2017 Master Catalog

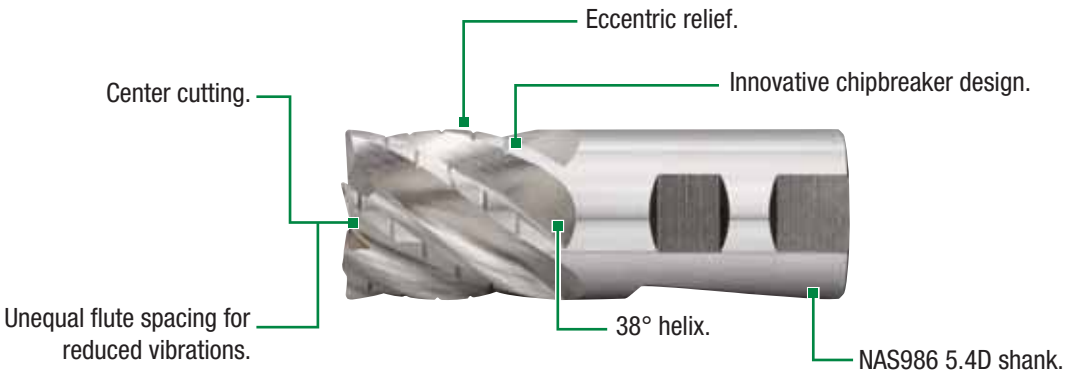
WIDIA™

Solid End Milling • High-Performance High-Speed Steel (HSS-E/PM)

HSS ER ROUGHER

The next generation of premium cobalt HSS roughers are designed specifically for titanium and stainless steels. They are engineered with an Eccentric Relief (ER) grind to provide a stronger cutting edge that requires less torque to operate. The unique proprietary chipbreaker geometry will break and control the chip, enabling higher metal removal rates and greater productivity. The HSS rougher offers the best-in-class performance for difficult-to-machine workpiece materials.

- 6-flute design with proprietary chipbreaker providing superior chip control.
- Eccentric relief geometry provides a stronger cutting edge resulting in longer tool life.
- NAS986 5.4D shank adds the flexibility of dual clamping.
- Higher metal removal rates enable productivity with lower tool costs.



High-Speed Steel ER Rougher

- Achieve outstanding tool life results due to unequal flute spacing and eccentric relief reinforcing the cutting edge.
- Benefit from proprietary chipbreaker pattern for improved chip formation.
- Apply at highest feed rates in full slotting, ramping, and side milling due to proprietary core design.

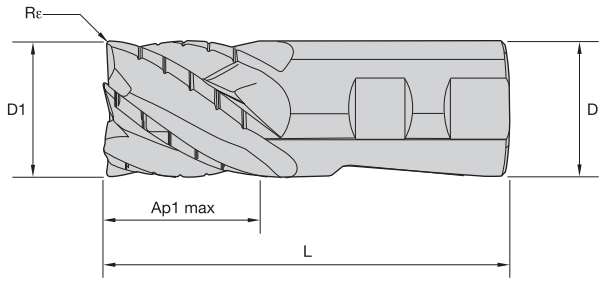
620E Series

- Highest metal removal rates and tool life in:
  — Titanium
  — Stainless steels
- Corner radii.
- Various lengths-of-cut.

Application Example
Roughing a forged landing gear link.
Gantry-type vertical milling machine.

Workpiece material:	Titanium 6Al-4V
Tool:	D = 1 1/2"
Cutting data:	ap = 3"
	ae = 1/4"
	vc = 60 SFM
	fz = .006 IPT
Result:	20% higher cutting speed and more than 70% higher feed per tooth. 110% higher tool life compared to previous competitive tool.

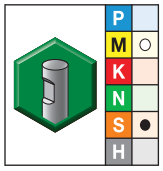
- Center cutting.
- Premium cobalt HSS.
- Eccentric relief grind with chipbreaker.
- Optimized geometry for titanium machining.



End Mill Tolerances

D1	tolerance	D	tolerance h6 + / -
All	+0.002/-0.0	All	h6

Series 620E • HSS ER Roughers

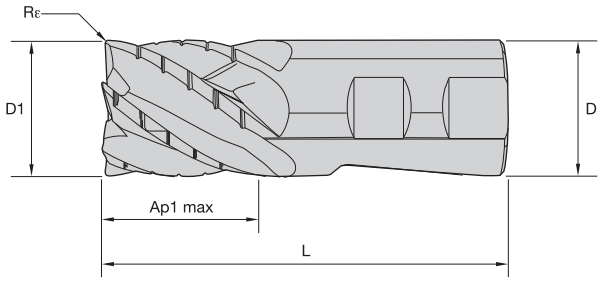


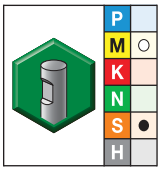
● first choice
○ alternate choice

grade UNCOATED						
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε
5329387	620E32009CW	1 1/4	1 1/4	2	4 1/2	.060
5599913	620E32009EW	1 1/4	1 1/4	2	4 1/2	.120
5329388	623E32009CW	1 1/4	1 1/4	3	5 1/2	.060
5599914	623E32009EW	1 1/4	1 1/4	3	5 1/2	.120
5329389	621E32009CW	1 1/4	1 1/4	4	6 1/2	.060
5599915	621E32009EW	1 1/4	1 1/4	4	6 1/2	.120
5329550	620E38009CW	1 1/2	1 1/4	2	4 1/2	.060
5599916	620E38009EW	1 1/2	1 1/4	2	4 1/2	.120
5329551	623E38009CW	1 1/2	1 1/4	3	5 1/2	.060
5599917	623E38009EW	1 1/2	1 1/4	3	5 1/2	.120
5329552	621E38009CW	1 1/2	1 1/4	4	6 1/2	.060
5599918	621E38009EW	1 1/2	1 1/4	4	6 1/2	.120
5329553	620E3800ACW	1 1/2	1 1/2	2	5 1/4	.060
5599919	620E3800AEW	1 1/2	1 1/2	2	5 1/4	.120
5329554	623E3800ACW	1 1/2	1 1/2	3	6 1/4	.060
5599970	623E3800AEW	1 1/2	1 1/2	3	6 1/4	.120

(continued)

(Series 620E • HSS ER Roughers — continued)





● first choice
○ alternate choice

grade UNCOATED						
order #	catalog #	D1	D	length of cut Ap1 max	length L	Rε
5329555	621E3800ACW	1 1/2	1 1/2	4	7 1/4	.060
5599971	621E3800AEW	1 1/2	1 1/2	4	7 1/4	.120
5329556	625E51022CW	2	2	2	5 3/4	.060
5599972	625E51022EW	2	2	2	5 3/4	.120
5329557	625E51032CW	2	2	3	6 3/4	.060
5599973	625E51032EW	2	2	3	6 3/4	.120
5329558	625E51042CW	2	2	4	7 3/4	.060
5599974	625E51042EW	2	2	4	7 3/4	.120
5329559	625E51062CW	2	2	6	9 3/4	.060
5599975	625E51062EW	2	2	6	9 3/4	.120

Series 620E • HSS ER Roughers

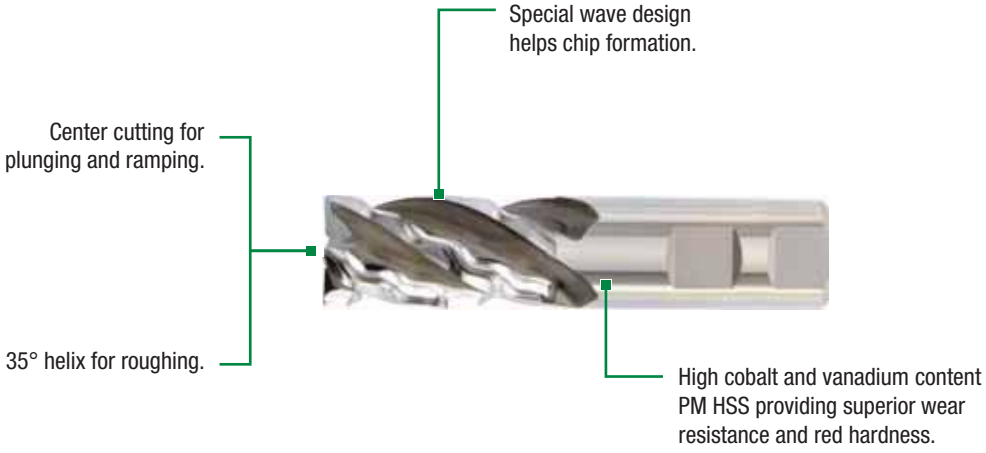
Material Group		Side Milling (A) and Slotting (B)			uncoated			Recommended feed per tooth (IPT=inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.			
		A		B	Cutting Speed — vc SFM				D1 — Diameter		
								frac.	1 1/4	1 1/2	2
		ap	ae	ap	min		max	dec.	1.2500	1.5000	2.0000
M	1	1.5 x D	0.5 x D	1 x D	40	–	60	IPT	.0052	.0053	.0053
	2	1.5 x D	0.5 x D	1 x D	40	–	60	IPT	.0042	.0042	.0043
S	4	1.5 x D	0.5 x D	1 x D	16	–	50	IPT	.0038	.0039	.0039

NOTE: Side milling applications — for longest length tools, reduce ae by 30%.
Slot milling applications — for longest length tools, reduce ap by 30%.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.

WavCut

WavCut tools for machining titanium are best suited for applications in aerospace and energy, providing high Metal Removal Rates (MRR) and increased tool life. The special wave design of these 4- and 6-fluted end mills require less horsepower during roughing and semi-finishing, and provide excellent chip formation. Since chips evacuate easily, WavCut tools do not recut chips thus increasing tool life. Also, the edges change the radial cutting edge position without changing the diameter.

- Center cutting offering excellent performance in roughing applications, especially in titanium.
- Capable of deep-slotting cuts for high Metal Removal Rates (MRR).
- Special wave design for excellent chip formation and evacuation preventing re-cutting of chips.



WavCut™ Series

- Benefit from reliable and trouble-free machining results using HSS WavCut cutter.
- Drastically reduce the risk of re-cutting chips, especially with vertical machines having multiple spindles.
- Increase stock removal rates over regular roughing tools due to reduced horsepower consumption.

620W Series

- 4-flute 35° helix for slotting.
- 6-flute 35° helix, for slotting, and in certain cases, pocketing and profiling.
- Center cutting, chamfered corner, uncoated.

Other featured HSS Series

- Sophisticated roughing profiles capable of dealing with chip formation issues.
- High cobalt and vanadium content PM HSS providing superior wear resistance and red hardness.
- High-performance finishers with specific geometries for different workpiece materials.

6A0R Series

- 3-flute, 45° helix.
- Coarse cord style roughing profile.
- Non-ferrous materials.

6ANR Series

- 3-flute, 45° helix.
- Extended neck for long-reach applications.
- Coarse cord style roughing profile.
- Non-ferrous materials.

6T0R Series

- 4-, 5-, and 6-flute, 35° helix.
- Fine cord style roughing profile.
- High-temp alloys and titanium.

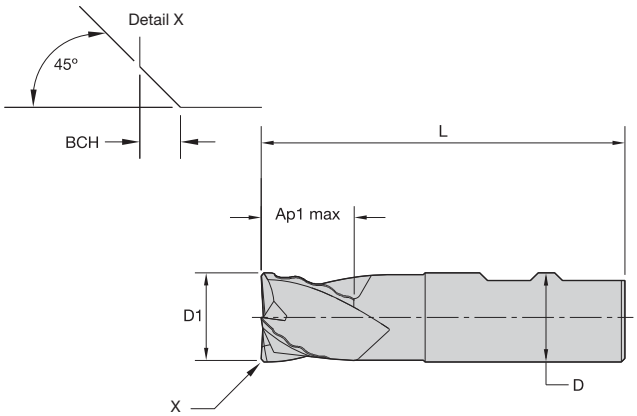
6TNR Series

- 4-, 5-, and 6-flute, 35° helix.
- Extended neck for long-reach applications.
- Fine cord style roughing profile.
- High-temp alloys and titanium.

3405/3407 Series

- Center Cutting.
- NAS Type 986 46 + 66 compliant.
- 4 and 6 flute, 35° helix.
- High-temp alloys and titanium.

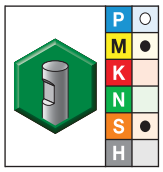
- Center cutting.
- NAS 986 5.2W Shank.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

D1	tolerance	D	tolerance h6 + / -
All	+0.004/-0.0	All	-0.0002/-0.0005

Series 620W • WavCut I



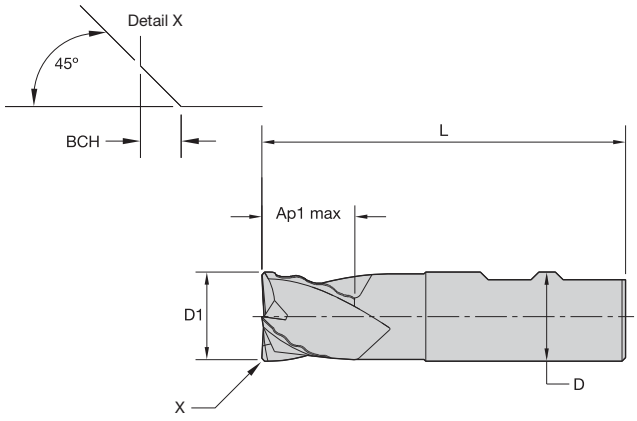
grade UNCOATED

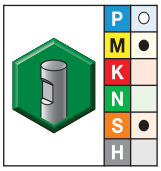
● first choice
○ alternate choice

order #	catalog #	D1	D	length of cut Ap1 max	length L	BCH	ZU
2709800	620W19077	3/4	3/4	1 5/8	3 7/8	.039	4
2709403	623W19077	3/4	3/4	2 1/4	4 1/2	.039	4
2709627	621W19077	3/4	3/4	3	5 1/4	.039	4
2709772	620W25088	1	1	2	4 1/2	.039	6
2709779	620W25078	1	1	2	4 1/2	.039	4
2709389	623W25078	1	1	3	5 1/2	.039	4
3032729	623W25088	1	1	3	5 1/2	.039	6
2709613	621W25078	1	1	4	6 1/2	.039	4
2709606	621W25088	1	1	4	6 1/2	.039	6
2709494	622W25078	1	1	6	8 1/2	.039	4
2709755	620W32079	1 1/4	1 1/4	2	4 1/2	.039	4
2709747	620W32089	1 1/4	1 1/4	2	4 1/2	.039	6
2709375	623W32089	1 1/4	1 1/4	3	5 1/2	.039	6
2709591	621W32079	1 1/4	1 1/4	4	6 1/2	.039	4
2709583	621W32089	1 1/4	1 1/4	4	6 1/2	.039	6
2709487	622W32089	1 1/4	1 1/4	6	8 1/2	.039	6
2709723	620W38079	1 1/2	1 1/4	2	4 1/2	.039	4
2709715	620W38089	1 1/2	1 1/4	2	4 1/2	.039	6
2709361	623W38089	1 1/2	1 1/4	3	5 1/2	.039	6
2709562	621W38089	1 1/2	1 1/4	4	6 1/2	.039	6

(continued)

(Series 620W • WavCut I — continued)





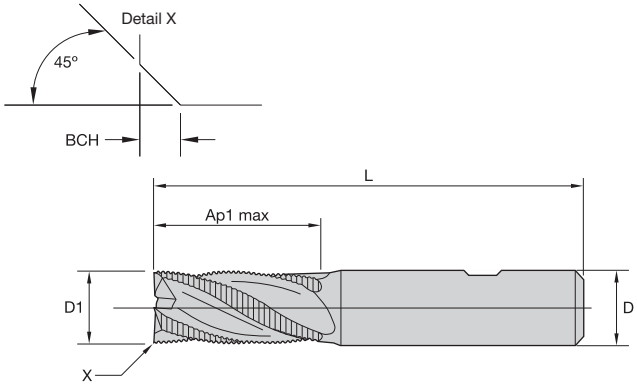
● first choice
○ alternate choice

grade UNCOATED

order #	catalog #	D1	D	length of cut Ap1 max	length L	BCH	ZU
2709569	**621W38079**	1 1/2	1 1/4	4	6 1/2	.039	4
2709473	**622W38089**	1 1/2	1 1/4	4	8 1/2	.039	6
2709233	**625W51722**	2	2	2	5 3/4	.039	6
2709219	**625W51732**	2	2	3	6 3/4	.039	6
2709206	**625W51742**	2	2	4	7 3/4	.039	6
2709200	**625W51762**	2	2	6	9 3/4	.039	6
2709191	**625W51782**	2	2	8	11 3/4	.039	6

NOTE: For application data, please see page O16.

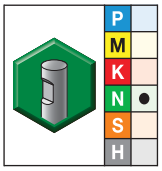
- Center cutting.
- Chamfered profile.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

D1	tolerance	D	tolerance
All	+0.0047/-0.0047	All	-0.0002/-0.0005

Series 6A0R

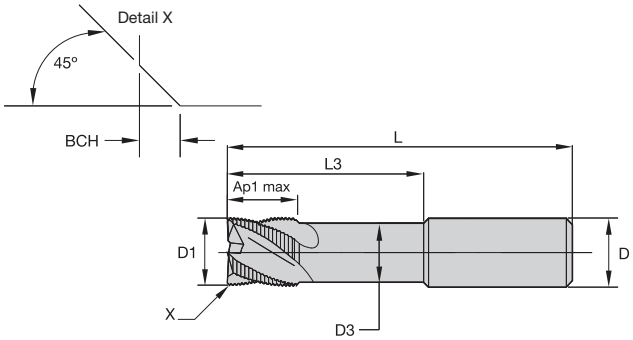


● first choice
○ alternate choice

order #	catalog #	grade TiCN TiCN	D1	D	length of cut Ap1 max	length L	BCH
2840160	TC6A0R13005		1/2	1/2	1 1/4	3 1/4	.014
2840121	TC6A1R13005		1/2	1/2	2	4	.014
2840146	TC6A0R19007		3/4	3/4	1 5/8	3 7/8	.014
2840087	TC6A3R19007		3/4	3/4	2 1/4	4 1/2	.014
2840108	TC6A1R19007		3/4	3/4	3	5 1/4	.014
2840138	TC6A0R25008		1	1	2	4 1/2	.020
1839782	TC6A3R25008		1	1	3	5 1/2	.020
2840103	TC6A1R25008		1	1	4	6 1/2	.020
2840132	TC6A0R32009		1 1/4	1 1/4	2	4 1/2	.020
2840073	TC6A3R32009		1 1/4	1 1/4	3	5 1/2	.020
2840099	TC6A1R32009		1 1/4	1 1/4	4	6 1/2	.020

NOTE: For application data, please see page O17.

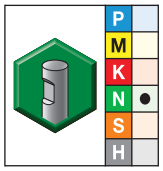
- Center cutting.
- Chamfered profile.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

D1	tolerance	D	tolerance
All	+0.0047/-0.0047	All	-0.0002/-0.0005

Series 6ANR

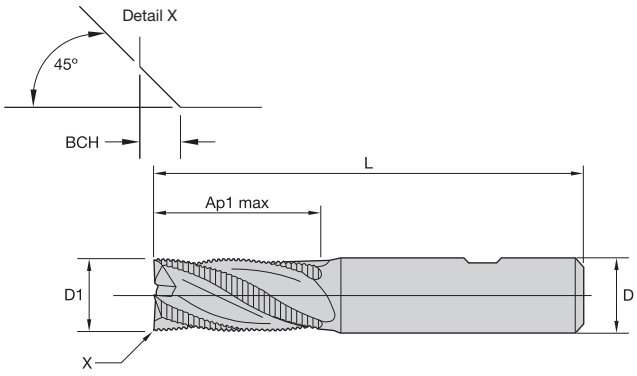


● first choice
○ alternate choice

order #	catalog #	grade TiCN TiCN	D1	D	D3	length of cut Ap1 max	L3	length L	BCH
2840040	TC6ANR13005		1/2	1/2	.470	1 1/4	2	4	.014
2840034	TC6ANR13015		1/2	1/2	.470	1 1/4	3	5	.014
2840028	TC6ANR13025		1/2	1/2	.470	1 1/4	4	6	.014
2840007	TC6ANR19007		3/4	3/4	.705	1 5/8	4	6 1/4	.014
2840000	TC6ANR19017		3/4	3/4	.705	1 5/8	6	8 1/4	.014
2839994	TC6ANR25008		1	1	.940	2	4	6 1/2	.020
1907409	TC6ANR25018		1	1	.940	2	6	8 1/2	.020
2839981	TC6ANR32009		1 1/4	1 1/4	1.175	2	4	6 1/2	.020
2839975	TC6ANR32019		1 1/4	1 1/4	1.175	2	6	8 1/2	.020
2839969	TC6ANR32029		1 1/4	1 1/4	1.175	2	8	10 1/2	.020

NOTE: For application data, please see page O17.

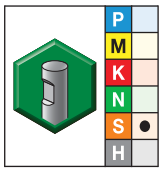
- Center cutting.
- Chamfered profile.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

D1	tolerance	D	tolerance
All	+0.0047/-0.0047	All	-0.0002/-0.0005

Series 6T0R • Series 6T0R 6T1R 6T3R

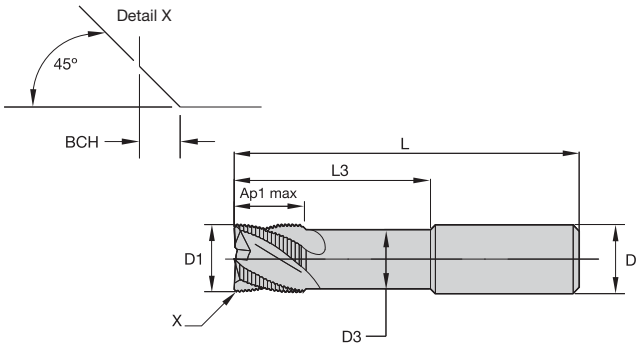


● first choice
○ alternate choice

order #	catalog #	grade TiAlN TiAlN	D1	D	length of cut Ap1 max	length L	BCH	ZU
2836219	TF6T0R13005		1/2	1/2	1 1/4	3 1/4	.035	4
2836188	TF6T1R13005		1/2	1/2	2	4	.035	4
2836212	TF6T0R16006		5/8	5/8	1 5/8	3 3/4	.047	4
2836182	TF6T1R16006		5/8	5/8	2 1/2	4 5/8	.047	4
2836206	TF6T0R19007		3/4	3/4	1 5/8	3 7/8	.047	4
2836151	TF6T3R19007		3/4	3/4	2 1/4	4 1/2	.047	4
2836176	TF6T1R19007		3/4	3/4	3	5 1/4	.047	4
2836204	TF6T0R25008		1	1	2	4 1/2	.059	5
2836145	TF6T3R25008		1	1	3	5 1/2	.059	5
2836169	TF6T1R25008		1	1	4	6 1/2	.059	5
2836199	TF6T0R32009		1 1/4	1 1/4	2	4 1/2	.059	6
2836138	TF6T3R32009		1 1/4	1 1/4	3	5 1/2	.059	6
2836163	TF6T1R32009		1 1/4	1 1/4	4	6 1/2	.059	6
2836193	TF6T0R38009		1 1/2	1 1/4	2	4 1/2	.059	6
2836132	TF6T3R38009		1 1/2	1 1/4	3	5 1/2	.059	6
2836157	TF6T1R38009		1 1/2	1 1/4	4	6 1/2	.059	6

NOTE: For application data, please see page O18.

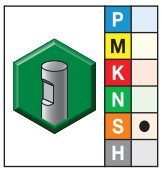
- Center cutting.
- Chamfered profile.
- Standard items listed. Additional styles and coatings made-to-order.



End Mill Tolerances

D1	tolerance	D	tolerance
All	+0.0047/-0.0047	All	-0.0002/-0.0005

Series 6TNR

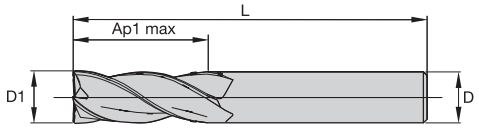


● first choice
○ alternate choice

order #	catalog #	grade TiAlN TiAlN	D1	D	D3	length of cut Ap1 max	L3	length L	BCH	ZU
2836090	TF6TNR16006	●	5/8	5/8	.588	1 5/8	3	5 1/8	.047	4
2836087	TF6TNR16016	●	5/8	5/8	.588	1 5/8	4	6 1/8	.047	4
2836081	TF6TNR19007	●	3/4	3/4	.705	1 5/8	4	6 1/4	.047	4
2836075	TF6TNR19017	●	3/4	3/4	.705	1 5/8	6	8 1/4	.047	4
2836068	TF6TNR25008	●	1	1	.940	2	4	6 1/2	.059	5
2836063	TF6TNR25018	●	1	1	.940	2	6	8 1/2	.059	5
2836059	TF6TNR32009	●	1 1/4	1 1/4	1.175	2	4	6 1/2	.059	6
2836054	TF6TNR32019	●	1 1/4	1 1/4	1.175	2	6	8 1/2	.059	6
2836048	TF6TNR32029	●	1 1/4	1 1/4	1.175	2	8	10 1/2	.059	6

NOTE: For application data, please see page O18.

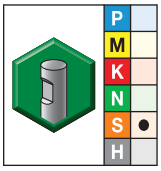
- Center cutting.
- NAS Type 986 46 + 66 compliant.
- Standard items listed. Additional styles and coatings made-to-order.

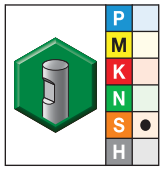


End Mill Tolerances

D1	tolerance	D	tolerance
All	+.002/-0.0	All	-0.0002/-0.0005

Series 3405 3415 3425 3435 3455 3407 3417 3427 3437 3457



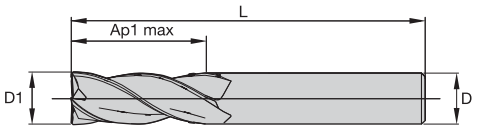


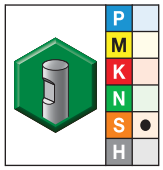
● first choice
○ alternate choice

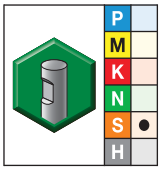
grade UNCOATED		grade TiAlN TiAlN						
order #	catalog #	order #	catalog #	D1	D	length of cut Ap1 max	length L	ZU
2866066	341510004		–	3/8	3/8	1 1/2	3 1/4	4
2866063	341513005	2838292	TF341513005	1/2	1/2	2	4	4
2866027	342513005		–	1/2	1/2	3	5	4
2866099	340516006		–	5/8	5/8	1 5/8	3 3/4	4
	–	2838285	TF341516006	5/8	5/8	2 1/2	4 5/8	4
2865994	343519007	2838241	TF343519007	3/4	3/4	2 1/4	4 1/2	4
	–	2838218	TF343719007	3/4	3/4	2 1/4	4 1/2	6
2866057	341519007	2838277	TF341519007	3/4	3/4	3	5 1/4	4
	–	2838260	TF341719007	3/4	3/4	3	5 1/4	6
2866021	342519007		–	3/4	3/4	4	6 1/4	4
2866009	342719007		–	3/4	3/4	4	6 1/4	6
2866090	340525008		–	1	1	2	4 1/2	4
2865990	343525008	2838234	TF343525008	1	1	3	5 1/2	4
2865982	343725008	2838212	TF343725008	1	1	3	5 1/2	6
2866036	341725008	2838254	TF341725008	1	1	4	6 1/2	6
2866051	341525008	2838273	TF341525008	1	1	4	6 1/2	4
2866018	342525008		–	1	1	6	8 1/2	4
2866006	342725008		–	1	1	6	8 1/2	6
2866072	340732009		–	1 1/4	1 1/4	2	4 1/2	6
2865988	343532009	2838227	TF343532009	1 1/4	1 1/4	3	5 1/2	4
2865978	343732009	2838205	TF343732009	1 1/4	1 1/4	3	5 1/2	6
	–	2838265	TF341532009	1 1/4	1 1/4	4	6 1/2	4
2866033	341732009	2838248	TF341732009	1 1/4	1 1/4	4	6 1/2	6
2866015	342532009		–	1 1/4	1 1/4	6	8 1/2	4

(continued)

(Series 3405 3415 3425 3435 3455 3407 3417 3427 3437 3457 — continued)







● first choice
○ alternate choice

grade UNCOATED		grade TiAlN TiAlN						
order #	catalog #	order #	catalog #	D1	D	length of cut Ap1 max	length L	ZU
2866003	342732009		–	1 1/4	1 1/4	6	8 1/2	6
2865999	342738009		–	1 1/2	1 1/4	6	8 1/2	6
2865975	343738009		–	1 1/2	1 1/2	3	5 1/2	6
2866030	341738009		–	1 1/2	1 1/2	4	6 1/2	6
2865960	345751020		–	2	2	2	5 3/4	6
2865958	345751030		–	2	2	3	6 3/4	6
2865955	345751040	2838177	TF345751040	2	2	4	7 3/4	6
2865969	345551040	2838193	TF345551040	2	2	4	7 3/4	4
2865951	345751060	2838170	TF345751060	2	2	6	9 3/4	6
2865948	345751080		–	2	2	8	11 3/4	6
2865963	345551080		–	2	2	8	11 3/4	4

NOTE: For application data, please see page O18.

Series 620W • WavCut I



Material Group		Side Milling (A) and Slotting (B)			uncoated			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.					
		A		B	Cutting Speed — vc SFM				D1 — Diameter				
								frac.	3/4	1	1 1/4	1 1/2	2
		ap	ae	ap	min		max	dec.	.7500	1.0000	1.2500	1.5000	2.0000
P	5	1.5 x D	0.4 x D	1 x D	30	–	50	IPT	.0030	.0040	.0045	.0050	.0055
M	1	1.5 x D	0.4 x D	1 x D	30	–	50	IPT	.0040	.0045	.0050	.0055	.0060
	2	1.5 x D	0.4 x D	1 x D	30	–	40	IPT	.0035	.0040	.0045	.0050	.0055
S	4	1.5 x D	0.4 x D	0.75 x D	50	–	70	IPT	.0033	.0040	.0050	.0055	.0060

NOTE: Side milling applications — For longest length tools, reduce ae by 30%.
Slot milling applications — For longest length tools, reduce ap by 30%.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >1/2".

Series 6A0R

Material Group		Side Milling (A) and Slotting (B)			uncoated			TiCN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.				
		A		B	Cutting Speed — vc SFM			Cutting Speed — vc SFM				D1 — Diameter			
											frac.	1/2	3/4	1	1 1/4
		ap	ae	ap	min		max	min		max	dec.	.5000	.7500	1.0000	1.2500
N	1	1.25 x D	0.5 x D	1 x D	1050	–	1750	1500	–	2500	IPT	.0055	.0075	.0085	.0100
	2	1.25 x D	0.5 x D	1 x D	840	–	1400	1200	–	2000	IPT	.0050	.0068	.0077	.0090

NOTE: Side milling applications — For longest length tools, reduce ae by 30%.
Slot milling applications — For longest length tools, reduce ap by 30%.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >1/2".

Series 6ANR

Material Group		Side Milling (A) and Slotting (B)			TiCN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.				
		A		B	Cutting Speed — vc SFM				D1 — Diameter			
								frac.	1/2	3/4	1	1 1/4
		ap	ae	ap	min		max	dec.	.5000	.7500	1.0000	1.2500
N	1	1 x D	0.3 x D	0.75 x D	1500	–	2500	IPT	.0055	.0075	.0085	.0100
	2	1 x D	0.3 x D	0.5 x D	1200	–	2000	IPT	.0050	.0068	.0077	.0090

NOTE: Side milling applications — For longest length tools, reduce ae by 30%.
Slot milling applications — For longest length tools, reduce ap by 30%.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >1/2".

Series 6T0R

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.						
		A		B	Cutting Speed — vc SFM				D1 — Diameter					
								frac.	1/2	5/8	3/4	1	1 1/4	1 1/2
		ap	ae	ap	min		max	dec.	.5000	.6250	.7500	1.0000	1.2500	1.5000
S	3	1.25 x D	0.5 x D	1 x D	50	–	90	IPT	.0028	.0033	.0036	.0040	.0050	.0060
	4	1.25 x D	0.3 x D	0.5 x D	50	–	90	IPT	.0026	.0030	.0033	.0036	.0045	.0055

NOTE: Side milling applications — For longest length tools, reduce ae by 30%.
Slot milling applications — For longest length tools, reduce ap by 30%.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >1/2".

Application Data • Series 6TNR

Series 6TNR

Material Group		Side Milling (A) and Slotting (B)			TiAlN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.				
		A		B	Cutting Speed — vc SFM				D1 — Diameter			
								frac.	5/8	3/4	1	1 1/4
		ap	ae	ap	min		max	dec.	.6250	.7500	1.0000	1.2500
S	3	0.75 x D	0.4 x D	0.5 x D	50	–	90	IPT	.0033	.0036	.0040	.0050
	4	0.75 x D	0.3 x D	0.3 x D	50	–	90	IPT	.0030	.0033	.0036	.0045

NOTE: Side milling applications — For longest length tools, reduce ae by 30%.
Slot milling applications — For longest length tools, reduce ap by 30%.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >1/2".

Application Data • Series 3405 3415 3425 3435 3455 3407 3417 3427 3437 3457

Series 3405 3415 3425 3435 3455 3407 3417 3427 3437 3457

Material Group		Side Milling (A) and Slotting (B)			uncoated			TiAlN			Recommended feed per tooth (IPT = inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.								
		A		B	Cutting Speed — vc SFM			Cutting Speed — vc SFM				D1 — Diameter							
											frac.	3/8	1/2	5/8	3/4	1	1 1/4	1 1/2	2
		ap	ae	ap	min		max	min		max	dec.	.3750	.5000	.6250	.7500	1.0000	1.2500	1.5000	2.0000
S	3	1.5 x D	0.1 x D	0.5 x D	50	–	80	50	–	90	IPT	.0020	.0025	.0029	.0032	.0038	.0042	.0045	.0048
	4	1.5 x D	0.1 x D	0.4 x D	40	–	60	50	–	90	IPT	.0018	.0023	.0026	.0029	.0035	.0038	.0041	.0044

NOTE: Side milling applications — For longest reach (L3) tools, reduce ae by 30%.
Slot milling applications — For longest reach (L3) tools, reduce ap by 30%.
For cutting aluminum with high silicon, coating is recommended.
Lower value of cutting speed is used for high stock removal applications or for higher hardness (machinability) within group.
Higher value of cutting speed is used for finishing applications or for lower hardness (machinability) within group.
Above parameters are based on ideal conditions. For smaller taper machining centers, please adjust parameters accordingly on diameters >1/2".