


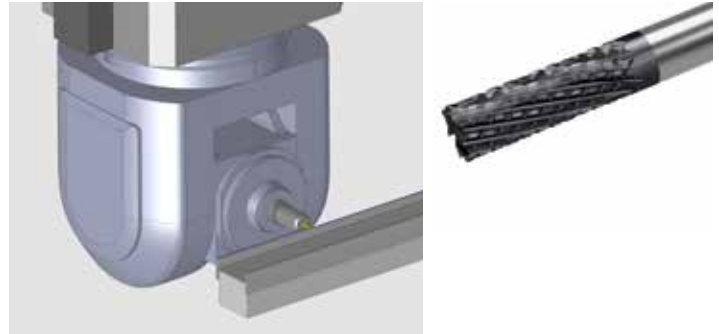
Floor Beam

Carbon Fiber Reinforced Plastics (CFRP) Trimming & Drilling


1



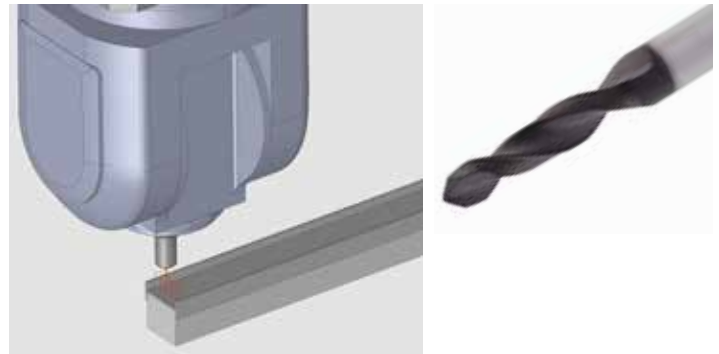
TRIMMING	
Tool Dimensions	3/8 x 3/8 x 1.25 x 3
Description	Special Tool
Series	12 Flute
Vc	135 m/min 443 SFM
S (RPM)	4,500
Fz	0,023mm 0.0009"
F	1,200 mm/min 49.0 IPM
Ap	8mm 0.315"
Ae	6,7mm 0.264"



2



DRILLING	
Tool Dimensions	4.88 x 6 x 10 x 73
Description	Special Drill
Series	2 Flute
Vc	100 m/min 328 SFM
S (RPM)	6,526
Fz	0,031mm 0.0012"
F	400 mm/min 15.75 IPM
Ap	4,5–7mm 0.177–0.2755"
Ae	—

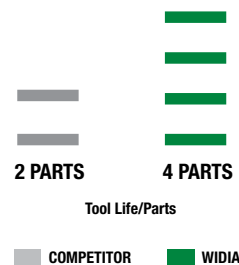


WIDIA™ tooling for composite machining utilizes PCD and diamond coatings specifically made for the machining of aerospace CFRP (Carbon Fiber Reinforced Plastics). As demonstrated here, these coatings enable longer tool life at much higher machining speeds. The combination of coating with optimized tool geometry and machining strategy which is needed to achieve the required finish allows machining Aerospace CFRP without delamination of the composite fibers. This is also important from a safety perspective.

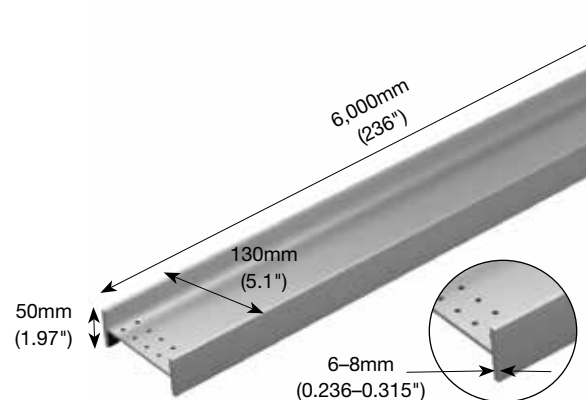
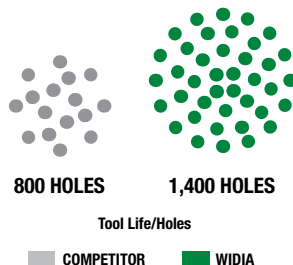


REDUCES COST OF TOOLS AND INCREASES TOOL LIFE! See Operations 1 & 2

Trimming CFRP Floor Beam	COMPETITOR	WIDIA™
Workpiece Material	CFRP	
Application	Trimming	
Tool Life/Parts	2	4



Drilling CFRP Floor Beam	COMPETITOR	WIDIA
Workpiece Material	CFRP	
Application	Drilling	
Tool Life/Holes	800	1,400



Aerospace Product Details

High-Performance Roughers



- Shallow pitch rougher.
- 4–6 flutes with variable spacing.
- Regular length of cut.
- Stainless steel and high-temp alloys.
- Center cutting.



	Series	Grade	(ZU) Flutes	(D1) Diameter Range
Inch	4U80	ALTIN-MT	4	5/16–1"
			6	5/8–1"
Metric			4	6–12mm
			6	16–25mm

High-Performance Solid Carbide End Mills • Roughing



- Center cutting.
- Flat shallow profile.
- Standard items listed. Additional styles and coatings made-to-order.
- Roughing profile also on radii portion of end mill.



	Series	Grade	(ZU) Flutes	(D1) Diameter Range
Inch	4969	WP15PE	4	.3937–.9843"
Metric				

High-Performance Solid Carbide End Mills • VariMill™

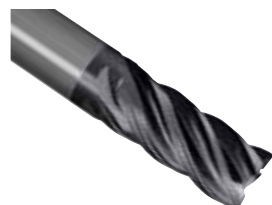


- Unequal flute spacing.
- Center cutting.
- Ramping angle 3°.
- Optimized for difficult-to-machine workpiece materials.
- Semi-finishing to finishing applications.
- High-speed machining capability.
- Standard items listed. Additional styles and coatings made-to-order.



	Series	Grade	(ZU) Flutes	(D1) Diameter Range
Inch	7VNX	WS15PE	7	3/8–1"
Metric	77NE			

High-Performance Solid Carbide End Mills • VariMill



- Shallow pitch rougher.
- 4–6 flutes with variable spacing.
- Regular length of cut.
- Stainless steel and high-temp alloys.
- Center cutting.



	Series	Grade	(ZU) Flutes	(D1) Diameter Range
Inch	5V0T	ALTIN-MT	5	1/4–3/4"
Metric	57N8			

These pages overview the details for the products presented in the operations throughout this catalog



■ X-Feed™

- Designed for high-feed rates.
- 6 flutes and 3 x D diameter neck reach.
- Designed for circular plunging and ramping, 3D machining, face milling, and pocketing applications.
- Stainless steel and high-temp alloys.
- Improved tool life due to reduced radial forces.



	Series	Grade	(ZU) Flutes	(D1) Diameter Range
Inch	7FNS	ALTIN-MT	6	1/4–1"
Metric	7ONS			6–25mm

New Advances products launching January 1, 2019



■ Solid Carbide Drills

- Low thrust.
- Excellent centering capabilities.
- Easy to regrind.
- Reduces risk of chip jamming and catastrophic failure.
- Improves hole straightness.
- Improves hole alignment when drilling through cross holes and inclined exits.



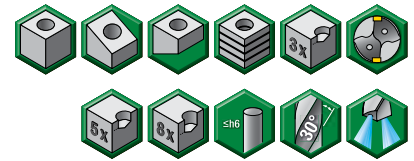
Series	Grade	L:D	(D1) Inch Diameter	(D1) Metric Diameter
TDD105Z	WU20PD	15xD	.1181–.5118"	3–13mm
TDD106Z		20xD		
TDD107Z		25xD		
TDD108Z		30xD		

All-Star items (not all diameters are included in the program.)



■ Solid Carbide Drills

- Excellent chip flow due to flute design and finish.
- New coating enables higher cutting speeds.
- Higher feed rates on stainless steels and duplex.
- Available for custom solutions, as well as step-drilling.
- Real 8 x D drill lengths.
- Cylindrical shank h6 for perfect runout.
- Double-margin design for critical operations.



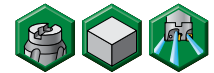
Series	Grade	L:D	(D1) Inch Diameter	(D1) Metric Diameter
TDS	WK15PD	3xD	.1181–.7874"	3–20mm
		5xD		
		8xD		

All-Star items (not all diameters are included in the program.)



■ Face Mills • Victory™ M1200 Series

- Twelve cutting edges.
- High feed rates for rough face milling.
- Use standard M1200 inserts.
- Do not load wiper inserts.




Series	Cutting Edges	(ZU) Flutes	(D1) Inch Diameter	(D1) Metric Diameter	All-Star
M1200™ Shell Mill	12	4	2"	50,8mm	NO
		5	2.5"	63,5mm	NO
		6	3"	76,2mm	YES
		8	4"	101,6mm	YES
		9	5"	127mm	NO

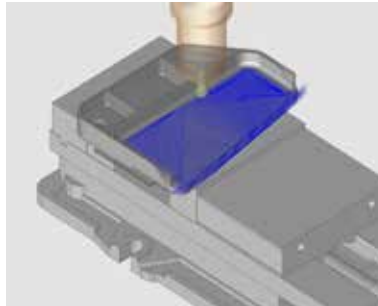
BENEFITS OF THIS BROCHURE

Advanced milling methods (i.e., high-speed, trochoidal, etc.) were used, which enabled the use of higher feeds and speeds beyond traditional methods published by WIDIA™. Use of tooling in advanced-application parameters is highly dependent on proper application of machining programming methods. Users may want to also want to consult their CAM system supplier on programming techniques for advanced milling.

ILLUSTRATED PROCESS STEPS

For each component, see actual strategies and tooling technologies specifically designed for aerospace.

1		ROUGHING HIGH MACHINING (ROUGH BIG POCKET)	
	Tool Dimensions	12 x 12 x 26 x 83 x R-3.0	
	Description	Special VariMill III™ End Mill	
	Series	77NE 7 Flute	7VNX 7 Flute
	Vc	115 m/min	378 SFM
	S (RPM)	3,052	3,052
	Fz	0,1mm	0.0039"
	F	2,136 mm/min	84 IPM
	Ap	24mm	0.094"
	Ae	0,6mm	0.0236"



WIDIA SHINING MOMENTS


Each component includes a real-life customer case where WIDIA tooling technology and machining strategy came together to increase productivity and reduce cost!

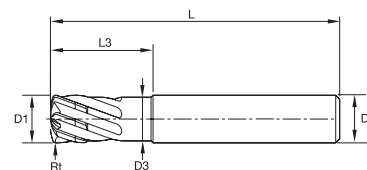


	COMPETITOR	WIDIA
	Roughing AIRFOIL	
Specifications	16x16x15x83xR-1 6 Flutes	Based on 77NE 7 Flute
Workpiece Material	Titanium	
Width	230mm	
Length of Blade	420mm	
Total Milling Cycle Time	93 Minutes	62 Minutes

APPLICATION PARAMETERS

This cutting data shows real-life application parameters.

	ROUGHING HIGH MACHINING (ROUGH BIG POCKET)		D1 = 12 D = 12 Ap1 max = 26 L = 83 Rt = 3.0	
	Tool Dimensions	12 x 12 x 26 x 83 x R-3.0		
	Description	Special VariMill III™ End Mill		
	Series	77NE 7 Flute		7VNX 7 Flute
	Vc	115 m/min		378 SFM
	S (RPM)	3,052		3,052
	Fz	0,1mm		0.0039"
	F	2,136 mm/min		84 IPM
	Ap	24mm		0.094"
	Ae	0,6mm		0.0236"



S (RPM)	=	Spindle Speed
Fz [IPT]	=	Feed per Tooth
F	=	Feed
Ap	=	Axial Depth of Cut
Ae	=	Radial Width of Cut
D1	=	Outer Diameter Tool
Rt	=	Radius
L	=	Length