WIDIA™ HSS ER Rougher ADVANCES 2015

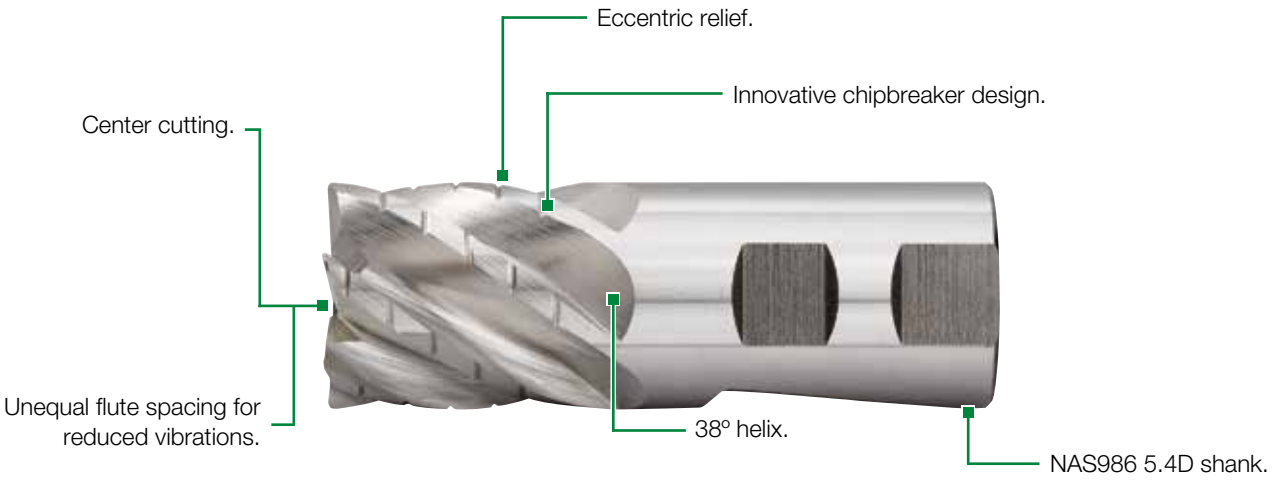
WIDIA™

High-Speed Steel 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.

HSS ER ROUGHER

- Six-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.

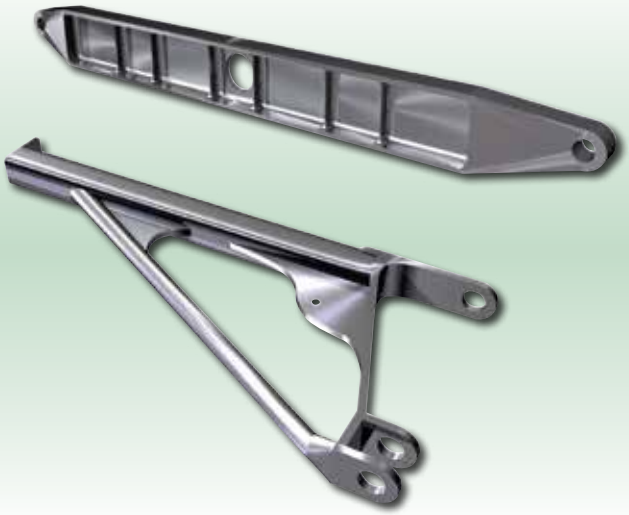


High-Speed Steel ER Rougher

- 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 length of cut.

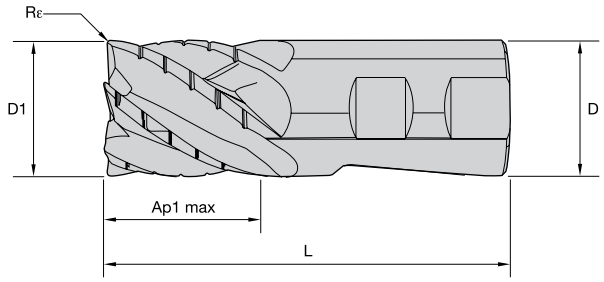


Application example

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

	M		S
	1	2	4
M42	●	●	●

P — Steels *K — Cast Iron* *S — High-Temp Alloys*
M — Stainless Steels *N — Non-Ferrous* *H — Hard Materials*

Series 620E • HSS-E ER Rougher • Lists 620E 621E 623E 625E

M42	D1	D	length of cut Ap1 max	length L	Rε
620E32009CW	1 1/4	1 1/4	2	4 1/2	.060
620E32009EW	1 1/4	1 1/4	2	4 1/2	.120
621E32009CW	1 1/4	1 1/4	4	6 1/2	.060
621E32009EW	1 1/4	1 1/4	4	6 1/2	.120
623E32009CW	1 1/4	1 1/4	3	5 1/2	.060
623E32009EW	1 1/4	1 1/4	3	5 1/2	.120
620E38009CW	1 1/2	1 1/4	2	4 1/2	.060
620E38009EW	1 1/2	1 1/4	2	4 1/2	.120
620E3800ACW	1 1/2	1 1/2	2	5 1/4	.060
620E3800AEW	1 1/2	1 1/2	2	5 1/4	.120
621E38009CW	1 1/2	1 1/4	4	6 1/2	.060
621E38009EW	1 1/2	1 1/4	4	6 1/2	.120
621E3800ACW	1 1/2	1 1/2	4	7 1/4	.060
621E3800AEW	1 1/2	1 1/2	4	7 1/4	.120
623E38009CW	1 1/2	1 1/4	3	5 1/2	.060
623E38009EW	1 1/2	1 1/4	3	5 1/2	.120
623E3800ACW	1 1/2	1 1/2	3	6 1/4	.060
623E3800AEW	1 1/2	1 1/2	3	6 1/4	.120
625E51022CW	2	2	2	5 3/4	.060
625E51022EW	2	2	2	5 3/4	.120
625E51032CW	2	2	3	6 3/4	.060
625E51032EW	2	2	3	6 3/4	.120
625E51042CW	2	2	4	7 3/4	.060
625E51042EW	2	2	4	7 3/4	.120
625E51062CW	2	2	6	9 3/4	.060
625E51062EW	2	2	6	9 3/4	.120

Series 620E • HSS-E ER Rougher • Lists 620E 621E 623E 625E											
											
		A		B	Uncoated			Recommended feed per tooth (IPT=inch/th) for side milling (A). For slotting (B), reduce IPT by 20%.			
					Cutting Speed — vc				D1 — Diameter		
					SFM			frac.	1 1/4	1 1/2	2
Material Group		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	0.0052	0.0053	0.0053
	2	1.5 x D	0.5 x D	1 x D	40	–	60	IPT	0.0042	0.0042	0.0043
S	4	1.5 x D	0.5 x D	1 x D	16	–	50	IPT	0.0038	0.0039	0.0039

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.

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