

**NEW**

# 415SD

FIRST CHOICE FOR HIGH-FEED MACHINING OF  
TITANIUM ALLOYS

MP111E



*Mplus...*

# 415SD

## FOR HIGH-FEED EFFICIENT MACHINING



### HIGH-FEED MILLING CUTTER CONCEPT FOR STABILITY AND HIGH PERFORMANCE

- Unevenly spaced cutting edges reduce vibrations, especially in long overhang applications.
- Fine and extra fine pitch types enable a highly efficient cutting performance.
- Carefully selected steel for the tool body is capable of safely absorbing machining forces. In addition, the nickel coating increases wear and corrosion protection.
- The insert location in the holder combined with the ideal geometry and a precisely positioned coolant outlet achieves maximum stability and machining performance.

### CUTTING PERFORMANCE

The approach angle of 15° achieves an APMX of 2 mm, which enables a high removal rate but with low radial forces.

### TARGETED APPLICATIONS

The use of different diameters and the precise positioning of the coolant nozzles enables perfect chip removal as well as reducing and dissipating the high temperatures that occur at the cutting edge.

### SAFE, PRECISE AND RELIABLE

Exact positioning, secure insert clamping with large contact surfaces offers the possibility of high-performance and efficient high-feed machining of stainless steels and heat resistant materials.

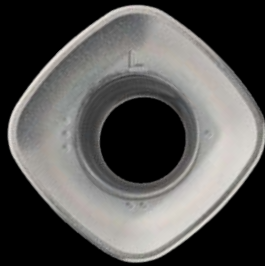


# 415SD

## INSERTS FOR HIGH-FEED EFFICIENT MACHINING

### THE PVD-COATED, HIGH-PERFORMANCE GRADE MP9130 FOCUSES ON TITANIUM MACHINING

- High-feed face milling including radial, plunge and ramping operations.
- Ideal for machining components that require a long overhang.
- Highly suitable for low power machines and low rigidity component clamping.



#### L-BREAKER

Ideal for applications that require low cutting resistance.



#### M-BREAKER

First recommendation - ideal combination of cutting edge stability and low cutting resistance.



#### R-BREAKER

High cutting edge stability, for heavy interrupted machining or difficult cutting conditions.



**Highest productivity even when applications require low cutting resistance.**

- Low power consumption.
- Designed to achieve low radial cutting forces.
- Process reliability and long tool life, especially when machining difficult-to-cut materials.
- Stable and robust 4-edge insert for efficient, high-feed milling.

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## HIGH-FEED CUTTER

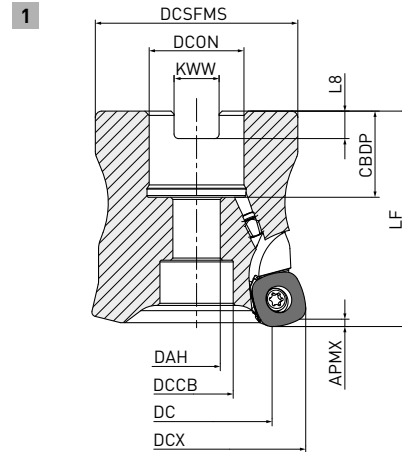
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
### 415SD

GAMP : 9°


GAMF : 5° - 6°



Right hand tool holder only.

DCX	Set bolt	Geometry
Ø 50, Ø 52	HSC10035	1 
Ø 63, Ø 66	HSC12035	

### ARBOR TYPE

Order number	Stock	APMX	DC	DCON	DCX	LF	RMPX	WT	ZEFP	Type	
415SD-050A04AR-E	●	2	33.4	22	50	50	3°	0.4	4	1	SDMT12
415SD-050A05AR-E	●	2	33.4	22	50	50	3°	0.4	5	1	
415SD-052A04AR-E	●	2	35.4	22	52	50	3°	0.4	4	1	
415SD-052A06AR-E	●	2	35.4	22	52	50	3°	0.4	6	1	
415SD-063X05AR-E	●	2	46.5	27	63	50	2°	0.7	5	1	
415SD-063X07AR-E	●	2	46.5	27	63	50	2°	0.7	7	1	
415SD-066X05AR-E	●	2	49.4	27	66	50	1.9°	0.7	5	1	
415SD-066X07AR-E	●	2	49.4	27	66	50	1.9°	0.7	7	1	

1. Please refer to page 144, for maximum depth of cut (APMX).



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## HIGH-FEED CUTTER

### MOUNTING DIMENSIONS

Order number	CBDP	DAH	DCCB	DCON	DCSFMS	DCX	KWW	L8	Type
415SD-050A04AR-E	20	11	17	22	47	50	10.4	6.3	1
415SD-050A05AR-E	20	11	17	22	47	50	10.4	6.3	1
415SD-052A04AR-E	20	11	17	22	47	52	10.4	6.3	1
415SD-052A06AR-E	20	11	17	22	47	52	10.4	6.3	1
415SD-063X05AR-E	22	13	19	27	60	63	12.4	7.0	1
415SD-063X07AR-E	22	13	19	27	60	63	12.4	7.0	1
415SD-066X05AR-E	22	13	19	27	60	66	12.4	7.0	1
415SD-066X07AR-E	22	13	19	27	60	66	12.4	7.0	1

## INSERTS

Order number	Class	MP9130	IC	S	RE	Shape
SDMT125530ZEN-L MP9130	L	●	12.25	5.56	3.0	
SDMT125530ZEN-M MP9130	M	●	12.25	5.56	3.0	
SDMT125530ZEN-R MP9130	R	●	12.25	5.56	3.0	

## SPARE PARTS

Tool holder					
	Clamp screw	Flag Wrench	Coolant Nozzle	Standard L Wrench	Anti-seize Lubricant
415SD	TPS43	TIP15W-E	HSD04004H12	HKY20R	MK1KS

1. Clamp torque (N • m) : **TPS43=3.5**

### COOLANT NOZZLES ARE AVAILABLE WITH VARYING DIAMETERS FOR ADJUSTING COOLANT PRESSURE

←Standard→

Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm
Order number	HSD04004H06	HSD04004H08	HSD04004H12	HSD04004H16

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## RECOMMENDED CUTTING CONDITIONS




### CORRECTION FACTOR BY OVERHANG LENGTH

	DCX	Overhang length	Adjustment value		
			Vc	ap	fz
Arbor type	50-66	<2.5xDCX	100%	100%	100%
		3.0xDCX	85%	100%	90%
		4.0xDCX	80%	80%	80%
		5.0xDCX	75%	75%	60%
		6.0xDCX	70%	70%	40%

### CUTTING SPEED / WET CUTTING

Material	Properties	Cutting Conditions	Grade	APMX	Vc		
					ae ≤ 0.5 DC	ae ≤ 0.75 DC	ae = DC
S Titanium alloy	—	● ● ✘	MP9130	≤ 1	55 (40-70)	50 (35-65)	45 (30-60)
			MP9130	≤ 2	55 (40-70)	50 (35-65)	45 (30-60)

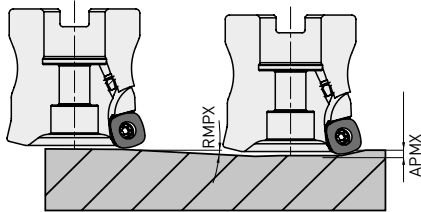
### DEPTH OF CUT / FEED PER TOOTH

Material	Properties	Cutting conditions	Coolant	Grade	ae ≤ 0.5 DC		ae ≤ 0.75 DC		ae = DC				
					 ap	fz	 ap	fz	 ap	fz			
S Titanium alloy	—	● ● ✘	●	MP9130	L	≤ 1	0.7 (0.5-0.9)	L	≤ 1	0.6 (0.4-0.7)	L	≤ 1	0.5 (0.3-0.6)
				MP9130	L	≤ 2	0.6 (0.4-0.8)	L	≤ 2	0.5 (0.3-0.6)	L	≤ 2	0.4 (0.2-0.5)
				MP9130	M	≤ 1	0.7 (0.5-0.9)	M	≤ 1	0.6 (0.4-0.7)	M	≤ 1	0.5 (0.3-0.6)
				MP9130	M	≤ 2	0.6 (0.4-0.8)	M	≤ 2	0.5 (0.3-0.6)	M	≤ 2	0.4 (0.2-0.5)
				MP9130	R	≤ 1	0.8 (0.6-1.0)	R	≤ 1	0.7 (0.4-0.9)	R	≤ 1	0.6 (0.4-0.8)
				MP9130	R	≤ 2	0.7 (0.5-0.9)	R	≤ 2	0.6 (0.3-0.8)	R	≤ 2	0.5 (0.3-0.7)
				MP9130	R	≤ 1	0.7 (0.5-0.9)	R	≤ 1	0.6 (0.4-0.7)	R	≤ 1	0.5 (0.3-0.6)
				MP9130	R	≤ 2	0.6 (0.4-0.8)	R	≤ 2	0.5 (0.3-0.6)	R	≤ 2	0.4 (0.2-0.5)

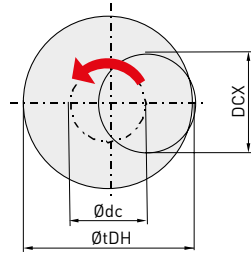
# 415SD

## MAXIMUM CAPACITIES BY MODE

### RAMPING



### HELICAL DRILLING



- How to derive a locus of the centre of the tool.

$$\text{ØDC} = \text{ØDH} - \text{DCX}$$

Locus of the centre of the tool      Desired hole diameter      Cutting Diameter Maximum

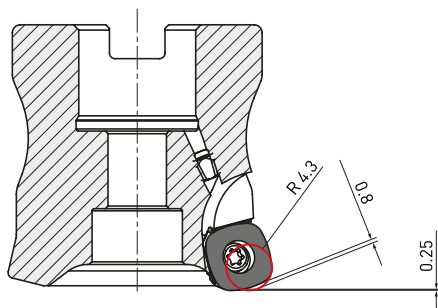
- For the depth of cut per pass, refer to the cutting conditions above for helical drilling.
- Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

- When ramping and helical cutting, please apply a lower feed (60% of the calculated feed rate or less).
- The long chips generated can disperse, ensure that adequate safety precautions are taken.

Tool Holder Type	DCX	DC	APMX	Ramping		Helical Drilling	
				RMPX	DH		
					Min.	Max.	
<b>ARBOR TYPE</b>							
41SD-050A04AR-E	50	33.4	2	3	84	97	
41SD-050A05AR-E	50	33.4	2	3	84	97	
41SD-052A04AR-E	52	35.4	2	3	88	101	
41SD-052A06AR-E	52	35.4	2	3	88	101	
41SD-063A05AR-E	63	46.5	2	2	110	123	
41SD-063A07AR-E	63	46.5	2	2	110	123	
41SD-066A05AR-E	66	49.4	2	1.9	116	129	
41SD-066A07AR-E	66	49.4	2	1.9	116	129	

## NOTE FOR PROGRAMMING

When using 415SD (MPLUS), please programme as an RE = 4.3 radius cutter. The approximate uncut portions for the programme are as follows.





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