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DYNAMICS



Solid Carbide

Selected Factory Standards





The power of precision.

At W Dynamics, we believe precision isn't a feature — it's the foundation. Every cut, every pass, and every detail begins with a commitment to exactness. From high-efficiency milling to complex surface finishing, our cutting tools are designed to deliver results that move production forward with confidence and consistency.

We were founded on a simple idea: performance follows precision. That belief drives every innovation, every test, and every refinement in our design process. Our engineers work at the intersection of material science, machining technology, and real-world production feedback — ensuring that every tool head that leaves our floor performs to the same high standard as the one before it.

W Dynamics tools are built for the realities of modern CNC machining — faster feed rates, harder alloys, and tighter tolerances. Our cutting heads are optimized to maintain stability under load, reduce vibration, and extend tool life without sacrificing finish quality. Because in high-performance manufacturing, precision isn't optional — it's expected.

Our approach is rooted in dynamic thinking. We don't just react to change; we design for it. By continually evolving our geometries, coatings, and materials, we give machinists the flexibility to push limits and the reliability to repeat success, run after run. Each product we make is tested to perform under pressure — and to perform again.



Behind every tool is a team that understands the demands of the floor. We partner closely with our customers to solve challenges that can't be met by off-the-shelf solutions. From prototype to production, W Dynamics is built on collaboration, because innovation happens fastest when performance meets purpose.

Our catalog reflects more than a collection of products — it's a toolkit for precision. Inside, you'll find cutting heads engineered for strength, stability, and speed. Each design represents thousands of hours of testing, refinement, and feedback from the field. Together, they form a system built to maximize machine potential and operator control.

In an industry defined by microns and milliseconds, W Dynamics stands for the pursuit of better — not just in what we make, but in how we think.

**PERFORMANCE IN MOTION. PRECISION BY DESIGN.
THAT'S THE W DYNAMICS DIFFERENCE.**



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Premium quality tools for high performance.

W Dynamics Performance line offers premium tools designed for specific applications, delivering outstanding performance. For top-tier production results, choose our Premium tools.



Quality tools for standard applications.

W Dynamics Standard tools are powerful, reliable, and trusted worldwide. Ideal for standard applications, they guarantee optimal results.

Symbol explanation

Shank



Application



Machining example



The red arrows describe the possible feed directions



Number of flutes



$\lambda_s = 48^\circ$
 $\gamma_s = 10^\circ$
 \square_s = Helix Angle
 \square_s = Rake Angle



Variable helix angle



Unequal Helix



Cutting edge preparation



Square end



Corner chamfer (CHW = chamfer width in inch)











Corner radius



Full Radius

- Flute = Number of flutes
- = **Main Application**
- = Extended application

Micro end mills

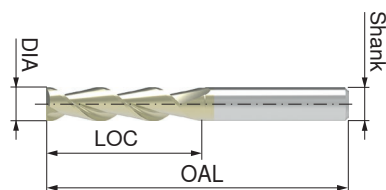
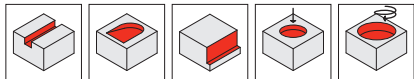
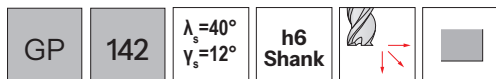
Performance line	Series	Number of flutes	Cutting diameter range	Ø DC	Material Compatibility							Cutting edge design	coated	uncoated	Page
					Steel	Stainless steel	Cast iron	Non-ferrous metals	Heat-resistant	Tempered steel	Non-metal materials				
	HP	501	4	0.005"–0.120"	•	•	•	•	•	•	•		•		68–70
	HP	504	4	0.005"–0.120"	•	•	•	•	•	•	•		•		71–73
	HP	503	4	0.005"–0.120"	•	•	•	•	•	•	•		•		74–76
	HP	506	4	0.005–0.120	•	•	•	•	•	•	•		•		77–79

On Request – other available micro end mills

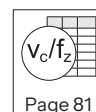
	Square		Radius		Ball	
	Available	Performance Line	Available	Performance Line	Available	Performance Line
2 Flute	•	GP			•	GP
3 Flute	•	GP / HP	•	HP	•	GP / HP
4 Flute	•	GP / HP	•	HP	•	GP / HP

LOC: 1.5xD / 3xD / 5xD / 8xD
 LOR: 5xD / 8xD / 12xD / 15xD

2 Flute with square end



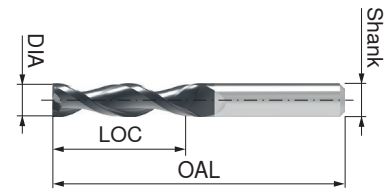
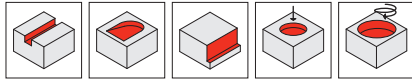
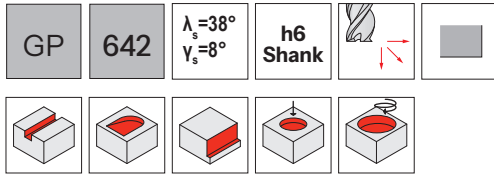
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material	
					uncoated	coated (ZrN)
1/8	1/8	1/4	1 1/2	2	23292155	23292156
1/8	1/8	3/8	1 1/2	2	23292131	23292132
5/32	3/16	5/16	2	2	23292157	23292158
5/32	3/16	9/16	2	2	23292133	23292134
3/16	3/16	5/16	2	2	23292159	23292150
3/16	3/16	9/16	2	2	23292135	23292136
7/32	1/4	3/8	2	2	23292161	23292162
1/4	1/4	3/8	2	2	23292163	23292164
1/4	1/4	3/4	2 1/2	2	23292137	23292138
1/4	1/4	1 1/4	3 1/2	2	23292173	23292174
5/16	5/16	13/16	2 1/2	2	23292141	23292142
5/16	5/16	1 1/4	4	2	23292175	23292176
5/16	5/16	2 1/8	4	2	23292183	23292184
11/32	3/8	1	2 1/2	2	23292143	23292144
3/8	3/8	1/2	2 1/2	2	23292165	23292166
3/8	3/8	1	2 1/2	2	23292145	23292146
3/8	3/8	1 1/2	4	2	23292177	23292178
3/8	3/8	2 1/2	6	2	23292185	23292186
1/2	1/2	5/8	2 1/2	2	23292167	23292168
1/2	1/2	1 1/4	3	2	23292149	23292140
1/2	1/2	2	4	2	23292179	23292170
1/2	1/2	3	6	2	23292187	23292188
5/8	5/8	15/8	3 1/2	2	23292151	23292152
3/4	3/4	1	4	2	23292169	23292160
3/4	3/4	15/8	4	2	23292153	23292154
3/4	3/4	3	6	2	23292181	23292182
3/4	3/4	4	7	2	23292189	23292180
1	1	2	5	2	23292129	23292120
1	1	3	6	2	23292171	23292172



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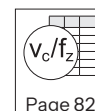
P	•
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2 Flute with square end



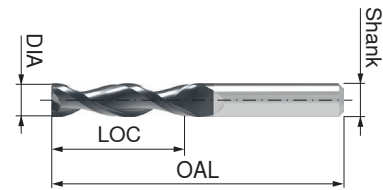
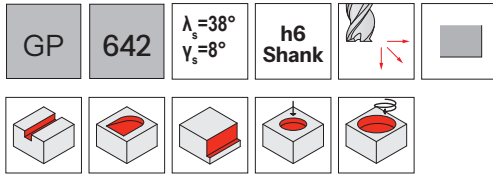
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material	
					uncoated	coated (AlTiN)
1/16	1/8	1/8	11/2	2	23292683	23292685
1/16	1/8	3/16	11/2	2	23292344	23292346
3/32	1/8	3/16	11/2	2	23292689	23292691
3/32	1/8	9/32	11/2	2	23292353	23292355
1/8	1/8	1/4	11/2	2	25542246	25542247
1/8	1/8	1/2	11/2	2	25542248	25542249
1/8	1/8	3/4	3	2	25542262	25542263
1/8	1/8	3/4	2 1/2	2	25542250	25542261
1/8	1/8	1	3	2	25542264	25542265
5/32	3/16	3/8	2	2	25542266	25542267
5/32	3/16	1/2	2	2	25542268	25542269
5/32	3/16	3/4	2 1/2	2	25542260	25542271
3/16	3/16	3/8	2	2	25542272	25542273
3/16	3/16	5/8	2	2	25542274	25542275
3/16	3/16	1	2 1/2	2	25542280	25542291
3/16	3/16	3/4	2 1/2	2	25542288	25542289
3/16	3/16	11/8	3	2	25542294	25542295
3/16	3/16	1	4	2	25542292	25542293
7/32	1/4	3/8	2	2	25542296	25542297
7/32	1/4	5/8	2 1/2	2	25542298	25542299
7/32	1/4	1	3	2	25542290	25542201
1/4	1/4	3/8	2	2	25542202	25542203
1/4	1/4	11/8	3	2	25542322	25542323
1/4	1/4	1	4	2	25542310	25542321
1/4	1/4	3/4	2 1/2	2	25542204	25542205
1/4	1/4	11/4	3	2	25542324	25542325
1/4	1/4	11/2	4	2	25542326	25542327
1/4	1/4	11/2	6	2	25542328	25542329
9/32	5/16	1/2	2	2	25542320	25542331
9/32	5/16	3/4	2 1/2	2	25542332	25542333
9/32	5/16	11/4	3	2	25542334	25542335
5/16	5/16	1/2	2	2	25542336	25542337
5/16	5/16	3/4	2 1/2	2	25542338	25542339
5/16	5/16	13/8	3	2	25542358	25542359
5/16	5/16	1	4	2	25542354	25542355
5/16	5/16	11/8	3	2	25542356	25542357
5/16	5/16	15/8	4	2	25542362	25542363
5/16	5/16	11/2	6	2	25542350	25542361

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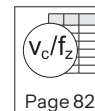


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2 Flute with square end



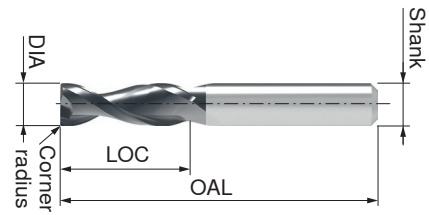
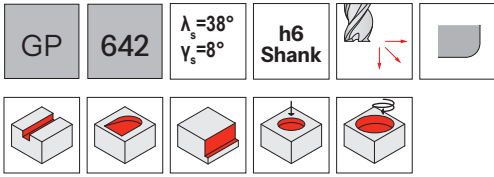
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material	
					uncoated	coated (AlTiN)
3/8	3/8	5/8	2	2	25542364	25542365
3/8	3/8	7/8	2 1/2	2	25542366	25542367
3/8	3/8	13/8	3	2	25542388	25542389
3/8	3/8	1	4	2	25542384	25542385
3/8	3/8	11/8	3	2	25542386	25542387
3/8	3/8	13/4	4	2	25542392	25542393
3/8	3/8	11/2	6	2	25542380	25542391
3/8	3/8	3	6	2	25542394	25542395
1/2	1/2	5/8	2 1/2	2	25542396	25542397
1/2	1/2	1	3	2	25542398	25542399
1/2	1/2	1	4	2	25542416	25542417
1/2	1/2	1 1/2	3 1/2	2	25542418	25542419
1/2	1/2	2	4	2	25542422	25542423
1/2	1/2	1 1/2	6	2	25542410	25542421
1/2	1/2	3	6	2	25542424	25542425
5/8	5/8	7/8	3	2	25542426	25542427
5/8	5/8	1 1/4	3 1/2	2	25542428	25542429
5/8	5/8	2	6	2	25542430	25542441
5/8	5/8	2 1/8	4 5/8	2	25542442	25542443
5/8	5/8	3	6	2	25542444	25542445
3/4	3/4	1	3	2	25542446	25542447
3/4	3/4	1 1/2	4	2	25542448	25542449
3/4	3/4	2	6	2	25542450	25542461
3/4	3/4	2 1/4	5	2	25542462	25542463
3/4	3/4	3	6	2	25542464	25542465
1	1	13/4	4	2	25542466	25542467
1	1	2	6	2	25542468	25542469
1	1	2 1/4	5	2	25542460	25542471
1	1	3	6	2	25542472	25542473



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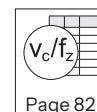
P	•
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2 Flute with corner Radius



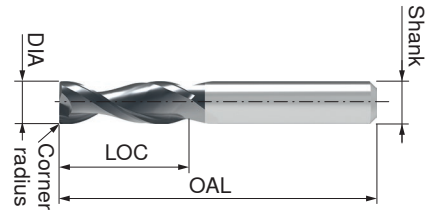
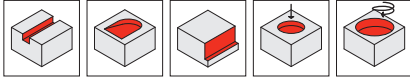
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						uncoated	coated (AlTiN)
1/8	1/8	1/2	1 1/2	0.010	2	25542251	
1/8	1/8	1/2	1 1/2	0.015	2	25542252	
1/8	1/8	1/2	1 1/2	0.020	2		25542255
1/8	1/8	1/2	1 1/2	0.030	2		25542257
1/8	1/8	1/2	1 1/2	0.045	2		25542257
3/16	3/16	5/8	2	0.010	2		25542277
3/16	3/16	5/8	2	0.015	2		25542277
3/16	3/16	5/8	2	0.020	2		25542281
3/16	3/16	5/8	2	0.030	2		25542283
3/16	3/16	5/8	2	0.045	2		25542285
3/16	3/16	5/8	2	0.060	2		25542287
1/4	1/4	3/4	2 1/2	0.010	2		25542207
1/4	1/4	3/4	2 1/2	0.015	2		25542209
1/4	1/4	3/4	2 1/2	0.020	2		25542311
1/4	1/4	3/4	2 1/2	0.030	2		25542313
1/4	1/4	3/4	2 1/2	0.045	2		25542315
1/4	1/4	3/4	2 1/2	0.060	2		25542317
1/4	1/4	3/4	2 1/2	0.090	2		25542319
5/16	5/16	3/4	2 1/2	0.010	2		25542341
5/16	5/16	3/4	2 1/2	0.015	2		25542343
5/16	5/16	3/4	2 1/2	0.020	2		25542345
5/16	5/16	3/4	2 1/2	0.030	2		25542347
5/16	5/16	3/4	2 1/2	0.045	2		25542349
5/16	5/16	3/4	2 1/2	0.060	2		25542351
5/16	5/16	3/4	2 1/2	0.090	2		25542353
3/8	3/8	7/8	2 1/2	0.010	2		25542369
3/8	3/8	7/8	2 1/2	0.015	2		25542371
3/8	3/8	7/8	2 1/2	0.020	2		25542373
3/8	3/8	7/8	2 1/2	0.030	2		25542375
3/8	3/8	7/8	2 1/2	0.045	2		25542377
3/8	3/8	7/8	2 1/2	0.060	2		25542379
3/8	3/8	7/8	2 1/2	0.090	2		25542381
3/8	3/8	7/8	2 1/2	0.125	2		25542383

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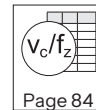


P	●
M	●
K	●
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2 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	Corner radius inch	Flute	Material	
						uncoated	coated (AlTiN)
1/2	1/2	1	3	0.010	2		25542301
1/2	1/2	1	3	0.015	2		25542303
1/2	1/2	1	3	0.020	2		25542305
1/2	1/2	1	3	0.030	2		25542307
1/2	1/2	1	3	0.045	2		25542309
1/2	1/2	1	3	0.060	2		25542411
1/2	1/2	1	3	0.090	2		25542413
1/2	1/2	1	3	0.125	2		25542415
5/8	5/8	11/4	3 1/2	0.030	2		25542431
5/8	5/8	11/4	3 1/2	0.045	2		25542433
5/8	5/8	11/4	3 1/2	0.060	2		25542435
5/8	5/8	11/4	3 1/2	0.090	2		25542437
5/8	5/8	11/4	3 1/2	0.125	2		25542439
3/4	3/4	1 1/2	4	0.030	2		25542451
3/4	3/4	1 1/2	4	0.045	2		25542453
3/4	3/4	1 1/2	4	0.060	2		25542455
3/4	3/4	1 1/2	4	0.090	2		25542457
3/4	3/4	1 1/2	4	0.125	2		25542459

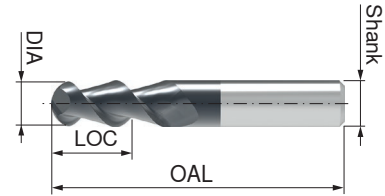


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P	•
M	•
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2 Flute with Ball Nosed

GP	662	$\lambda_s = 38^\circ$ $\gamma_s = 8^\circ$	h6 Shank		
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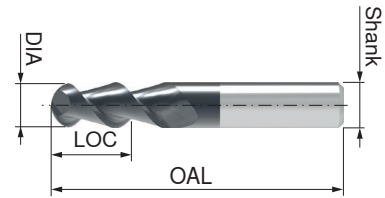
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material	
					uncoated	coated (AlTiN)
1/16	1/8	1/8	11/2	2	23295181	23295183
1/16	1/8	3/16	11/2	2	23294013	23294015
1/8	1/8	1/4	11/2	2	25543442	25543443
1/8	1/8	1/2	11/2	2	25543444	25543445
1/8	1/8	3/4	2 1/2	2	25543446	25543447
1/8	1/8	1	3	2	25543440	25543451
1/8	1/8	3/4	3	2	25543448	25543449
3/16	3/16	3/8	2	2	25543452	25543453
3/16	3/16	5/8	2	2	25543454	25543455
3/16	3/16	1	4	2	25543458	25543459
3/16	3/16	3/4	2 1/2	2	25543456	25543457
3/16	3/16	11/8	3	2	25543450	25543461
1/4	1/4	3/8	2	2	25543462	25543463
1/4	1/4	3/4	2 1/2	2	25543464	25543465
1/4	1/4	11/8	3	2	25543468	25543469
1/4	1/4	1	4	2	25543466	25543467
1/4	1/4	11/2	4	2	25543460	25543471
1/4	1/4	11/2	6	2	25543472	25543473
5/16	5/16	1/2	2	2	25543474	25543475
5/16	5/16	3/4	2 1/2	2	25543476	25543477
5/16	5/16	11/8	3	2	25543470	25543481
5/16	5/16	1	4	2	25543478	25543479
5/16	5/16	11/2	6	2	25543482	25543483
5/16	5/16	15/8	4	2	25543484	25543485
3/8	3/8	5/8	2	2	25543486	25543487
3/8	3/8	7/8	2 1/2	2	25543488	25543489
3/8	3/8	11/2	6	2	25543494	25543495
3/8	3/8	1	4	2	25543480	25543491
3/8	3/8	11/8	3	2	25543492	25543493
3/8	3/8	13/4	4	2	25543496	25543497
3/8	3/8	3	6	2	25543498	25543499
1/2	1/2	5/8	2 1/2	2	25543490	25543401
1/2	1/2	1	3	2	25543402	25543403
1/2	1/2	11/2	6	2	25543406	25543407
1/2	1/2	1	4	2	25543404	25543405
1/2	1/2	2	4	2	25543408	25543409
1/2	1/2	3	6	2	25543400	25543511

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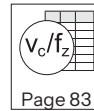
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2 Flute with Ball Nosed

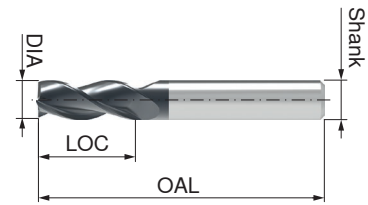
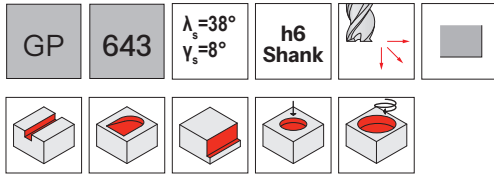


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material	
					uncoated	coated (AlTiN)
5/8	5/8	7/8	3	2	25543512	25543513
5/8	5/8	11/4	3 1/2	2	25543514	25543515
5/8	5/8	2 1/8	4 5/8	2	25543518	25543519
5/8	5/8	2	6	2	25543516	25543517
5/8	5/8	3	6	2	25543510	25543521
3/4	3/4	1	3	2	25543522	25543523
3/4	3/4	1 1/2	4	2	25543524	25543525
3/4	3/4	2 1/4	5	2	25543528	25543529
3/4	3/4	2	6	2	25543526	25543527
3/4	3/4	3	6	2	25543520	25543531
1	1	2	6	2	25543534	25543535
1	1	2 1/4	5	2	25543536	25543537
1	1	1 3/4	4	2	25543532	25543533
1	1	3	6	2	25543538	25543539



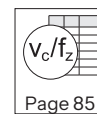
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3 Flute with square end



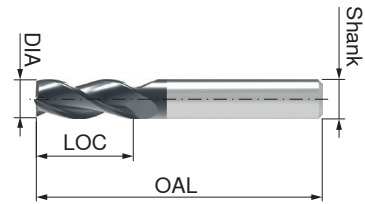
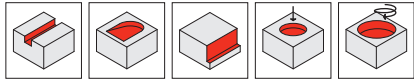
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
1/16	1/8	1/8	11/2	3	23293264
1/16	1/8	11/2	1/8	3	23292964
5/64	1/8	1/4	11/2	3	23292967
3/32	1/8	3/16	11/2	3	23293267
3/32	1/8	11/2	1/8	3	23292960
1/8	1/8	1/4	11/2	3	25542476
1/8	1/8	1/2	11/2	3	25542478
1/8	1/8	3/4	3	3	25542492
1/8	1/8	21/2	1/8	3	25542480
1/8	1	3	1/8	3	25542494
5/32	3/16	3/8	2	3	25542496
5/32	3/16	2	3/16	3	25542498
3/16	3/16	3/8	2	3	25542490
3/16	3/16	5/8	2	3	25542402
3/16	3/16	1	21/2	3	25542518
3/16	3/16	21/2	3/16	3	25542516
3/16	3/16	4	3/16	3	25542510
3/16	3/16	3	3/16	3	25542522
7/32	1/4	3/8	2	3	25542524
7/32	1/4	21/2	1/4	3	25542526
1/4	1/4	3/8	2	3	25542528
1/4	1/4	3/4	21/2	3	25542520
1/4	1/4	11/8	3	3	25542548
1/4	1/4	4	1/4	3	25542546
1/4	1/4	6	1/4	3	25542552
1/4	1/4	4	1/4	3	25542540
9/32	5/16	1/2	2	3	25542554
9/32	5/16	21/2	5/16	3	25542556
5/16	5/16	1/2	2	3	25542558
5/16	5/16	3/4	21/2	3	25542550
5/16	5/16	11/8	3	3	25542578
5/16	5/16	4	5/16	3	25542576
5/16	5/16	6	5/16	3	25542570
5/16	5/16	4	5/16	3	25542582

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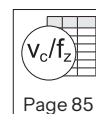


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3 Flute with square end



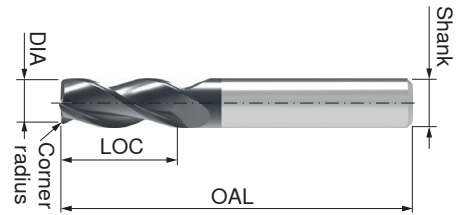
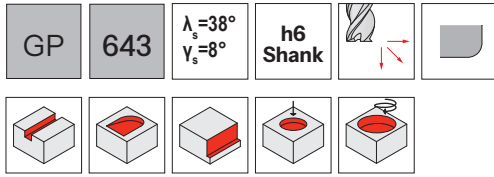
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
3/8	3/8	5/8	2	3	25542584
3/8	3/8	7/8	2 1/2	3	25542586
3/8	3/8	1 1/8	3	3	25542506
3/8	3/8	1 1/2	6	3	25542508
3/8	3/8	4	3/8	3	25542504
3/8	3/8	4	3/8	3	25542500
3/8	3/8	6	3/8	3	25542612
1/2	1/2	5/8	2 1/2	3	25542614
1/2	1/2	1	3	3	25542616
1/2	1/2	1 1/2	6	3	25542636
1/2	1/2	4	1/2	3	25542634
1/2	1/2	4	1/2	3	25542638
1/2	1/2	6	1/2	3	25542630
5/8	5/8	7/8	3	3	25542642
5/8	5/8	1 1/4	3 1/2	3	25542644
5/8	5/8	2 1/8	4 5/8	3	25542662
5/8	5/8	6	5/8	3	25542650
5/8	5/8	6	5/8	3	25542664
3/4	3/4	1	3	3	25542666
3/4	3/4	1 1/2	4	3	25542668
3/4	3/4	2 1/4	5	3	25542684
3/4	3/4	6	3/4	3	25542682
3/4	3/4	6	3/4	3	25542686
1	1	1 3/4	4	3	25542688
1	1	2 1/4	5	3	25542602
1	1	6	1	3	25542690
1	1	6	1	3	25542604



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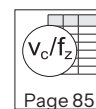
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3 Flute with corner Radius



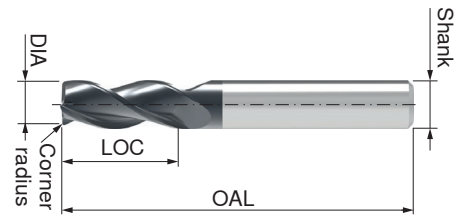
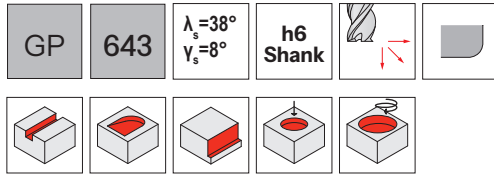
DIA inch	Shank inch	LOC inch	OAL inch	Corner radius inch	Flute	Material coated (AlTiN)
1/8	1/8	1/2	1 1/2	0.010	3	25542470
1/8	1/8	1/2	1 1/2	0.015	3	25542482
1/8	1/8	1/2	1 1/2	0.020	3	25542484
1/8	1/8	1/2	1 1/2	0.030	3	25542486
1/8	1/8	1/2	1 1/2	0.045	3	25542488
3/16	3/16	5/8	2	0.010	3	25542404
3/16	3/16	5/8	2	0.015	3	25542406
3/16	3/16	5/8	2	0.020	3	25542408
3/16	3/16	5/8	2	0.030	3	25542400
3/16	3/16	5/8	2	0.045	3	25542512
3/16	3/16	5/8	2	0.060	3	25542514
1/4	1/4	3/4	2 1/2	0.010	3	25542532
1/4	1/4	3/4	2 1/2	0.015	3	25542534
1/4	1/4	3/4	2 1/2	0.020	3	25542536
1/4	1/4	3/4	2 1/2	0.030	3	25542538
1/4	1/4	3/4	2 1/2	0.045	3	25542530
1/4	1/4	3/4	2 1/2	0.060	3	25542542
1/4	1/4	3/4	2 1/2	0.090	3	25542544
5/16	5/16	3/4	2 1/2	0.010	3	25542562
5/16	5/16	3/4	2 1/2	0.015	3	25542564
5/16	5/16	3/4	2 1/2	0.020	3	25542566
5/16	5/16	3/4	2 1/2	0.030	3	25542568
5/16	5/16	3/4	2 1/2	0.045	3	25542560
5/16	5/16	3/4	2 1/2	0.060	3	25542572
5/16	5/16	3/4	2 1/2	0.090	3	25542574
3/8	3/8	7/8	2 1/2	0.010	3	25542588
3/8	3/8	7/8	2 1/2	0.015	3	25542580
3/8	3/8	7/8	2 1/2	0.020	3	25542592
3/8	3/8	7/8	2 1/2	0.030	3	25542594
3/8	3/8	7/8	2 1/2	0.045	3	25542596
3/8	3/8	7/8	2 1/2	0.060	3	25542598
3/8	3/8	7/8	2 1/2	0.090	3	25542590
3/8	3/8	7/8	2 1/2	0.125	3	25542502

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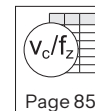


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3 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	Corner radius inch	Flute	Material coated (AlTiN)
1/2	1/2	1	3	0.010	3	25542618
1/2	1/2	1	3	0.015	3	25542610
1/2	1/2	1	3	0.020	3	25542622
1/2	1/2	1	3	0.030	3	25542624
1/2	1/2	1	3	0.045	3	25542626
1/2	1/2	1	3	0.060	3	25542628
1/2	1/2	1	3	0.090	3	25542620
1/2	1/2	1	3	0.125	3	25542632
5/8	5/8	11/4	3 1/2	0.015	3	25542646
5/8	5/8	11/4	3 1/2	0.020	3	25542648
5/8	5/8	11/4	3 1/2	0.030	3	25542640
5/8	5/8	11/4	3 1/2	0.045	3	25542652
5/8	5/8	11/4	3 1/2	0.060	3	25542654
5/8	5/8	11/4	3 1/2	0.090	3	25542656
5/8	5/8	11/4	3 1/2	0.125	3	25542658
3/4	3/4	1 1/2	4	0.020	3	25542660
3/4	3/4	1 1/2	4	0.030	3	25542672
3/4	3/4	1 1/2	4	0.045	3	25542674
3/4	3/4	1 1/2	4	0.060	3	25542676
3/4	3/4	1 1/2	4	0.090	3	25542678
3/4	3/4	1 1/2	4	0.125	3	25542670
1	1	13/4	4	0.030	3	25542680
1	1	13/4	4	0.045	3	25542692
1	1	13/4	4	0.060	3	25542694
1	1	13/4	4	0.090	3	25542696
1	1	13/4	4	0.125	3	25542698

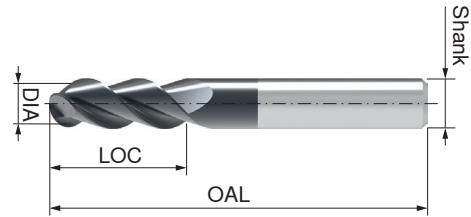


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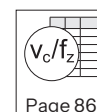
3 Flute with Ball Nosed

GP	663	$\lambda_s=38^\circ$ $\gamma_s=8^\circ$	h6 Shank		
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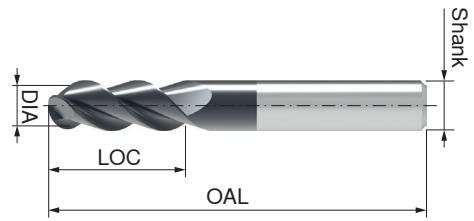
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
1/8	1/8	1/2	1 1/2	3	25543543
1/8	1/8	1/4	1 1/2	3	25543541
1/8	1/8	3/4	3	3	25543547
1/8	1/8	3/4	2 1/2	3	25543545
1/8	1/8	1	3	3	25543549
3/16	3/16	5/8	2	3	25543553
3/16	3/16	3/8	2	3	25543551
3/16	3/16	1	2 1/2	3	25543559
3/16	3/16	3/4	2 1/2	3	25543555
3/16	3/16	1 1/8	3	3	25543561
3/16	3/16	1	4	3	25543559
1/4	1/4	3/8	2	3	25543563
1/4	1/4	3/4	2 1/2	3	25543565
1/4	1/4	1	4	3	25543567
1/4	1/4	1 1/8	3	3	25543569
1/4	1/4	1 1/2	4	3	25543571
1/4	1/4	1 1/2	6	3	25543573
5/16	5/16	3/4	2 1/2	3	25543575
5/16	5/16	1	4	3	25543577
5/16	5/16	1 1/2	6	3	25543579
3/8	3/8	5/8	2	3	25543581
3/8	3/8	7/8	2 1/2	3	25543583
3/8	3/8	1 1/8	3	3	25543587
3/8	3/8	1 1/2	6	3	25543589
3/8	3/8	1 3/4	4	3	25543591
3/8	3/8	1	4	3	25543585
3/8	3/8	3	6	3	25543593
1/2	1/2	5/8	2 1/2	3	25543595
1/2	1/2	1	3	3	25543597
1/2	1/2	1 1/2	6	3	25543501
1/2	1/2	1	4	3	25543599
1/2	1/2	2	4	3	25543503
1/2	1/2	3	6	3	25543505

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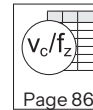
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3 Flute with Ball Nosed

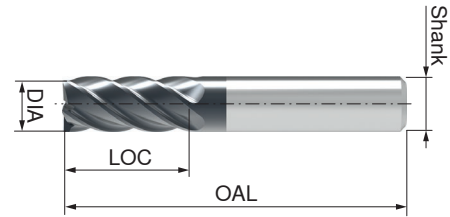
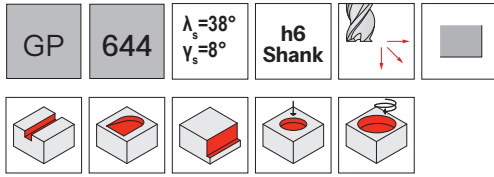


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
5/8	5/8	11/4	3 1/2	3	25543507
5/8	5/8	2 1/8	4 5/8	3	25543611
5/8	5/8	2	6	3	25543509
5/8	5/8	3	6	3	25543613
3/4	3/4	1 1/2	4	3	25543615
3/4	3/4	2 1/4	5	3	25543619
3/4	3/4	3	6	3	25543621
3/4	3/4	2	6	3	25543617
1	1	1 3/4	4	3	25543623
1	1	2 1/4	5	3	25543627
1	1	2	6	3	25543625
1	1	3	6	3	25543629

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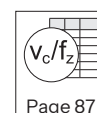


4 Flute with square end



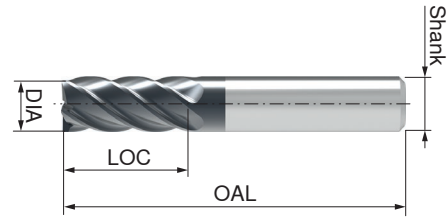
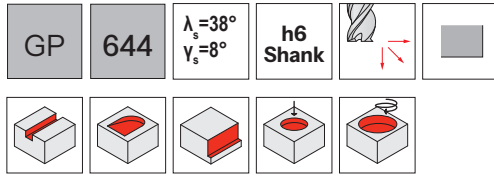
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
1/32	1/8	1/16	11/2	4	23293704
1/32	1/8	3/32	11/2	4	23293432
3/64	1/8	3/32	11/2	4	23293700
3/64	1/8	9/64	11/2	4	23293438
1/16	1/8	1/8	11/2	4	23293816
1/16	1/8	3/16	11/2	4	23293444
5/64	1/8	1/4	11/2	4	23293447
3/32	1/8	3/16	11/2	4	23293822
3/32	1/8	9/32	11/2	4	23293453
7/64	1/8	3/16	11/2	4	23293888
7/64	1/8	3/8	11/2	4	23293546
1/8	1/8	1/4	11/2	4	25542606
1/8	1/8	1/2	11/2	4	25542718
1/8	1/8	3/4	3	4	25542720
1/8	1/8	3/4	2 1/2	4	25542728
1/8	1/8	1	3	4	25542732
5/32	3/16	3/8	2	4	25542744
5/32	3/16	1/2	2	4	25542746
5/32	3/16	3/4	2 1/2	4	25542748
3/16	3/16	3/8	2	4	25542740
3/16	3/16	5/8	2	4	25542764
3/16	3/16	1	2 1/2	4	25542770
3/16	3/16	3/4	2 1/2	4	25542778
3/16	3/16	1 1/8	3	4	25542796
3/16	3/16	1	4	4	25542782
7/32	1/4	3/8	2	4	25542700
7/32	1/4	5/8	2 1/2	4	25542812
7/32	1/4	1	3	4	25542814
1/4	1/4	3/8	2	4	25542816
1/4	1/4	3/4	2 1/2	4	25542832
1/4	1/4	1 1/4	3	4	25542870
1/4	1/4	1	4	4	25542848
1/4	1/4	1 1/8	3	4	25542864
1/4	1/4	1 1/2	4	4	25542882
1/4	1/4	1 1/2	6	4	25542898
9/32	5/16	1/2	2	4	25542914
9/32	5/16	3/4	2 1/2	4	25542916
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5/16	5/16	1/2	2	4	25542910

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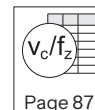


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4 Flute with square end

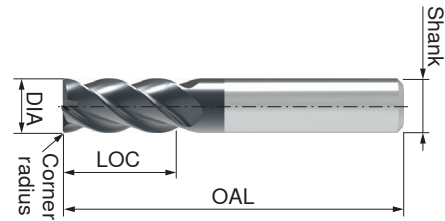
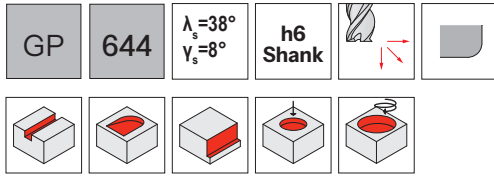


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
5/16	5/16	3/4	21/2	4	25542938
5/16	5/16	13/8	3	4	25542992
5/16	5/16	1	4	4	25542956
5/16	5/16	11/8	3	4	25542974
5/16	5/16	15/8	4	4	25542012
5/16	5/16	11/2	6	4	25542994
3/8	3/8	5/8	2	4	25542020
3/8	3/8	7/8	21/2	4	25542048
3/8	3/8	11/8	3	4	25542084
3/8	3/8	13/8	3	4	25542002
3/8	3/8	1	4	4	25542066
3/8	3/8	13/4	4	4	25543122
3/8	3/8	11/2	6	4	25542004
3/8	3/8	3	6	4	25543130
1/2	1/2	5/8	21/2	4	25543158
1/2	1/2	1	3	4	25543176
1/2	1/2	11/2	31/2	4	25543212
1/2	1/2	11/2	6	4	25543214
5/8	5/8	7/8	3	4	25543268
1/2	1/2	1	4	4	25543194
1/2	1/2	2	4	4	25543232
1/2	1/2	3	6	4	25543240
5/8	5/8	11/4	31/2	4	25543260
5/8	5/8	2	6	4	25543286
5/8	5/8	3	6	4	25543318
5/8	5/8	21/8	45/8	4	25543202
3/4	3/4	1	3	4	25543334
3/4	3/4	11/2	4	4	25543336
3/4	3/4	21/4	5	4	25543365
3/4	3/4	2	6	4	25543351
3/4	3/4	3	6	4	25543379
1	1	13/4	4	4	25543393
1	1	21/4	5	4	25543419
1	1	2	6	4	25543307
1	1	3	6	4	25543431



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4 Flute with corner Radius



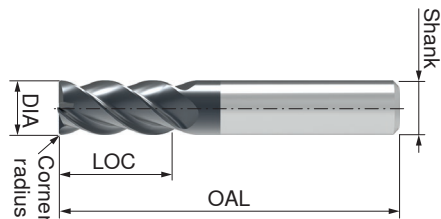
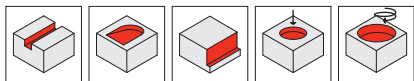
DIA inch	Shank inch	LOC inch	OAL inch	Corner radius inch	Flute	Material coated (AlTiN)
1/8	1/8	1/4	1 1/2	0.010	4	25542608
1/8	1/8	1/4	1 1/2	0.015	4	25542600
1/8	1/8	1/4	1 1/2	0.020	4	25542712
1/8	1/8	1/4	1 1/2	0.030	4	25542714
1/8	1/8	1/4	1 1/2	0.045	4	25542716
3/16	3/16	3/8	2	0.010	4	25542752
3/16	3/16	3/8	2	0.015	4	25542754
3/16	3/16	3/8	2	0.020	4	25542756
3/16	3/16	3/8	2	0.030	4	25542758
3/16	3/16	3/8	2	0.045	4	25542750
3/16	3/16	3/8	2	0.060	4	25542762
1/4	1/4	3/8	2	0.010	4	25542818
1/4	1/4	3/8	2	0.015	4	25542810
1/4	1/4	3/8	2	0.020	4	25542822
1/4	1/4	3/8	2	0.030	4	25542824
1/4	1/4	3/8	2	0.045	4	25542826
1/4	1/4	3/8	2	0.060	4	25542828
1/4	1/4	3/8	2	0.090	4	25542820
1/4	1/4	3/4	2 1/2	0.010	4	25542834
1/4	1/4	3/4	2 1/2	0.015	4	25542836
1/4	1/4	3/4	2 1/2	0.020	4	25542838
1/4	1/4	3/4	2 1/2	0.030	4	25542830
1/4	1/4	3/4	2 1/2	0.045	4	25542842
1/4	1/4	3/4	2 1/2	0.060	4	25542844
1/4	1/4	3/4	2 1/2	0.090	4	25542846
5/16	5/16	1/2	2	0.010	4	25542922
5/16	5/16	1/2	2	0.015	4	25542924
5/16	5/16	1/2	2	0.020	4	25542926
5/16	5/16	1/2	2	0.030	4	25542928
5/16	5/16	1/2	2	0.045	4	25542920
5/16	5/16	1/2	2	0.060	4	25542932
5/16	5/16	1/2	2	0.090	4	25542934
5/16	5/16	1/2	2	0.125	4	25542936
5/16	5/16	3/4	2 1/2	0.010	4	25542930
5/16	5/16	3/4	2 1/2	0.015	4	25542942
5/16	5/16	3/4	2 1/2	0.020	4	25542944
5/16	5/16	3/4	2 1/2	0.030	4	25542946
5/16	5/16	3/4	2 1/2	0.045	4	25542948
5/16	5/16	3/4	2 1/2	0.060	4	25542940

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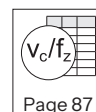
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4 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	Corner radius inch	Flute	Material coated (AlTiN)
5/16	5/16	3/4	2 1/2	0.090	4	25542952
3/8	3/8	5/8	2	0.010	4	25542032
3/8	3/8	5/8	2	0.015	4	25542034
3/8	3/8	5/8	2	0.020	4	25542036
3/8	3/8	5/8	2	0.030	4	25542038
3/8	3/8	5/8	2	0.045	4	25542030
3/8	3/8	5/8	2	0.060	4	25542042
3/8	3/8	5/8	2	0.090	4	25542044
3/8	3/8	5/8	2	0.125	4	25542046
3/8	3/8	7/8	2 1/2	0.010	4	25542040
3/8	3/8	7/8	2 1/2	0.015	4	25542052
3/8	3/8	7/8	2 1/2	0.020	4	25542054
3/8	3/8	7/8	2 1/2	0.030	4	25542056
3/8	3/8	7/8	2 1/2	0.045	4	25542058
3/8	3/8	7/8	2 1/2	0.060	4	25542050
3/8	3/8	7/8	2 1/2	0.090	4	25542062
3/8	3/8	7/8	2 1/2	0.125	4	25542064
1/2	1/2	5/8	2 1/2	0.010	4	25543150
1/2	1/2	5/8	2 1/2	0.015	4	25543162
1/2	1/2	5/8	2 1/2	0.020	4	25543164
1/2	1/2	5/8	2 1/2	0.030	4	25543166
1/2	1/2	5/8	2 1/2	0.045	4	25543168
1/2	1/2	5/8	2 1/2	0.060	4	25543160
1/2	1/2	5/8	2 1/2	0.090	4	25543172
1/2	1/2	5/8	2 1/2	0.125	4	25543174
1/2	1/2	1	3	0.010	4	25543178
1/2	1/2	1	3	0.015	4	25543170
1/2	1/2	1	3	0.020	4	25543182
1/2	1/2	1	3	0.030	4	25543184
1/2	1/2	1	3	0.045	4	25543186
1/2	1/2	1	3	0.060	4	25543188
1/2	1/2	1	3	0.090	4	25543180
1/2	1/2	1	3	0.125	4	25543192
1/2	1/2	1	4	0.010	4	25543196
1/2	1/2	1	4	0.015	4	25543198
1/2	1/2	1	4	0.020	4	25543190
1/2	1/2	1	4	0.030	4	25543102
1/2	1/2	1	4	0.045	4	25543104
1/2	1/2	1	4	0.060	4	25543106

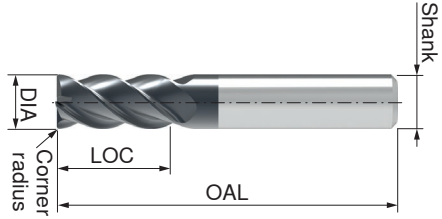
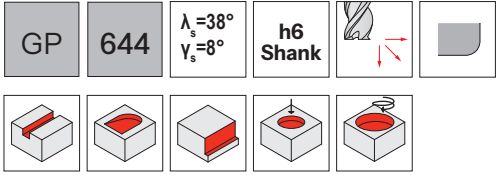
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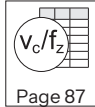
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4 Flute with corner Radius

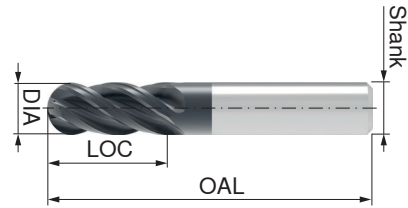
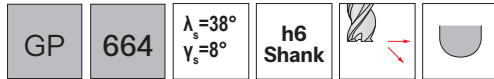


DIA inch	Shank inch	LOC inch	OAL inch	Corner radius inch	Flute	Material coated (AlTiN)
1/2	1/2	1	4	0.090	4	25543108
1/2	1/2	1	4	0.125	4	25543100
5/8	5/8	1 1/4	3 1/2	0.015	4	25543272
5/8	5/8	1 1/4	3 1/2	0.020	4	25543274
5/8	5/8	1 1/4	3 1/2	0.030	4	25543276
5/8	5/8	1 1/4	3 1/2	0.045	4	25543278
5/8	5/8	1 1/4	3 1/2	0.060	4	25543270
5/8	5/8	1 1/4	3 1/2	0.090	4	25543282
5/8	5/8	1 1/4	3 1/2	0.125	4	25543284
3/4	3/4	1 1/2	4	0.020	4	25543339
3/4	3/4	1 1/2	4	0.030	4	25543341
3/4	3/4	1 1/2	4	0.045	4	25543343
3/4	3/4	1 1/2	4	0.060	4	25543345
3/4	3/4	1 1/2	4	0.090	4	25543347
3/4	3/4	1 1/2	4	0.125	4	25543349
1	1	1 3/4	4	0.030	4	25543397
1	1	1 3/4	4	0.045	4	25543399
1	1	1 3/4	4	0.060	4	25543301
1	1	1 3/4	4	0.090	4	25543303
1	1	1 3/4	4	0.125	4	25543305

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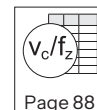


4 Flute with Ball Nosed



DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material
1/32	1/8	3/32	11/2	4	23295654
3/64	1/8	9/64	11/2	4	23295650
1/16	1/8	1/8	11/2	4	23295834
1/16	1/8	3/16	11/2	4	23295666
3/32	1/8	3/16	11/2	4	23295830
3/32	1/8	9/32	11/2	4	23295675
1/8	1/8	1/4	11/2	4	25543631
1/8	1/8	1/2	11/2	4	25543633
1/8	1/8	3/4	3	4	25543637
1/8	1/8	3/4	2 1/2	4	25543635
1/8	1/8	1	3	4	25543639
5/32	3/16	3/8	2	4	25543641
5/32	3/16	1/2	2	4	25543643
3/16	3/16	3/8	2	4	25543645
3/16	3/16	5/8	2	4	25543647
3/16	3/16	1	4	4	25543651
3/16	3/16	3/4	2 1/2	4	25543649
3/16	3/16	1 1/8	3	4	25543653
1/4	1/4	3/8	2	4	25543655
1/4	1/4	3/4	2 1/2	4	25543657
1/4	1/4	1 1/8	3	4	25543661
1/4	1/4	1 1/2	4	4	25543663
1/4	1/4	1	4	4	25543659
1/4	1/4	1 1/2	6	4	25543665
5/16	5/16	1/2	2	4	25543667
5/16	5/16	3/4	2 1/2	4	25543669
5/16	5/16	1 1/8	3	4	25543673
5/16	5/16	1 5/8	4	4	25543677
5/16	5/16	1	4	4	25543671
5/16	5/16	1 1/2	6	4	25543675
3/8	3/8	5/8	2	4	25543679
3/8	3/8	7/8	2 1/2	4	25543681
3/8	3/8	1 1/8	3	4	25543685
3/8	3/8	1 1/2	6	4	25543687
3/8	3/8	1 3/4	4	4	25543689
3/8	3/8	1	4	4	25543683
3/8	3/8	3	6	4	25543691

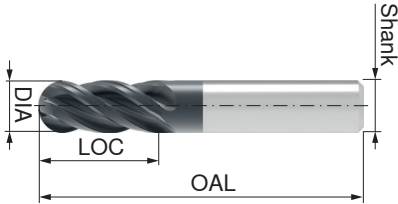
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4 Flute with Ball Nosed

GP	664	$\lambda_s = 38^\circ$ $\gamma_s = 8^\circ$	h6 Shank		
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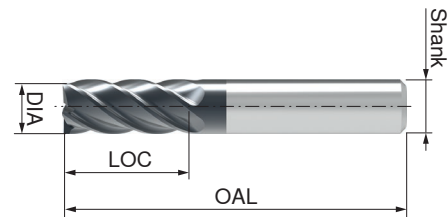
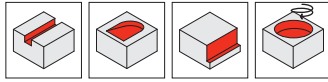
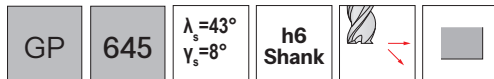


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material
1/2	1/2	5/8	2 1/2	4	25543693
1/2	1/2	1	3	4	25543697
1/2	1/2	1 1/2	6	4	25543699
1/2	1/2	2	4	4	25543601
1/2	1/2	1	4	4	25543697
1/2	1/2	3	6	4	25543603
5/8	5/8	7/8	3	4	25543605
5/8	5/8	1 1/4	3 1/2	4	25543607
5/8	5/8	2 1/8	4 5/8	4	25543711
5/8	5/8	3	6	4	25543713
5/8	5/8	2	6	4	25543609
3/4	3/4	1	3	4	25543715
3/4	3/4	1 1/2	4	4	25543717
3/4	3/4	2 1/4	5	4	25543721
3/4	3/4	3	6	4	25543723
3/4	3/4	2	6	4	25543719
1	1	1 3/4	4	4	25543725
1	1	2 1/4	5	4	25543729
1	1	3	6	4	25543731
1	1	2	6	4	25543727

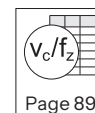
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5 Flute with square end



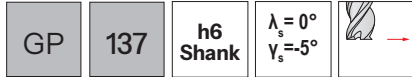
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
1/8	1/8	1/4	11/2	5	25543948
1/8	1/8	1/2	11/2	5	25543940
5/32	3/16	5/16	2	5	25543952
5/32	3/16	9/16	2	5	25543954
3/16	3/16	5/16	2	5	25543956
3/16	3/16	9/16	2	5	25543958
7/32	1/4	3/8	2	5	25543950
7/32	1/4	3/4	2 1/2	5	25543962
1/4	1/4	3/8	2	5	25543964
1/4	1/4	3/4	2 1/2	5	25543966
1/4	1/4	1 1/4	4	5	25543968
5/16	5/16	7/16	2	5	25543960
5/16	5/16	13/16	2 1/2	5	25543972
3/8	3/8	1/2	2	5	25543974
3/8	3/8	1	2 1/2	5	25543976
3/8	3/8	1 1/2	4	5	25543978
1/2	1/2	5/8	2 1/2	5	25543970
1/2	1/2	1 1/4	3	5	25543982
1/2	1/2	2	4	5	25543984
5/8	5/8	3/4	3	5	25543986
5/8	5/8	15/8	3 1/2	5	25543988
5/8	5/8	2 1/2	5	5	25543980
3/4	3/4	1	3	5	25543992
3/4	3/4	15/8	4	5	25543994
3/4	3/4	3 1/4	6	5	25543996
1	1	1 1/4	3	5	25543998
1	1	2	4	5	25543990
1	1	3 1/4	6	5	25543902



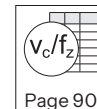
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Profile end milling cutter



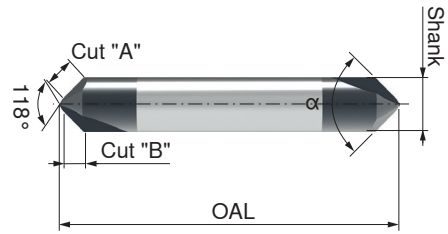
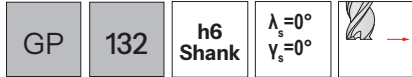
PRFRAD inch	Shank inch	DIA inch	OAL inch	Flute	Material	
					uncoated	coated (AlTiN)
0.010	1/8	0.105	1 1/2	2	23291308	23291300
0.015	1/8	0.095	1 1/2	2	23291411	23291413
0.020	1/8	0.085	1 1/2	2	23291414	23291416
0.025	1/8	0.075	1 1/2	2	23291417	23291419
0.031	1/8	0.063	1 1/2	2	23291410	23291422
0.035	1/8	0.055	1 1/2	2	23291423	23291425
0.040	1/8	0.045	1 1/2	2	23291426	23291428
0.046	1/8	0.095	1 1/2	2	23291429	23291431
0.050	3/16	0.087	2	2	23291432	23291434
0.055	3/16	0.077	2	2	23291435	23291437
0.062	3/16	0.058	2	2	23291438	23291430
0.072	1/4	0.106	2 1/2	2	23291441	23291443
0.078	1/4	0.094	2 1/2	2	23291444	23291446
0.085	1/4	0.080	2 1/2	2	23291447	23291449
0.094	1/4	0.062	2 1/2	2	23291440	23291452
0.100	1/4	0.050	2 1/2	2	23291453	23291455
0.109	1/4	0.094	2 1/2	2	23291456	23291458
0.118	5/16	0.076	2 1/2	2	23291459	23291461
0.125	5/16	0.063	2 1/2	2	23291462	23291464
0.140	3/8	0.095	2 1/2	2	23291465	23291467
0.156	3/8	0.063	2 1/2	2	23291468	23291460



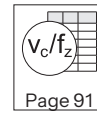
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Chamfer milling cutter 60°




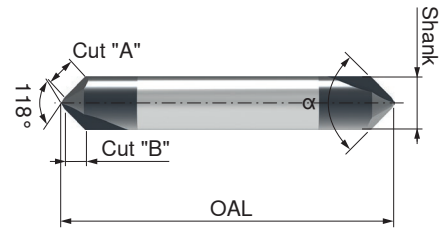
DIA inch	Shank inch	Cut "A" inch	Cut "B" inch	OAL inch	Flute	Material	
						uncoated	coated (AlTiN)
1/8	1/8	0.098	0.085	1 1/2	2	23291350	23291362
3/16	3/16	0.147	0.127	2	2	23291363	23291365
1/4	1/4	0.200	0.173	2 1/2	2	23291366	23291368
3/8	3/8	0.313	0.271	2 1/2	2	23291369	23291371
1/2	1/2	0.430	0.372	3	2	23291372	23291374



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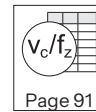
Chamfer milling cutter 90°

GP	134	h6 Shank	$\lambda_s=0^\circ$ $V_s=0^\circ$	
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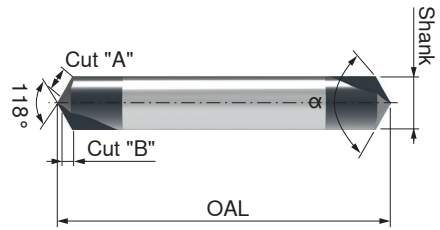
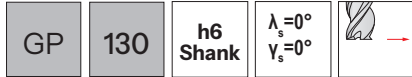


DIA inch	Shank inch	Cut "A" inch	Cut "B" inch	OAL inch	Flute	Material	
						uncoated	coated (AlTiN)
1/8	1/8	0.071	0.050	1 1/2	2	23291384	23291386
3/16	3/16	0.107	0.076	2	2	23291387	23291389
1/4	1/4	0.141	0.100	2 1/2	2	23291380	23291392
3/8	3/8	0.221	0.157	2 1/2	2	23291393	23291395
1/2	1/2	0.304	0.215	3	2	23291396	23291398

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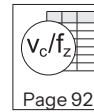


Chamfer milling cutter 120°



DIA inch	Shank inch	Cut "A" inch	Cut "B" inch	OAL inch	Flute	Material	
						uncoated	coated (AlTiN)
1/4	1/4	0.124	0.062	2 1/2	2	23291342	23291344
3/8	3/8	0.199	0.100	2 1/2	2	23291345	23291347
1/2	1/2	0.266	0.133	3	2	23291348	23291340

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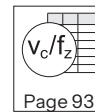
Profile end milling cutter

GP	139	h6 Shank	$\lambda_s=0^\circ$ $\gamma_s=3,5^\circ$	
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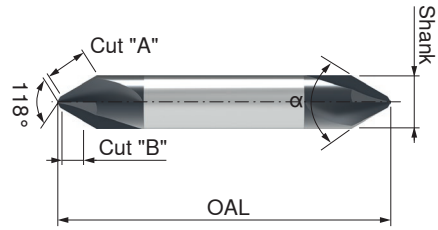
PRFRAD inch	DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material	
						uncoated	coated (AlTiN)
0.010	0.162	3/16	3/16	2	4	23291471	23291473
0.015	0.152	3/16	3/16	2	4	23291474	23291476
0.020	0.142	3/16	3/16	2	4	23291477	23291479
0.025	0.132	3/16	3/16	2	4	23291470	23291482
0.031	0.120	3/16	3/16	2	4	23291483	23291485
0.035	0.112	3/16	3/16	2	4	23291486	23291488
0.040	0.165	1/4	1/4	2 1/2	4	23291489	23291491
0.046	0.153	1/4	1/4	2 1/2	4	23291492	23291494
0.050	0.145	1/4	1/4	2 1/2	4	23291495	23291497
0.055	0.135	1/4	1/4	2 1/2	4	23291401	23291403
0.062	0.121	1/4	1/4	2 1/2	4	23291498	23291490
0.078	0.214	3/8	3/8	2 1/2	4	23291404	23291406
0.094	0.182	3/8	3/8	2 1/2	4	23291407	23291409
0.100	0.170	3/8	3/8	2 1/2	4	23291400	23291512
0.118	0.134	3/8	3/8	2 1/2	4	23291513	23291515
0.125	0.120	3/8	3/8	2 1/2	4	23291516	23291518
0.156	0.183	1/2	1/2	3	4	23291519	23291521

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Chamfer milling cutter 60°

GP	133	h6 Shank	$\lambda_s=0^\circ$ $\gamma_s=0^\circ$	
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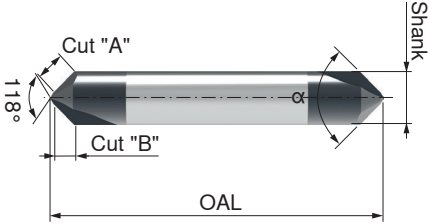
DIA inch	Shank inch	Cut "A" inch	Cut "B" inch	OAL inch	Flute	Material	
						uncoated	coated (AlTiN)
1/4	1/4	0.200	0.173	2 1/2	4	23291375	23291377
3/8	3/8	0.313	0.271	2 1/2	4	23291378	23291370
1/2	1/2	0.430	0.372	3	4	23291381	23291383

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
Chamfer milling cutter 90°

GP	135	h6 Shank	$\lambda_s=0^\circ$ $V_s=0^\circ$	
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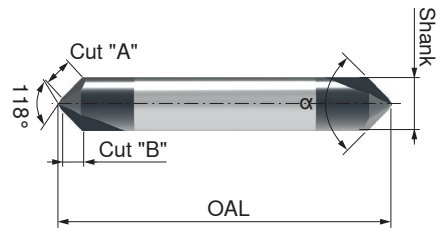
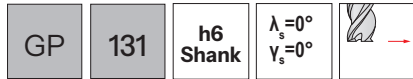
DIA inch	Shank inch	Cut "A" inch	Cut "B" inch	OAL inch	Flute	Material	
						uncoated	coated (AlTiN)
1/4	1/4	0.141	0.100	2 1/2	4	23291399	23291301
3/8	3/8	0.221	0.157	2 1/2	4	23291302	23291304
1/2	1/2	0.304	0.215	3	4	23291305	23291307

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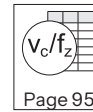
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Chamfer milling cutter 120°



DIA inch	Shank inch	Cut "A" inch	Cut "B" inch	OAL inch	Flute	Material	
						uncoated	coated (AlTiN)
1/4	1/4	0.144	0.072	2 1/2	4	23291351	23291353
3/8	3/8	0.217	0.108	2 1/2	4	23291354	23291356
1/2	1/2	0.289	0.144	3	4	23291357	23291359

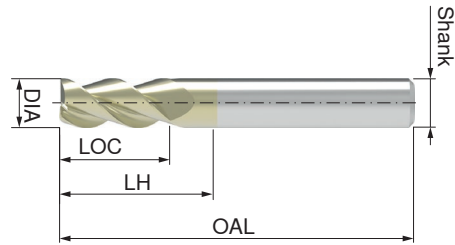
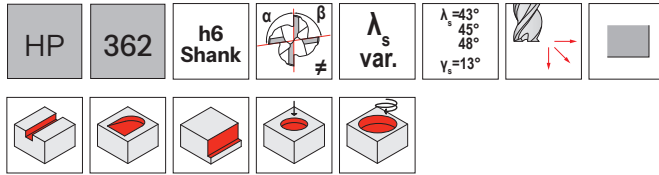
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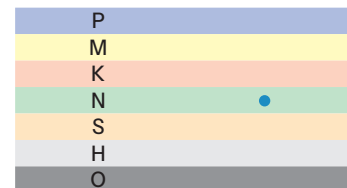
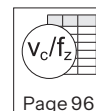


3 Flute with square end

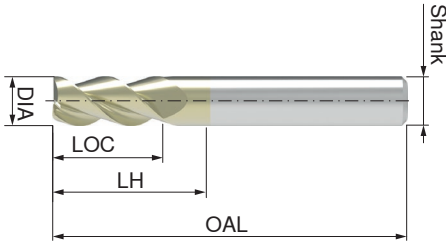
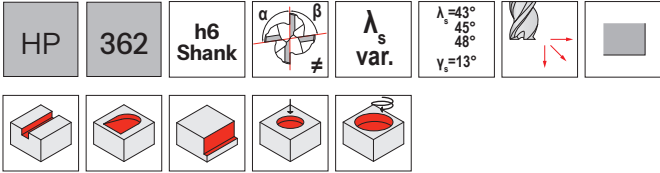


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	Flute	Material coated (ZrN)
3/16	3/16	3/8	2		3	25530497
3/16	3/16	3/8	2	0.025	3	25030780
3/16	3/16	3/4	2 1/2		3	25530490
3/16	3/16	1	3		3	25530403
1/4	1/4	3/8	2 1/2	0.030	3	25030792
1/4	1/4	3/8	3	0.044	3	25030795
1/4	1/4	3/8	4	0.084	3	25030798
1/4	1/4	3/8	2		3	25530406
1/4	1/4	3/4	2 1/2		3	25530400
1/4	1/4	1	3		3	25530514
5/16	5/16	7/16	2 1/2	0.044	3	25030704
5/16	5/16	7/16	2 1/2		3	25030701
5/16	5/16	7/16	4	0.084	3	25030707
3/8	3/8	1/2	3	0.044	3	25030813
3/8	3/8	1/2	4	0.086	3	25030817
3/8	3/8	1/2	2		3	25530518
3/8	3/8	1	2 1/2		3	25530523
3/8	3/8	1 1/2	3 1/2		3	25530528
1/2	1/2	5/8	3	0.059	3	25030821
1/2	1/2	5/8	4	0.089	3	25030826
1/2	1/2	5/8	5	0.133	3	25030831
1/2	1/2	5/8	2 1/2		3	25530533
1/2	1/2	5/8	6	0.157	3	25030837
1/2	1/2	1	3		3	25530539
1/2	1/2	1 1/4	3		3	25530545
1/2	1/2	1 5/8	4		3	25530551
1/2	1/2	2	4		3	25530557
5/8	5/8	3/4	4	0.064	3	25030842
5/8	5/8	3/4	6	0.094	3	25030847
5/8	5/8	3/4	3		3	25530563
5/8	5/8	1 1/4	3 1/2		3	25530568
5/8	5/8	1 5/8	4		3	25530573
3/4	3/4	1	3		3	25530578
3/4	3/4	1	4	0.079	3	25030852
3/4	3/4	1	6	0.103	3	25030857
3/4	3/4	1 5/8	4		3	25530585
3/4	3/4	2 1/4	5		3	25530592

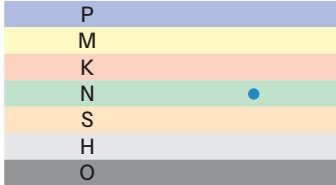
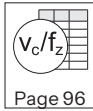
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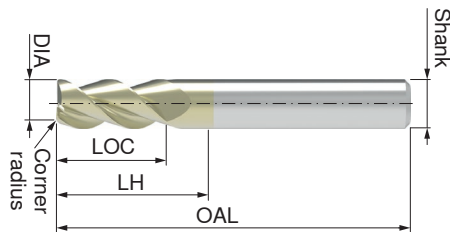
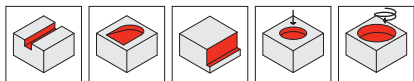
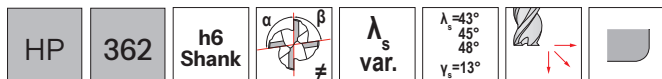
3 Flute with square end



DIA inch	Shank inch	LOC inch	OAL inch	LH inch	Flute	Material coated (ZrN)
1	1	1 1/4	4		3	25530599
1	1	1 1/4	5	0.103	3	25030862
1	1	1 1/4	7	0.148	3	25030867
1	1	2	5		3	25530506
1	1	3 1/4	6		3	25530613

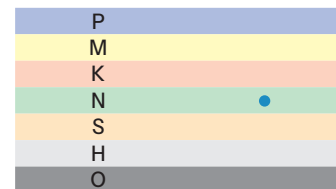
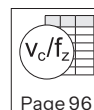


3 Flute with corner Radius

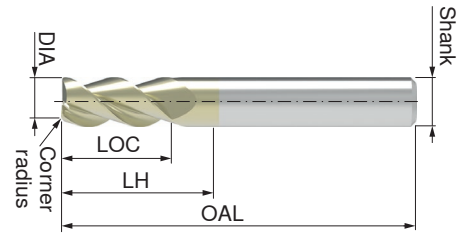
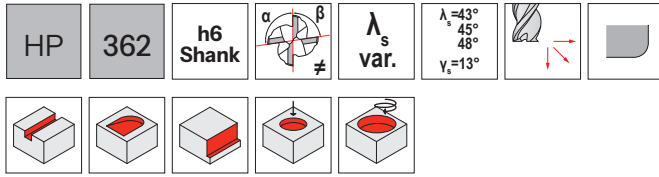


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	Corner radius inch	Flute	Material coated (ZrN)
3/16	3/16	3/8	2	0.625	0.010	3	25030791
3/16	3/16	3/8	2		0.015	3	25530498
3/16	3/16	3/8	2		0.030	3	25530499
3/16	3/16	3/4	2 1/2		0.015	3	25530401
3/16	3/16	3/4	2 1/2		0.030	3	25530402
3/16	3/16	1	3		0.015	3	25530404
3/16	3/16	1	3		0.030	3	25530405
1/4	1/4	3/8	2 1/2	0.750	0.010	3	25030793
1/4	1/4	3/8	3	1.125	0.010	3	25030796
1/4	1/4	3/8	4	2.125	0.010	3	25030799
1/4	1/4	3/8	2		0.015	3	25530407
1/4	1/4	3/8	2		0.030	3	25530408
1/4	1/4	3/8	2 1/2	0.750	0.030	3	25030794
1/4	1/4	3/8	3	1.125	0.030	3	25030797
1/4	1/4	3/8	4	2.125	0.030	3	25030790
1/4	1/4	3/8	2		0.060	3	25530409
1/4	1/4	3/4	2 1/2		0.015	3	25530511
1/4	1/4	3/4	2 1/2		0.030	3	25530512
1/4	1/4	3/4	2 1/2		0.060	3	25530513
1/4	1/4	1	3		0.015	3	25530515
1/4	1/4	1	3		0.030	3	25530516
1/4	1/4	1	3		0.060	3	25530517
5/16	5/16	7/16	2 1/2		0.010	3	25030702
5/16	5/16	7/16	2 1/2	1.125	0.010	3	25030705
5/16	5/16	7/16	4	2.125	0.010	3	25030708
5/16	5/16	7/16	2 1/2	1.125	0.030	3	25030706
5/16	5/16	7/16	2 1/2		0.030	3	25030703
5/16	5/16	7/16	4	2.125	0.030	3	25030709
3/8	3/8	1/2	2		0.010	3	25030700
3/8	3/8	1/2	3	1.125	0.010	3	25030814
3/8	3/8	1/2	4	2.188	0.010	3	25030818
3/8	3/8	1/2	2		0.015	3	25530519
3/8	3/8	1/2	2		0.030	3	25530510
3/8	3/8	1/2	3	1.125	0.030	3	25030815
3/8	3/8	1/2	4	2.188	0.030	3	25030819
3/8	3/8	1/2	2		0.060	3	25530521
3/8	3/8	1/2	3	1.125	0.060	3	25030816
3/8	3/8	1/2	4	2.188	0.060	3	25030810
3/8	3/8	1/2	2		0.090	3	25530522

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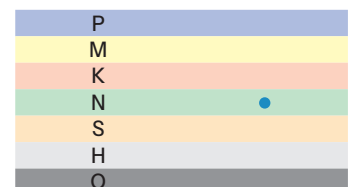
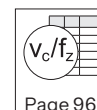


3 Flute with corner Radius

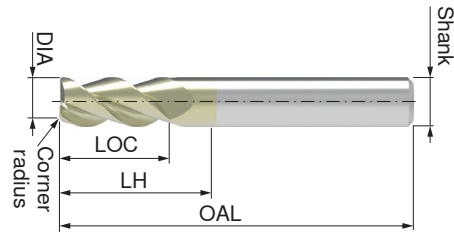
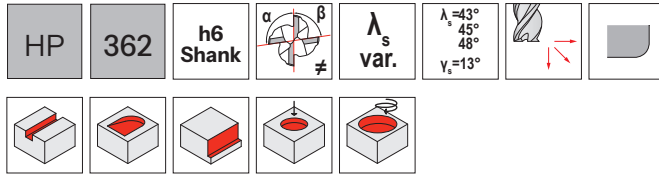


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	Corner radius inch	Flute	Material coated (ZrN)
3/8	3/8	1	2 1/2		0.015	3	25530524
3/8	3/8	1	2 1/2		0.030	3	25530525
3/8	3/8	1	2 1/2		0.060	3	25530526
3/8	3/8	1	2 1/2		0.090	3	25530527
3/8	3/8	1	2 1/2		0.010	3	25030811
3/8	3/8	1 1/2	3 1/2		0.015	3	25530529
3/8	3/8	1 1/2	3 1/2		0.030	3	25530520
3/8	3/8	1 1/2	3 1/2		0.060	3	25530531
3/8	3/8	1 1/2	3 1/2		0.090	3	25530532
3/8	3/8	1 1/2	3 1/2		0.010	3	25030812
1/2	1/2	5/8	5	3.375	0.010	3	25030832
1/2	1/2	5/8	2 1/2		0.015	3	25530534
1/2	1/2	5/8	2 1/2		0.030	3	25530535
1/2	1/2	5/8	3	1.500	0.030	3	25030822
1/2	1/2	5/8	4	2.250	0.030	3	25030827
1/2	1/2	5/8	5	3.375	0.030	3	25030833
1/2	1/2	5/8	6	4.000	0.030	3	25030838
1/2	1/2	5/8	2 1/2		0.060	3	25530536
1/2	1/2	5/8	3	1.500	0.060	3	25030823
1/2	1/2	5/8	4	2.250	0.060	3	25030828
1/2	1/2	5/8	5	3.375	0.060	3	25030834
1/2	1/2	5/8	6	4.000	0.060	3	25030839
1/2	1/2	5/8	2 1/2		0.090	3	25530537
1/2	1/2	5/8	3	1.500	0.090	3	25030824
1/2	1/2	5/8	4	2.250	0.090	3	25030829
1/2	1/2	5/8	5	3.375	0.090	3	25030835
1/2	1/2	5/8	6	4.000	0.090	3	25030830
1/2	1/2	5/8	3	1.500	0.120	3	25030825
1/2	1/2	5/8	4	2.250	0.120	3	25030820
1/2	1/2	5/8	5	3.375	0.120	3	25030836
1/2	1/2	5/8	6	4.000	0.120	3	25030841
1/2	1/2	5/8	2 1/2		0.125	3	25530538
1/2	1/2	1	3		0.015	3	25530530
1/2	1/2	1	3		0.030	3	25530541
1/2	1/2	1	3		0.060	3	25530542
1/2	1/2	1	3		0.090	3	25530543
1/2	1/2	1	3		0.125	3	25530544
1/2	1/2	1 1/4	3		0.015	3	25530546
1/2	1/2	1 1/4	3		0.030	3	25530547

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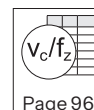


3 Flute with corner Radius

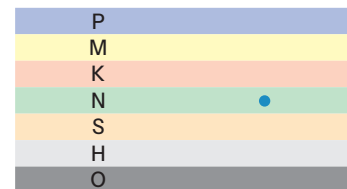


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	Corner radius inch	Flute	Material coated (ZrN)
1/2	1/2	11/4	3		0.060	3	25530548
1/2	1/2	11/4	3		0.090	3	25530549
1/2	1/2	11/4	3		0.125	3	25530540
1/2	1/2	15/8	4		0.015	3	25530552
1/2	1/2	15/8	4		0.030	3	25530553
1/2	1/2	15/8	4		0.060	3	25530554
1/2	1/2	15/8	4		0.090	3	25530555
1/2	1/2	15/8	4		0.125	3	25530556
1/2	1/2	2	4		0.015	3	25530558
1/2	1/2	2	4		0.030	3	25530559
1/2	1/2	2	4		0.060	3	25530550
1/2	1/2	2	4		0.090	3	25530561
1/2	1/2	2	4		0.125	3	25530562
5/8	5/8	3/4	3		0.030	3	25530564
5/8	5/8	3/4	3		0.060	3	25530565
5/8	5/8	3/4	4	1.625	0.060	3	25030843
5/8	5/8	3/4	6	2.375	0.060	3	25030848
5/8	5/8	3/4	3		0.090	3	25530566
5/8	5/8	3/4	4	1.625	0.090	3	25030844
5/8	5/8	3/4	6	2.375	0.090	3	25030849
5/8	5/8	3/4	4	1.625	0.120	3	25030845
5/8	5/8	3/4	6	2.375	0.120	3	25030840
5/8	5/8	3/4	3		0.125	3	25530567
5/8	5/8	3/4	4	1.625	0.190	3	25030846
5/8	5/8	3/4	6	2.375	0.190	3	25030851
5/8	5/8	11/4	3 1/2		0.030	3	25530569
5/8	5/8	11/4	3 1/2		0.060	3	25530560
5/8	5/8	11/4	3 1/2		0.090	3	25530571
5/8	5/8	11/4	3 1/2		0.125	3	25530572
5/8	5/8	15/8	4		0.030	3	25530574
5/8	5/8	15/8	4		0.060	3	25530575
5/8	5/8	15/8	4		0.090	3	25530576
5/8	5/8	15/8	4		0.125	3	25530577
3/4	3/4	1	3		0.030	3	25530579
3/4	3/4	1	3		0.060	3	25530570
3/4	3/4	1	3		0.090	3	25530581
3/4	3/4	1	3		0.125	3	25530582
3/4	3/4	1	3		0.190	3	25530583
3/4	3/4	1	3		0.250	3	25530584

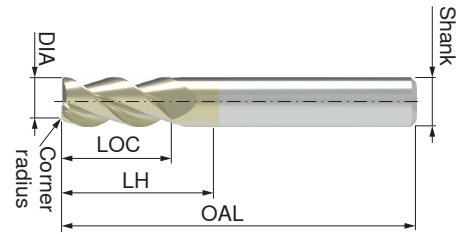
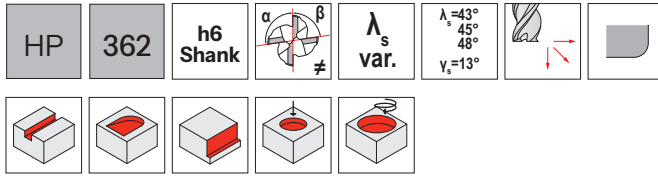
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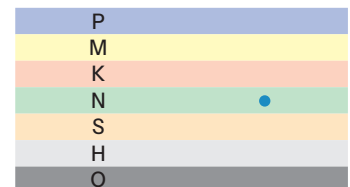
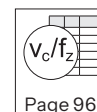


3 Flute with corner Radius

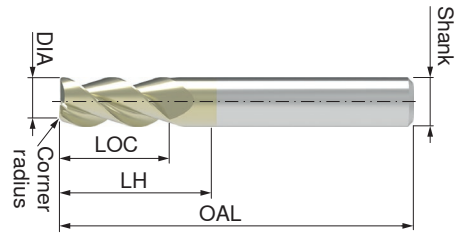
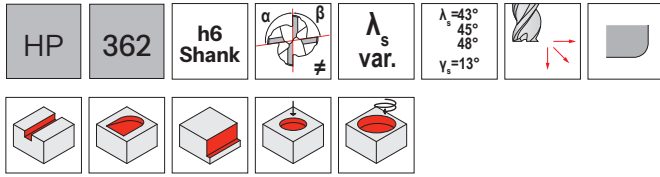


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	Corner radius inch	Flute	Material coated (ZrN)
3/4	3/4	1	4	2.000	0.060	3	25030853
3/4	3/4	1	6	2.625	0.060	3	25030858
3/4	3/4	1	4	2.000	0.090	3	25030854
3/4	3/4	1	6	2.625	0.090	3	25030859
3/4	3/4	1	4	2.000	0.120	3	25030855
3/4	3/4	1	6	2.625	0.120	3	25030850
3/4	3/4	1	4	2.000	0.190	3	25030856
3/4	3/4	1	6	2.625	0.190	3	25030861
3/4	3/4	15/8	4		0.030	3	25530586
3/4	3/4	15/8	4		0.060	3	25530587
3/4	3/4	15/8	4		0.090	3	25530588
3/4	3/4	15/8	4		0.125	3	25530589
3/4	3/4	15/8	4		0.190	3	25530580
3/4	3/4	15/8	4		0.250	3	25530591
3/4	3/4	21/4	5		0.030	3	25530593
3/4	3/4	21/4	5		0.060	3	25530594
3/4	3/4	21/4	5		0.090	3	25530595
3/4	3/4	21/4	5		0.125	3	25530596
3/4	3/4	21/4	5		0.190	3	25530597
3/4	3/4	21/4	5		0.250	3	25530598
1	1	11/4	4		0.030	3	25530590
1	1	11/4	4		0.060	3	25530501
1	1	11/4	4		0.090	3	25530502
1	1	11/4	4		0.125	3	25530503
1	1	11/4	4		0.190	3	25530504
1	1	11/4	4		0.250	3	25530505
1	1	11/4	5	2.625	0.060	3	25030863
1	1	11/4	7	3.750	0.060	3	25030868
1	1	11/4	5	2.625	0.090	3	25030864
1	1	11/4	7	3.750	0.090	3	25030869
1	1	11/4	5	2.625	0.120	3	25030865
1	1	11/4	7	3.750	0.120	3	25030860
1	1	11/4	5	2.625	0.190	3	25030866
1	1	11/4	7	3.750	0.190	3	25030871
1	1	2	5		0.030	3	25530507
1	1	2	5		0.060	3	25530508
1	1	2	5		0.090	3	25530509
1	1	2	5		0.125	3	25530500
1	1	2	5		0.190	3	25530611

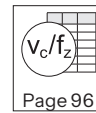
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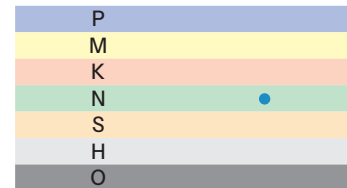
3 Flute with corner Radius



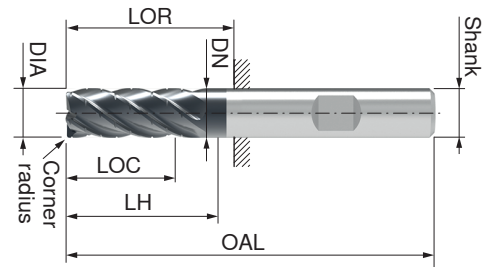
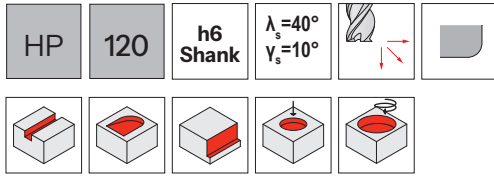
DIA inch	Shank inch	LOC inch	OAL inch	LH inch	Corner radius inch	Flute	Material coated (ZrN)
1	1	2	5		0.250	3	25530612
1	1	3 1/4	6		0.030	3	25530614
1	1	3 1/4	6		0.060	3	25530615
1	1	3 1/4	6		0.090	3	25530616
1	1	3 1/4	6		0.125	3	25530617
1	1	3 1/4	6		0.190	3	25530618
1	1	3 1/4	6		0.250	3	25530619



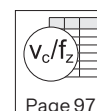
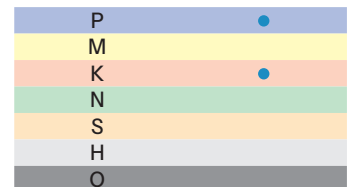
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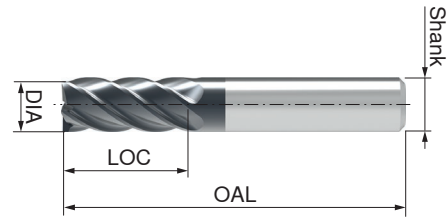
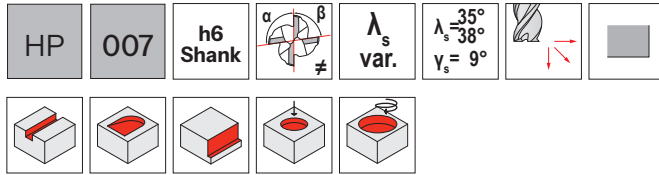
4 Flute with corner Radius



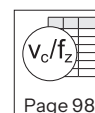
DIA inch	Shank inch	LOC inch	OAL inch	LOR inch	LH inch	DN inch	Radius corner inch	Flute	Material coated (AlTiN)
1/8	1/8	1/4	1 1/2	0.520			0.010	4	23291193
1/8	1/8	1/2	1 1/2	0.520			0.010	4	23291180
5/32	3/16	3/8	2	0.898			0.010	4	23291199
5/32	3/16	1/2	2	0.898			0.010	4	23291196
5/32	3/16	1/2	2	0.898			0.010	4	23291196
3/16	3/16	5/8	2	0.898			0.010	4	23291102
7/32	1/4	3/8	2	1.083			0.020	4	23291211
7/32	1/4	3/4	2 1/2	0.583			0.020	4	23291108
1/4	1/4	3/8	2	0.583			0.020	4	23291217
1/4	1/4	3/4	2 1/2	1.083			0.020	4	23291214
1/4	1/4	1 1/4	3	1.583			0.020	4	23291210
1/4	1/4	3/4	4	2.5	2 1/8	0.240	0.020	4	23291226
1/4	1/4	1 1/2	3 1/2	2.0			0.020	4	23291223
9/32	5/16	1/2	2 1/2	1.083			0.020	4	23291232
9/32	5/16	3/4	2 1/2	1.083			0.020	4	23291229
5/16	5/16	1/2	2 1/2	1.083			0.020	4	23291238
5/16	5/16	3/4	2 1/2	1.083			0.020	4	23291235
11/32	3/8	5/8	2	0.825			0.020	4	23291244
11/32	3/8	7/8	2 1/2	0.960			0.020	4	23291241
3/8	3/8	5/8	2	0.825			0.020	4	23291240
3/8	3/8	7/8	2 1/2	0.960			0.020	4	23291259
3/8	3/8	1 1/2	3 1/2	1.925			0.020	4	23291253
3/8	3/8	2	4	2.460			0.020	4	23291256
3/8	3/8	7/8	4	2.4	2 1/8	0.360	0.020	4	23291259
3/8	3/8	7/8	6	4.4	3 3/8	0.360	0.020	4	23291262
7/16	7/16	1	2 3/4	1.165			0.020	4	23291265
1/2	1/2	5/8	2 1/2	0.735			0.020	4	23291271
1/2	1/2	1 1/4	3	1.425			0.020	4	23291268
1/2	1/2	1 1/2	3 1/2	1.735			0.020	4	23291274
1/2	1/2	2	4	2.235			0.020	4	23291277
1/2	1/2	1	6	4.2	2 3/8	0.480	0.020	4	23291270
1/2	1/2	1	6	4.2	3 3/8	0.480	0.020	4	23291283
9/16	9/16	1 1/4	3 1/2	1.675			0.030	4	23291286
5/8	5/8	7/8	3	1.113			0.030	4	23291292
5/8	5/8	1 1/4	3 1/2	1.613			0.030	4	23291289
5/8	5/8	1 3/4	4	2.113			0.030	4	23291295
5/8	5/8	2 1/2	5	3.1			0.030	4	23291298
3/4	3/4	1	3	1.228			0.030	4	23291204
3/4	3/4	1 5/8	4	1.978			0.030	4	23291207
3/4	3/4	1 5/8	6	3.6	2 1/2	0.720	0.030	4	23291201
1	1	1 3/4	4	1.7			0.030	4	23291200



4 Flute with square end

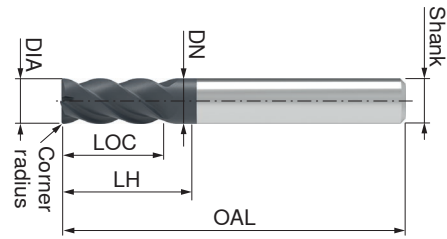
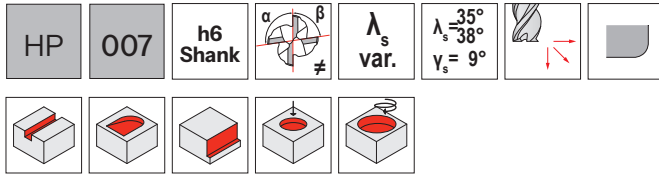


DIA inch	LOC inch	OAL inch	Shank inch	Flute	Material coated (DPB72S)
1/8	1/4	1 1/2	1/8	4	25538363
1/8	1/2	2 1/2	1/8	4	25538366
3/16	5/16	2	3/16	4	25538369
3/16	5/8	2 1/2	3/16	4	25538372
1/4	3/8	2	1/4	4	25538375
1/4	1/2	2 1/2	1/4	4	25538379
1/4	3/4	2 1/2	1/4	4	25538383
1/4	1	3	1/4	4	25538387
5/16	1/2	2	5/16	4	25538391
5/16	3/4	2 1/2	5/16	4	25538395
5/16	1 1/4	3	5/16	4	25538399
3/8	1/2	2	3/8	4	25538303
3/8	7/8	3	3/8	4	25538308
3/8	1	3	3/8	4	25538413
3/8	1 1/4	3	3/8	4	25538418
7/16	1	2 3/4	7/16	4	25022452
7/16	2	4	7/16	4	25022453
1/2	5/8	2 1/2	1/2	4	25538423
1/2	1	3	1/2	4	25538429
1/2	1 1/4	3	1/2	4	25538435
1/2	1 5/8	4	1/2	4	25538441
5/8	3/4	3	5/8	4	25538447
5/8	1 1/4	3 1/2	5/8	4	25538452
5/8	1 5/8	3 1/2	5/8	4	25538457
5/8	2	4	5/8	4	25538462
5/8	3 1/4	6	5/8	4	25538467
3/4	7/8	3	3/4	4	25538472
3/4	1 1/4	4	3/4	4	25538479
3/4	1 5/8	4	3/4	4	25538486
3/4	2 1/4	5	3/4	4	25538493
3/4	3 1/4	6	3/4	4	25538490
1	1 1/2	4	1	4	25538407
1	2	4 1/2	1	4	25538514
1	2 5/8	5	1	4	25538521
1	3	6	1	4	25538528
1	4 1/4	7	1	4	25538535

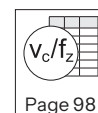


P	●
M	●
K	
N	●
S	●
H	
O	

4 Flute with corner Radius

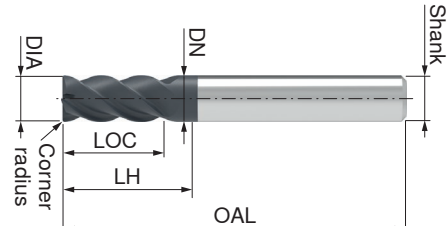
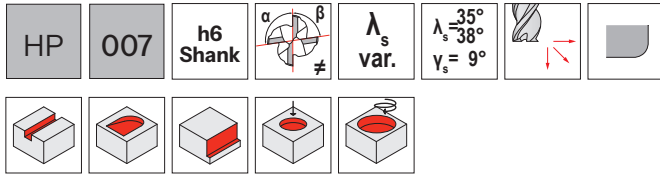


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Radius corner inch	Flute	Material coated (DPB72S)
1/8	1/8	0.156	3	0.375	0.120	0.010	4	25022438
1/8	1/8	0.156	3	0.500	0.120	0.010	4	25022439
1/8	1/8	0.156	3	0.625	0.120	0.010	4	25022430
1/8	1/8	1/4	11/2			0.010	4	25538364
1/8	1/8	1/4	11/2			0.030	4	25538365
1/8	1/8	1/2	21/2			0.010	4	25538367
1/8	1/8	1/2	21/2			0.030	4	25538368
3/16	3/16	0.219	3	0.500	0.180	0.010	4	25022441
3/16	3/16	0.219	3	0.750	0.180	0.010	4	25022442
3/16	3/16	0.219	3	1.000	0.180	0.010	4	25022443
3/16	3/16	5/16	2			0.010	4	25538360
3/16	3/16	5/16	2			0.030	4	25538371
3/16	3/16	5/8	21/2			0.010	4	25538373
3/16	3/16	5/8	21/2			0.030	4	25538374
1/4	1/4	3/8	2			0.020	4	25538376
1/4	1/4	3/8	2			0.030	4	25538377
1/4	1/4	3/8	2			0.060	4	25538378
1/4	1/4	3/8	3	0.750	0.240	0.020	4	25022444
1/4	1/4	3/8	4	1.125	0.240	0.020	4	25022445
1/4	1/4	3/8	4	1.625	0.240	0.020	4	25022446
1/4	1/4	3/8	4	2.125	0.240	0.020	4	25022447
1/4	1/4	1/2	21/2			0.020	4	25538370
1/4	1/4	1/2	21/2			0.030	4	25538381
1/4	1/4	1/2	21/2			0.060	4	25538382
1/4	1/4	3/4	21/2			0.020	4	25538384
1/4	1/4	3/4	21/2			0.030	4	25538385
1/4	1/4	3/4	21/2			0.060	4	25538386
1/4	1/4	1	3			0.020	4	25538388
1/4	1/4	1	3			0.030	4	25538389
1/4	1/4	1	3			0.060	4	25538380
1/4	1	11/4	6			0.030	4	
5/16	5/16	1/2	2			0.020	4	25538392
5/16	5/16	1/2	2			0.030	4	25538393
5/16	5/16	1/2	2			0.060	4	25538394
5/16	5/16	3/4	21/2			0.020	4	25538396
5/16	5/16	3/4	21/2			0.030	4	25538397
5/16	5/16	3/4	21/2			0.060	4	25538398
5/16	5/16	11/4	3			0.020	4	25538390
5/16	5/16	11/4	3			0.030	4	25538301



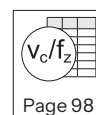
P	•
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4 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Radius corner inch	Flute	Material coated (DPB72S)
5/16	5/16	1 1/4	3			0.060	4	25538302
3/8	3/8	1/2	2			0.020	4	25538304
3/8	3/8	1/2	2			0.030	4	25538305
3/8	3/8	1/2	2			0.060	4	25538306
3/8	3/8	1/2	2			0.090	4	25538307
3/8	3/8	1/2	4	1.125	0.360	0.030	4	25022448
3/8	3/8	1/2	4	2.125	0.360	0.030	4	25022449
3/8	3/8	1/2	6	3.125	0.360	0.030	4	25022440
3/8	3/8	1/2	6	4.125	0.360	0.030	4	25022451
3/8	3/8	7/8	3			0.020	4	25538309
3/8	3/8	7/8	3			0.030	4	25538300
3/8	3/8	7/8	3			0.060	4	25538411
3/8	3/8	7/8	3			0.090	4	25538412
3/8	3/8	1	3			0.020	4	25538414
3/8	3/8	1	3			0.030	4	25538415
3/8	3/8	1	3			0.060	4	25538416
3/8	3/8	1	3			0.090	4	25538417
3/8	3/8	1 1/4	3			0.020	4	25538419
3/8	3/8	1 1/4	3			0.030	4	25538410
3/8	3/8	1 1/4	3			0.060	4	25538421
3/8	3/8	1 1/4	3			0.090	4	25538422
1/2	1/2	5/8	2 1/2			0.020	4	25538424
1/2	1/2	5/8	2 1/2			0.030	4	25538425
1/2	1/2	5/8	2 1/2			0.060	4	25538426
1/2	1/2	5/8	2 1/2			0.090	4	25538427
1/2	1/2	5/8	2 1/2			0.125	4	25538428
1/2	1/2	5/8	4	1.500	0.480	0.030	4	25022454
1/2	1/2	5/8	4	2.250	0.480	0.030	4	25022455
1/2	1/2	5/8	6	3.375	0.480	0.030	4	25022456
1/2	1/2	5/8	6	4.125	0.480	0.030	4	25022457
1/2	1/2	1	3			0.020	4	25538420
1/2	1/2	1	3			0.030	4	25538431
1/2	1/2	1	3			0.060	4	25538432
1/2	1/2	1	3			0.090	4	25538433
1/2	1/2	1	3			0.125	4	25538434
1/2	1/2	1 1/4	3			0.020	4	25538436
1/2	1/2	1 1/4	3			0.030	4	25538437
1/2	1/2	1 1/4	3			0.060	4	25538438
1/2	1/2	1 1/4	3			0.090	4	25538439

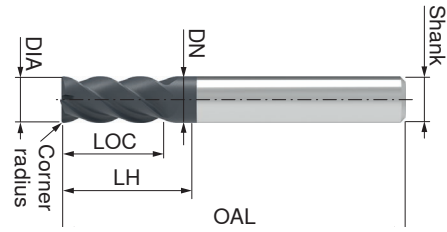
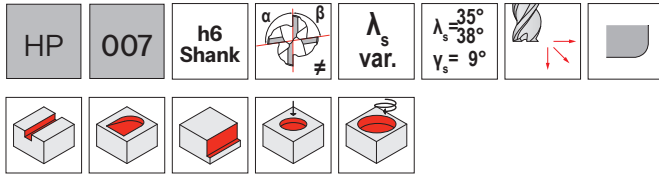
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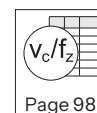
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4 Flute with corner Radius



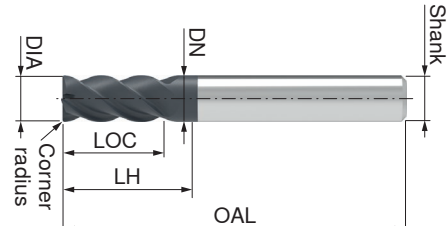
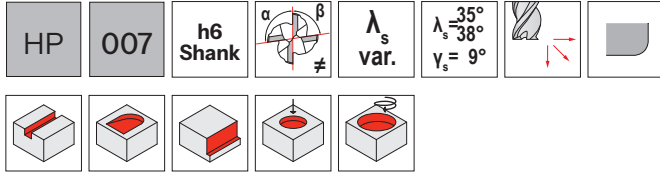
DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Radius corner inch	Flute	Material coated (DPB72S)
1/2	1/2	1 1/4	3			0.125	4	25538430
1/2	1/2	1 5/8	4			0.020	4	25538442
1/2	1/2	1 5/8	4			0.030	4	25538443
1/2	1/2	1 5/8	4			0.060	4	25538444
1/2	1/2	1 5/8	4			0.090	4	25538445
1/2	1/2	1 5/8	4			0.125	4	25538446
5/8	5/8	3/4	3			0.030	4	25538448
5/8	5/8	3/4	3			0.060	4	25538449
5/8	5/8	3/4	3			0.090	4	25538440
5/8	5/8	3/4	3			0.125	4	25538451
5/8	5/8	3/4	4	1.625	0.600	0.030	4	25022458
5/8	5/8	3/4	6	2.375	0.600	0.030	4	25022459
5/8	5/8	3/4	6	3.375	0.600	0.030	4	25022450
5/8	5/8	3/4	6	4.125	0.600	0.030	4	25022461
5/8	5/8	1 1/4	3 1/2			0.030	4	25538453
5/8	5/8	1 1/4	3 1/2			0.060	4	25538454
5/8	5/8	1 1/4	3 1/2			0.090	4	25538455
5/8	5/8	1 1/4	3 1/2			0.125	4	25538456
5/8	5/8	1 5/8	3 1/2			0.030	4	25538458
5/8	5/8	1 5/8	3 1/2			0.060	4	25538459
5/8	5/8	1 5/8	3 1/2			0.090	4	25538450
5/8	5/8	1 5/8	3 1/2			0.125	4	25538461
5/8	5/8	2	4			0.030	4	25538463
5/8	5/8	2	4			0.060	4	25538464
5/8	5/8	2	4			0.090	4	25538465
5/8	5/8	2	4			0.125	4	25538466
5/8	5/8	3 1/4	6			0.030	4	25538468
5/8	5/8	3 1/4	6			0.060	4	25538469
5/8	5/8	3 1/4	6			0.090	4	25538460
5/8	5/8	3 1/4	6			0.125	4	25538471
3/4	3/4	7/8	3			0.030	4	25538473
3/4	3/4	7/8	3			0.060	4	25538474
3/4	3/4	7/8	3			0.090	4	25538475
3/4	3/4	7/8	3			0.125	4	25538476
3/4	3/4	7/8	3			0.190	4	25538477
3/4	3/4	7/8	3			0.250	4	25538478
3/4	3/4	1	4	2.000	0.720	0.030	4	25022462
3/4	3/4	1	6	2.500	0.720	0.030	4	25022463
3/4	3/4	1	6	3.375	0.720	0.030	4	25022464

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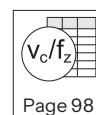
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4 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Radius corner inch	Flute	Material coated (DPB72S)
3/4	3/4	1	6	4.125	0.720	0.030	4	25022465
3/4	3/4	1 1/4	4			0.030	4	25538470
3/4	3/4	1 1/4	4			0.060	4	25538481
3/4	3/4	1 1/4	4			0.090	4	25538482
3/4	3/4	1 1/4	4			0.125	4	25538483
3/4	3/4	1 1/4	4			0.190	4	25538484
3/4	3/4	1 1/4	4			0.250	4	25538485
3/4	3/4	1 5/8	4			0.030	4	25538487
3/4	3/4	1 5/8	4			0.060	4	25538488
3/4	3/4	1 5/8	4			0.090	4	25538489
3/4	3/4	1 5/8	4			0.125	4	25538480
3/4	3/4	1 5/8	4			0.190	4	25538491
3/4	3/4	1 5/8	4			0.250	4	25538492
3/4	3/4	2 1/4	5			0.030	4	25538494
3/4	3/4	2 1/4	5			0.060	4	25538495
3/4	3/4	2 1/4	5			0.090	4	25538496
3/4	3/4	2 1/4	5			0.125	4	25538497
3/4	3/4	2 1/4	5			0.190	4	25538498
3/4	3/4	2 1/4	5			0.250	4	25538499
3/4	3/4	3 1/4	6			0.030	4	25538401
3/4	3/4	3 1/4	6			0.060	4	25538402
3/4	3/4	3 1/4	6			0.090	4	25538403
3/4	3/4	3 1/4	6			0.125	4	25538404
3/4	3/4	3 1/4	6			0.190	4	25538405
3/4	3/4	3 1/4	6			0.250	4	25538406
1	1	1 1/4	4	2.250	0.950	0.030	4	25022466
1	1	1 1/4	6	2.625	0.950	0.030	4	25022467
1	1	1 1/4	6	3.375	0.950	0.030	4	25022468
1	1	1 1/2	4			0.030	4	25538408
1	1	1 1/2	4			0.060	4	25538409
1	1	1 1/2	4			0.090	4	25538400
1	1	1 1/2	4			0.125	4	25538511
1	1	1 1/2	4			0.190	4	25538512
1	1	1 1/2	4			0.250	4	25538513
1	1	2	4 1/2			0.030	4	25538515
1	1	2	4 1/2			0.060	4	25538516
1	1	2	4 1/2			0.090	4	25538517
1	1	2	4 1/2			0.125	4	25538518
1	1	2	4 1/2			0.190	4	25538519

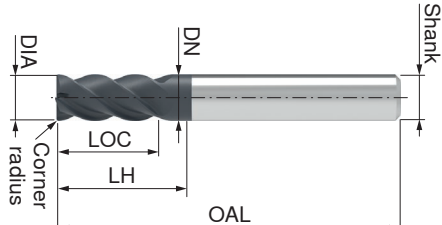
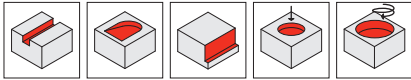
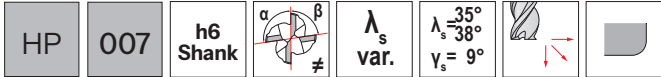
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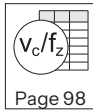
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4 Flute with corner Radius

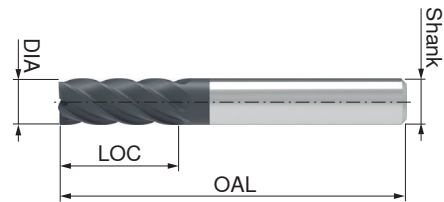
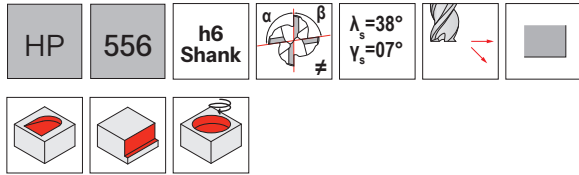


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Radius corner inch	Flute	Material coated (DPB72S)
1	1	2	4 1/2			0.250	4	25538510
1	1	2 5/8	5			0.030	4	25538522
1	1	2 5/8	5			0.060	4	25538523
1	1	2 5/8	5			0.090	4	25538524
1	1	2 5/8	5			0.125	4	25538525
1	1	2 5/8	5			0.190	4	25538526
1	1	2 5/8	5			0.250	4	25538527
1	1	3	6			0.030	4	25538529
1	1	3	6			0.060	4	25538520
1	1	3	6			0.090	4	25538531
1	1	3	6			0.125	4	25538532
1	1	3	6			0.190	4	25538533
1	1	3	6			0.250	4	25538534
1	1	4 1/4	7			0.030	4	25538536
1	1	4 1/4	7			0.060	4	25538537
1	1	4 1/4	7			0.090	4	25538538
1	1	4 1/4	7			0.125	4	25538539
1	1	4 1/4	7			0.190	4	25538530
1	1	4 1/4	7			0.250	4	25538541

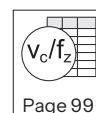


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5 Flute with square end

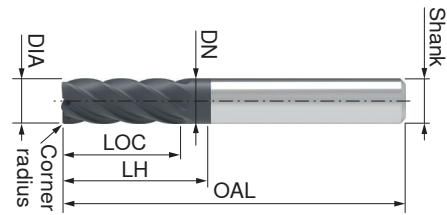
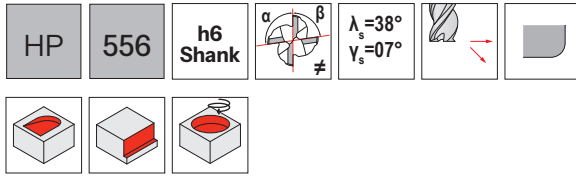


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (DPB72S)
1/8	1/8	1/4	11/2	5	25022460
1/8	1/8	1/2	11/2	5	25022473
3/16	3/16	5/16	2	5	25022479
3/16	3/16	5/8	2 1/2	5	25022482
1/4	1/4	3/8	2	5	25530208
1/4	1/4	1/2	2 1/2	5	25530312
1/4	1/4	3/4	2 1/2	5	25530316
1/4	1/4	1	3	5	25530310
1/4	1/4	1 1/4	3	5	25530324
5/16	5/16	1/2	2	5	25022492
5/16	5/16	3/4	2 1/2	5	25022496
5/16	5/16	1 1/4	3	5	25022490
3/8	3/8	1/2	2	5	25530328
3/8	3/8	1	3	5	25530333
3/8	3/8	1 1/4	3	5	25530338
3/8	3/8	1 1/2	3 1/2	5	25530343
7/16	7/16	1	2 3/4	5	25022408
7/16	7/16	2	4	5	25022409
1/2	1/2	5/8	2 1/2	5	25530348
1/2	1/2	1	3	5	25530354
1/2	1/2	1 1/4	3	5	25530350
1/2	1/2	1 5/8	4	5	25530366
1/2	1/2	2	4	5	25530372
5/8	5/8	3/4	3	5	25530378
5/8	5/8	1 1/4	3 1/2	5	25530383
5/8	5/8	1 5/8	3 1/2	5	25530388
5/8	5/8	2 1/4	4	5	25530393
5/8	5/8	2 1/2	5	5	25530398
3/4	3/4	1	3	5	25530303
3/4	3/4	1 5/8	4	5	25530300
3/4	3/4	2 1/4	5	5	25530417
3/4	3/4	2 3/4	5	5	25530424
3/4	3/4	3 1/4	6	5	25530431
1	1	1 1/4	4	5	25530438
1	1	2	4 1/2	5	25530445
1	1	2 5/8	5	5	25530452
1	1	3 1/4	6	5	25530459
1	1	4 1/4	7	5	25530466
1 1/4	1 1/4	2	4 1/2	5	25065749
1 1/4	1 1/4	3 3/8	6	5	25065751
1 1/4	1 1/4	4 3/4	8	5	25065753



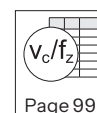
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5 Flute with corner Radius



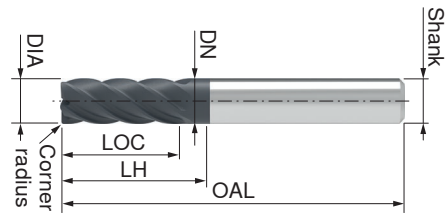
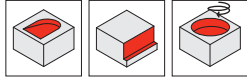
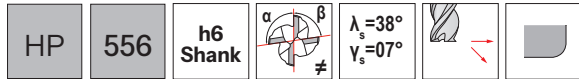
DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Corner radius inch	Flute	Material coated (DPB72S)
1/8	1/8	0.156	3	0.375	0.118	0.010	5	25022476
1/8	1/8	0.156	3	0.500	0.118	0.010	5	25022477
1/8	1/8	0.156	3	0.625	0.118	0.010	5	25022478
1/8	1/8	1/4	11/2			0.010	5	25022471
1/8	1/8	1/4	11/2			0.030	5	25022472
1/8	1/8	1/2	11/2			0.010	5	25022474
1/8	1/8	1/2	11/2			0.030	5	25022475
3/16	3/16	0.219	3	0.500	0.178	0.010	5	25022485
3/16	3/16	0.219	3			0.010	5	25022487
3/16	3/16	0.219	3	0.750	0.178	0.010	5	25022486
3/16	3/16	5/16	2			0.010	5	25022470
3/16	3/16	5/16	2			0.030	5	25022481
3/16	3/16	5/8	2 1/2			0.010	5	25022483
3/16	3/16	5/8	2 1/2			0.030	5	25022484
1/4	1/4	3/8	2			0.015	5	25530209
1/4	1/4	3/8	2			0.030	5	25530200
1/4	1/4	3/8	2			0.060	5	25530311
1/4	1/4	3/8	3	0.750	0.237	0.020	5	25022488
1/4	1/4	3/8	4	1.125	0.237	0.020	5	25022489
1/4	1/4	3/8	4	1.625	0.237	0.020	5	25022480
1/4	1/4	3/8	4	2.125	0.237	0.020	5	25022491
1/4	1/4	1/2	2 1/2			0.015	5	25530313
1/4	1/4	1/2	2 1/2			0.030	5	25530314
1/4	1/4	1/2	2 1/2			0.060	5	25530315
1/4	1/4	3/4	2 1/2			0.015	5	25530317
1/4	1/4	3/4	2 1/2			0.030	5	25530318
1/4	1/4	3/4	2 1/2			0.060	5	25530319
1/4	1/4	1	3			0.015	5	25530321
1/4	1/4	1	3			0.030	5	25530322
1/4	1/4	1	3			0.060	5	25530323
1/4	1/4	1 1/4	3			0.015	5	25530325
1/4	1/4	1 1/4	3			0.030	5	25530326
1/4	1/4	1 1/4	3			0.060	5	25530327
5/16	5/16	1/2	2			0.020	5	25022493
5/16	5/16	1/2	2			0.030	5	25022494
5/16	5/16	1/2	2			0.060	5	25022495
5/16	5/16	3/4	2 1/2			0.020	5	25022497
5/16	5/16	3/4	2 1/2			0.030	5	25022498
5/16	5/16	3/4	2 1/2			0.060	5	25022499

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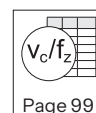
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5 Flute with corner Radius



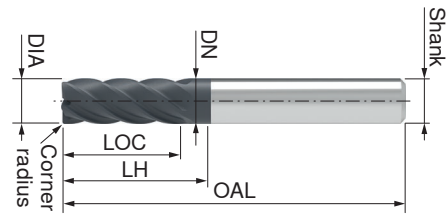
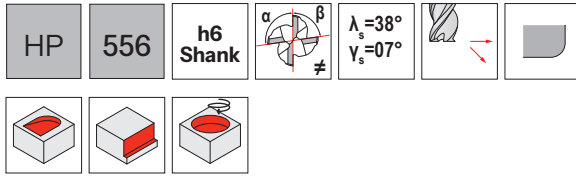
DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Corner radius inch	Flute	Material coated (DPB72S)
5/16	5/16	1 1/4	3			0.020	5	25022401
5/16	5/16	1 1/4	3			0.030	5	25022402
5/16	5/16	1 1/4	3			0.060	5	25022403
3/8	3/8	1/2	2			0.015	5	25530329
3/8	3/8	1/2	2			0.030	5	25530320
3/8	3/8	1/2	2			0.060	5	25530331
3/8	3/8	1/2	2			0.090	5	25530332
3/8	3/8	1/2	4	1.125	0.356	0.030	5	25022404
3/8	3/8	1/2	4	2.125	0.356	0.030	5	25022405
3/8	3/8	1/2	6	3.125	0.356	0.030	5	25022406
3/8	3/8	1/2	6	4.125	0.356	0.030	5	25022407
3/8	3/8	1	3			0.015	5	25530334
3/8	3/8	1	3			0.030	5	25530335
3/8	3/8	1	3			0.060	5	25530336
3/8	3/8	1	3			0.090	5	25530337
3/8	3/8	1 1/4	3			0.015	5	25530339
3/8	3/8	1 1/4	3			0.030	5	25530330
3/8	3/8	1 1/4	3			0.060	5	25530341
3/8	3/8	1 1/4	3			0.090	5	25530342
3/8	3/8	1 1/2	3 1/2			0.015	5	25530344
3/8	3/8	1 1/2	3 1/2			0.030	5	25530345
3/8	3/8	1 1/2	3 1/2			0.060	5	25530346
3/8	3/8	1 1/2	3 1/2			0.090	5	25530347
1/2	1/2	5/8	2 1/2			0.015	5	25530349
1/2	1/2	5/8	2 1/2			0.030	5	25530340
1/2	1/2	5/8	2 1/2			0.060	5	25530351
1/2	1/2	5/8	2 1/2			0.090	5	25530352
1/2	1/2	5/8	2 1/2			0.125	5	25530353
1/2	1/2	5/8	4	1.500	0.475	0.030	5	25022400
1/2	1/2	5/8	4	2.250	0.475	0.030	5	25022511
1/2	1/2	5/8	6	3.375	0.475	0.030	5	25022512
1/2	1/2	5/8	6	4.125	0.475	0.030	5	25022513
1/2	1/2	1	3			0.015	5	25530355
1/2	1/2	1	3			0.030	5	25530356
1/2	1/2	1	3			0.060	5	25530357
1/2	1/2	1	3			0.090	5	25530358
1/2	1/2	1	3			0.125	5	25530359
1/2	1/2	1 1/4	3			0.015	5	25530361
1/2	1/2	1 1/4	3			0.030	5	25530362

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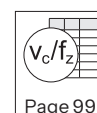
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5 Flute with corner Radius



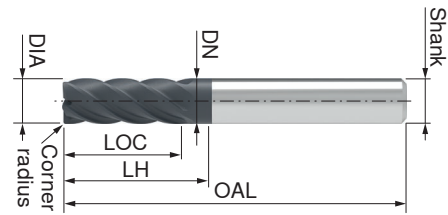
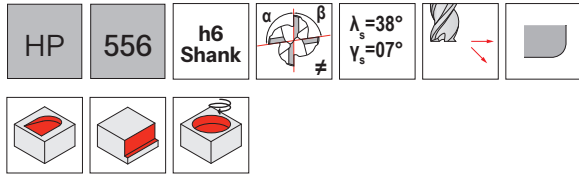
DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Corner radius inch	Flute	Material coated (DPB72S)
1/2	1/2	1 1/4	3			0.060	5	25530363
1/2	1/2	1 1/4	3			0.090	5	25530364
1/2	1/2	1 1/4	3			0.125	5	25530365
1/2	1/2	1 5/8	4			0.015	5	25530367
1/2	1/2	1 5/8	4			0.030	5	25530368
1/2	1/2	1 5/8	4			0.060	5	25530369
1/2	1/2	1 5/8	4			0.090	5	25530360
1/2	1/2	1 5/8	4			0.125	5	25530371
1/2	1/2	2	4			0.015	5	25530373
1/2	1/2	2	4			0.030	5	25530374
1/2	1/2	2	4			0.060	5	25530375
1/2	1/2	2	4			0.090	5	25530376
1/2	1/2	2	4			0.125	5	25530377
5/8	5/8	3/4	3			0.030	5	25530379
5/8	5/8	3/4	3			0.060	5	25530370
5/8	5/8	3/4	3			0.090	5	25530381
5/8	5/8	3/4	3			0.125	5	25530382
5/8	5/8	3/4	4	1.625	0.593	0.030	5	25022514
5/8	5/8	3/4	6	2.375	0.593	0.030	5	25022515
5/8	5/8	3/4	6	3.375	0.593	0.030	5	25022516
5/8	5/8	3/4	6	4.125	0.593	0.030	5	25022517
5/8	5/8	1 1/4	3 1/2			0.030	5	25530384
5/8	5/8	1 1/4	3 1/2			0.060	5	25530385
5/8	5/8	1 1/4	3 1/2			0.090	5	25530386
5/8	5/8	1 1/4	3 1/2			0.125	5	25530387
5/8	5/8	1 5/8	3 1/2			0.030	5	25530389
5/8	5/8	1 5/8	3 1/2			0.060	5	25530380
5/8	5/8	1 5/8	3 1/2			0.090	5	25530391
5/8	5/8	1 5/8	3 1/2			0.125	5	25530392
5/8	5/8	2 1/4	4			0.030	5	25530394
5/8	5/8	2 1/4	4			0.060	5	25530395
5/8	5/8	2 1/4	4			0.090	5	25530396
5/8	5/8	2 1/4	4			0.125	5	25530397
5/8	5/8	2 1/2	5			0.030	5	25530399
5/8	5/8	2 1/2	5			0.060	5	25530390
5/8	5/8	2 1/2	5			0.090	5	25530301
5/8	5/8	2 1/2	5			0.125	5	25530302
3/4	3/4	1	3			0.030	5	25530304
3/4	3/4	1	3			0.060	5	25530305

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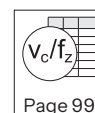
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5 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Corner radius inch	Flute	Material coated (DPB72S)
3/4	3/4	1	3			0.090	5	25530306
3/4	3/4	1	3			0.125	5	25530307
3/4	3/4	1	3			0.190	5	25530308
3/4	3/4	1	3			0.250	5	25530309
3/4	3/4	1	4			0.030	5	25022518
3/4	3/4	1	6	2.500	0.712	0.030	5	25022519
3/4	3/4	1	6	3.375	0.712	0.030	5	25022510
3/4	3/4	1	6	4.125	0.712	0.030	5	25022521
3/4	3/4	15/8	4			0.030	5	25530411
3/4	3/4	15/8	4			0.060	5	25530412
3/4	3/4	15/8	4			0.090	5	25530413
3/4	3/4	15/8	4			0.125	5	25530414
3/4	3/4	15/8	4			0.190	5	25530415
3/4	3/4	15/8	4			0.250	5	25530416
3/4	3/4	21/4	5			0.030	5	25530418
3/4	3/4	21/4	5			0.060	5	25530419
3/4	3/4	21/4	5			0.090	5	25530410
3/4	3/4	21/4	5			0.125	5	25530421
3/4	3/4	21/4	5			0.190	5	25530422
3/4	3/4	21/4	5			0.250	5	25530423
3/4	3/4	23/4	5			0.030	5	25530425
3/4	3/4	23/4	5			0.060	5	25530426
3/4	3/4	23/4	5			0.090	5	25530427
3/4	3/4	23/4	5			0.125	5	25530428
3/4	3/4	23/4	5			0.190	5	25530429
3/4	3/4	23/4	5			0.250	5	25530420
3/4	3/4	31/4	6			0.030	5	25530432
3/4	3/4	31/4	6			0.060	5	25530433
3/4	3/4	31/4	6			0.090	5	25530434
3/4	3/4	31/4	6			0.125	5	25530435
3/4	3/4	31/4	6			0.190	5	25530436
3/4	3/4	31/4	6			0.250	5	25530437
1	1	11/4	4	2.250	0.950	0.030	5	25022522
1	1	11/4	4			0.030	5	25022522
1	1	11/4	4			0.060	5	25530430
1	1	11/4	4			0.090	5	25530441
1	1	11/4	4			0.125	5	25530442
1	1	11/4	4			0.190	5	25530443
1	1	11/4	4			0.250	5	25530444

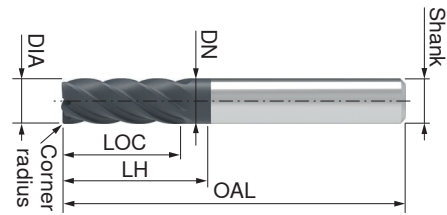
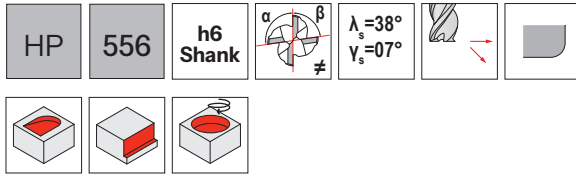
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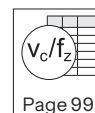
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5 Flute with corner Radius

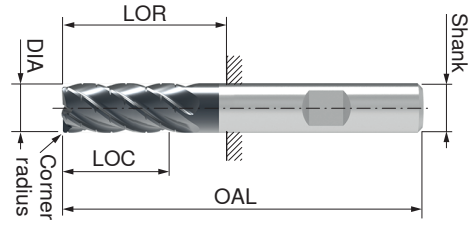
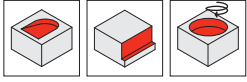
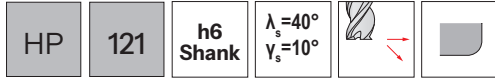


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Corner radius inch	Flute	Material coated (DPB72S)
1	1	11/4	6	2.625	0.950	0.030	5	25022523
1	1	11/4	6	3.375	0.950	0.030	5	25022524
1	1	11/4	6	4.125	0.950	0.030	5	25022525
1	1	2	4 1/2			0.030	5	25530446
1	1	2	4 1/2			0.060	5	25530447
1	1	2	4 1/2			0.090	5	25530448
1	1	2	4 1/2			0.125	5	25530449
1	1	2	4 1/2			0.190	5	25530440
1	1	2	4 1/2			0.250	5	25530451
1	1	2 5/8	5			0.030	5	25530453
1	1	2 5/8	5			0.060	5	25530454
1	1	2 5/8	5			0.090	5	25530455
1	1	2 5/8	5			0.125	5	25530456
1	1	2 5/8	5			0.190	5	25530457
1	1	2 5/8	5			0.250	5	25530458
1	1	3 1/4	6			0.030	5	25530450
1	1	3 1/4	6			0.060	5	25530461
1	1	3 1/4	6			0.090	5	25530462
1	1	3 1/4	6			0.125	5	25530463
1	1	3 1/4	6			0.190	5	25530464
1	1	3 1/4	6			0.250	5	25530465
1	1	4 1/4	7			0.030	5	25530467
1	1	4 1/4	7			0.060	5	25530468
1	1	4 1/4	7			0.090	5	25530469
1	1	4 1/4	7			0.125	5	25530460
1	1	4 1/4	7			0.190	5	25530471
1	1	4 1/4	7			0.250	5	25530472
1 1/4	1 1/4	2	4 1/2			0.030	5	25065740
1 1/4	1 1/4	3 3/8	6			0.030	5	25065752
1 1/4	1 1/4	4 3/4	8			0.030	5	25065754

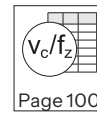
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5 Flute with corner Radius

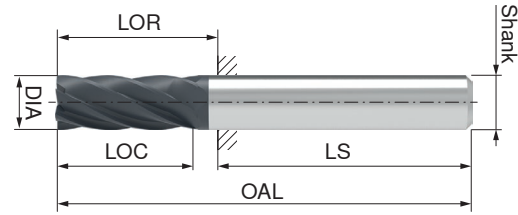
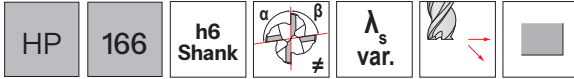


DIA inch	Shank inch	LOC inch	OAL inch	LOR inch	Radius corner inch	Flute	Material coated (AlTiN)
3/4	3/4	2 1/2	5	2.9	0.030	5	23291313
3/4	3/4	3 1/4	6	3.9	0.030	5	23291316
1	1	2 3/4	5	2.7	0.030	5	23291319
1	1	3 3/8	6	3.7	0.030	5	23291322

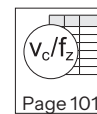


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6 Flute with square end

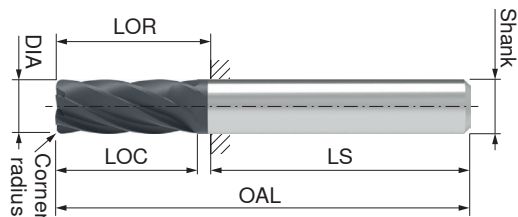
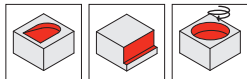
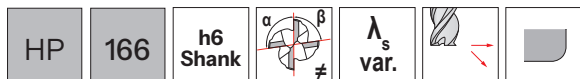


DIA inch	Shank inch	LOC inch	OAL inch	LOR inch	LS inch	Flute	Material coated (DPB72S)
1/4	1/4	3/8	2	0.583	1.417	6	25900792
1/4	1/4	1/2	2 1/2	1.083	1.417	6	25900793
1/4	1/4	3/4	2 1/2	1.083	1.417	6	25900794
1/4	1/4	11/4	3	1.583	1.417	6	25900795
5/16	5/16	3/4	2 1/2	1.083	1.417	6	25038506
5/16	5/16	1	3	1.583	1.417	6	25900797
3/8	3/8	1/2	2	0.825	1.175	6	25900798
3/8	3/8	1	2 1/2	1.083	1.417	6	25900799
3/8	3/8	11/4	3	1.583	1.417	6	25900790
3/8	3/8	11/2	3 1/2	1.925	1.575	6	25900701
1/2	1/2	5/8	2 1/2	0.735	1.765	6	25900702
1/2	1/2	1	3	1.235	1.765	6	25902924
1/2	1/2	11/4	3	1.425	1.575	6	25900703
1/2	1/2	11/2	4	1.625	2.375	6	25900704
1/2	1/2	2	4	2.235	1.765	6	25900705
5/8	5/8	3/4	3	1.110	1.890	6	25900706
5/8	5/8	11/4	3 1/2	1.613	1.888	6	25900707
5/8	5/8	15/8	4	2.228	1.772	6	25900708
5/8	5/8	2	5	3.032	1.969	6	25900709
3/4	3/4	1	3	1.228	1.773	6	25900700
3/4	3/4	11/4	4	2.032	1.969	6	25900811
3/4	3/4	15/8	5	3.032	1.969	6	25900812
3/4	3/4	2 1/4	5	3.032	1.969	6	25900813
3/4	3/4	3 1/4	6	4.032	1.969	6	25900814
1	1	2	4 1/2	2.295	2.205	6	25900815
1	1	2 1/2	5	3.032	1.969	6	25900816
1	1	3 1/4	6	3.795	2.205	6	25900817



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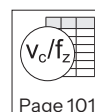
6 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	LOR inch	LS inch	Radius corner inch	Flute	Material coated (DPB72S)
1/4	1/4	3/8	2	0.583	1.417	0.015	6	25900818
1/4	1/4	3/8	2	0.583	1.417	0.030	6	25900833
1/4	1/4	1/2	2 1/2	1.083	1.417	0.015	6	25900819
1/4	1/4	1/2	2 1/2	1.083	1.417	0.030	6	25900834
1/4	1/4	3/4	2 1/2	1.083	1.417	0.015	6	25900810
1/4	1/4	3/4	2 1/2	1.083	1.417	0.030	6	25900835
1/4	1/4	1 1/4	3	1.583	1.417	0.015	6	25900821
1/4	1/4	1 1/4	3	1.583	1.417	0.030	6	25900836
5/16	5/16	3/4	2 1/2	1.083	1.417	0.015	6	25900822
5/16	5/16	3/4	2 1/2	1.083	1.417	0.030	6	25900837
5/16	5/16	1	3	1.583	1.417	0.015	6	25900823
5/16	5/16	1	3	1.583	1.417	0.030	6	25900838
5/16	5/16	1	3	1.583	1.417	0.060	6	25900859
3/8	3/8	1/2	2	0.825	1.175	0.015	6	25900824
3/8	3/8	1/2	2	0.825	1.175	0.030	6	25900839
3/8	3/8	1/2	2	0.825	1.175	0.060	6	25900850
3/8	3/8	1	2 1/2	1.083	1.417	0.015	6	25900825
3/8	3/8	1	2 1/2	1.083	1.417	0.030	6	25900830
3/8	3/8	1	2 1/2	1.083	1.417	0.060	6	25900861
3/8	3/8	1 1/4	3	1.583	1.417	0.015	6	25900826
3/8	3/8	1 1/4	3	1.583	1.417	0.030	6	25900841
3/8	3/8	1 1/4	3	1.583	1.417	0.060	6	25900862
3/8	3/8	1 1/2	3 1/2	1.925	1.575	0.015	6	25900827
3/8	3/8	1 1/2	3 1/2	1.925	1.575	0.030	6	25900842
3/8	3/8	1 1/2	3 1/2	1.925	1.575	0.060	6	25900863
1/2	1/2	5/8	2 1/2	0.728	1.772	0.015	6	25900828
1/2	1/2	5/8	2 1/2	0.728	1.772	0.030	6	25900843
1/2	1/2	5/8	2 1/2	0.728	1.772	0.060	6	25900864
1/2	1/2	5/8	2 1/2	0.728	1.772	0.090	6	25900881
1/2	1/2	5/8	2 1/2	0.735	1.765	0.120	6	25900898
1/2	1/2	1	3	1.228	1.772	0.015	6	25900829
1/2	1/2	1	3	1.228	1.772	0.030	6	25900844
1/2	1/2	1	3	1.228	1.772	0.060	6	25900865
1/2	1/2	1	3	1.228	1.772	0.090	6	25900882
1/2	1/2	1	3	1.228	1.772	0.120	6	25900899
1/2	1/2	1 1/4	3	1.425	1.575	0.015	6	25900820*
1/2	1/2	1 1/4	3	1.425	1.575	0.030	6	25902931*
1/2	1/2	1 1/4	3	1.425	1.575	0.060	6	25900866*
1/2	1/2	1 1/4	3	1.425	1.575	0.090	6	25900883*

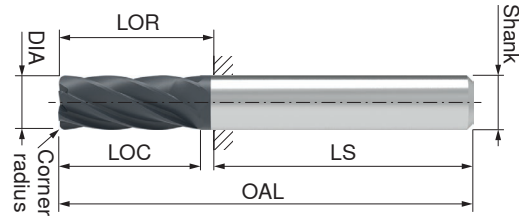
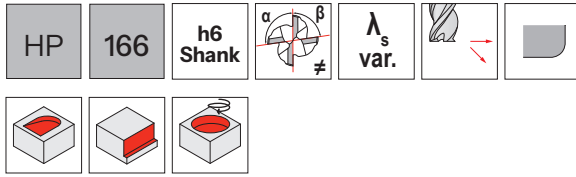
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6 Flute with corner Radius

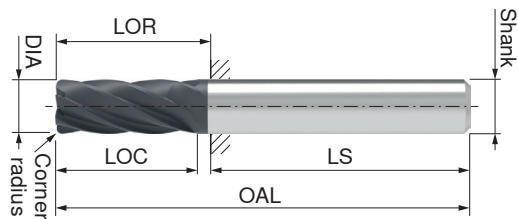
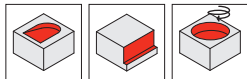
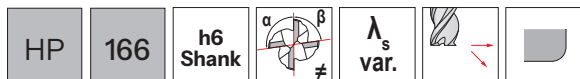


DIA inch	Shank inch	LOC inch	OAL inch	LOR inch	LS inch	Radius corner inch	Flute	Material coated (DPB72S)
1/2	1/2	1 1/4	3	1.425	1.575	0.120	6	25900890*
1/2	1/2	1 1/2	4	1.625	2.375	0.015	6	25900831*
1/2	1/2	1 1/2	4	1.625	2.375	0.030	6	25900845*
1/2	1/2	1 1/2	4	1.625	2.375	0.060	6	25900867*
1/2	1/2	1 1/2	4	1.625	2.375	0.090	6	25900884*
1/2	1/2	1 1/2	4	1.625	2.375	0.120	6	25900801*
1/2	1/2	2	4	2.228	1.772	0.015	6	25900832*
1/2	1/2	2	4	2.228	1.772	0.030	6	25900846*
1/2	1/2	2	4	2.228	1.772	0.060	6	25900868*
1/2	1/2	2	4	2.228	1.772	0.090	6	25900885*
1/2	1/2	2	4	2.228	1.772	0.120	6	25900802*
5/8	5/8	3/4	3	1.122	1.890	0.030	6	25900847
5/8	5/8	3/4	3	1.122	1.890	0.060	6	25900869
5/8	5/8	3/4	3	1.122	1.890	0.090	6	25900886
5/8	5/8	3/4	3	1.110	1.890	0.120	6	25900803
5/8	5/8	1 1/4	3 1/2	1.610	1.890	0.030	6	25900848*
5/8	5/8	1 1/4	3 1/2	1.610	1.890	0.060	6	25900860*
5/8	5/8	1 1/4	3 1/2	1.610	1.890	0.090	6	25900887*
5/8	5/8	1 1/4	3 1/2	1.610	1.890	0.120	6	25900804*
5/8	5/8	1 5/8	4	2.228	1.772	0.030	6	25900849*
5/8	5/8	1 5/8	4	2.228	1.772	0.060	6	25900871*
5/8	5/8	1 5/8	4	2.228	1.772	0.090	6	25900888*
5/8	5/8	1 5/8	4	2.228	1.772	0.120	6	25900805*
5/8	5/8	2	5	3.032	1.969	0.030	6	25900840*
5/8	5/8	2	5	3.032	1.969	0.060	6	25900872*
5/8	5/8	2	5	3.032	1.969	0.090	6	25900889*
5/8	5/8	2	5	3.032	1.969	0.120	6	25900806*
3/4	3/4	1	3	1.228	1.773	0.030	6	25900851
3/4	3/4	1	3	1.228	1.773	0.060	6	25900873
3/4	3/4	1	3	1.228	1.773	0.090	6	25900880
3/4	3/4	1	3	1.228	1.773	0.120	6	25900807
3/4	3/4	1	3	1.228	1.773	0.160	6	25900914
3/4	3/4	1	3	1.228	1.773	0.190	6	25900922
3/4	3/4	1	3	1.228	1.773	0.250	6	25900920
3/4	3/4	1 1/4	4	2.032	1.969	0.030	6	25900852
3/4	3/4	1 1/4	4	2.032	1.969	0.060	6	25900874
3/4	3/4	1 1/4	4	2.032	1.969	0.090	6	25900891
3/4	3/4	1 1/4	4	2.032	1.969	0.120	6	25900808
3/4	3/4	1 1/4	4	2.032	1.969	0.160	6	25900915

*) with chip splitter

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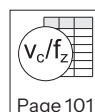
6 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	LOR inch	LS inch	Radius corner inch	Flute	Material coated (DPB72S)
3/4	3/4	1 1/4	4	2.032	1.969	0.190	6	25900923
3/4	3/4	1 1/4	4	2.032	1.969	0.250	6	25900931
3/4	3/4	1 5/8	5	3.032	1.969	0.030	6	25900853
3/4	3/4	1 5/8	5	3.032	1.969	0.060	6	25900875
3/4	3/4	1 5/8	5	3.032	1.969	0.090	6	25900892
3/4	3/4	1 5/8	5	3.032	1.969	0.120	6	25900809
3/4	3/4	1 5/8	5	3.032	1.969	0.160	6	25900916
3/4	3/4	1 5/8	5	3.032	1.969	0.190	6	25900924
3/4	3/4	1 5/8	5	3.032	1.969	0.250	6	25900932
3/4	3/4	2 1/4	5	3.032	1.969	0.030	6	25900854*
3/4	3/4	2 1/4	5	3.032	1.969	0.060	6	25900876*
3/4	3/4	2 1/4	5	3.032	1.969	0.090	6	25900893*
3/4	3/4	2 1/4	5	3.032	1.969	0.120	6	25900800*
3/4	3/4	2 1/4	5	3.032	1.969	0.160	6	25900917*
3/4	3/4	2 1/4	5	3.032	1.969	0.190	6	25900925*
3/4	3/4	2 1/4	5	3.032	1.969	0.250	6	25900933*
3/4	3/4	3 1/4	6	4.032	1.969	0.030	6	25900855*
3/4	3/4	3 1/4	6	4.032	1.969	0.060	6	25900877*
3/4	3/4	3 1/4	6	4.032	1.969	0.090	6	25900894*
3/4	3/4	3 1/4	6	4.032	1.969	0.120	6	25900911*
3/4	3/4	3 1/4	6	4.032	1.969	0.160	6	25900918*
3/4	3/4	3 1/4	6	4.032	1.969	0.190	6	25900926*
3/4	3/4	3 1/4	6	4.032	1.969	0.250	6	25900934*
1	1	2	4 1/2	2.295	2.205	0.030	6	25900856
1	1	2	4 1/2	2.295	2.205	0.060	6	25900878
1	1	2	4 1/2	2.295	2.205	0.090	6	25900895
1	1	2	4 1/2	2.295	2.205	0.120	6	25900912
1	1	2	4 1/2	2.295	2.205	0.160	6	25900919
1	1	2	4 1/2	2.295	2.205	0.190	6	25900927
1	1	2	4 1/2	2.295	2.205	0.250	6	25900935
1	1	2 1/2	5	3.032	1.969	0.030	6	25900857*
1	1	2 1/2	5	3.032	1.969	0.060	6	25900879*
1	1	2 1/2	5	3.032	1.969	0.090	6	25900896*
1	1	2 1/2	5	3.032	1.969	0.120	6	25900913*
1	1	2 1/2	5	3.032	1.969	0.160	6	25900910*
1	1	2 1/2	5	3.032	1.969	0.190	6	25900928*
1	1	2 1/2	5	3.032	1.969	0.250	6	25900936*
1	1	3 1/4	6	3.795	2.205	0.030	6	25900858*
1	1	3 1/4	6	3.795	2.205	0.060	6	25900870*

*) with chip splitter

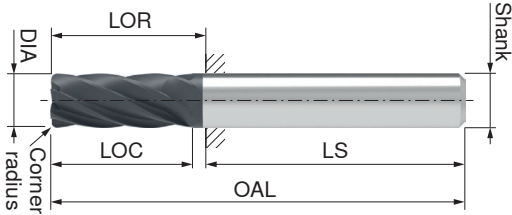
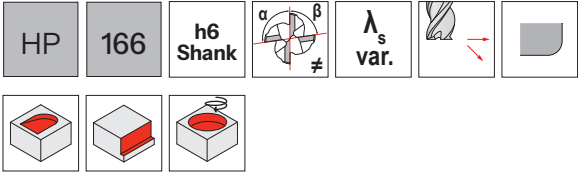
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6 Flute with corner Radius



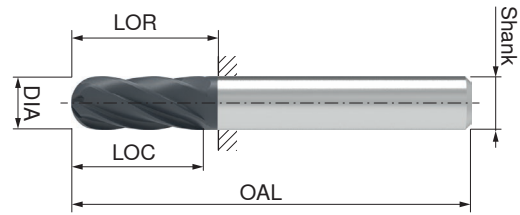
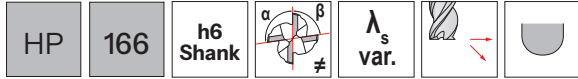
DIA inch	Shank inch	LOC inch	OAL inch	LOR inch	LS inch	Radius corner inch	Flute	Material coated (DPB72S)
1	1	3 1/4	6	3.795	2.205	0.090	6	25900897*
1	1	3 1/4	6	3.795	2.205	0.120	6	25997862*
1	1	3 1/4	6	3.795	2.205	0.160	6	25900921*
1	1	3 1/4	6	3.795	2.205	0.190	6	25900929*

*) with chip splitter

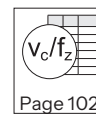
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6 Flute with Ball Nosed

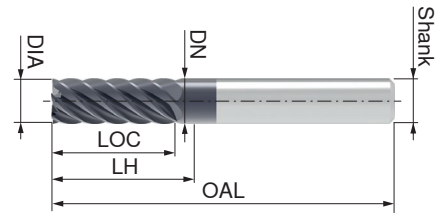
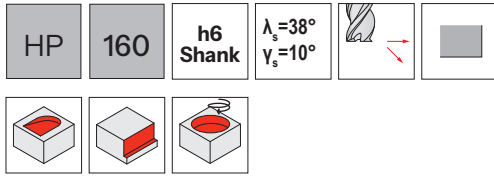


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (DPB72S)
1/4	1/4	3/8	2	6	25038502
1/4	1/4	1/2	2 1/2	6	25038503
1/4	1/4	3/4	2 1/2	6	25038504
1/4	1/4	11/4	3	6	25038505
5/16	5/16	3/4	2 1/2	6	25038506
5/16	5/16	1	3	6	25038507
3/8	3/8	1/2	2	6	25038508
3/8	3/8	1	2 1/2	6	25038509
3/8	3/8	1 1/4	3	6	25038500
3/8	3/8	1 1/2	3 1/2	6	25038611
1/2	1/2	5/8	2 1/2	6	25038612
1/2	1/2	1	3	6	25038613
1/2	1/2	1 1/4	3	6	25038614
1/2	1/2	1 1/2	4	6	25038615
1/2	1/2	2	4	6	25038616
5/8	5/8	3/4	3	6	25038617
5/8	5/8	1 1/4	3 1/2	6	25038618
5/8	5/8	1 5/8	4	6	25038619
5/8	5/8	2	5	6	25038610
3/4	3/4	1	3	6	25038621
3/4	3/4	1 1/4	4	6	25038622
3/4	3/4	1 5/8	5	6	25038623
3/4	3/4	2 1/4	5	6	25038624
3/4	3/4	3 1/4	6	6	25038625
1	1	2	4 1/2	6	25038626
1	1	2 1/2	5	6	25038627
1	1	3 1/4	6	6	25038628

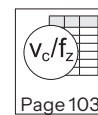


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7 Flute with square end

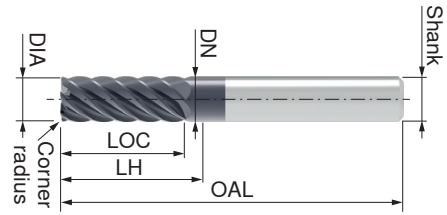
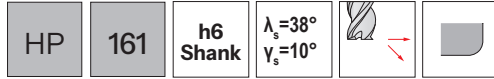


DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Flute	Material coated (DPB60S)
1/4	1/4	3/8	2			7	25022526
1/4	1/4	1/2	2			7	25022527
1/4	1/4	3/4	2 1/2			7	23291932
3/8	3/8	1/2	2			7	25022528
3/8	3/8	7/8	2 1/2			7	23291933
3/8	3/8	1 1/4	3			7	23291934
3/8	3/8	1/2	6	3 1/8	0.360	7	23291935
1/2	1/2	5/8	2 1/2			7	25022529
1/2	1/2	1	3			7	25022520
1/2	1/2	1 1/4	3			7	23291936
1/2	1/2	1 5/8	4			7	23291937
1/2	1/2	5/8	6	3 1/8	0.480	7	23291938
5/8	5/8	3/4	3			7	25022531
5/8	5/8	1 1/4	3 1/2			7	25022532
5/8	5/8	1 5/8	3 1/2			7	23291939
5/8	5/8	2 1/8	4			7	23291930
5/8	5/8	3/4	6	3 1/8	0.600	7	23291941
3/4	3/4	1	3			7	25022533
3/4	3/4	1 1/4	3 1/2			7	25022534
3/4	3/4	1 5/8	4			7	23291942
3/4	3/4	2 1/4	5			7	23291943
3/4	3/4	1	6	3 1/8	0.720	7	23291944
1	1	2	4			7	23291945
1	1	2 5/8	5			7	23291946
1	1	3 1/4	6			7	25022535

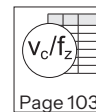


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7 Flute with corner Radius



DIA inch	Shank inch	LOC inch	OAL inch	LH inch	DN inch	Radius corner inch	Flute	Material coated (DPB60S)
1/4	1/4	3/8	2			0.020	7	25022536
1/4	1/4	1/2	2			0.020	7	25022537
1/4	1/4	3/4	2 1/2			0.020	7	23291947
1/4	1/4	3/4	2 1/2			0.030	7	23291956
1/4	1/4	1 1/8	3			0.020	7	23291948
1/4	1/4	3/8	4	2 1/2	0.240	0.030	7	23291957
1/4	1/4	3/8	4	2 1/2	0.240	0.020	7	23291949
3/8	3/8	1/2	2			0.020	7	25022538
3/8	3/8	7/8	2 1/2			0.020	7	23291940
3/8	3/8	7/8	2 1/2			0.030	7	23291958
3/8	3/8	1 1/4	3			0.030	7	23291959
3/8	3/8	1 1/4	3			0.020	7	23291951
3/8	3/8	1/2	6	3 1/8	0.360	0.020	7	23291952
1/2	1/2	5/8	2 1/2			0.030	7	25022539
1/2	1/2	1	3			0.030	7	25022530
1/2	1/2	1 1/4	3			0.020	7	23291954
1/2	1/2	1 1/4	3			0.030	7	23291950
1/2	1/2	1 5/8	4			0.030	7	23291961
1/2	1/2	1 5/8	4			0.020	7	23291954
1/2	1/2	5/8	6	3 1/8	0.480	0.030	7	23291962
1/2	1/2	5/8	6	3 1/8	0.480	0.020	7	23291955
5/8	5/8	3/4	3			0.030	7	25022541
5/8	5/8	1 1/4	3 1/2			0.030	7	25022542
5/8	5/8	1 5/8	3 1/2			0.030	7	23291963
5/8	5/8	2 1/8	4			0.030	7	23291964
5/8	5/8	3/4	6	3 1/8	0.600	0.030	7	23291965
3/4	3/4	1	3			0.030	7	25022543
3/4	3/4	1 1/4	3 1/2			0.030	7	25022544
3/4	3/4	1 5/8	4			0.030	7	23291966
3/4	3/4	2 1/4	5			0.030	7	23291967
3/4	3/4	1	6	3 1/8	0.720	0.030	7	23291968
3/4	3/4	1 1/4	3 1/2			0.030	7	25022544
1	1	3 1/4	6			0.030	7	25022545



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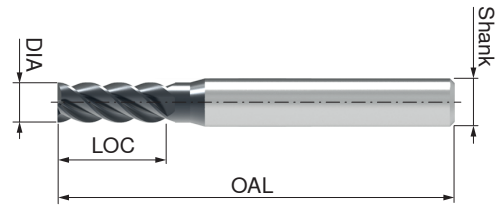
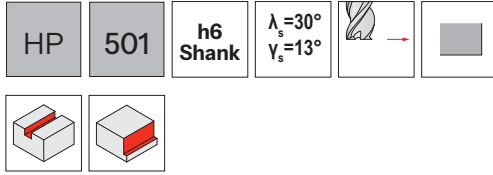
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Mikro end mills

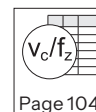


4 Flute Micro end milling cutter



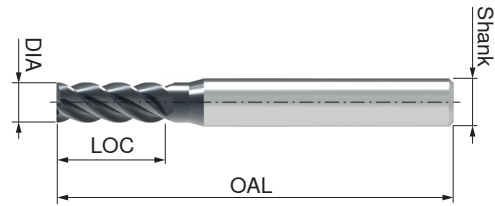
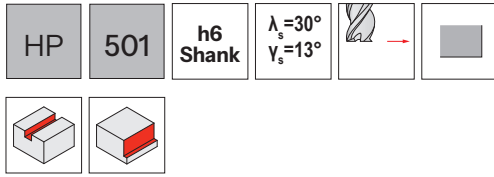
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.005	1/8	0.015	1 1/2	4	23387427
0.006	1/8	0.018	1 1/2	4	23387428
0.007	1/8	0.021	1 1/2	4	23387429
0.008	1/8	0.024	1 1/2	4	23387420
0.009	1/8	0.027	1 1/2	4	23387431
0.010	1/8	0.030	1 1/2	4	23387432
0.011	1/8	0.033	1 1/2	4	23387433
0.012	1/8	0.036	1 1/2	4	23387434
0.013	1/8	0.039	1 1/2	4	23387435
0.014	1/8	0.042	1 1/2	4	23387436
0.015	1/8	0.045	1 1/2	4	23387437
0.016	1/8	0.048	1 1/2	4	23387438
0.017	1/8	0.051	1 1/2	4	23387439
0.018	1/8	0.054	1 1/2	4	23387430
0.019	1/8	0.057	1 1/2	4	23387441
0.020	1/8	0.060	1 1/2	4	23387442
0.021	1/8	0.063	1 1/2	4	23387443
0.022	1/8	0.066	1 1/2	4	23387444
0.023	1/8	0.069	1 1/2	4	23387445
0.024	1/8	0.072	1 1/2	4	23387446
0.025	1/8	0.075	1 1/2	4	23387447
0.026	1/8	0.078	1 1/2	4	23387448
0.027	1/8	0.081	1 1/2	4	23387449
0.028	1/8	0.084	1 1/2	4	23387440
0.029	1/8	0.087	1 1/2	4	23387451
0.030	1/8	0.090	1 1/2	4	23387452
0.031	1/8	0.093	1 1/2	4	23387453
0.032	1/8	0.096	1 1/2	4	23387454
0.033	1/8	0.099	1 1/2	4	23387455
0.034	1/8	0.102	1 1/2	4	23387456
0.035	1/8	0.105	1 1/2	4	23387457
0.036	1/8	0.108	1 1/2	4	23387458
0.037	1/8	0.111	1 1/2	4	23387459
0.038	1/8	0.114	1 1/2	4	23387450
0.039	1/8	0.117	1 1/2	4	23387461
0.040	1/8	0.120	1 1/2	4	23387462
0.041	1/8	0.123	1 1/2	4	23387463
0.042	1/8	0.126	1 1/2	4	23387464
0.043	1/8	0.129	1 1/2	4	23387465

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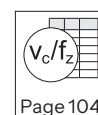
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4 Flute Micro end milling cutter



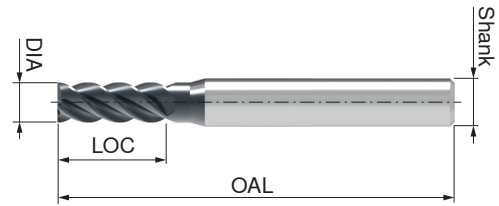
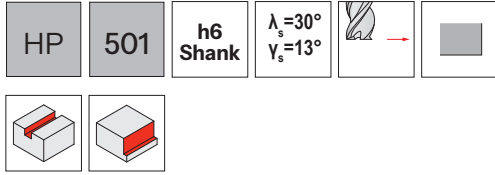
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.044	1/8	0.132	11/2	4	23387466
0.045	1/8	0.135	11/2	4	23387467
0.046	1/8	0.138	11/2	4	23387468
0.047	1/8	0.141	11/2	4	23387469
0.048	1/8	0.144	11/2	4	23387460
0.049	1/8	0.147	11/2	4	23387471
0.050	1/8	0.150	11/2	4	23387472
0.051	1/8	0.153	11/2	4	23387473
0.052	1/8	0.156	11/2	4	23387474
0.053	1/8	0.159	11/2	4	23387475
0.054	1/8	0.162	11/2	4	23387476
0.055	1/8	0.165	11/2	4	23387477
0.056	1/8	0.168	11/2	4	23387478
0.057	1/8	0.171	11/2	4	23387479
0.058	1/8	0.174	11/2	4	23387470
0.059	1/8	0.177	11/2	4	23387481
0.060	1/8	0.180	11/2	4	23387482
0.061	1/8	0.183	11/2	4	23387483
0.062	1/8	0.186	11/2	4	23387484
0.063	1/8	0.189	11/2	4	23387485
0.064	1/8	0.192	11/2	4	23387486
0.065	1/8	0.195	11/2	4	23387487
0.066	1/8	0.198	11/2	4	23387488
0.067	1/8	0.201	11/2	4	23387489
0.068	1/8	0.204	11/2	4	23387480
0.069	1/8	0.207	11/2	4	23387491
0.070	1/8	0.210	11/2	4	23387492
0.071	1/8	0.213	11/2	4	23387493
0.072	1/8	0.216	11/2	4	23387494
0.073	1/8	0.219	11/2	4	23387495
0.074	1/8	0.222	11/2	4	23387496
0.075	1/8	0.225	11/2	4	23387497
0.076	1/8	0.228	11/2	4	23387498
0.077	1/8	0.231	11/2	4	23387499
0.078	1/8	0.234	11/2	4	23387490
0.079	1/8	0.237	11/2	4	23387401
0.080	1/8	0.240	11/2	4	23387402
0.081	1/8	0.243	11/2	4	23387403
0.082	1/8	0.246	11/2	4	23387404

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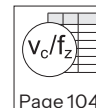


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4 Flute Micro end milling cutter

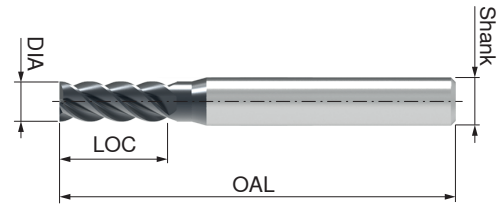
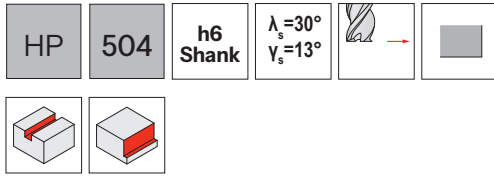


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.083	1/8	0.249	1 1/2	4	23387405
0.084	1/8	0.252	1 1/2	4	23387406
0.085	1/8	0.255	1 1/2	4	23387407
0.086	1/8	0.258	1 1/2	4	23387408
0.087	1/8	0.261	1 1/2	4	23387409
0.088	1/8	0.264	1 1/2	4	23387400
0.089	1/8	0.267	1 1/2	4	23387511
0.090	1/8	0.270	1 1/2	4	23387512
0.091	1/8	0.273	1 1/2	4	23387513
0.092	1/8	0.276	1 1/2	4	23387514
0.093	1/8	0.279	1 1/2	4	23387515
0.094	1/8	0.282	1 1/2	4	23387516
0.095	1/8	0.285	1 1/2	4	23387517
0.096	1/8	0.288	1 1/2	4	23387518
0.097	1/8	0.291	1 1/2	4	23387519
0.098	1/8	0.294	1 1/2	4	23387510
0.099	1/8	0.297	1 1/2	4	23387521
0.100	1/8	0.300	1 1/2	4	23387522
0.101	1/8	0.303	1 1/2	4	23387523
0.102	1/8	0.306	1 1/2	4	23387524
0.103	1/8	0.309	1 1/2	4	23387525
0.104	1/8	0.312	1 1/2	4	23387526
0.105	1/8	0.315	1 1/2	4	23387527
0.106	1/8	0.318	1 1/2	4	23387528
0.107	1/8	0.321	1 1/2	4	23387529
0.108	1/8	0.324	1 1/2	4	23387520
0.109	1/8	0.327	1 1/2	4	23387531
0.110	1/8	0.330	1 1/2	4	23387532
0.111	1/8	0.333	1 1/2	4	23387533
0.112	1/8	0.336	1 1/2	4	23387534
0.113	1/8	0.339	1 1/2	4	23387535
0.114	1/8	0.341	1 1/2	4	23387536
0.115	1/8	0.345	1 1/2	4	23387537
0.116	1/8	0.348	1 1/2	4	23387538
0.117	1/8	0.351	1 1/2	4	23387539
0.118	1/8	0.354	1 1/2	4	23387530
0.119	1/8	0.357	1 1/2	4	23387541
0.120	1/8	0.360	1 1/2	4	23387542



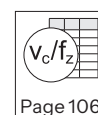
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4 Flute Micro end milling cutter



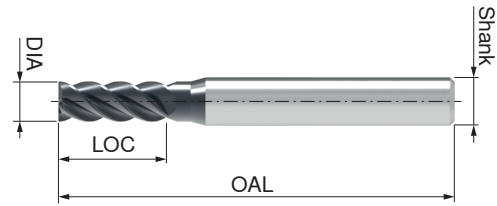
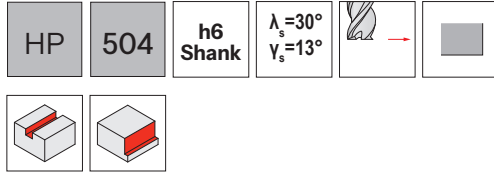
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.005	1/8	0.008	11/2	4	23387659
0.006	1/8	0.009	11/2	4	23387650
0.007	1/8	0.011	11/2	4	23387661
0.008	1/8	0.012	11/2	4	23387662
0.009	1/8	0.014	11/2	4	23387663
0.010	1/8	0.015	11/2	4	23387664
0.011	1/8	0.017	11/2	4	23387665
0.012	1/8	0.018	11/2	4	23387666
0.013	1/8	0.020	11/2	4	23387667
0.014	1/8	0.021	11/2	4	23387668
0.015	1/8	0.023	11/2	4	23387669
0.016	1/8	0.024	11/2	4	23387660
0.017	1/8	0.026	11/2	4	23387671
0.018	1/8	0.027	11/2	4	23387672
0.019	1/8	0.029	11/2	4	23387673
0.020	1/8	0.030	11/2	4	23387674
0.021	1/8	0.032	11/2	4	23387675
0.022	1/8	0.033	11/2	4	23387676
0.023	1/8	0.035	11/2	4	23387677
0.024	1/8	0.036	11/2	4	23387678
0.025	1/8	0.038	11/2	4	23387679
0.026	1/8	0.039	11/2	4	23387670
0.027	1/8	0.041	11/2	4	23387681
0.028	1/8	0.042	11/2	4	23387682
0.029	1/8	0.044	11/2	4	23387683
0.030	1/8	0.045	11/2	4	23387684
0.031	1/8	0.047	11/2	4	23387685
0.032	1/8	0.048	11/2	4	23387686
0.033	1/8	0.050	11/2	4	23387687
0.034	1/8	0.051	11/2	4	23387688
0.035	1/8	0.053	11/2	4	23387689
0.036	1/8	0.054	11/2	4	23387680
0.037	1/8	0.056	11/2	4	23387691
0.038	1/8	0.057	11/2	4	23387692
0.039	1/8	0.059	11/2	4	23387693
0.040	1/8	0.060	11/2	4	23387694
0.041	1/8	0.062	11/2	4	23387695
0.042	1/8	0.063	11/2	4	23387696
0.043	1/8	0.065	11/2	4	23387697

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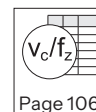
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4 Flute Micro end milling cutter



DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.044	1/8	0.066	1 1/2	4	23387698
0.045	1/8	0.068	1 1/2	4	23387699
0.046	1/8	0.069	1 1/2	4	23387690
0.047	1/8	0.071	1 1/2	4	23387601
0.048	1/8	0.072	1 1/2	4	23387602
0.049	1/8	0.074	1 1/2	4	23387603
0.050	1/8	0.075	1 1/2	4	23387604
0.051	1/8	0.077	1 1/2	4	23387605
0.052	1/8	0.078	1 1/2	4	23387606
0.053	1/8	0.080	1 1/2	4	23387607
0.054	1/8	0.081	1 1/2	4	23387608
0.055	1/8	0.083	1 1/2	4	23387609
0.056	1/8	0.084	1 1/2	4	23387600
0.057	1/8	0.086	1 1/2	4	23387711
0.058	1/8	0.087	1 1/2	4	23387712
0.059	1/8	0.089	1 1/2	4	23387713
0.060	1/8	0.090	1 1/2	4	23387714
0.061	1/8	0.092	1 1/2	4	23387715
0.062	1/8	0.093	1 1/2	4	23387716
0.063	1/8	0.095	1 1/2	4	23387717
0.064	1/8	0.096	1 1/2	4	23387718
0.065	1/8	0.098	1 1/2	4	23387719
0.066	1/8	0.099	1 1/2	4	23387710
0.067	1/8	0.101	1 1/2	4	23387721
0.068	1/8	0.102	1 1/2	4	23387722
0.069	1/8	0.104	1 1/2	4	23387723
0.070	1/8	0.105	1 1/2	4	23387724
0.071	1/8	0.107	1 1/2	4	23387725
0.072	1/8	0.108	1 1/2	4	23387726
0.073	1/8	0.110	1 1/2	4	23387727
0.074	1/8	0.111	1 1/2	4	23387728
0.075	1/8	0.113	1 1/2	4	23387729
0.076	1/8	0.114	1 1/2	4	23387720
0.077	1/8	0.116	1 1/2	4	23387731
0.078	1/8	0.117	1 1/2	4	23387732
0.079	1/8	0.119	1 1/2	4	23387733
0.080	1/8	0.120	1 1/2	4	23387734
0.081	1/8	0.122	1 1/2	4	23387735
0.082	1/8	0.123	1 1/2	4	23387736

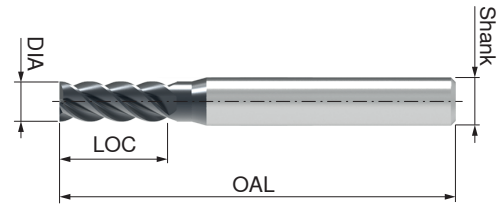
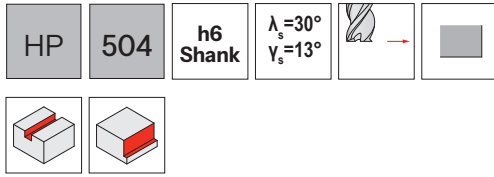
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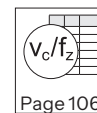
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4 Flute Micro end milling cutter

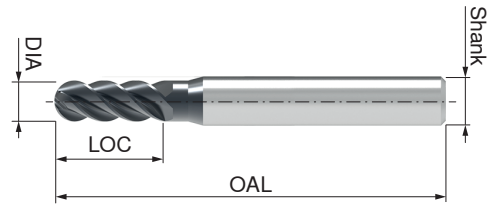
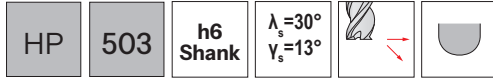


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.083	1/8	0.125	1 1/2	4	23387737
0.084	1/8	0.126	1 1/2	4	23387738
0.085	1/8	0.128	1 1/2	4	23387739
0.086	1/8	0.129	1 1/2	4	23387730
0.087	1/8	0.131	1 1/2	4	23387741
0.088	1/8	0.132	1 1/2	4	23387742
0.089	1/8	0.134	1 1/2	4	23387743
0.090	1/8	0.135	1 1/2	4	23387744
0.091	1/8	0.137	1 1/2	4	23387745
0.092	1/8	0.138	1 1/2	4	23387746
0.093	1/8	0.140	1 1/2	4	23387747
0.094	1/8	0.141	1 1/2	4	23387748
0.095	1/8	0.143	1 1/2	4	23387749
0.096	1/8	0.144	1 1/2	4	23387740
0.097	1/8	0.146	1 1/2	4	23387751
0.098	1/8	0.147	1 1/2	4	23387752
0.099	1/8	0.149	1 1/2	4	23387753
0.100	1/8	0.150	1 1/2	4	23387754
0.101	1/8	0.152	1 1/2	4	23387755
0.102	1/8	0.153	1 1/2	4	23387756
0.103	1/8	0.155	1 1/2	4	23387757
0.104	1/8	0.156	1 1/2	4	23387758
0.105	1/8	0.158	1 1/2	4	23387759
0.106	1/8	0.159	1 1/2	4	23387750
0.107	1/8	0.161	1 1/2	4	23387761
0.108	1/8	0.162	1 1/2	4	23387762
0.109	1/8	0.164	1 1/2	4	23387763
0.110	1/8	0.165	1 1/2	4	23387764
0.111	1/8	0.167	1 1/2	4	23387765
0.112	1/8	0.168	1 1/2	4	23387766
0.113	1/8	0.170	1 1/2	4	23387767
0.114	1/8	0.171	1 1/2	4	23387768
0.115	1/8	0.173	1 1/2	4	23387769
0.116	1/8	0.174	1 1/2	4	23387760
0.117	1/8	0.176	1 1/2	4	23387771
0.118	1/8	0.177	1 1/2	4	23387772
0.119	1/8	0.179	1 1/2	4	23387773
0.120	1/8	0.180	1 1/2	4	23387774



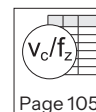
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4 Flute Micro end milling cutter



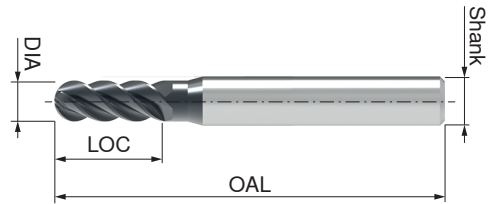
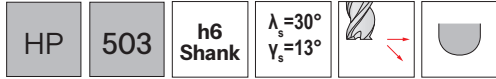
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.005	1/8	0.015	11/2	4	23387543
0.006	1/8	0.018	11/2	4	23387544
0.007	1/8	0.021	11/2	4	23387545
0.008	1/8	0.024	11/2	4	23387546
0.009	1/8	0.027	11/2	4	23387547
0.010	1/8	0.030	11/2	4	23387548
0.011	1/8	0.033	11/2	4	23387549
0.012	1/8	0.036	11/2	4	23387540
0.013	1/8	0.039	11/2	4	23387551
0.014	1/8	0.042	11/2	4	23387552
0.015	1/8	0.045	11/2	4	23387553
0.016	1/8	0.048	11/2	4	23387554
0.017	1/8	0.051	11/2	4	23387555
0.018	1/8	0.054	11/2	4	23387556
0.019	1/8	0.057	11/2	4	23387557
0.020	1/8	0.060	11/2	4	23387558
0.021	1/8	0.063	11/2	4	23387559
0.022	1/8	0.066	11/2	4	23387550
0.023	1/8	0.069	11/2	4	23387561
0.024	1/8	0.072	11/2	4	23387562
0.025	1/8	0.075	11/2	4	23387563
0.026	1/8	0.078	11/2	4	23387564
0.027	1/8	0.081	11/2	4	23387565
0.028	1/8	0.084	11/2	4	23387566
0.029	1/8	0.087	11/2	4	23387567
0.030	1/8	0.090	11/2	4	23387568
0.031	1/8	0.093	11/2	4	23387569
0.032	1/8	0.096	11/2	4	23387560
0.033	1/8	0.099	11/2	4	23387571
0.034	1/8	0.102	11/2	4	23387572
0.035	1/8	0.105	11/2	4	23387573
0.036	1/8	0.108	11/2	4	23387574
0.037	1/8	0.111	11/2	4	23387575
0.038	1/8	0.114	11/2	4	23387576
0.039	1/8	0.117	11/2	4	23387577
0.040	1/8	0.120	11/2	4	23387578
0.041	1/8	0.123	11/2	4	23387579
0.042	1/8	0.126	11/2	4	23387570
0.043	1/8	0.129	11/2	4	23387581

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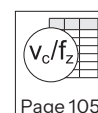
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4 Flute Micro end milling cutter



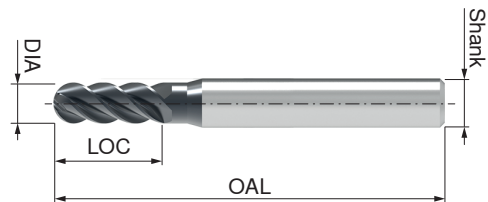
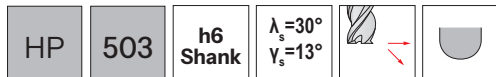
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.044	1/8	0.132	1 1/2	4	23387582
0.045	1/8	0.135	1 1/2	4	23387583
0.046	1/8	0.138	1 1/2	4	23387584
0.047	1/8	0.141	1 1/2	4	23387585
0.048	1/8	0.144	1 1/2	4	23387586
0.049	1/8	0.147	1 1/2	4	23387587
0.050	1/8	0.150	1 1/2	4	23387588
0.051	1/8	0.153	1 1/2	4	23387589
0.052	1/8	0.156	1 1/2	4	23387580
0.053	1/8	0.159	1 1/2	4	23387591
0.054	1/8	0.162	1 1/2	4	23387592
0.055	1/8	0.165	1 1/2	4	23387593
0.056	1/8	0.168	1 1/2	4	23387594
0.057	1/8	0.171	1 1/2	4	23387595
0.058	1/8	0.174	1 1/2	4	23387596
0.059	1/8	0.177	1 1/2	4	23387597
0.060	1/8	0.180	1 1/2	4	23387598
0.061	1/8	0.183	1 1/2	4	23387599
0.062	1/8	0.186	1 1/2	4	23387590
0.063	1/8	0.189	1 1/2	4	23387501
0.064	1/8	0.192	1 1/2	4	23387502
0.065	1/8	0.195	1 1/2	4	23387503
0.066	1/8	0.198	1 1/2	4	23387504
0.067	1/8	0.201	1 1/2	4	23387505
0.068	1/8	0.204	1 1/2	4	23387506
0.069	1/8	0.207	1 1/2	4	23387507
0.070	1/8	0.210	1 1/2	4	23387508
0.071	1/8	0.213	1 1/2	4	23387509
0.072	1/8	0.216	1 1/2	4	23387500
0.073	1/8	0.219	1 1/2	4	23387611
0.074	1/8	0.222	1 1/2	4	23387612
0.075	1/8	0.225	1 1/2	4	23387613
0.076	1/8	0.228	1 1/2	4	23387614
0.077	1/8	0.231	1 1/2	4	23387615
0.078	1/8	0.234	1 1/2	4	23387616
0.079	1/8	0.237	1 1/2	4	23387617
0.080	1/8	0.240	1 1/2	4	23387618
0.081	1/8	0.243	1 1/2	4	23387619
0.082	1/8	0.246	1 1/2	4	23387610

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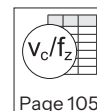


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4 Flute Micro end milling cutter

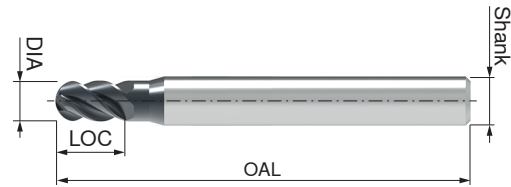
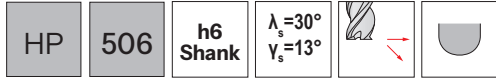


DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.083	1/8	0.249	11/2	4	23387621
0.084	1/8	0.252	11/2	4	23387622
0.085	1/8	0.255	11/2	4	23387623
0.086	1/8	0.258	11/2	4	23387624
0.087	1/8	0.261	11/2	4	23387625
0.088	1/8	0.264	11/2	4	23387626
0.089	1/8	0.267	11/2	4	23387627
0.090	1/8	0.270	11/2	4	23387628
0.091	1/8	0.273	11/2	4	23387629
0.092	1/8	0.276	11/2	4	23387620
0.093	1/8	0.279	11/2	4	23387631
0.094	1/8	0.282	11/2	4	23387632
0.095	1/8	0.285	11/2	4	23387633
0.096	1/8	0.288	11/2	4	23387634
0.097	1/8	0.291	11/2	4	23387635
0.098	1/8	0.294	11/2	4	23387636
0.099	1/8	0.297	11/2	4	23387637
0.100	1/8	0.300	11/2	4	23387638
0.101	1/8	0.303	11/2	4	23387639
0.102	1/8	0.306	11/2	4	23387630
0.103	1/8	0.309	11/2	4	23387641
0.104	1/8	0.312	11/2	4	23387642
0.105	1/8	0.315	11/2	4	23387643
0.106	1/8	0.318	11/2	4	23387644
0.107	1/8	0.321	11/2	4	23387645
0.108	1/8	0.324	11/2	4	23387646
0.109	1/8	0.327	11/2	4	23387647
0.110	1/8	0.330	11/2	4	23387648
0.111	1/8	0.333	11/2	4	23387649
0.112	1/8	0.336	11/2	4	23387640
0.113	1/8	0.339	11/2	4	23387651
0.114	1/8	0.341	11/2	4	23387652
0.115	1/8	0.345	11/2	4	23387653
0.116	1/8	0.348	11/2	4	23387654
0.117	1/8	0.351	11/2	4	23387655
0.118	1/8	0.354	11/2	4	23387656
0.119	1/8	0.357	11/2	4	23387657
0.120	1/8	0.360	11/2	4	23387658



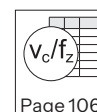
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4 Flute Micro end milling cutter



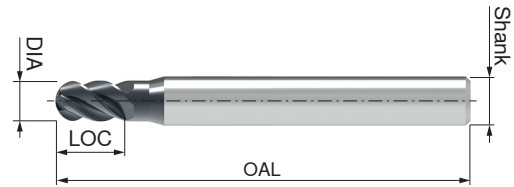
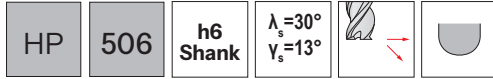
DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.005	1/8	0.008	1 1/2	4	23387775
0.006	1/8	0.009	1 1/2	4	23387776
0.007	1/8	0.011	1 1/2	4	23387777
0.008	1/8	0.012	1 1/2	4	23387778
0.009	1/8	0.014	1 1/2	4	23387779
0.010	1/8	0.015	1 1/2	4	23387770
0.011	1/8	0.017	1 1/2	4	23387781
0.012	1/8	0.018	1 1/2	4	23387782
0.013	1/8	0.020	1 1/2	4	23387783
0.014	1/8	0.021	1 1/2	4	23387784
0.015	1/8	0.023	1 1/2	4	23387785
0.016	1/8	0.024	1 1/2	4	23387786
0.017	1/8	0.026	1 1/2	4	23387787
0.018	1/8	0.027	1 1/2	4	23387788
0.019	1/8	0.029	1 1/2	4	23387789
0.020	1/8	0.030	1 1/2	4	23387780
0.021	1/8	0.032	1 1/2	4	23387791
0.022	1/8	0.033	1 1/2	4	23387792
0.023	1/8	0.035	1 1/2	4	23387793
0.024	1/8	0.036	1 1/2	4	23387794
0.025	1/8	0.038	1 1/2	4	23387795
0.026	1/8	0.039	1 1/2	4	23387796
0.027	1/8	0.041	1 1/2	4	23387797
0.028	1/8	0.042	1 1/2	4	23387798
0.029	1/8	0.044	1 1/2	4	23387799
0.030	1/8	0.045	1 1/2	4	23387790
0.031	1/8	0.047	1 1/2	4	23387701
0.032	1/8	0.048	1 1/2	4	23387702
0.033	1/8	0.050	1 1/2	4	23387703
0.034	1/8	0.051	1 1/2	4	23387704
0.035	1/8	0.053	1 1/2	4	23387705
0.036	1/8	0.054	1 1/2	4	23387706
0.037	1/8	0.056	1 1/2	4	23387707
0.038	1/8	0.057	1 1/2	4	23387708
0.039	1/8	0.059	1 1/2	4	23387709
0.040	1/8	0.060	1 1/2	4	23387700
0.041	1/8	0.062	1 1/2	4	23387811
0.042	1/8	0.063	1 1/2	4	23387812
0.043	1/8	0.065	1 1/2	4	23387813

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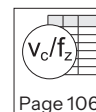
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4 Flute Micro end milling cutter



DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.044	1/8	0.066	11/2	4	23387814
0.045	1/8	0.068	11/2	4	23387815
0.046	1/8	0.069	11/2	4	23387816
0.047	1/8	0.071	11/2	4	23387817
0.048	1/8	0.072	11/2	4	23387818
0.049	1/8	0.074	11/2	4	23387819
0.050	1/8	0.075	11/2	4	23387810
0.051	1/8	0.077	11/2	4	23387821
0.052	1/8	0.078	11/2	4	23387822
0.053	1/8	0.080	11/2	4	23387823
0.054	1/8	0.081	11/2	4	23387824
0.055	1/8	0.083	11/2	4	23387825
0.056	1/8	0.084	11/2	4	23387826
0.057	1/8	0.086	11/2	4	23387827
0.058	1/8	0.087	11/2	4	23387828
0.059	1/8	0.089	11/2	4	23387829
0.060	1/8	0.090	11/2	4	23387820
0.061	1/8	0.092	11/2	4	23387831
0.062	1/8	0.093	11/2	4	23387832
0.063	1/8	0.095	11/2	4	23387833
0.064	1/8	0.096	11/2	4	23387834
0.065	1/8	0.098	11/2	4	23387835
0.066	1/8	0.099	11/2	4	23387836
0.067	1/8	0.101	11/2	4	23387837
0.068	1/8	0.102	11/2	4	23387838
0.069	1/8	0.104	11/2	4	23387839
0.070	1/8	0.105	11/2	4	23387830
0.071	1/8	0.107	11/2	4	23387841
0.072	1/8	0.108	11/2	4	23387842
0.073	1/8	0.110	11/2	4	23387843
0.074	1/8	0.111	11/2	4	23387844
0.075	1/8	0.113	11/2	4	23387845
0.076	1/8	0.114	11/2	4	23387846
0.077	1/8	0.116	11/2	4	23387847
0.078	1/8	0.117	11/2	4	23387848
0.079	1/8	0.119	11/2	4	23387849
0.080	1/8	0.120	11/2	4	23387840
0.081	1/8	0.122	11/2	4	23387851
0.082	1/8	0.123	11/2	4	23387852

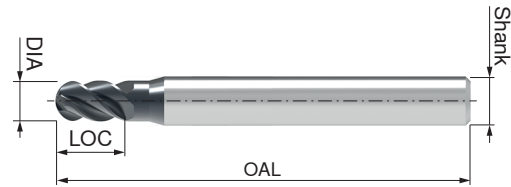
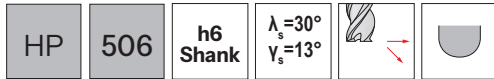
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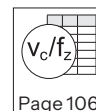
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4 Flute Micro end milling cutter



DIA inch	Shank inch	LOC inch	OAL inch	Flute	Material coated (AlTiN)
0.083	1/8	0.125	1 1/2	4	23387853
0.084	1/8	0.126	1 1/2	4	23387854
0.085	1/8	0.128	1 1/2	4	23387855
0.086	1/8	0.129	1 1/2	4	23387856
0.087	1/8	0.131	1 1/2	4	23387857
0.088	1/8	0.132	1 1/2	4	23387858
0.089	1/8	0.134	1 1/2	4	23387859
0.090	1/8	0.135	1 1/2	4	23387850
0.091	1/8	0.137	1 1/2	4	23387861
0.092	1/8	0.138	1 1/2	4	23387862
0.093	1/8	0.140	1 1/2	4	23387863
0.094	1/8	0.141	1 1/2	4	23387864
0.095	1/8	0.143	1 1/2	4	23387865
0.096	1/8	0.144	1 1/2	4	23387866
0.097	1/8	0.146	1 1/2	4	23387867
0.098	1/8	0.147	1 1/2	4	23387868
0.099	1/8	0.149	1 1/2	4	23387869
0.100	1/8	0.150	1 1/2	4	23387860
0.101	1/8	0.152	1 1/2	4	23387871
0.102	1/8	0.153	1 1/2	4	23387872
0.103	1/8	0.155	1 1/2	4	23387873
0.104	1/8	0.156	1 1/2	4	23387874
0.105	1/8	0.158	1 1/2	4	23387875
0.106	1/8	0.159	1 1/2	4	23387876
0.107	1/8	0.161	1 1/2	4	23387877
0.108	1/8	0.162	1 1/2	4	23387878
0.109	1/8	0.164	1 1/2	4	23387879
0.110	1/8	0.165	1 1/2	4	23387870
0.111	1/8	0.167	1 1/2	4	23387881
0.112	1/8	0.168	1 1/2	4	23387882
0.113	1/8	0.170	1 1/2	4	23387883
0.114	1/8	0.171	1 1/2	4	23387884
0.115	1/8	0.173	1 1/2	4	23387885
0.116	1/8	0.174	1 1/2	4	23387886
0.117	1/8	0.176	1 1/2	4	23387887
0.118	1/8	0.177	1 1/2	4	23387888
0.119	1/8	0.179	1 1/2	4	23387889
0.120	1/8	0.180	1 1/2	4	23387880

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Material examples for cutting data tables

	Material sub-group	Index	Composition / Structure / Heat treatment	Tensile strength lbf/in ² / HB / HRC	Material number	Material designation	Material number	Material designation	
P	Unalloyed steel	P.1.1	< 0.15 % C	Annealed	60900 lbf/in ² / 125 HB	1.0401	1015	1.0301	1010
		P.1.2	< 0.45 % C	Annealed	92800 lbf/in ² / 190 HB	1.1191	1045	1.0737	12L14
		P.1.3		Tempered	121800 lbf/in ² / 250 HB	1.1191	1045	1.0503	1043
		P.1.4	< 0.75 % C	Annealed	132000 lbf/in ² / 270 HB	1.1223	1060	1.0535	1055
		P.1.5		Tempered	146500 lbf/in ² / 300 HB	1.1223	1060	1.1274	1095
	Low-alloy steel	P.2.1		Annealed	88500 lbf/in ² / 180 HB	1.7131	5115	1.6523	8620
		P.2.2		Tempered	134900 lbf/in ² / 275 HB	1.7131	5115	1.6582	4340
		P.2.3		Tempered	146500 lbf/in ² / 300 HB	1.7225	4142	1.7131	5115
		P.2.4		Tempered	174000 lbf/in ² / 375 HB	1.7225	4142	1.7223	4140
	High-alloy steel and high-alloy tool steel	P.3.1		Annealed	98600 lbf/in ² / 200 HB	1.4021	420	1.2379	D2
		P.3.2		Hardened and tempered	159500 lbf/in ² / 300 HB	1.2343	H11	1.3343	M2
		P.3.3		Hardened and tempered	188500 lbf/in ² / 400 HB	1.2343	H11	1.2363	A2
	Stainless steel	P.4.1	Ferritic / martensitic	Annealed	98600 lbf/in ² / 200 HB	1.4016	430	1.4125	440C
		P.4.2	Martensitic	Tempered	117500 lbf/in ² / 250 HB	1.4112	S44003	1.4021	420
M	Stainless steel	M.1.1	Austenitic / austenitic-ferritic	Quenched	88500 lbf/in ² / 200 HB	1.4301	304	1.4401	316
		M.2.1	Austenitic	Tempered	300 HB	1.4841	314	1.4568	17-7 PH
		M.3.1	Austenitic / ferritic (Duplex)		113100 lbf/in ² / 230 HB	1.4462	S32205	1.4410	S32750
K	Grey cast iron	K.1.1	Pearlitic / ferritic		88500 lbf/in ² / 180 HB	0.6010	A48-20B	0.6025	A48-40 B
		K.1.2	Pearlitic (martensitic)		127600 lbf/in ² / 260 HB	0.6030	A48-45B	0.6040	A48-60 B
	Spherulitic graphite cast iron	K.2.1	Ferritic		78300 lbf/in ² / 160 HB	0.7040	60-40-18	0.7050	65-45-12
		K.2.2	Pearlitic		122600 lbf/in ² / 250 HB	0.7070	100-70-03	0.7660	A439 Type D2
	Malleable iron	K.3.1	Ferritic		63800 lbf/in ² / 130 HB	0.8035	GTW-35-04		
		K.3.2	Pearlitic		113100 lbf/in ² / 230 HB	0.8170	70003		
N	Aluminium wrought alloy	N.1.1	Non-hardenable		60 HB	3.0255	A91060	3.0255	A91060
		N.1.2	Hardenable		49300 lbf/in ² / 100 HB	3.1355	2024	3.1355	2024
	Cast aluminium alloy	N.2.1	≤ 12 % Si, non-hardenable		36300 lbf/in ² / 75 HB	3.2581	A04130 / A413-0	3.2581	A04130 / A413-0
		N.2.2	≤ 12 % Si, hardenable		43500 lbf/in ² / 90 HB	3.2134	G-AISI5Cu1Mg		
		N.2.3	> 12 % Si, non-hardenable		63800 lbf/in ² / 130 HB		G-AISI17Cu4Mg		
	Copper and copper alloys (bronze/brass)	N.3.1	Free-machining alloys, PB > 1 %		54400 lbf/in ² / 110 HB	2.0380	CuZn39Pb2 (Ms58)	2.0380	C37700
		N.3.2	CuZn, CuSnZn		43500 lbf/in ² / 90 HB	2.0331	CuZn15	2.0331	C34000
		N.3.3	CuSn, lead-free copper and electrolytic copper		49300 lbf/in ² / 100 HB	2.0060	E-Cu57		
Magnesium alloys	N.4.1	Magnesium and magnesium alloys		70 HB	3.5612	MgAl6Zn			
S	Heat-resistant alloys	S.1.1	Fe - basis	Annealed	98600 lbf/in ² / 200 HB	1.4864	X12NiCrSi 36-16	1.4864	330
		S.1.2			137800 lbf/in ² / 280 HB	1.4980	X6NiCrTiMoVB25-15-2	1.4980	S66286
		S.2.1	Ni or Co basis	Annealed	121800 lbf/in ² / 250 HB	2.4856	Inconel 625	2.4812	Hastelloy C
		S.2.2			171100 lbf/in ² / 350 HB	2.4952	Nimonic 80A	2.4668	Inconel 718
		S.2.3		Cast	156600 lbf/in ² / 320 HB	2.4674	Nimocast PK24	2.4670	Nimocast 713
	Titanium alloys	S.3.1	Pure titanium		5800 lbf/in ²	3.7025	Ti99,8		
		S.3.2	Alpha + beta alloys		152300 lbf/in ²	3.7165	TiAl6V4		
S.3.3	Beta alloys		203100 lbf/in ² / 410 HB	Ti555.3	Ti-5Al-5V-5Mo-3Cr				
H	Hardened steel	H.1.1		Hardened and tempered	46-55 HRC				
		H.1.2		Hardened and tempered	56-60 HRC				
		H.1.3		Hardened and tempered	61-65 HRC				
		H.1.4		Hardened and tempered	66-70 HRC				
	Chilled iron	H.2.1		Cast	400 HB				
	Hardened cast iron	H.3.1		Hardened and tempered	55 HRC				
O	Non-metal materials	O.1.1	Plastics, duroplastic		≤ 21800 lbf/in ²				
		O.1.2	Plastics, thermoplastic		≤ 14500 lbf/in ²				
		O.2.1	Aramid fibre-reinforced		≤ 145000 lbf/in ²				
		O.2.2	Glass/carbon-fibre reinforced		≤ 145000 lbf/in ²				
		O.3.1	Graphite						

* Tensile Strength at Rupture (Rm)

Cutting Data – HP121 – 5 Flute with corner Radius

Index	V _c ft/min	a _{pmax} X DC	Ø DC =		Legend		
			3/4"	1"	● 1st choice	○ suitable	
			a _e 1x DC	a _e 1x DC	Emulsion	Compressed air	MQL
			f _z inch	f _z inch			
P.1.1	480	1.0	0.0033	0.0039	●	○	○
P.1.2	460	1.0	0.0033	0.0039	●	○	○
P.1.3	460	1.0	0.0033	0.0039	●	○	○
P.1.4	440	1.0	0.0033	0.0039	●	○	○
P.1.5	440	1.0	0.0033	0.0039	●	○	○
P.2.1	460	1.0	0.0033	0.0039	●	○	○
P.2.2	440	1.0	0.0026	0.0030	●	○	○
P.2.3	410	1.0	0.0033	0.0039	●	○	○
P.2.4	390	1.0	0.0026	0.0030	●	○	○
P.3.1	410	1.0	0.0033	0.0039	●	○	○
P.3.2	390	1.0	0.0033	0.0039	●	○	○
P.3.3	320	1.0	0.0033	0.0039	●	○	○
P.4.1	230	1.0	0.0023	0.0026	●		
P.4.2	180	1.0	0.0023	0.0026	●		
M.1.1	230	1.0	0.0023	0.0026	●		
M.2.1	230	1.0	0.0023	0.0026	●		
M.3.1	230	1.0	0.0023	0.0026	●		
K.1.1	460	1.0	0.0039	0.0044	●	○	○
K.1.2	410	1.0	0.0039	0.0044	●	○	○
K.2.1	440	1.0	0.0033	0.0039	●	○	○
K.2.2	390	1.0	0.0033	0.0039	●	○	○
K.3.1	410	1.0	0.0033	0.0039	●	○	○
K.3.2	370	1.0	0.0033	0.0039	●	○	○
N.1.1							
N.1.2							
N.2.1							
N.2.2							
N.2.3							
N.3.1							
N.3.2							
N.3.3							
N.4.1							
S.1.1	130	1.0	0.0026	0.0030	●		
S.1.2	130	1.0	0.0026	0.0030	●		
S.2.1	130	1.0	0.0026	0.0030	●		
S.2.2	130	1.0	0.0026	0.0030	●		
S.2.3	130	1.0	0.0026	0.0030	●		
S.3.1	280	1.0	0.0039	0.0044	●		
S.3.2	180	1.0	0.0026	0.0030	●		
S.3.3							
H.1.1							
H.1.2							
H.1.3							
H.1.4							
H.2.1							
H.3.1							
O.1.1							
O.1.2							
O.2.1							
O.2.2							
O.3.1							

Cutting Data – HP166 – 6 Flute with Ball Nosed

Index	V _c ft/min	a _p max X DC	Ø DC =						<input checked="" type="radio"/> 1st choice <input type="radio"/> suitable		
			1/4"	3/8"	1/2"	5/8"	3/4"	1"	Emulsion	Compressed air	MOL
			a _e 1x DC inch	a _e 1x DC inch	a _e 1x DC inch	a _e 1x DC inch	a _e 1x DC inch	a _e 1x DC inch			
P.1.1	690	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.1.2	660	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.1.3	660	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.1.4	620	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.1.5	620	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.2.1	660	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.2.2	620	0.5	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.2.3	590	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.2.4	560	0.5	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.3.1	590	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.3.2	560	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.3.3	460	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.4.1	330	0.5	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
P.4.2	260	0.5	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
M.1.1	330	0.5	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
M.2.1	330	0.5	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
M.3.1	330	0.5	0.0010	0.0013	0.0019	0.0020	0.0023	0.0026	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
K.1.1	660	0.5	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
K.1.2	590	0.5	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
K.2.1	620	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
K.2.2	560	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
K.3.1	590	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
K.3.2	520	0.5	0.0016	0.0020	0.0028	0.0030	0.0033	0.0039	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.1.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.1.2									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.2.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.2.2									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.2.3									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.3.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.3.2									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.3.3									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
N.4.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.1.1	120	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.1.2	120	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.2.1	80	1.0	0.0010	0.0012	0.0018	0.0020	0.0022	0.0024	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.2.2	80	1.0	0.0010	0.0012	0.0018	0.0020	0.0022	0.0024	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.2.3	80	1.0	0.0010	0.0012	0.0018	0.0020	0.0022	0.0024	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.3.1	300	1.0	0.0019	0.0023	0.0032	0.0034	0.0039	0.0044	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.3.2	180	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
S.3.3	140	1.0	0.0012	0.0015	0.0022	0.0023	0.0026	0.0030	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
H.1.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H.1.2									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H.1.3									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H.1.4									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H.2.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
H.3.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O.1.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O.1.2									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O.2.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O.2.2									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O.3.1									<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Technical references

Feedrate Adjustment

If the rpm indicated in the tables cannot be obtained by the machine spindle, the feed rate is to be reduced proportionally to the max rpm.

Example:

according to table = n 50000/min. and v_f 40 inch/min.,
maximum machine rpm = 40000/min.

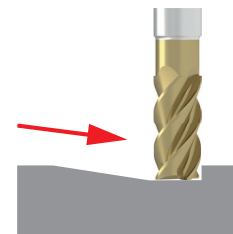
Calculation of feed rate which can be applied:

40000 = 80 % of 50000/min. accordingly 80 % of 40 = 32 inch/min.

Feed rate which can be applied = **32 inch/min.**

Angled ramping with solid carbide cutters

Angled ramping with solid carbide cutters is possible at an angle of 3° to 6° depending on the cutter type. A protective edge chamfer or corner radius is an advantage.



S.F.M./R.P.M. CONVERSION CHART															
DIAMETER															
S.F.M.	1/16	3/32	1/8	5/32	3/16	7/32	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1
50	3.050	2.040	1.530	1.220	1.020	875	765	610	510	440	380	310	250	220	190
75	4.580	3.060	2.290	1.830	1.530	1.310	1.150	920	760	660	570	460	380	330	285
100	6.100	4.080	3.050	2.450	2.040	1.750	1.530	1.220	1.020	870	760	610	510	440	385
125	7.630	5.100	3.820	3.050	2.550	2.180	1.920	1.530	1.270	1.100	950	770	630	550	475
150	9.150	6.120	4.570	3.670	3.060	2.620	2.290	1.83	1.530	1.310	1.140	920	760	660	575
175	10.680	7.140	5.350	4.270	3.570	3.060	2.680	2.140	1.780	1.540	1.330	1.080	880	770	665
200	12.200	8.150	6.100	4.900	4.070	3.500	3.100	2.450	2.00	1.750	1.500	1.200	1.000	875	750
300	18.500	12.200	9.200	7.300	6.100	5.250	4.600	3.700	3.100	2.600	2.300	1.800	1.500	1.300	1.100
400	24.500	16.300	12.200	9.800	8.150	7.000	6.100	4.900	4.100	3.500	3.050	2.450	2.050	1.750	1.525
500	30.500	20.400	15.300	12.200	10.200	8.700	7.600	6.100	5.100	4.400	3.800	3.100	2.500	2.200	1.900
750	45.800	36.700	22.900	18.300	15.300	13.100	11.500	9.200	7.600	6.550	5.700	4.600	3.800	3.700	2.850
1.000	-	40.800	30.600	24.500	20.400	17.500	15.300	12.200	10.3200	8.750	7.650	6.100	5.100	4.400	3.800
1.500	-	-	45.900	36.700	30.600	26.200	22.900	18.300	15.300	13.150	11.300	9.200	7.600	6.500	5.700
2.000	-	-	-	49.000	40.800	35.000	30.600	24.400	20.400	17.500	15.300	12.200	10.200	8.700	7.600
3.000	-	-	-	-	-	52.500	45.900	36.600	30.600	26.250	22.900	18.300	15.300	13.100	11.400
4.000	-	-	-	-	-	-	-	48.800	40.800	35.000	30.600	24.400	20.400	17.500	15.200
5.000	-	-	-	-	-	-	-	-	-	43.700	38.200	30.600	25.500	21.800	19.000

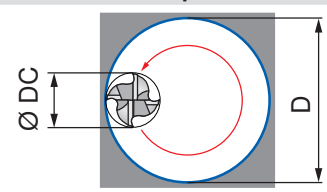
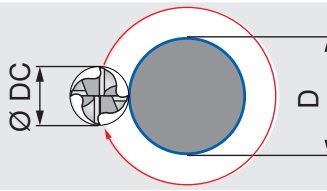
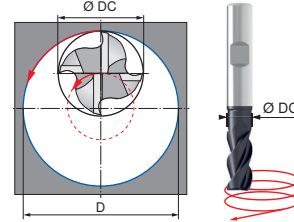
General formula for calculating the cutting parameters

Designation	Abbreviation	Unit	Formula	Example	
Number of revolutions	n	min ⁻¹	$n = \frac{v_c \times 12}{DC \times \pi}$	$v_c = 80 \text{ ft/min}$ $DC = 0.75 \text{ inch}$	$n = \frac{80 \times 12}{0.75 \times \pi} = 408 \text{ min}^{-1}$
Cutting speed	v_c	ft/min	$v_c = \frac{DC \times \pi \times n}{12}$	$n = 400 \text{ min}^{-1}$ $DC = 0.75 \text{ inch}$	$v_c = \frac{0.75 \times \pi \times 400}{12} = 78 \text{ ft/min}$
Feed per tooth	f_z	inch	$f_z = \frac{v_f}{Z \times n}$	$v_f = 12.8 \text{ inch/min}$ $n = 400 \text{ min}^{-1}$ $Z = 4$	$f_z = \frac{12.8}{4 \times 400} = 0.008 \text{ inch}$
Feed per revolution	f	inch/rev	$f = f_z \times Z$	$f_z = 0.008 \text{ inch}$ $Z = 4$	$f = 0.008 \times 4 = 0.032 \text{ inch/rev}$
Feed rate	v_f	inch/min.	$v_f = f_z \times Z \times n$	$f_z = 0.008$ $Z = 4$ $n = 400 \text{ min}^{-1}$	$v_f = 0.008 \times 4 \times 400 = 12.8 \text{ inch/min}$
Average chip thickness	h_m	inch	$h_m = f_z \times \sqrt{\frac{a_e}{DC}}$	$f_z = 0.008 \text{ inch}$ $a_e = 0.012 \text{ inch}$ $DC = 0.75$	$h_m = 0.008 \times \sqrt{\frac{0.012}{0.75}} = 0.001 \text{ inch}$

ZEPF Number of flutes

a_e = cutting width

Calculation of the feed rate on the midpoint path of the milling cutter (v_{fM})

Designation	Abbreviation	Unit	Formula	Example
Internal contour	v_{fM}	inch/min.	$v_{fM} = \frac{v_f \times (D - DC)}{D}$	
Outside profile	v_{fM}	inch/min.	$v_{fM} = \frac{v_f \times (D + DC)}{D}$	
Helical ramping	v_{fM}	inch/min.	$v_{fM} = \frac{n \times f_z \times Z \times (D - D_c)}{D}$	

Contact W Dynamics

Website

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Email

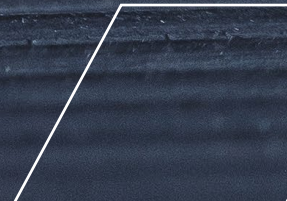
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910-695-6882



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Our catalog reflects more than a collection of products — it's a toolkit for precision. Inside, you'll find cutting heads engineered for strength, stability, and speed. Each design represents thousands of hours of testing, refinement, and feedback from the field. Together, they form a system built to maximize machine potential and operator control.

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