March 2019
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NEW PRODUCT NEWS

STARMILL

new

New SED 7 Series for Outstanding Machining of Difficult-to-Cut Materials

TaeguTec
Member IMC Group

KEY POINT

The market demand for high-speed, high efficiency machining has grown, TaeguTec has upped the game with an expanded series of solid carbide end mills.

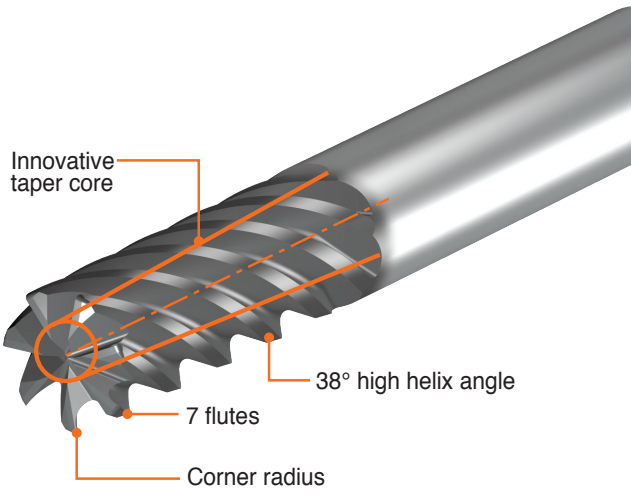
Trochoidal machining is one of the fastest operations for the machining of difficult-to-cut materials, as such it is a very widely used application for aerospace components. Whether it is stainless steel or titanium alloy, the SED 7 end mill line is optimized with the correct grades and shapes.

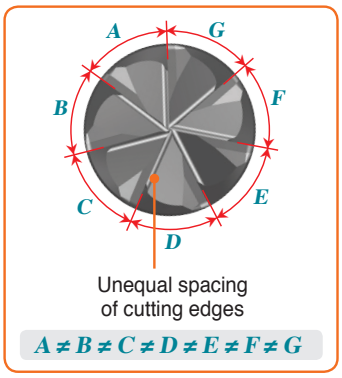
The SED 7 comes designed with seven unequally spaced cutting edges and a high helix cutting angle that enable high productivity and excellent surface roughness. Furthermore, it can be applied to a variety of applications, such as regular end mills.

Please contact the product manager or CAM engineer for further technical enquiries.

New Features

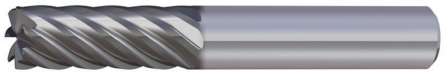
- High productivity in high-speed machining applications
  - Optimized for trochoidal operations
  - Higher than 2xD DOC with 7 flutes
- Optimal high helix angle and specialized cutting edges for smoother machining
  - Optimized for stainless steel and titanium alloy machining
- Unequal spacing of cutting edges
  - Prevention of chipping and increased tool life due to vibration reduction
- Innovative taper core
  - Wide chip gullet ensures good chip evacuation
  - Increased tool stiffness with an incremental core taper
- Corner radius
  - Enhanced stiffness during machining
- Suitable for a wide range of applications
  - Trochoidal operations
  - Side milling operations



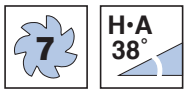


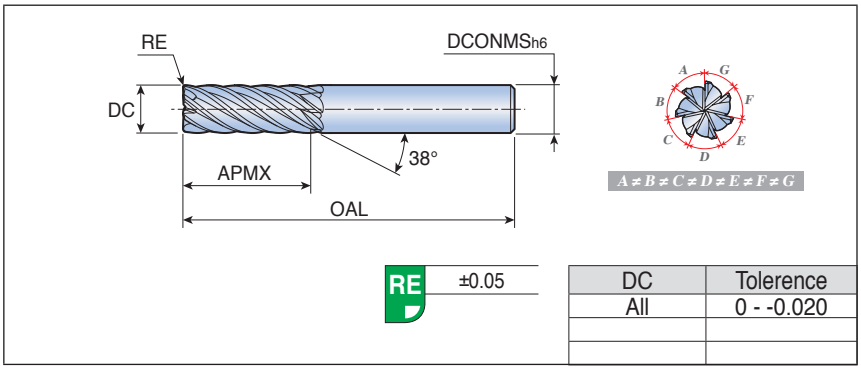
SED 7...

7 flute medium corner radius



- Excellent chatter damping credit to unequal spacing of cutting edges





DC	Tolerence
All	0 - -0.020

Designation	Feed (mm/tooth)	Dimension (mm)					Grade
		DC	RE	OAL	APMX	DCONMS	TT5515
SED 7060	0.02-0.04	6	0.5	57	15	6	●
7080	0.02-0.05	8	0.5	70	25	8	●
7100	0.03-0.07	10	0.5	72	25	10	●
7120	0.03-0.09	12	0.5	83	30	12	●
7160	0.04-0.11	16	0.5	100	42	16	●
7200	0.05-0.12	20	0.5	104	48	20	●

●: Standard items

Recommended Cutting Conditions

■ Medium·Finishing

Material	Side milling			f (mm/tooth)					
	ap	ae	Speed Vc(m/min)	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
Alloy steel (<=HRC 45)	2D Max	0.3D Max	80-130	0.02-0.035	0.03-0.045	0.04-0.06	0.05-0.08	0.06-0.1	0.06-0.11
Stainless steel	2D Max	0.3D Max	50-100	0.025-0.04	0.03-0.05	0.04-0.07	0.05-0.09	0.06-0.11	0.06-0.12
Titanium	2D Max	0.3D Max	50-120	0.02-0.035	0.025-0.04	0.03-0.05	0.03-0.06	0.04-0.07	0.05-0.08
Inconel 718	2D Max	0.3D Max	30-60	0.015-0.025	0.02-0.03	0.025-0.04	0.03-0.045	0.04-0.055	0.05-0.06

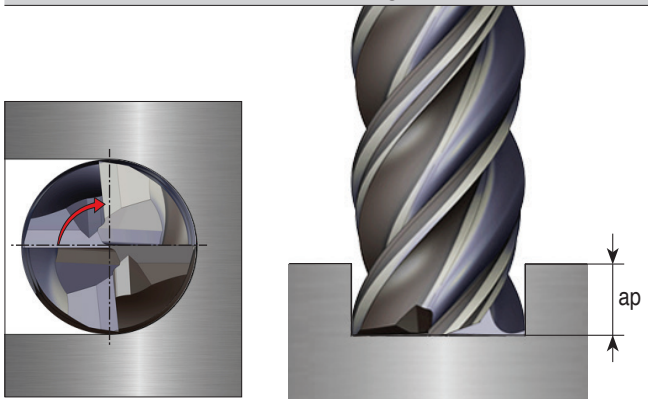
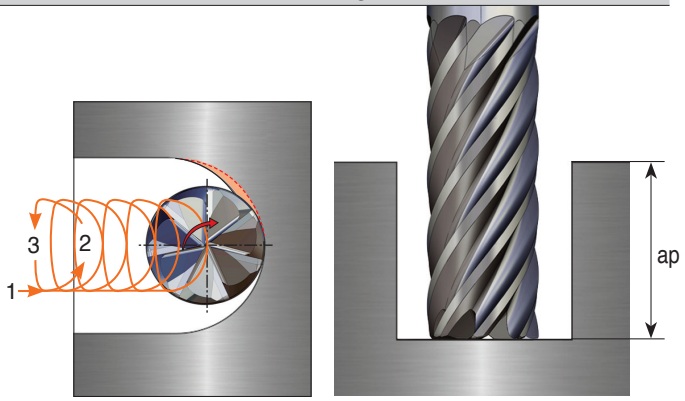
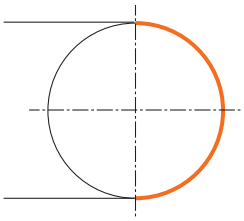
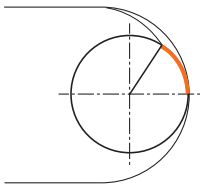
• When trochoidal machining under the above conditions, the recommended ae value is 0.05-0.1D

■ Finishing

Material	Side milling			f (mm/tooth)					
	ap	ae	Speed Vc(m/min)	Ø6	Ø8	Ø10	Ø12	Ø16	Ø20
Alloy steel (<=HRC 45)	2D Max	0.05D Max	120-200	0.02-0.035	0.03-0.045	0.04-0.06	0.05-0.08	0.06-0.1	0.06-0.11
Stainless steel	2D Max	0.05D Max	75-150	0.025-0.04	0.03-0.05	0.04-0.07	0.05-0.09	0.06-0.11	0.06-0.12
Titanium	2D Max	0.05D Max	75-180	0.02-0.035	0.025-0.04	0.03-0.05	0.03-0.06	0.04-0.07	0.05-0.08
Inconel 718	2D Max	0.05D Max	45-90	0.015-0.025	0.02-0.03	0.025-0.04	0.03-0.045	0.04-0.055	0.05-0.06

What is trochoidal milling?

A high efficiency milling operation where high-speed machining is suitable for shallow radial, deep axial cutting with end mill diameters smaller than the groove width. Generally, it is used to keep the chip thickness constant while properly controlling the radial contact area during machining. To achieve this, the cutter proceeds in a spiraling tool path during machining.

Conventional slotting application	Trochoidal slotting application
	
	
End mill arc contact surface	**End mill arc contact surface**
• ap＜1D • Up and down simultaneous cutting • Excessive heat generation due to the wide contact area • Problems with chip evacuation • Decreased tool life in simultaneous cutting	• ap≧2D • Constant, narrow contact area minimizes heat generation • Maximizes productivity with high-speed and feed • Increased tool life due to constant (reduced) wear • Optimized for difficult-to-cut material machining

Calculating trochoidal milling values: Tool diameter (D), machining depth (W) and width of cut (ae)

When D is fixed	When W is fixed	ae
1.2D ≦ W ≦ 1.5D	0.6W ≦D ≦0.8W	ae=0.05D-0.1D

Trochoidal milling requirements:

- CAM system
- High dynamic machine