
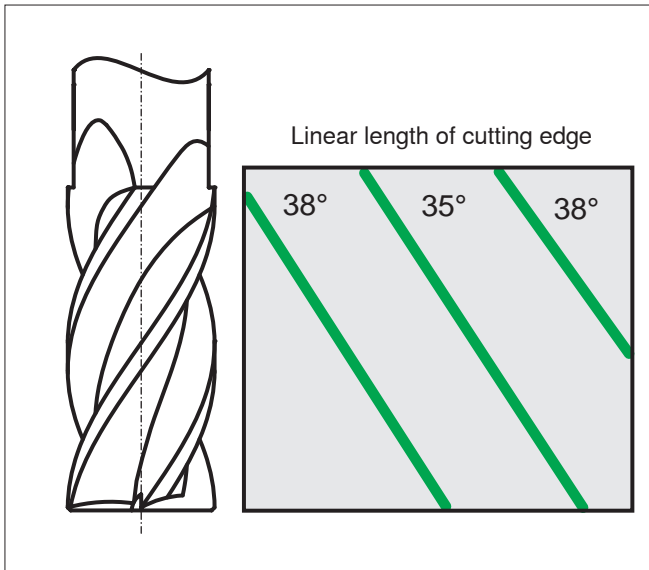


The following illustration compares a HPC cutter with irregular pitch to a HPC2 end mill additionally characterised by a variable helix angle and core diameter. It shows the 'linear' length of the cutting edge or length of the helical flutes of the tools. This

points out the difference of the variable helix angle of a HPC2 W4420 end mill when compared with a solid carbide milling cutter commonly used on the market, one that has a constant helix angle over the entire length of the groove.

Tool with irregular pitch

HPC2 tool with irregular pitch and variable helix angle



Resulting forces

Compared to competitor tools, the HPC2 tool exhibits notably lower forces generated by the tool (see chart). Improvements in tool life of up to 45% are achieved when the cutting forces

are equal.

Material: non alloyed steel, annealed
1.2379 X155 Cr V Mo 121

	Competitor	CERATIZIT
Cutter Ø [mm]	10	10
a_e [mm]	10	10
a_p [mm]	10 (1xD)	10 (1xD)
V_c [m/min]	160	160
n [min ⁻¹]	5093	5093
f_z [mm]	0,05	0,05
V_f [mm/min]	1019	1019
Tool life [m]	7,8	11,3

