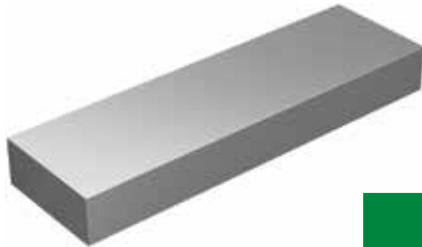


Fitting Pivot

Titanium Milling

WIDIA HANITA 



BEFORE MILLING



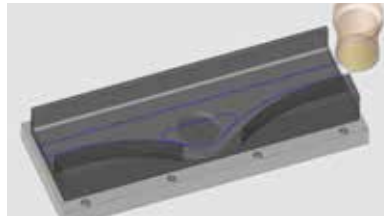
AFTER MILLING

1



ROUGHING OPERATION

Tool Dimensions	16 x 16 x 32-48 x 100 x R-0.5	
Description	M1200™ High-feed D-80 Body — M1200HF080Z06HN09 Insert — HNPJ090543ANSNHD	
Series	Face Mill D-80	
Vc	54 m/min	177 SFM
S (RPM)	215	
Fz	0,5mm	0.02"
F	645 mm/min	25.4 IPM
Ap	1,8mm	0.03"
Ae	70% x D	



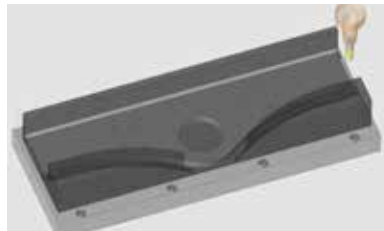
See page 29 for product details.

2



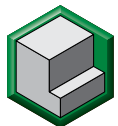
FULL SLOT OPERATION

Tool Dimensions	16 x 16 x 32-48 x 100 x R-0.5	
Description	VariMill II™ End Mill	
Series	57N8 5 Flute	5VOT 5 Flute
Vc	55 m/min	378 SFM
S (RPM)	1,094	
Fz	0,05mm	0.002"
F	274 mm/min	10.8 IPM
Ap	12mm	0.47"
Ae	16mm	0.63"



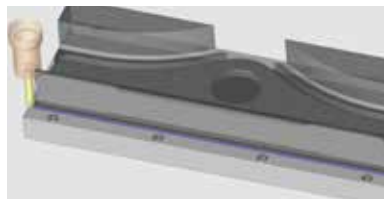
See page 28 for product details.

3



ROUGHING & FINISHING PEEL MILLING (EXTERNAL & INTERNAL CONTOURED WALLS)

Tool Dimensions	16 x 16 x 83 x 141 x R-3 mm	
Description	Special VariMill III™ End Mill	
Series	77NE 7 Flute	7VNX 7 Flute
Vc	115 m/min	378 SFM
S (RPM)	2,289	
Fz	0,1mm	0.0039"
F	1,602 mm/min	63 IPM
Ap	78mm	3.07"
Ae	0,5mm	0.02"



See page 28 for product details.

WIDIA 

MACHINING BRILLIANCE

For more information, please contact your local Authorized Distributor or visit widia.com.

Fitting Pivot

Titanium Milling

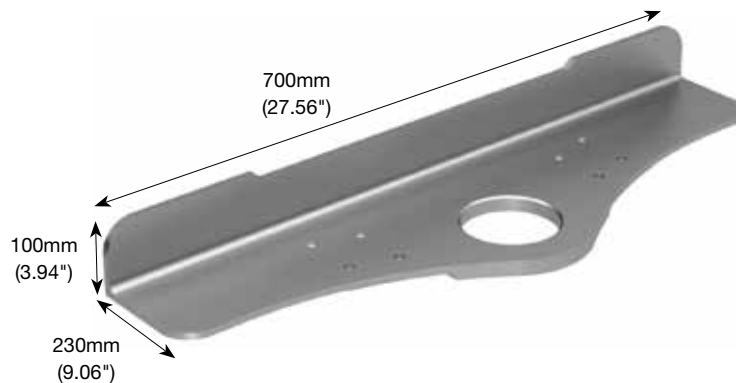
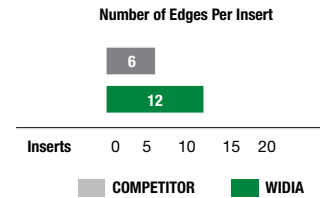
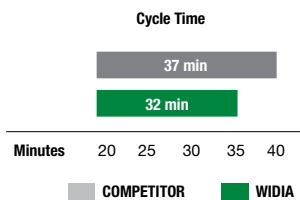


REDUCES CYCLE TIME AND INSERT EDGE COST! *See Operation 1*

Titanium Fitting Pivot Roughing

**These three operations represent the majority of the solution*

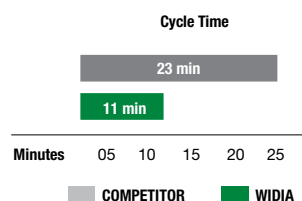
Fitting Pivot	COMPETITOR	WIDIA
Workpiece Material	Titanium 6AL4V	
Application	Rougher — M1200 HF	
Cycle Time	37 min	32 min
Number of Edges Per Insert	6	12



REDUCES CYCLE TIME AND IMPROVES SURFACE QUALITY! *See Operation 3*

Peel Milling Titanium Fitting Pivot

Fitting Pivot	COMPETITOR	WIDIA
Workpiece Material	Titanium 6AL4V	
Application	Roughing and Finishing Peel Milling	
Number of Flutes	5	7
Cycle Time	23 min	11 min
Surface Quality	Good	Excellent



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™

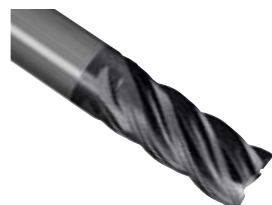


- Unequal flute spacing.
- Center cutting.
- Ramping angle 3°.
- Optimized for difficult-to-machine workpiece materials.
- Semi-finishing to finishing applications.
- High-speed machining capability.
- Standard items listed. Additional styles and coatings made-to-order.



	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



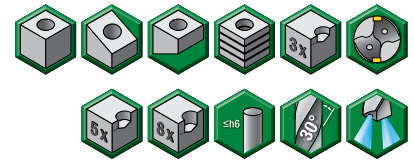
- Low thrust.
- Excellent centering capabilities.
- Easy to regrind.
- Reduces risk of chip jamming and catastrophic failure.
- Improves hole straightness.
- Improves hole alignment when drilling through cross holes and inclined exits.

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



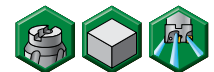
- Excellent chip flow due to flute design and finish.
- New coating enables higher cutting speeds.
- Higher feed rates on stainless steels and duplex.
- Available for custom solutions, as well as step-drilling.
- Real 8 x D drill lengths.
- Cylindrical shank h6 for perfect runout.
- Double-margin design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

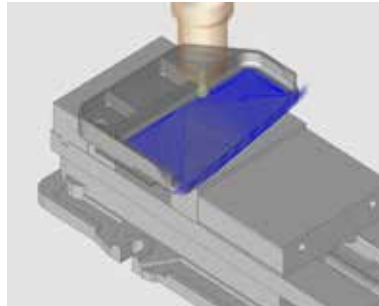
BENEFITS OF THIS BROCHURE

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		
	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
	F_z	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!

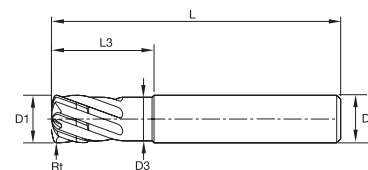


Specifications	COMPETITOR	WIDIA
	Roughing AIRFOIL	
	16x16x15x83xR-1 6 Flutes	Based on 77NE 7 Flute
Workpiece Material	Titanium	
Width	230mm	
Length of Blade	420mm	
Total Milling Cycle Time	93 Minutes	62 Minutes

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
	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
	F_z	0,1mm		0.0039"
	F	2,136 mm/min		84 IPM
	Ap	24mm		0.094"
	Ae	0,6mm		0.0236"



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