NEXGEN TOOLING

PRODUCT SOLUTIONS CATALOG

MADE IN USA

TABLE OF CONTENTS

MADE IN USA

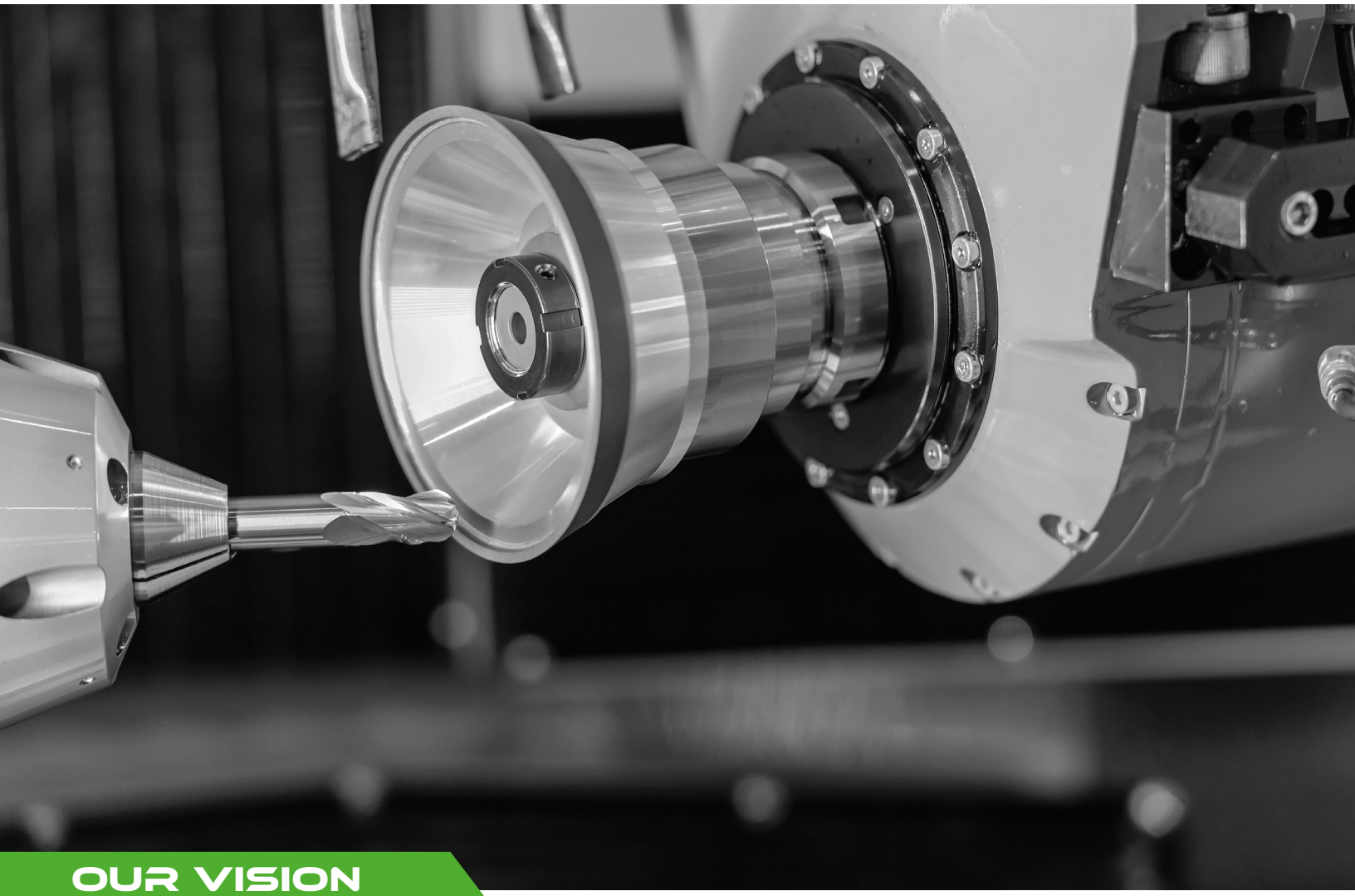
TRUSTED PERFORMANCE

nexgentooling.com
855-263-2328
sales@nexgentooling.com

MISSION & VISION

OUR MISSION

Our mission is to deliver exceptional tooling solutions by blending expert application engineering with high-performance cutting tools and services, ensuring our customers get the best value, precision, and performance at competitive prices.



OUR VISION

At NEXGEN Tooling, our vision is to be the industry leader in precision round tool solutions—empowering manufacturers to achieve higher performance, tighter tolerances, and greater efficiency through innovation, expertise, and unmatched customer service.

OUR PHILOSOPHY OF QUALITY

At NEXGEN Tooling, quality isn't just a benchmark, it's a commitment woven into every tool we craft and every process we perfect. Our philosophy is rooted in precision, consistency, and continuous innovation. That's why we invest in the most advanced inspection and measurement technologies available today.

From **Walter Helichecks** that ensure fully automated micron-level accuracy of tool geometry, to the **Zoller Pom Basic** that delivers non-contact profile and edge analysis, we utilize the best-in-class to maintain our exacting standards. **Winslow microscopes** give us a detailed view into tool surfaces, cutting angles and post-machining wear patterns, while our **non-contact laser micrometers** provide ultra-precise dimensional verification without compromising tool integrity. Each measurement is validated in-process, using **certified Mitutoyo calipers and verniers**, guaranteeing reliability down to the smallest detail.

This integration of cutting-edge technology and deep expertise allows us to exceed expectations in tool quality and performance. At NEXGEN Tooling, quality is more than a process, it's our promise.

ENGINEERED PEACE OF MIND

- All inspection equipment certified by external 3rd party.
- Complete lot# traceability for every tool - raw materials to finished product.
- Employ four-eye principle - every inspection verified by two people (four-eyes). Inspect & verify.
- Full in-house coating inspection - adhesion testing, thickness testing, hardness testing and surface finish inspection.
- Inspection throughout production—1st piece, in-process and final.

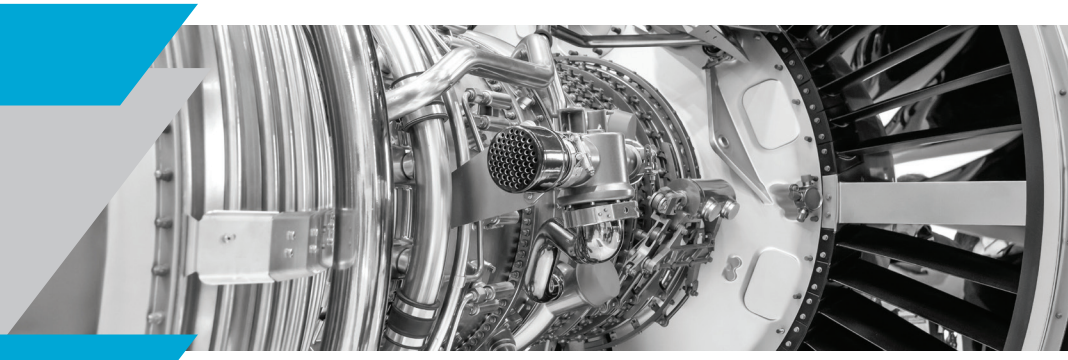
INDUSTRIES SERVED

AEROSPACE

Titanium Alloys, Aluminum Alloys, Nickel Alloys

T-ProMAX Coating

Impellers, Turbine Blades, Landing Gear Assemblies

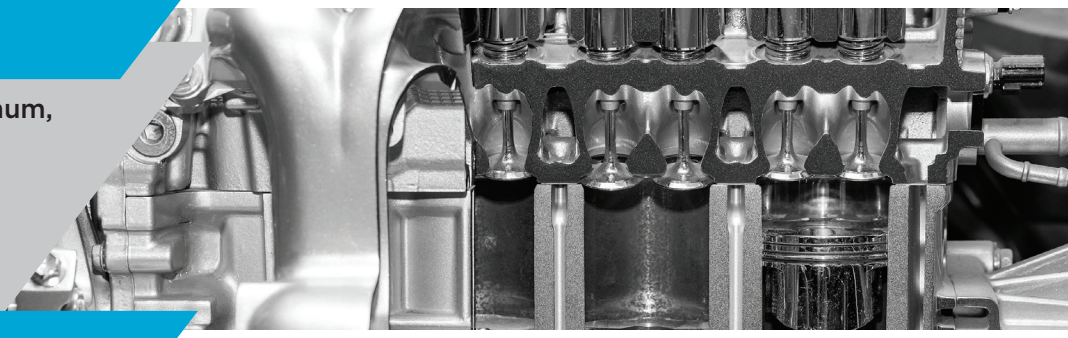


AUTOMOTIVE

Nodular Iron, Gray Iron, Cast Aluminum, Alloyed Steel

A-ProMAX & X-ProMAX

Blocks, Heads, Pistons, Camshaft, Connecting Rods



DEFENSE

Alloyed Steels, Hardened Steels, Titanium, HRSA

A-ProMAX & T-ProMAX

Armor-plated components, engine turbines, systems housings

MEDICAL

Stainless Steels, Titanium, Cobalt-chrome, Carbon Steel

A-ProMAX & T-ProMAX

Knee & knee implants, bone plates, rods

GENERAL MACHINING

Carbon Steel, Alloyed Steels, Aluminum, HRSA

A-ProMAX

NEXGEN high performance catalog stocked to support a wide variety of applications

At NEXGEN we have an engineering team that is ready to handle all of your round tool application needs. Looking for a solution partner? We can do that! After sending us your part print and feature your needing resolved, we will collaborate with you on a single or combo-tool solution and get you prints of our tooling solution quickly.

COMMON SPECIAL TOOLS THAT WE MANUFACTURE

- Chamfer Mills
- Drill Mills
- Countersink Combo Tools
- Dovetail Cutters
- Drills & Drill-Reamers
- Form/Profile Tooling
- Key Slot Cutters
- Reamers & Step Reamers
- Step Drills
- Tapered Ball Nose End Mills
- T-Slot Cutters
- Coolant Through Capabilities

OUR PROMISE AND COMMITMENT TO YOU

- **24-hour quotes**
- **Drawings and DXF files** upon request
- **Application support** at the spindle
- **Tools tailored specifically to your application** to ensure the highest performance possible
- **Permanent part number assignment** for easy re-ordering, tool specification management, and assurance of same tool manufacturing, every time
- **Expedite service** available
- **Knowledgeable sales and support staff** that will, and can, assist you

MADE IN USA

TOOL COATINGS

HIGH-PERFORMANCE TOOL COATINGS

NEXGEN Tooling takes tool performance to the next level with our advanced, in-house coating. Using state of the art coating equipment combined with our skillfully engineered pre- and post-process treatments, our material specific coatings will exceed all expectations.

- Increased Tool Life
- Increased Wear Resistance
- Improved Performance
- Improved Surface Finishes
- Added Lubricity
- Lower Tool Costs

OUR IN-HOUSE COATINGS

A-ProMAX

Our in-house high-performance coating, based on AlCrN with added titanium, is engineered for an optimal balance of core toughness and top-layer abrasion resistance. Titanium reduces adhesive wear versus conventional AlCrN, boosts micro-hardness to 3500 Hv, and prevents crack propagation through the coating.

Color: Blue Grey

Friction Coefficient: 0.5

Max. Service Temp (F): 1650

T-ProMAX

Our in-house high-performance nano-composite coating is designed for milling and drilling stainless steels, titanium, and high-temp alloys. It offers exceptional heat and wear resistance, making it ideal for machining tough materials prone to work hardening and abrasion, such as chromium- and nickel-based alloys.

Color: Bronze

Friction Coefficient: 0.4

Max. Service Temp (F): 2015

X-ProMAX

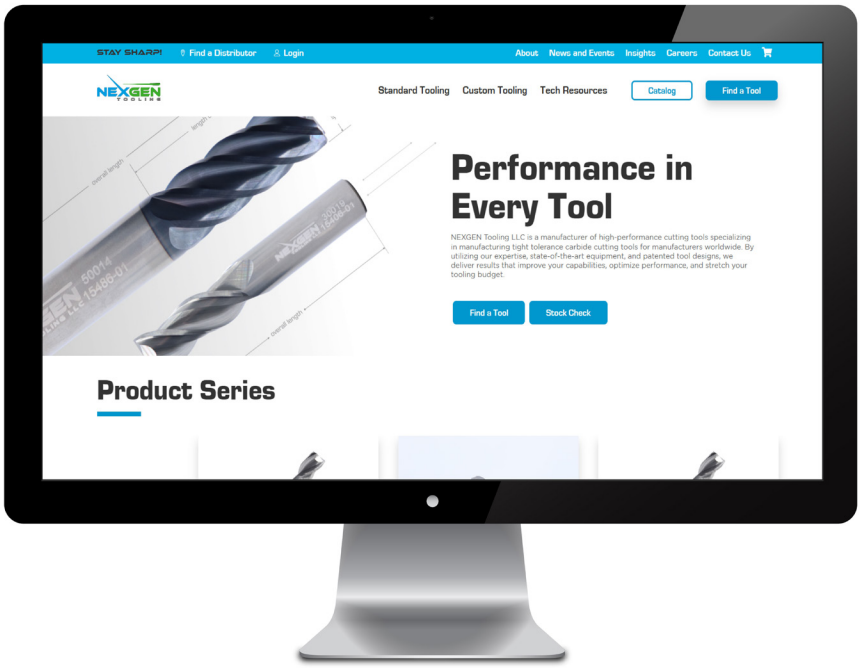
Our in-house high-performance coating is engineered for milling non-ferrous materials like aluminum, brass, and bronze. Designed to prevent edge build-up common with soft, sticky metals, it delivers outstanding performance and significantly extends tool life in ultra-high-speed machining environments.

Color: Multi-Colored

Friction Coefficient: 0.4

Max. Service Temp (F): 1200

OPTIONAL COATINGS AVAILABLE UPON REQUEST



NEXGEN Resources

- Find a Tool
- Stock Check
- Digital Catalog
- Find a Distributor
- Custom Tool Quote Request
- Technical Resources

NEXGEN News

- News & Press Releases
- Events
- Insights Blog

STOCK CHECK

Social Media

nexgen-tooling

nexgentooling

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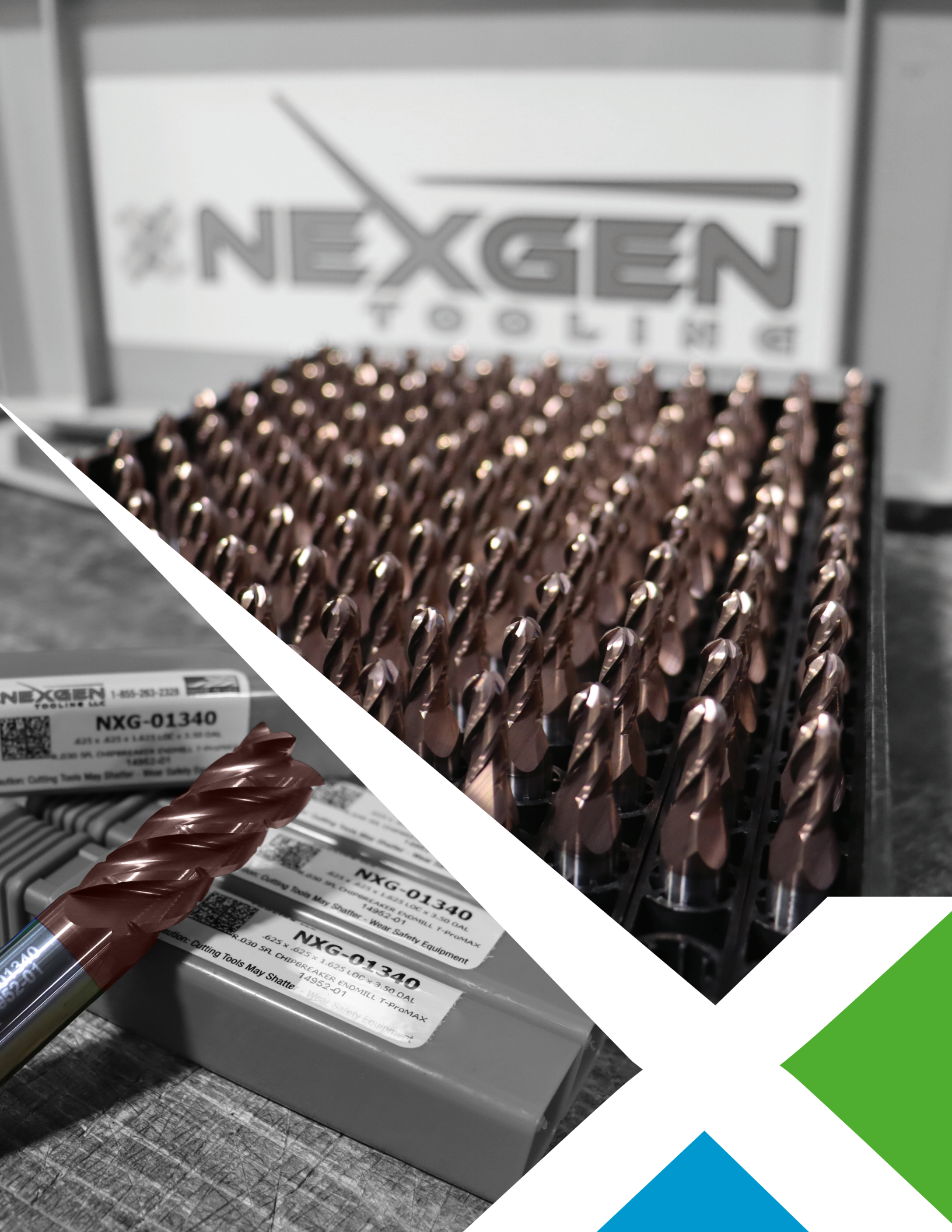
nexgentooling


NEXGEN
TOOLING
NXG-01340
.625 x .625 x 1.625 LOC x 3.50 OAL
CHIPBREAKER ENDMILL T-ProMAX
14952-01
Wear Safety Equipment

MILLING SOLUTIONS

ROUGHING					
SERIES NAME	**# FLUTES**	**END**	**COATING**	**DESCRIPTION**	**PAGE #**
NXG-3-CB	3	Square, Corner Radius	Uncoated	37 deg, Chip Breaker	14
NXG-3-CB	3	Square, Corner Radius	X-ProMAX	37 deg, Chip Breaker	16
NXG-4-CB	4	Square, Corner Radius	A-ProMAX	35 deg, Chip Breaker	18
NXG-4-CB	4	Square, Corner Radius	T-ProMAX	35 deg, Chip Breaker	20
NXG-5-CB	5	Square, Corner Radius	A-ProMAX	40 deg, Chip Breaker	22
NXG-5-CB	5	Square, Corner Radius	T-ProMAX	40 deg, Chip Breaker	24
NXG-6-CB	6	Square, Corner Radius	A-ProMAX	37 deg, Chip Breaker	26
NXG-6-CB	6	Square, Corner Radius	T-ProMAX	37 deg, Chip Breaker	28
NXG-7-CB	7	Square, Corner Radius	A-ProMAX	37 deg, Chip Breaker	30
NXG-7-CB	7	Square, Corner Radius	T-ProMAX	37 deg, Chip Breaker	32
2-FLUTE					
NXG-2	2	Square	Uncoated	45 deg	34
NXG-2	2	Square	X-ProMAX	45 deg	35
3-FLUTE					
NXG-3	3	Square, Corner Radius	Uncoated	37 deg	37
NXG-3	3	Ball	Uncoated	37 deg	39
NXG-3	3	Square, Corner Radius	X-ProMAX	37 deg	41
NXG-3	3	Square, Corner Radius	X-ProMAX	37 deg	43
NXG-3V	3	Square, Corner Radius	Uncoated	40 deg, Variable Pitch	45
NXG-3V	3	Ball	Uncoated	40 deg, Variable Pitch	47
NXG-3V-RN	3	Square, Corner Radius	Uncoated	40 deg, Variable Pitch, Reduced Neck	49
NXG-3V-RN	3	Ball	Uncoated	40 deg, Variable Pitch, Reduced Neck	51
NXG-3V-RN	3	Square, Corner Radius	X-ProMAX	40 deg, Variable Pitch, Reduced Neck	53
NXG-3V-RN	3	Ball	X-ProMAX	40 deg, Variable Pitch, Reduced Neck	55

NON-FERROUS		STEEL		CAST IRON	STAINLESS		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
**	**									
**	**									
		**	**	**	*	**	*	**	**	*
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		**	**	**	*	**	*	**	**	*
		*	*	*	**	*	**	**	**	**
		**	**	**	*	**	*	**	**	*
		*	*	*	**	*	**	**	**	**
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
**	**									
**	**									
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
**	**									
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SERIES NAME	# FLUTES	END	COATING	DESCRIPTION	PAGE #
4-FLUTE					
NXG-4	4	Square, Corner Radius	A-ProMAX	35 deg, Variable Pitch	57
NXG-4	4	Ball	A-ProMAX	35 deg, Variable Pitch	59
NXG-4-RN	4	Square, Corner Radius	A-ProMAX	35 deg, Variable Pitch, Reduced Neck	61
NXG-4-RN	4	Ball	A-ProMAX	35 deg, Variable Pitch, Reduced Neck	63
NXG-4	4	Square, Corner Radius	T-ProMAX	40 deg, Variable Pitch	65
NXG-4	4	Ball	T-ProMAX	40 deg, Variable Pitch	67
5-FLUTE					
NXG-5	5	Square, Corner Radius	A-ProMAX	40 deg, Variable Pitch	69
NXG-5-RN	5	Square, Corner Radius	A-ProMAX	40 deg, Variable Pitch, Reduced Neck	71
NXG-5	5	Square, Corner Radius	T-ProMAX	40 deg, Variable Pitch	73
6-FLUTE					
NXG-6	6	Square, Corner Radius	A-ProMAX	37 deg, Variable Pitch	75
NXG-6	6	Ball	A-ProMAX	37 deg, Variable Pitch	77
NXG-6	6	Square, Corner Radius	T-ProMAX	37 deg, Variable Pitch	79
NXG-6	6	Ball	T-ProMAX	37 deg, Variable Pitch	81
7-FLUTE					
NXG-7	7	Square, Corner Radius	A-ProMAX	37 deg, Variable Pitch	83
NXG-7	7	Square, Corner Radius	T-ProMAX	37 deg, Variable Pitch	85
CHAMFER MILLS					
CHM-2	2	Straight Flute	A-ProMAX	0 deg, 60~120 Point Angles	88
CHM-3S	3	Spiral Flute	A-ProMAX	20 deg, 60~120 Point Angles, Non C.C.	89
CHM-4	4	Straight Flute	A-ProMAX	0 deg, 60~120 Point Angles, Non C.C.	90
CHM-5S	5	Spiral Flute	A-ProMAX	20 deg, 60~120 Point Angles, Non C.C.	91
CHM-DA	4-6	Double Angle	A-ProMAX	0 deg	92

STOCK CHECK

NON-FERROUS		STEEL		CAST IRON	STAINLESS		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
		**	**	**	*	**		*	*	
		**	**	**	*	**		*	*	
		**	**	**	*	**		*	*	
		**	**	**	*	**		*	*	
		*	*	*	**	*	**	**	**	**
		*	*	*	**	*	**	**	**	**
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
		**	**	**	*	**	*	**	**	*
		**	**	**	*	**	*	**	**	*
		*	*	*	**	*	**	**	**	**
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
		**	**	**	*	**	*	**	**	*
		**	**	**	*	**	*	**	**	*
		*	*	*	**	*	**	**	**	**
		*	*	*	**	*	**	**	**	**
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
		**	**	**	*	**	*	**	**	*
		*	*	*	**	*	**	**	**	**
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	Ni-Alloy	Titanium	<50 HRC	>50 HRC
**	**	**	**	**	*	**			*	
**	**	**	**	**	*	**		*	**	*
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STOCK CHECK

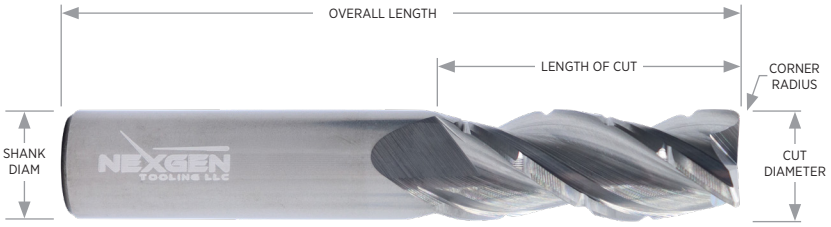
NXG-3-CB

3-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

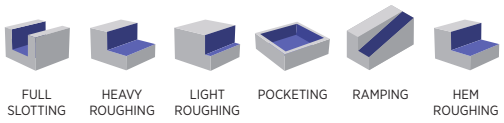
Premium high performance carbide end mill for roughing of Non-Ferrous alloys.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.



- 37 Degree Helix
- 3-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.94



STOCK ✓ CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	3	35000	35001	35002	35003	35004						
		1/2	2	3	35005	35006	35007	35008	35009						
		3/4	2-1/2	3	35010	35011	35012	35013	35014						
3/16	3/16	5/16	2	3	35015	35016	35017	35018	35019						
		9/16	2-1/2	3	35020	35021	35022	35023	35024						
		3/4	2-1/2	3	35025	35026	35027	35028	35029						
1/4	1/4	3/8	2	3	35030	35031	35032	35033	35034	35035					
		1/2	2-1/2	3	35036	35037	35038	35039	35040	35041					
		3/4	2-1/2	3	35042	35043	35044	35045	35046	35047					
		1	3	3	35048	35049	35050	35051	35052	35053					
		1-1/4	3	3	35054	35055	35056	35057	35058	35059					
5/16	5/16	7/16	2	3	35060	35061	35062	35063	35064	35065					
		13/16	2-1/2	3	35066	35067	35068	35069	35070	35071					
		1-1/4	3	3	35072	35073	35074	35075	35076	35077					
3/8	3/8	1/2	2	3	35078	35079	35080	35081	35082	35083	35084	35085	35086		
		3/4	2-1/2	3	35087	35088	35089	35090	35091	35092	35093	35094	35095		
		1	3	3	35096	35097	35098	35099	35100	35101	35102	35103	35104		
		1-1/4	3	3	35105	35106	35107	35108	35109	35110	35111	35112	35113		
		1-1/2	3-1/2	3	35114	35115	35116	35117	35118	35119	35120	35121	35122		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	3	35123	35124	35125	35126	35127	35128	35129	35130	35131		
		1	3	3	35132	35133	35134	35135	35136	35137	35138	35139	35140		
		1-1/4	3	3	35141	35142	35143	35144	35145	35146	35147	35148	35149		
		1-5/8	4	3	35150	35151	35152	35153	35154	35155	35156	35157	35158		
		2	4	3	35159	35160	35161	35162	35163	35164	35165	35166	35167		
		2-1/2	5	3	35168	35169	35170	35171	35172	35173	35174	35175	35176		
5/8	5/8	3/4	3	3	35177	35178	35179	35180	35181	35182	35183	35184	35185		
		1-1/4	3-1/2	3	35186	35187	35188	35189	35190	35191	35192	35193	35194		
		1-5/8	3-1/2	3	35195	35196	35197	35198	35199	35200	35201	35202	35203		
		2-1/8	4	3	35204	35205	35206	35207	35208	35209	35210	35211	35212		
		2-1/2	5	3	35213	35214	35215	35216	35217	35218	35219	35220	35221		
3/4	3/4	1	3	3	35222	35223	35224	35225	35226	35227	35228	35229	35230	35231	35232
		1-5/8	4	3	35233	35234	35235	35236	35237	35238	35239	35240	35241	35242	35243
		2-1/4	5	3	35244	35245	35246	35247	35248	35249	35250	35251	35252	35253	35254
		2-3/4	5	3	35255	35256	35257	35258	35259	35260	35261	35262	35263	35264	35265
		3-1/4	6	3	35266	35267	35268	35269	35270	35271	35272	35273	35274	35275	35276
1	1	1-1/4	4-1/2	3	35277	35278	35279	35280	35281	35282	35283	35284	35285	35286	35287
		2	4-1/2	3	35288	35289	35290	35291	35292	35293	35294	35295	35296	35297	35298
		2-5/8	5	3	35299	35300	35301	35302	35303	35304	35305	35306	35307	35308	35309
		3-1/4	6	3	35310	35311	35312	35313	35314	35315	35316	35317	35318	35319	35320
		4-1/4	7	3	35321	35322	35323	35324	35325	35326	35327	35328	35329	35330	35331

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
h6	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

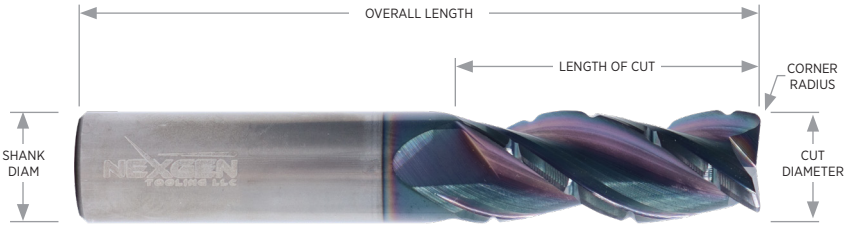
NXG-3-CB

3-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

Premium high performance carbide end mill for roughing of Non-Ferrous alloys.

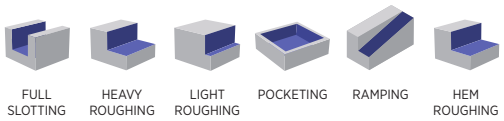
X-ProMAX coating for extended tool life in ultra-high production settings.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.



X-ProMAX

- 37 Degree Helix
- 3-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.94



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	3	36001	36002	36003	36004	36005						
		1/2	2	3	36006	36007	36008	36009	36010						
		3/4	2-1/2	3	36011	36012	36013	36014	36015						
3/16	3/16	5/16	2	3	36016	36017	36018	36019	36020						
		9/16	2-1/2	3	36021	36022	36023	36024	36025						
		3/4	2-1/2	3	36026	36027	36028	36029	36030						
1/4	1/4	3/8	2	3	36031	36032	36033	36034	36035	36036					
		1/2	2-1/2	3	36037	36038	36039	36040	36041	36042					
		3/4	2-1/2	3	36043	36044	36045	36046	36047	36048					
		1	3	3	36049	36050	36051	36052	36053	36054					
		1-1/4	3	3	36055	36056	36057	36058	36059	36060					
5/16	5/16	7/16	2	3	36061	36062	36063	36064	36065	36066					
		13/16	2-1/2	3	36067	36068	36069	36070	36071	36072					
		1-1/4	3	3	36073	36074	36075	36076	36077	36078					
3/8	3/8	1/2	2	3	36079	36080	36081	36082	36083	36084	36085	36086	36087		
		3/4	2-1/2	3	36088	36089	36090	36091	36092	36093	36094	36095	36096		
		1	3	3	36097	36098	36099	36100	36101	36102	36103	36104	36105		
		1-1/4	3	3	36106	36107	36108	36109	36110	36111	36112	36113	36114		
		1-1/2	3-1/2	3	36115	36116	36117	36118	36119	36120	36121	36122	36123		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	3	36124	36125	36126	36127	36128	36129	36130	36131	36132		
		1	3	3	36133	36134	36135	36136	36137	36138	36139	36140	36141		
		1-1/4	3	3	36142	36143	36144	36145	36146	36147	36148	36149	36150		
		1-5/8	4	3	36151	36152	36153	36154	36155	36156	36157	36158	36159		
		2	4	3	36160	36161	36162	36163	36164	36165	36166	36167	36168		
		2-1/2	5	3	36169	36170	36171	36172	36173	36174	36175	36176	36177		
5/8	5/8	3/4	3	3	36178	36179	36180	36181	36182	36183	36184	36185	36186		
		1-1/4	3-1/2	3	36187	36188	36189	36190	36191	36192	36193	36194	36195		
		1-5/8	3-1/2	3	36196	36197	36198	36199	36200	36201	36202	36203	36204		
		2-1/8	4	3	36205	36206	36207	36208	36209	36210	36211	36212	36213		
		2-1/2	5	3	36214	36215	36216	36217	36218	36219	36220	36221	36222		
3/4	3/4	1	3	3	36223	36224	36225	36226	36227	36228	36229	36230	36231	36232	36233
		1-5/8	4	3	36234	36235	36236	36237	36238	36239	36240	36241	36242	36243	36244
		2-1/4	5	3	36245	36246	36247	36248	36249	36250	36251	36252	36253	36254	36255
		2-3/4	5	3	36256	36257	36258	36259	36260	36261	36262	36263	36264	36265	36266
		3-1/4	6	3	36267	36268	36269	36270	36271	36272	36273	36274	36275	36276	36277
1	1	1-1/4	4-1/2	3	36278	36279	36280	36281	36282	36283	36284	36285	36286	36287	36288
		2	4-1/2	3	36289	36290	36291	36292	36293	36294	36295	36296	36297	36298	36299
		2-5/8	5	3	36300	36301	36302	36303	36304	36305	36306	36307	36308	36309	36310
		3-1/4	6	3	36311	36312	36313	36314	36315	36316	36317	36318	36319	36320	36321
		4-1/4	7	3	36322	36323	36324	36325	36326	36327	36328	36329	36330	36331	36332

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
h6	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

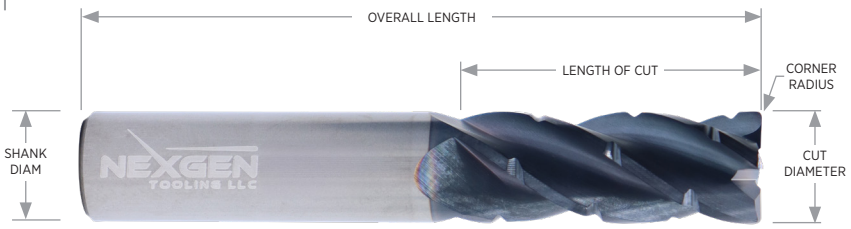
NXG-4-CB

4-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

Premium high performance carbide end mill for roughing of Ferrous materials.

With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.



A-ProMAX

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.95

STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	4	45000	45001	45002	45003	45004						
		1/2	2	4	45005	45006	45007	45008	45009						
		3/4	2-1/2	4	45010	45011	45012	45013	45014						
3/16	3/16	5/16	2	4	45015	45016	45017	45018	45019						
		9/16	2-1/2	4	45020	45021	45022	45023	45024						
		3/4	2-1/2	4	45025	45026	45027	45028	45029						
1/4	1/4	3/8	2	4	45030	45031	45032	45033	45034	45035					
		1/2	2-1/2	4	45036	45037	45038	45039	45040	45041					
		3/4	2-1/2	4	45042	45043	45044	45045	45046	45047					
		1	3	4	45048	45049	45050	45051	45052	45053					
		1-1/4	3	4	45054	45055	45056	45057	45058	45059					
5/16	5/16	7/16	2	4	45060	45061	45062	45063	45064	45065					
		13/16	2-1/2	4	45066	45067	45068	45069	45070	45071					
3/8	3/8	1/2	2	4	45072	45073	45074	45075	45076	45077	45078	45079	45080		
		3/4	2-1/2	4	45317	45318	45319	45320	45321	45322	45323	45324	45325		
		1	3	4	45081	45082	45083	45084	45085	45086	45087	45088	45089		
		1-1/4	3	4	45090	45091	45092	45093	45094	45095	45096	45097	45098		
		1-1/2	3-1/2	4	45099	45100	45101	45102	45103	45104	45105	45106	45107		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	4	45108	45109	45110	45111	45112	45113	45114	45115	45116		
		1	3	4	45117	45118	45119	45120	45121	45122	45123	45124	45125		
		1-1/4	3	4	45126	45127	45128	45129	45130	45131	45132	45133	45134		
		1-5/8	4	4	45135	45136	45137	45138	45139	45140	45141	45142	45143		
		2	4	4	45144	45145	45146	45147	45148	45149	45150	45151	45152		
5/8	5/8	3/4	3	4	45153	45154	45155	45156	45157	45158	45159	45160	45161		
		1	3	4	45162	45163	45164	45165	45166	45167	45168	45169	45170		
		1-1/4	3-1/2	4	45171	45172	45173	45174	45175	45176	45177	45178	45179		
		1-5/8	3-1/2	4	45180	45181	45182	45183	45184	45185	45186	45187	45188		
		2-1/8	4	4	45189	45190	45191	45192	45193	45194	45195	45196	45197		
		2-1/2	5	4	45198	45199	45200	45201	45202	45203	45204	45205	45206		
3/4	3/4	1	3	4	45207	45208	45209	45210	45211	45212	45213	45214	45215	45216	45217
		1-5/8	4	4	45218	45219	45220	45221	45222	45223	45224	45225	45226	45227	45228
		2-1/4	5	4	45229	45230	45231	45232	45233	45234	45235	45236	45237	45238	45239
		2-3/4	5	4	45240	45241	45242	45243	45244	45245	45246	45247	45248	45249	45250
		3-1/4	6	4	45251	45252	45253	45254	45255	45256	45257	45258	45259	45260	45261
1	1	1-1/4	4-1/2	4	45262	45263	45264	45265	45266	45267	45268	45269	45270	45271	45272
		2	4-1/2	4	45273	45274	45275	45276	45277	45278	45279	45280	45281	45282	45283
		2-5/8	5	4	45284	45285	45286	45287	45288	45289	45290	45291	45292	45293	45294
		3-1/4	6	4	45295	45296	45297	45298	45299	45300	45301	45302	45303	45304	45305
		4-1/4		4	45306	45307	45308	45309	45310	45311	45312	45313	45314	45315	45316

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

NXG-4-CB

4-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

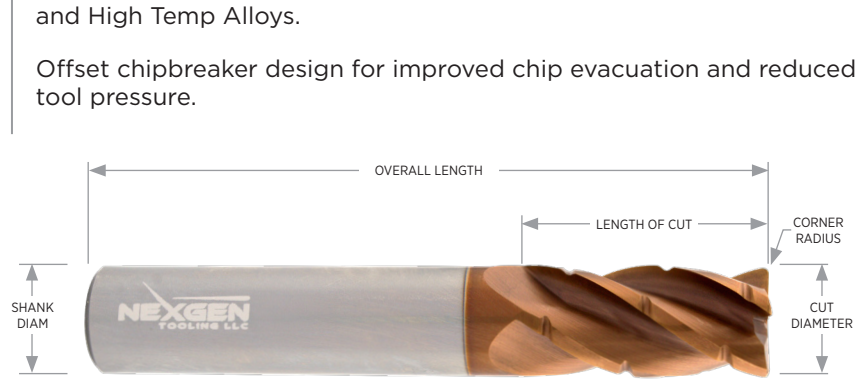
Premium high performance 4-flute carbide end mills ideal for roughing in Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.

T-ProMAX

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.95



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	4	45500	45501	45502	45503	45504						
		1/2	2	4	45505	45506	45507	45508	45509						
		3/4	2-1/2	4	45510	45511	45512	45513	45514						
3/16	3/16	5/16	2	4	45515	45516	45517	45518	45519						
		9/16	2-1/2	4	45520	45521	45522	45523	45524						
		3/4	2-1/2	4	45525	45526	45527	45528	45529						
1/4	1/4	3/8	2	4	45530	45531	45532	45533	45534	45535					
		1/2	2-1/2	4	45536	45537	45538	45539	45540	45541					
		3/4	2-1/2	4	45542	45543	45544	45545	45546	45547					
		1	3	4	45548	45549	45550	45551	45552	45553					
		1-1/4	3	4	45554	45555	45556	45557	45558	45559					
5/16	5/16	7/16	2	4	45560	45561	45562	45563	45564	45565					
		13/16	2-1/2	4	45566	45567	45568	45569	45570	45571					
3/8	3/8	1/2	2	4	45572	45573	45574	45575	45576	45577	45578	45579	45580		
		3/4	2-1/2	4	45581	45582	45583	45584	45585	45586	45587	45588	45589		
		1	3	4	45590	45591	45592	45593	45594	45595	45596	45597	45598		
		1-1/4	3	4	45599	45600	45601	45602	45603	45604	45605	45606	45607		
		1-1/4	3-1/2	4	45608	45609	45610	45611	45612	45613	45614	45615	45616		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	4	45617	45618	45619	45620	45621	45622	45623	45624	45625		
		1	3	4	45626	45627	45628	45629	45630	45631	45632	45633	45634		
		1-1/4	3	4	45635	45636	45637	45638	45639	45640	45641	45642	45643		
		1-5/8	4	4	45644	45645	45646	45647	45648	45649	45650	45651	45652		
		2	4	4	45653	45654	45655	45656	45657	45658	45659	45660	45661		
5/8	5/8	3/4	3	4	45662	45663	45664	45665	45666	45667	45668	45669	45670		
		1	3	4	45671	45672	45673	45674	45675	45676	45677	45678	45679		
		1-1/4	3-1/2	4	45680	45681	45682	45683	45684	45685	45686	45687	45688		
		1-5/8	3-1/2	4	45689	45690	45691	45692	45693	45694	45695	45696	45697		
		2-1/8	4	4	45698	45699	45700	45701	45702	45703	45704	45705	45706		
		2-1/2	5	4	45707	45708	45709	45710	45711	45712	45713	45714	45715		
3/4	3/4	1	3	4	45716	45717	45718	45719	45720	45721	45722	45723	45724	45725	45726
		1-5/8	4	4	45727	45728	45729	45730	45731	45732	45733	45734	45735	45736	45737
		2-1/4	5	4	45738	45739	45740	45741	45742	45743	45744	45745	45746	45747	45748
		2-3/4	5	4	45749	45750	45751	45752	45753	45754	45755	45756	45757	45758	45759
		3-1/4	6	4	45760	45761	45762	45763	45764	45765	45766	45767	45768	45769	45770
1	1	1-1/4	4-1/2	4	45771	45772	45773	45774	45775	45776	45777	45778	45779	45780	45781
		2	4-1/2	4	45782	45783	45784	45785	45786	45787	45788	45789	45790	45791	45792
		2-5/8	5	4	45793	45794	45795	45796	45797	45798	45799	45800	45801	45802	45803
		3-1/4	6	4	45804	45805	45806	45807	45808	45809	45810	45811	45812	45813	45814
		4-1/4	7	4	45815	45816	45817	45818	45819	45820	45821	45822	45823	45824	45825

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

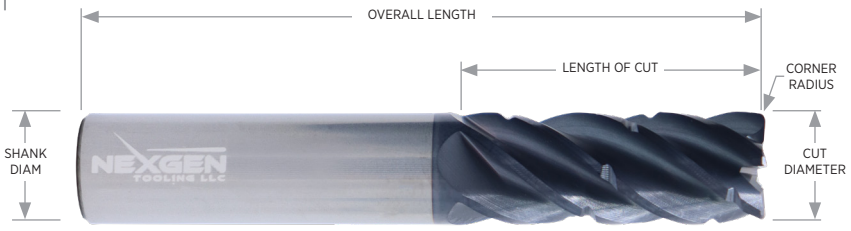
NXG-5-CB

5-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

Premium high performance carbide end mill for roughing of Ferrous materials.

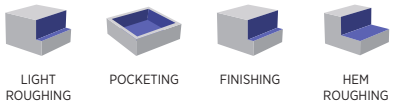
With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.



A-ProMAX

- 40 Degree Helix
- 5-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.96



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	5	55000	55001	55002	55003	55004						
		1/2	2	5	55005	55006	55007	55008	55009						
		3/4	2-1/2	5	55010	55011	55012	55013	55014						
3/16	3/16	5/16	2	5	55015	55016	55017	55018	55019						
		9/16	2-1/2	5	55020	55021	55022	55023	55024						
		3/4	2-1/2	5	55025	55026	55027	55028	55029						
1/4	1/4	3/8	2	5	55030	55031	55032	55033	55034	55035					
		1/2	2-1/2	5	55036	55037	55038	55039	55040	55041					
		3/4	2-1/2	5	55042	55043	55044	55045	55046	55047					
		1	3	5	55048	55049	55050	55051	55052	55053					
		1-1/4	3	5	55054	55055	55056	55057	55058	55059					
5/16	5/16	7/16	2	5	55060	55061	55062	55063	55064	55065					
		13/16	2-1/2	5	55066	55067	55068	55069	55070	55071					
3/8	3/8	1/2	2	5	55072	55073	55074	55075	55076	55077	55078	55079	55080		
		3/4	2-1/2	5	55081	55082	55083	55084	55085	55086	55087	55088	55089		
		1	3	5	55090	55091	55092	55093	55094	55095	55096	55097	55098		
		1-1/4	3	5	55099	55100	55101	55102	55103	55104	55105	55106	55107		
		1-1/2	3-1/2	5	55108	55109	55110	55111	55112	55113	55114	55115	55116		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	5	55117	55118	55119	55120	55121	55122	55123	55124	55125		
		1	3	5	55126	55127	55128	55129	55130	55131	55132	55133	55134		
		1-1/4	3	5	55135	55136	55137	55138	55139	55140	55141	55142	55143		
		1-5/8	4	5	55144	55145	55146	55147	55148	55149	55150	55151	55152		
		2	4	5	55153	55154	55155	55156	55157	55158	55159	55160	55161		
5/8	5/8	3/4	3	5	55162	55163	55164	55165	55166	55167	55168	55169	55170		
		1-1/4	3-1/2	5	55171	55172	55173	55174	55175	55176	55177	55178	55179		
		1-5/8	3-1/2	5	55180	55181	55182	55183	55184	55185	55186	55187	55188		
		2-1/8	4	5	55189	55190	55191	55192	55193	55194	55195	55196	55197		
		2-1/2	5	5	55198	55199	55200	55201	55202	55203	55204	55205	55206		
		1	3	5	55207	55208	55209	55210	55211	55212	55213	55214	55215	55216	55217
3/4	3/4	1-5/8	4	5	55218	55219	55220	55221	55222	55223	55224	55225	55226	55227	55228
		2-1/4	5	5	55229	55230	55231	55232	55233	55234	55235	55236	55237	55238	55239
		2-3/4	5	5	55240	55241	55242	55243	55244	55245	55246	55247	55248	55249	55250
		3-1/4	6	5	55251	55252	55253	55254	55255	55256	55257	55258	55259	55260	55261
1	1	1-1/4	4-1/2	5	55262	55263	55264	55265	55266	55267	55268	55269	55270	55271	55272
		2	4-1/2	5	55273	55274	55275	55276	55277	55278	55279	55280	55281	55282	55283
		2-5/8	5	5	55284	55285	55286	55287	55288	55289	55290	55291	55292	55293	55294
		3-1/4	6	5	55295	55296	55297	55298	55299	55300	55301	55302	55303	55304	55305
		4-1/4	7	5	55306	55307	55308	55309	55310	55311	55312	55313	55314	55315	55316

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

NXG-5-CB

5-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

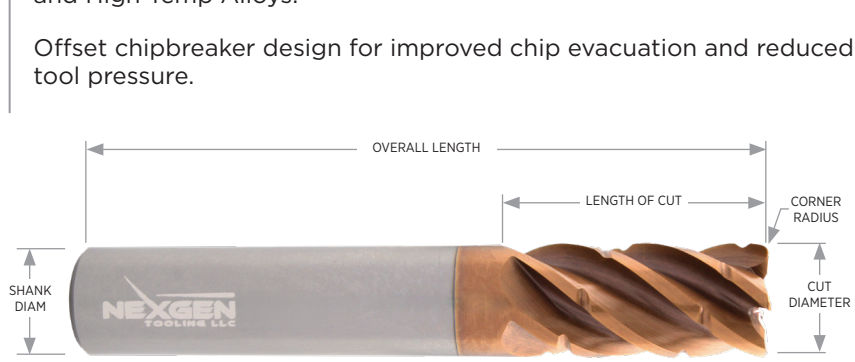
Premium high performance 5-flute carbide end mills ideal for roughing in Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

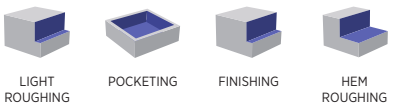
With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.

T-ProMAX

- 40 Degree Helix
- 5-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.96





STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	5	55500	55501	55502	55503	55504						
		1/2	2	5	55505	55506	55507	55508	55509						
		3/4	2-1/2	5	55510	55511	55512	55513	55514						
3/16	3/16	5/16	2	5	55515	55516	55517	55518	55519						
		9/16	2-1/2	5	55520	55521	55522	55523	55524						
		3/4	2-1/2	5	55525	55526	55527	55528	55529						
1/4	1/4	3/8	2	5	55530	55531	55532	55533	55534	55535					
		1/2	2-1/2	5	55536	55537	55538	55539	55540	55541					
		3/4	2-1/2	5	55542	55543	55544	55545	55546	55547					
		1	3	5	55548	55549	55550	55551	55552	55553					
		1-1/4	3	5	55554	55555	55556	55557	55558	55559					
5/16	5/16	7/16	2	5	55560	55561	55562	55563	55564	55565					
		13/16	2-1/2	5	55566	55567	55568	55569	55570	55571					
3/8	3/8	1/2	2	5	55572	55573	55574	55575	55576	55577	55578	55579	55580		
		3/4	2-1/2	5	55581	55582	55583	55584	55585	55586	55587	55588	55589		
		1	3	5	55590	55591	55592	55593	55594	55595	55596	55597	55598		
		1-1/4	3	5	55599	55600	55601	55602	55603	55604	55605	55606	55607		
		1-1/2	3-1/2	5	55608	55609	55610	55611	55612	55613	55614	55615	55616		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	5	55617	55618	55619	55620	55621	55622	55623	55624	55625		
		1	3	5	55626	55627	55628	55629	55630	55631	55632	55633	55634		
		1-1/4	3	5	55635	55636	55637	55638	55639	55640	55641	55642	55643		
		1-5/8	4	5	55644	55645	55646	55647	55648	55649	55650	55651	55652		
		2	4	5	55653	55654	55655	55656	55657	55658	55659	55660	55661		
5/8	5/8	3/4	3	5	55662	55663	55664	55665	55666	55667	55668	55669	55670		
		1-1/4	3-1/2	5	55671	55672	55673	55674	55675	55676	55677	55678	55679		
		1-5/8	3-1/2	5	55680	55681	55682	55683	55684	55685	55686	55687	55688		
		2-1/8	4	5	55689	55690	55691	55692	55693	55694	55695	55696	55697		
		2-1/2	5	5	55698	55699	55700	55701	55702	55703	55704	55705	55706		
3/4	3/4	1	3	5	55707	55708	55709	55710	55711	55712	55713	55714	55715	55716	55717
		1-5/8	4	5	55718	55719	55720	55721	55722	55723	55724	55725	55726	55727	55728
		2-1/4	5	5	55729	55730	55731	55732	55733	55734	55735	55736	55737	55738	55739
		2-3/4	5	5	55740	55741	55742	55743	55744	55745	55746	55747	55748	55749	55750
		3-1/4	6	5	55751	55752	55753	55754	55755	55756	55757	55758	55759	55760	55761
1	1	1-1/4	4-1/2	5	55762	55763	55764	55765	55766	55767	55768	55769	55770	55771	55772
		2	4-1/2	5	55773	55774	55775	55776	55777	55778	55779	55780	55781	55782	55783
		2-5/8	5	5	55784	55785	55786	55787	55788	55789	55790	55791	55792	55793	55794
		3-1/4	6	5	55795	55796	55797	55798	55799	55800	55801	55802	55803	55804	55805
		4-1/4	7	5	55806	55807	55808	55809	55810	55811	55812	55813	55814	55815	55816

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

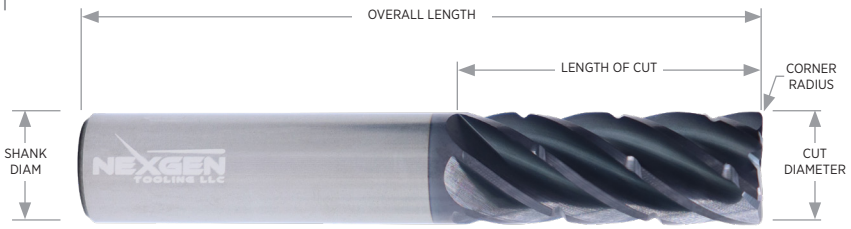
NXG-6-CB

6-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

Premium high performance carbide end mill for roughing of Ferrous materials.

With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.



A-ProMAX

- 37 Degree Helix
- 6-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.97

STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	6	65000	65001	65002	65003	65004	65005					
		1/2	2-1/2	6	65006	65007	65008	65009	65010	65011					
		3/4	2-1/2	6	65012	65013	65014	65015	65016	65017					
		1	3	6	65018	65019	65020	65021	65022	65023					
		1-1/4	3	6	65024	65025	65026	65027	65028	65029					
3/8	3/8	1/2	2	6	65030	65031	65032	65033	65034	65035	65036	65037	65038		
		3/4	3	6	65039	65040	65041	65042	65043	65044	65045	65046	65047		
		1	3	6	65048	65049	65050	65051	65052	65053	65054	65055	65056		
		1-1/4	3	6	65057	65058	65059	65060	65061	65062	65063	65064	65065		
		1-1/2	3-1/2	6	65066	65067	65068	65069	65070	65071	65072	65073	65074		
1/2	1/2	5/8	2-1/2	6	65075	65076	65077	65078	65079	65080	65081	65082	65083		
		1	3	6	65084	65085	65086	65087	65088	65089	65090	65091	65092		
		1-1/4	3	6	65093	65094	65095	65096	65097	65098	65099	65100	65101		
		1-5/8	4	6	65102	65103	65104	65105	65106	65107	65108	65109	65110		
		2	4	6	65111	65112	65113	65114	65115	65116	65117	65118	65119		
5/8	5/8	3/4	3	6	65120	65121	65122	65123	65124	65125	65126	65127	65128		
		1-1/4	3-1/2	6	65129	65130	65131	65132	65133	65134	65135	65136	65137		
		1-5/8	3-1/2	6	65138	65139	65140	65141	65142	65143	65144	65145	65146		
		2-1/8	4	6	65147	65148	65149	65150	65151	65152	65153	65154	65155		
		2-1/2	5	6	65156	65157	65158	65159	65160	65161	65162	65163	65164		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
3/4	3/4	1	3	6	65165	65166	65167	65168	65169	65170	65171	65172	65173	65174	65175
		1-5/8	4	6	65176	65177	65178	65179	65180	65181	65182	65183	65184	65185	65186
		2-1/4	5	6	65187	65188	65189	65190	65191	65192	65193	65194	65195	65196	65197
		2-3/4	5	6	65198	65199	65200	65201	65202	65203	65204	65205	65206	65207	65208
		3-1/4	6	6	65209	65210	65211	65212	65213	65214	65215	65216	65217	65218	65219
1	1	1-1/4	4-1/2	6	65220	65221	65222	65223	65224	65225	65226	65227	65228	65229	65230
		2	4-1/2	6	65231	65232	65233	65234	65235	65236	65237	65238	65239	65240	65241
		2-5/8	5	6	65242	65243	65244	65245	65246	65247	65248	65249	65250	65251	65252
		3-1/4	6	6	65253	65254	65255	65256	65257	65258	65259	65260	65261	65262	65263
		4-1/4	7	6	65264	65265	65266	65267	65268	65269	65270	65271	65272	65273	65274

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

NXG-6-CB

6-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

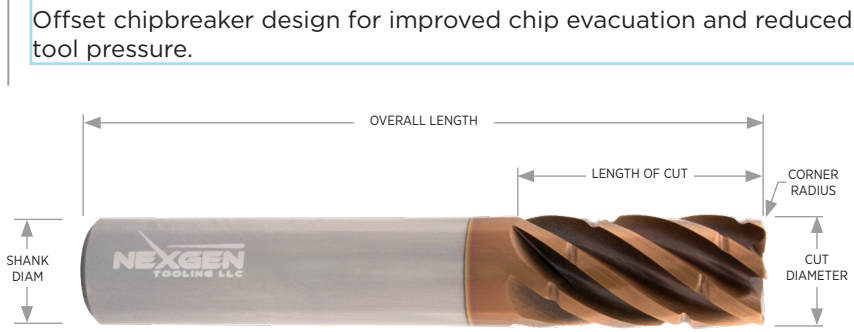
T-ProMAX

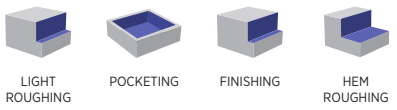
Premium high performance carbide end mill for roughing of Ferrous materials.

With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating the ideal tool coating for ferrous steel applications.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.

- 37 Degree Helix
- 6-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.97





STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	6	65500	65501	65502	65503	65504	65505					
		1/2	2-1/2	6	65506	65507	65508	65509	65510	65511					
		3/4	2-1/2	6	65512	65513	65514	65515	65516	65517					
		1	3	6	65518	65519	65520	65521	65522	65523					
		1-1/4	3	6	65524	65525	65526	65527	65528	65529					
3/8	3/8	1/2	2	6	65530	65531	65532	65533	65534	65535	65536	65537	65538		
		3/4	3	6	65539	65540	65541	65542	65543	65544	65545	65546	65547		
		1	3	6	65548	65549	65550	65551	65552	65553	65554	65555	65556		
		1-1/4	3	6	65557	65558	65559	65560	65561	65562	65563	65564	65565		
		1-1/2	3-1/2	6	65566	65567	65568	65569	65570	65571	65572	65573	65574		
1/2	1/2	5/8	2-1/2	6	65575	65576	65577	65578	65579	65580	65581	65582	65583		
		1	3	6	65584	65585	65586	65587	65588	65589	65590	65591	65592		
		1-1/4	3	6	65593	65594	65595	65596	65597	65598	65599	65600	65601		
		1-5/8	4	6	65602	65603	65604	65605	65606	65607	65608	65609	65610		
		2	4	6	65611	65612	65613	65614	65615	65616	65617	65618	65619		
5/8	5/8	3/4	3	6	65620	65621	65622	65623	65624	65625	65626	65627	65628		
		1-1/4	3-1/2	6	65629	65630	65631	65632	65633	65634	65635	65636	65637		
		1-5/8	3-1/2	6	65638	65639	65640	65641	65642	65643	65644	65645	65646		
		2-1/8	4	6	65647	65648	65649	65650	65651	65652	65653	65654	65655		
		2-1/2	5	6	65656	65657	65658	65659	65660	65661	65662	65663	65664		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
3/4	3/4	1	3	6	65665	65666	65667	65668	65669	65670	65671	65672	65673	65674	65675
		1-5/8	4	6	65676	65677	65678	65679	65680	65681	65682	65683	65684	65685	65686
		2-1/4	5	6	65687	65688	65689	65690	65691	65692	65693	65694	65695	65696	65697
		2-3/4	5	6	65698	65699	65700	65701	65702	65703	65704	65705	65706	65707	65708
		3-1/4	6	6	65709	65710	65711	65712	65713	65714	65715	65716	65717	65718	65719
1	1	1-1/4	4-1/2	6	65720	65721	65722	65723	65724	65725	65726	65727	65728	65729	65730
		2	4-1/2	6	65731	65732	65733	65734	65735	65736	65737	65738	65739	65740	65741
		2-5/8	5	6	65742	65743	65744	65745	65746	65747	65748	65749	65750	65751	65752
		3-1/4	6	6	65753	65754	65755	65756	65757	65758	65759	65760	65761	65762	65763
		4-1/4	7	6	65764	65765	65766	65767	65768	65769	65770	65771	65772	65773	65774

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

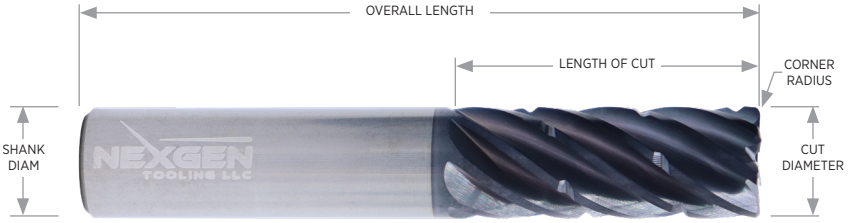
NXG-7-CB

7-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

Premium high performance carbide end mill for roughing of Ferrous materials.

With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.



A-ProMAX

- 37 Degree Helix
- 7-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.98


FINISHING


HEM ROUGHING

STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	7	75000	75001	75002	75003	75004	75005					
		1/2	2-1/2	7	75006	75007	75008	75009	75010	75011					
		3/4	2-1/2	7	75012	75013	75014	75015	75016	75017					
		1	3	7	75018	75019	75020	75021	75022	75023					
		1-1/4	3	7	75024	75025	75026	75027	75028	75029					
3/8	3/8	1/2	2	7	75030	75031	75032	75033	75034	75035					
		3/4	2-1/2	7	75244	75245	75246	75247	75248	75249					
		1	3	7	75036	75037	75038	75039	75040	75041					
		1-1/4	3	7	75042	75043	75044	75045	75046	75047					
		1-1/2	3-1/2	7	75048	75049	75050	75051	75052	75053					
1/2	1/2	5/8	2-1/2	7	75054	75055	75056	75057	75058	75059	75060	75061	75062		
		1	3	7	75063	75064	75065	75066	75067	75068	75069	75070	75071		
		1-1/4	3	7	75072	75073	75074	75075	75076	75077	75078	75079	75080		
		1-5/8	4	7	75081	75082	75083	75084	75085	75086	75087	75088	75089		
		2	4	7	75090	75091	75092	75093	75094	75095	75096	75097	75098		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
5/8	5/8	3/4	3	7	75099	75100	75101	75102	75103	75104	75105	75106	75107		
		1-1/4	3-1/2	7	75108	75109	75110	75111	75112	75113	75114	75115	75116		
		1-5/8	3-1/2	7	75117	75118	75119	75120	75121	75122	75123	75124	75125		
		2-1/8	4	7	75126	75127	75128	75129	75130	75131	75132	75133	75134		
		2-1/2	5	7	75135	75136	75137	75138	75139	75140	75141	75142	75143		
3/4	3/4	1	3	7	75144	75145	75146	75147	75148	75149	75150	75151	75152		
		1-5/8	4	7	75153	75154	75155	75156	75157	75158	75159	75160	75161		
		2-1/4	5	7	75162	75163	75164	75165	75166	75167	75168	75169	75170		
		2-3/4	5	7	75171	75172	75173	75174	75175	75176	75177	75178	75179		
		3-1/4	6	7	75180	75181	75182	75183	75184	75185	75186	75187	75188		
1	1	1-1/4	4-1/2	7	75189	75190	75191	75192	75193	75194	75195	75196	75197	75198	75199
		2	4-1/2	7	75200	75201	75202	75203	75204	75205	75206	75207	75208	75209	75210
		2-5/8	5	7	75211	75212	75213	75214	75215	75216	75217	75218	75219	75220	75221
		3-1/4	6	7	75222	75223	75224	75225	75226	75227	75228	75229	75230	75231	75232
		4-1/4	7	7	75233	75234	75235	75236	75237	75238	75239	75240	75241	75242	75243

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

NXG-7-CB

7-Flute | Square & Corner Radius | Chip Breaker | Carbide End Mill

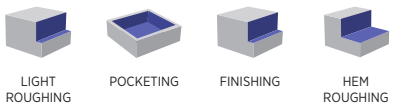
T-ProMAX

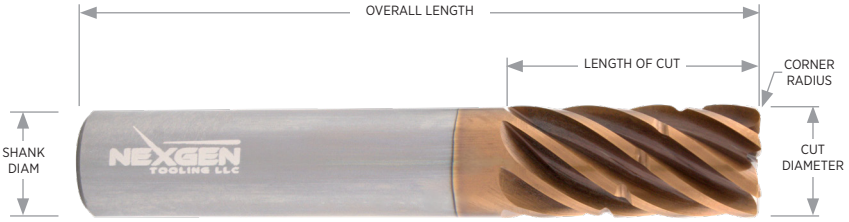
Premium high performance 7-flute carbide end mills ideal for roughing in Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Offset chipbreaker design for improved chip evacuation and reduced tool pressure.

- 37 Degree Helix
- 7-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Chip Breaker
- Micrograin Carbide
- Speed/Feed: p.98





STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	7	75500	75501	75502	75503	75504	75505					
		1/2	2-1/2	7	75506	75507	75508	75509	75510	75511					
		3/4	2-1/2	7	75512	75513	75514	75515	75516	75517					
		1	3	7	75518	75519	75520	75521	75522	75523					
		1-1/4	3	7	75524	75525	75526	75527	75528	75529					
3/8	3/8	1/2	2	7	75530	75531	75532	75533	75534	75535					
		3/4	2-1/2	7	75536	75537	75538	75539	75540	75541					
		1	3	7	75542	75543	75544	75545	75546	75547					
		1-1/4	3	7	75548	75549	75550	75551	75552	75553					
		1-1/2	3-1/2	7	75554	75555	75556	75557	75558	75559					
1/2	1/2	5/8	2-1/2	7	75560	75561	75562	75563	75564	75565	75566	75567	75568		
		1	3	7	75569	75570	75571	75572	75573	75574	75575	75576	75577		
		1-1/4	3	7	75578	75579	75580	75581	75582	75583	75584	75585	75586		
		1-5/8	4	7	75587	75588	75589	75590	75591	75592	75593	75594	75595		
		2	4	7	75596	75597	75598	75599	75600	75601	75602	75603	75604		
5/8	5/8	3/4	3	7	75605	75606	75607	75608	75609	75610	75611	75612	75613		
		1-1/4	3-1/2	7	75614	75615	75616	75617	75618	75619	75620	75621	75622		
		1-5/8	3-1/2	7	75623	75624	75625	75626	75627	75628	75629	75630	75631		
		2-1/8	4	7	75632	75633	75634	75635	75636	75637	75638	75639	75640		
		2-1/2	5	7	75641	75642	75643	75644	75645	75646	75647	75648	75649		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
3/4	3/4	1	3	7	75650	75651	75652	75653	75654	75655	75656	75657	75658		
		1-5/8	4	7	75659	75660	75661	75662	75663	75664	75665	75666	75667		
		2-1/4	5	7	75668	75669	75670	75671	75672	75673	75674	75675	75676		
		2-3/4	5	7	75677	75678	75679	75680	75681	75682	75683	75684	75685		
		3-1/4	6	7	75686	75687	75688	75689	75690	75691	75692	75693	75694		
1	1	1-1/4	4-1/2	7	75695	75696	75697	75698	75699	75700	75701	75702	75703	75704	75705
		2	4-1/2	7	75706	75707	75708	75709	75710	75711	75712	75713	75714	75715	75716
		2-5/8	5	7	75717	75718	75719	75720	75721	75722	75723	75724	75725	75726	75727
		3-1/4	6	7	75728	75729	75730	75731	75732	75733	75734	75735	75736	75737	75738
		4-1/4	7	7	75739	75740	75741	75742	75743	75744	75745	75746	75747	75748	75749

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

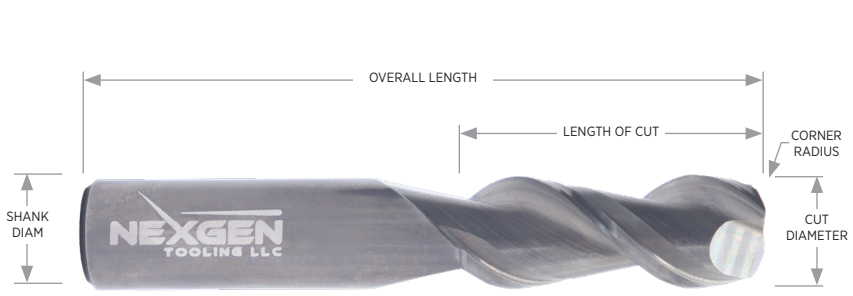
NXG-2

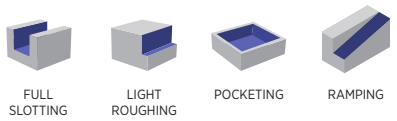
2-Flute | Square | Carbide End Mill

Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

- 45 Degree Helix
- 2-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.94





STOCK ✓ CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE END
1/8	1/8	1/4	1-1/2	2	20001
		1/2	2	2	20003
3/16	3/16	5/16	2-1/2	2	20005
		9/16	2-1/2	2	20007
1/4	1/4	1/2	2	2	20009
		3/4	2-1/2	2	20011
3/8	3/8	1/2	2	2	20013
		1	2-1/2	2	20015
1/2	1/2	5/8	2-1/2	2	20017
		1-1/4	3	2	20019
		1-5/8	4	2	20021
3/4	3/4	1	4	2	20023
		1-5/8	4	2	20025
1	1	1-1/4	4-1/2	2	20027
		2	5	2	20029

Tolerances

CUT Ø	SHANK Ø	LOC	OAL
h6	h6	+.032/-.000	+/- .050

Materials

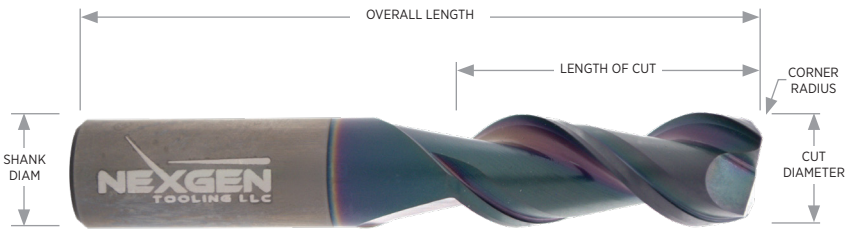
* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

2-Flute | Square | Carbide End Mill

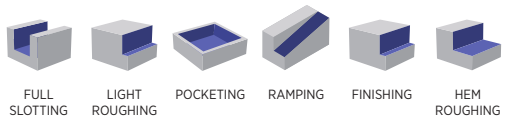
Premium high performance carbide end mill for Non-Ferrous materials.

X-ProMAX coating for extended tool life in ultra-high production settings.



X-ProMAX

- 45 Degree Helix
- 2-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.94



STOCK CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE END
1/8	1/8	1/4	1-1/2	2	23001
		1/2	2	2	23002
		3/4	2-1/2	2	23003
3/16	3/16	5/16	2	2	23004
		9/16	2-1/2	2	23005
		3/4	2-1/2	2	23006
1/4	1/4	3/8	2	2	23007
		1/2	2-1/2	2	23008
		3/4	2-1/2	2	23009
		1	3	2	23010
		1-1/4	3	2	23011
3/8	3/8	1/2	2	2	23012
		1	2-1/2	2	23013
		1-1/4	3	2	23014
		1-1/2	3-1/2	2	23015
1/2	1/2	5/8	2-1/2	2	23016
		1	3	2	23017
		1-1/4	3	2	23018
		1-5/8	4	2	23019
		2	4	2	23020

continued on next page →

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE END
5/8	5/8	3/4	3	2	23021
		1-1/4	3-1/2	2	23022
		1-5/8	3-1/2	2	23023
		2-1/4	4	2	23024
		2-1/2	5	2	23025
3/4	3/4	1	3	2	23026
		1-5/8	4	2	23027
		2-1/4	5	2	23028
		2-3/4	5	2	23029
		3-1/4	6	2	23030
1	1	1-1/4	4-1/2	2	23031
		2	4-1/2	2	23032
		2-5/8	5	2	23033
		3-1/4	6	2	23034
		4-1/4	7	2	23035

Tolerances

CUT Ø	SHANK Ø	LOC	OAL
h6	h6	+.032/-.000	+/- .050

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

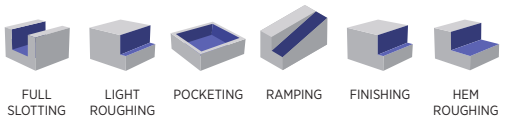
3-Flute | Square & Corner Radius | Carbide End Mill

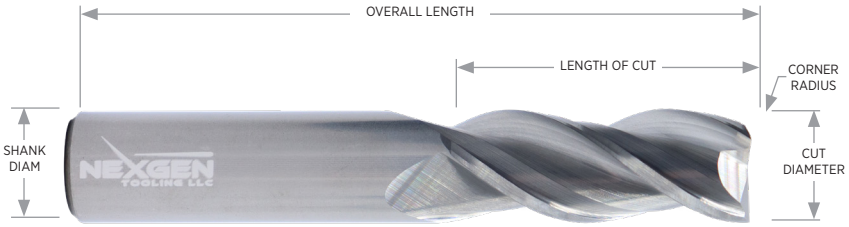
Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Wiper flat design leaves superior floor finishes. This feature is included on all square profiles with a corner radius ≤ 20% of cutter diameter.

- 37 Degree Helix
- 3-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Wiper Flat
- Micrograin Carbide
- Speed/Feed: p.94





STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	3	30001	31000	31001	31002	31003						
		1/2	2	3	30003	31004	31005	31006	31007						
		3/4	2-1/2	3	30031	31008	31009	31010	31011						
3/16	3/16	5/16	2	3	31292	31012	31013	31014	31015						
		5/16	2-1/2	3	30005										
		9/16	2-1/2	3	30007	31016	31017	31018	31019						
		3/4	2-1/2	3	30033	31020	31021	31022	31023						
1/4	1/4	3/8	2	3	30035	31024	31025	31026	31027	31028					
		1/2	2-1/2	3	30009	31029	31030	31031	31032	31033					
		3/4	2-1/2	3	30011	31034	31035	31036	31037	31038					
		1	3	3	30037	31039	31040	31041	31042	31043					
		1-1/4	3	3	30039	31044	31045	31046	31047	31048					
5/16	5/16	7/16	2	3	30041	31049	31050	31051	31052	31053					
		13/16	2-1/2	3	30043	31054	31055	31056	31057	31058					
		1-1/4	3	3	30068	31059	31060	31061	31062	31063					
3/8	3/8	1/2	2	3	30013	31064	31065	31066	31067	31068	31069	31070	31071		
		3/4	2-1/2	3	30069	31072	31073	31074	31075	31076	31077	31078	31079		
		1	2-1/2	3	30015										
		1	3	3	30074	31080	31081	31082	31083	31084	31085	31086	31087		
		1-1/4	3	3	30045	31088	31089	31090	31091	31092	31093	31094	31095		
		1-1/2	3-1/2	3	30047	31096	31097	31098	31099	31100	31101	31102	31103		

continued on next page →

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	3	30017	31104	31105	31106	31107	31108	31109	31110	31111		
		1	3	3	30049	31112	31113	31114	31115	31116	31117	31118	31119		
		1-1/4	3	3	30019	31120	31121	31122	31123	31124	31125	31126	31127		
		1-5/8	4	3	30021	31128	31129	31130	31131	31132	31133	31134	31135		
		2	4	3	30051	31136	31137	31138	31139	31140	31141	31142	31143		
		2-1/2	5	3	30070	31144	31145	31146	31147	31148	31149	31150	31151		
5/8	5/8	3/4	3	3	30053	31152	31153	31154	31155	31156	31157	31158	31159		
		1-1/4	3-1/2	3	30055	31160	31161	31162	31163	31164	31165	31166	31167		
		1-5/8	3-1/2	3	30057	31168	31169	31170	31171	31172	31173	31174	31175		
		2-1/8	4	3	30059	31176	31177	31178	31179	31180	31181	31182	31183		
		2-1/2	5	3	30061	31184	31185	31186	31187	31188	31189	31190	31191		
3/4	3/4	1	3	3	31293	31192	31193	31194	31195	31196	31197	31198	31199	31200	31201
		1	4	3	30023										
		1-5/8	4	3	30025	31202	31203	31204	31205	31206	31207	31208	31209	31210	31211
		2-1/4	5	3	30063	31212	31213	31214	31215	31216	31217	31218	31219	31220	31221
		2-3/4	5	3	30065	31222	31223	31224	31225	31226	31227	31228	31229	31230	31231
		3-1/4	6	3	30067	31232	31233	31234	31235	31236	31237	31238	31239	31240	31241
1	1	1-1/4	4-1/2	3	30027	31242	31243	31244	31245	31246	31247	31248	31249	31250	31251
		2	4-1/2	3	30029	31252	31253	31254	31255	31256	31257	31258	31259	31260	31261
		2-5/8	5	3	30071	31262	31263	31264	31265	31266	31267	31268	31269	31270	31271
		3-1/4	6	3	30072	31272	31273	31274	31275	31276	31277	31278	31279	31280	31281
		4-1/4	7	3	30073	31282	31283	31284	31285	31286	31287	31288	31289	31290	31291

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
h6	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

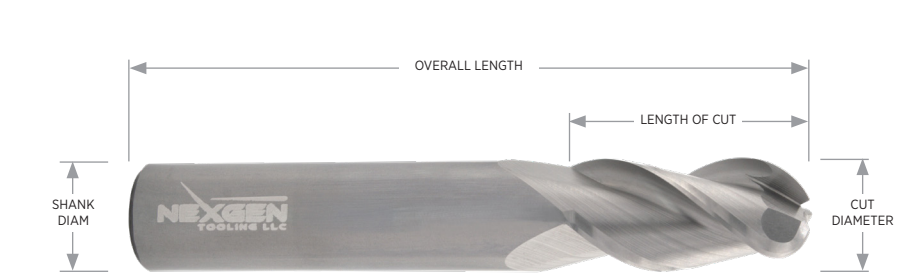
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

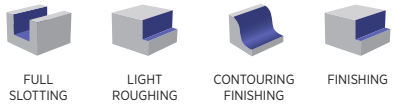
3-Flute | Ball | Carbide End Mill

Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

- 37 Degree Helix
- 3-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.94





STOCK ✓ CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
1/8	1/8	1/4	1-1/2	3	32000
		1/2	2	3	32001
		3/4	2-1/2	3	32002
3/16	3/16	5/16	2	3	32003
		9/16	2-1/2	3	32005
		3/4	2-1/2	3	32006
1/4	1/4	3/8	2	3	32007
		1/2	2-1/2	3	32008
		3/4	2-1/2	3	32009
		1	3	3	32010
		1-1/4	3	3	32011
5/16	5/16	7/16	2	3	32012
		13/16	2-1/2	3	32013
		1-1/4	3	3	32014
3/8	3/8	1/2	2	3	32015
		3/4	2-1/2	3	32016
		1	3	3	32017
		1-1/4	3	3	32018
		1-1/2	3-1/2	3	32019

continued on next page →

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
1/2	1/2	5/8	2-1/2	3	32020
		1	3	3	32021
		1-1/4	3	3	32022
		1-5/8	4	3	32023
		2	4	3	32024
		2-1/2	5	3	32025
5/8	5/8	3/4	3	3	32026
		1-1/4	3-1/2	3	32027
		1-5/8	3-1/2	3	32028
		2-1/8	4	3	32029
		2-1/2	5	3	32030
3/4	3/4	1	3	3	32031
		1-5/8	4	3	32032
		2-1/4	5	3	32033
		2-3/4	5	3	32034
		3-1/4	6	3	32035
1	1	1-1/4	4-1/2	3	32036
		2	4-1/2	3	32037
		2-5/8	5	3	32038
		3-1/4	6	3	32039
		4-1/4	7	3	32040

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
h6	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

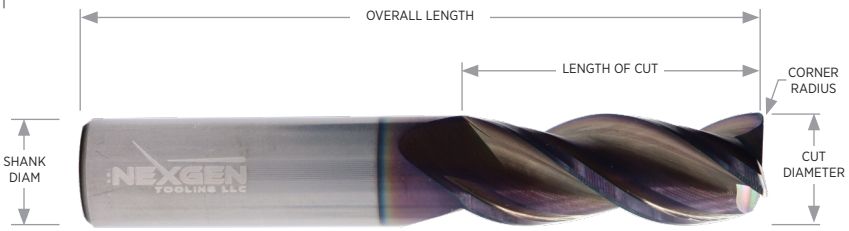
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

3-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance carbide end mill for Non-Ferrous materials.

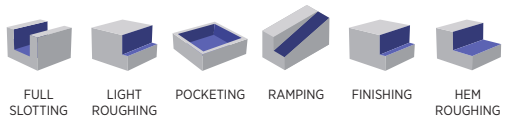
X-ProMAX coating for extended tool life in ultra-high production settings.

Wiper flat design leaves superior floor finishes. This feature is included on all square profiles with a corner radius ≤ 20% of cutter diameter.



X-ProMAX

- 37 Degree Helix
- 3-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Wiper Flat
- Micrograin Carbide
- Speed/Feed: p.94



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	3	30001	31000	31001	31002	31003						
		1/2	2	3	30003	31004	31005	31006	31007						
		3/4	2-1/2	3	30031	31008	31009	31010	31011						
3/16	3/16	5/16	2	3	31292	31012	31013	31014	31015						
		5/16	2-1/2	3	30005										
		9/16	2-1/2	3	30007	31016	31017	31018	31019						
		3/4	2-1/2	3	30033	31020	31021	31022	31023						
1/4	1/4	3/8	2	3	30035	31024	31025	31026	31027	31028					
		1/2	2-1/2	3	30009	31029	31030	31031	31032	31033					
		3/4	2-1/2	3	30011	31034	31035	31036	31037	31038					
		1	3	3	30037	31039	31040	31041	31042	31043					
		1-1/4	3	3	30039	31044	31045	31046	31047	31048					
5/16	5/16	7/16	2	3	30041	31049	31050	31051	31052	31053					
		13/16	2-1/2	3	30043	31054	31055	31056	31057	31058					
		1-1/4	3	3	30068	31059	31060	31061	31062	31063					
3/8	3/8	1/2	2	3	30013	31064	31065	31066	31067	31068	31069	31070	31071		
		3/4	2-1/2	3	30069	31072	31073	31074	31075	31076	31077	31078	31079		
		1	2-1/2	3	30015										
		1	3	3	30074	31080	31081	31082	31083	31084	31085	31086	31087		
		1-1/4	3	3	30045	31088	31089	31090	31091	31092	31093	31094	31095		
		1-1/2	3-1/2	3	30047	31096	31097	31098	31099	31100	31101	31102	31103		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	3	30017	31104	31105	31106	31107	31108	31109	31110	31111		
		1	3	3	30049	31112	31113	31114	31115	31116	31117	31118	31119		
		1-1/4	3	3	30019	31120	31121	31122	31123	31124	31125	31126	31127		
		1-5/8	4	3	30021	31128	31129	31130	31131	31132	31133	31134	31135		
		2	4	3	30051	31136	31137	31138	31139	31140	31141	31142	31143		
		2-1/2	5	3	30070	31144	31145	31146	31147	31148	31149	31150	31151		
5/8	5/8	3/4	3	3	30053	31152	31153	31154	31155	31156	31157	31158	31159		
		1-1/4	3-1/2	3	30055	31160	31161	31162	31163	31164	31165	31166	31167		
		1-5/8	3-1/2	3	30057	31168	31169	31170	31171	31172	31173	31174	31175		
		2-1/8	4	3	30059	31176	31177	31178	31179	31180	31181	31182	31183		
		2-1/2	5	3	30061	31184	31185	31186	31187	31188	31189	31190	31191		
3/4	3/4	1	3	3	31293	31192	31193	31194	31195	31196	31197	31198	31199	31200	31201
		1	4	3	30023										
		1-5/8	4	3	30025	31202	31203	31204	31205	31206	31207	31208	31209	31210	31211
		2-1/4	5	3	30063	31212	31213	31214	31215	31216	31217	31218	31219	31220	31221
		2-3/4	5	3	30065	31222	31223	31224	31225	31226	31227	31228	31229	31230	31231
		3-1/4	6	3	30067	31232	31233	31234	31235	31236	31237	31238	31239	31240	31241
1	1	1-1/4	4-1/2	3	30027	31242	31243	31244	31245	31246	31247	31248	31249	31250	31251
		2	4-1/2	3	30029	31252	31253	31254	31255	31256	31257	31258	31259	31260	31261
		2-5/8	5	3	30071	31262	31263	31264	31265	31266	31267	31268	31269	31270	31271
		3-1/4	6	3	30072	31272	31273	31274	31275	31276	31277	31278	31279	31280	31281
		4-1/4	7	3	30073	31282	31283	31284	31285	31286	31287	31288	31289	31290	31291

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
h6	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

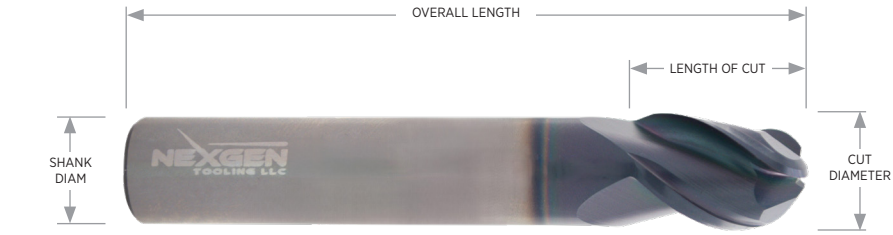
3-Flute | Ball | Carbide End Mill

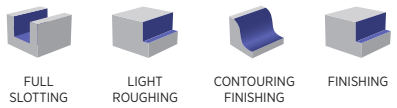
Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

X-PROMAX

- 37 Degree Helix
- 3-Flute
- Center Cutting
- Standard Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.94





STOCK CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
1/8	1/8	1/4	1-1/2	3	32000
		1/2	2	3	32001
		3/4	2-1/2	3	32002
3/16	3/16	5/16	2	3	32003
		9/16	2-1/2	3	32005
		3/4	2-1/2	3	32006
1/4	1/4	3/8	2	3	32007
		1/2	2-1/2	3	32008
		3/4	2-1/2	3	32009
		1	3	3	32010
		1-1/4	3	3	32011
5/16	5/16	7/16	2	3	32012
		13/16	2-1/2	3	32013
		1-1/4	3	3	32014
3/8	3/8	1/2	2	3	32015
		3/4	2-1/2	3	32016
		1	3	3	32017
		1-1/4	3	3	32018
		1-1/2	3-1/2	3	32019

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
1/2	1/2	5/8	2-1/2	3	32020
		1	3	3	32021
		1-1/4	3	3	32022
		1-5/8	4	3	32023
		2	4	3	32024
		2-1/2	5	3	32025
5/8	5/8	3/4	3	3	32026
		1-1/4	3-1/2	3	32027
		1-5/8	3-1/2	3	32028
		2-1/8	4	3	32029
		2-1/2	5	3	32030
3/4	3/4	1	3	3	32031
		1-5/8	4	3	32032
		2-1/4	5	3	32033
		2-3/4	5	3	32034
		3-1/4	6	3	32035
1	1	1-1/4	4-1/2	3	32036
		2	4-1/2	3	32037
		2-5/8	5	3	32038
		3-1/4	6	3	32039
		4-1/4	7	3	32040

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
h6	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

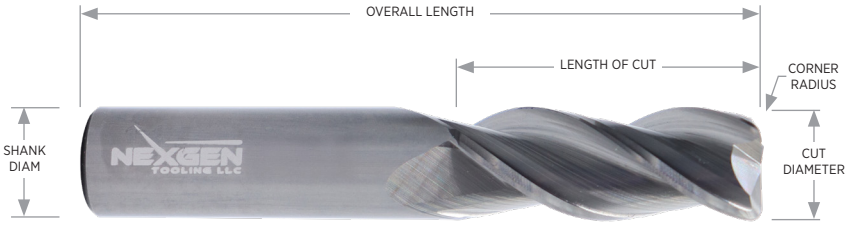
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

3-Flute | Square & Corner Radius | Carbide End Mill

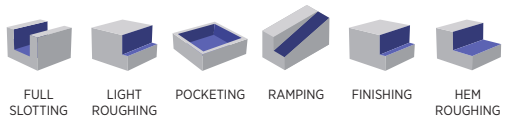
Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



- 40 Degree Helix
- 3-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.94



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	3	39000	39001	39002	39003	39004						
		1/2	2	3	39005	39006	39007	39008	39009						
		3/4	2-1/2	3	39010	39011	39012	39013	39014						
3/16	3/16	5/16	2	3	39015	39016	39017	39018	39019						
		9/16	2-1/2	3	39020	39021	39022	39023	39024						
		3/4	2-1/2	3	39025	39026	39027	39028	39029						
1/4	1/4	3/8	2	3	39030	39031	39032	39033	39034	39035					
		1/2	2-1/2	3	39036	39037	39038	39039	39040	39041					
		3/4	2-1/2	3	39042	39043	39044	39045	39046	39047					
		1	3	3	39048	39049	39050	39051	39052	39053					
		1-1/4	3	3	39054	39055	39056	39057	39058	39059					
5/16	5/16	7/16	2	3	39060	39061	39062	39063	39064	39065					
		13/16	2-1/2	3	39066	39067	39068	39069	39070	39071					
		1-1/4	3	3	39072	39073	39074	39075	39076	39077					
3/8	3/8	1/2	2	3	39078	39079	39080	39081	39082	39083	39084	39085	39086		
		3/4	2-1/2	3	39087	39088	39089	39090	39091	39092	39093	39094	39095		
		1	3	3	39096	39097	39098	39099	39100	39101	39102	39103	39104		
		1-1/4	3	3	39105	39106	39107	39108	39109	39110	39111	39112	39113		
		1-1/2	3-1/2	3	39114	39115	39116	39117	39118	39119	39120	39121	39122		

continued on next page →

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	3	39123	39124	39125	39126	39127	39128	39129	39130	39131		
		1	3	3	39132	39133	39134	39135	39136	39137	39138	39139	39140		
		1-1/4	3	3	39141	39142	39143	39144	39145	39146	39147	39148	39149		
		1-5/8	4	3	39150	39151	39152	39153	39154	39155	39156	39157	39158		
		2	4	3	39159	39160	39161	39162	39163	39164	39165	39166	39167		
		2-1/2	5	3	39168	39169	39170	39171	39172	39173	39174	39175	39176		
5/8	5/8	3/4	3	3	39177	39178	39179	39180	39181	39182	39183	39184	39185		
		1-1/4	3-1/2	3	39186	39187	39188	39189	39190	39191	39192	39193	39194		
		1-5/8	3-1/2	3	39195	39196	39197	39198	39199	39200	39201	39202	39203		
		2-1/8	4	3	39204	39205	39206	39207	39208	39209	39210	39211	39212		
		2-1/2	5	3	39213	39214	39215	39216	39217	39218	39219	39220	39221		
3/4	3/4	1	3	3	39222	39223	39224	39225	39226	39227	39228	39229	39230	39231	39232
		1-5/8	4	3	39233	39234	39235	39236	39237	39238	39239	39240	39241	39242	39243
		2-1/4	5	3	39244	39245	39246	39247	39248	39249	39250	39251	39252	39253	39254
		2-3/4	5	3	39255	39256	39257	39258	39259	39260	39261	39262	39263	39264	39265
		3-1/4	6	3	39266	39267	39268	39269	39270	39271	39272	39273	39274	39275	39276
1	1	1-1/4	4-1/2	3	39277	39278	39279	39280	39281	39282	39283	39284	39285	39286	39287
		2	4-1/2	3	39288	39289	39290	39291	39292	39293	39294	39295	39296	39297	39298
		2-5/8	5	3	39299	39300	39301	39302	39303	39304	39305	39306	39307	39308	39309
		3-1/4	6	3	39310	39311	39312	39313	39314	39315	39316	39317	39318	39319	39320
		4-1/4	7	3	39321	39322	39323	39324	39325	39326	39327	39328	39329	39330	39331

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
h6	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

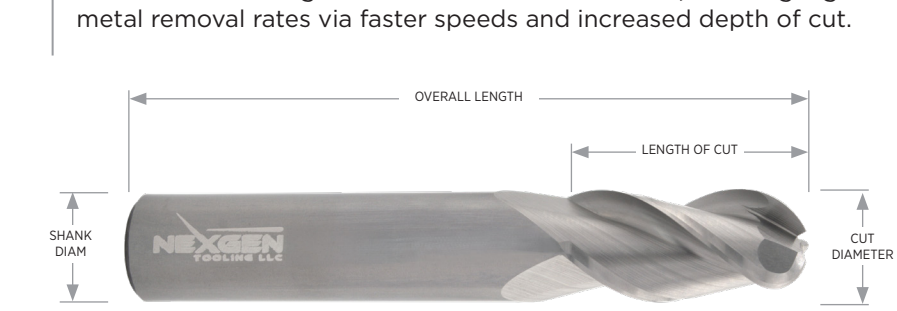
3-Flute | Ball | Carbide End Mill

Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.

- 40 Degree Helix
- 3-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.94



STOCK CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	BALL
1/8	1/8	1/4	1-1/2	3	39332
		1/2	2	3	39333
		3/4	2-1/2	3	39334
3/16	3/16	5/16	2	3	39335
		9/16	2-1/2	3	39336
		3/4	2-1/2	3	39337
1/4	1/4	3/8	2	3	39338
		1/2	2-1/2	3	39339
		3/4	2-1/2	3	39340
		1	3	3	39341
		1-1/4	3	3	39342
5/16	5/16	7/16	2	3	39343
		13/16	2-1/2	3	39344
		1-1/4	3	3	39345
3/8	3/8	1/2	2	3	39346
		3/4	2-1/2	3	39347
		1	3	3	39348
		1-1/4	3	3	39349
		1-1/2	3-1/2	3	39350
1/2	1/2	5/8	2-1/2	3	39351
		1	3	3	39352
		1-1/4	3	3	39353
		1-5/8	4	3	39354
		2	4	3	39355
		2-1/2	5	3	39356

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	BALL
5/8	5/8	3/4	3	3	39357
		1-1/4	3-1/2	3	39358
		1-5/8	3-1/2	3	39359
		2-1/8	4	3	39360
		2-1/2	5	3	39361
3/4	3/4	1	3	3	39362
		1-5/8	4	3	39363
		2-1/4	5	3	39364
		2-3/4	5	3	39365
		3-1/4	6	3	39366
1	1	1-1/4	4-1/2	3	39367
		2	4-1/2	3	39368
		2-5/8	5	3	39369
		3-1/4	6	3	39370
		4-1/4	7	3	39371

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
h6	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

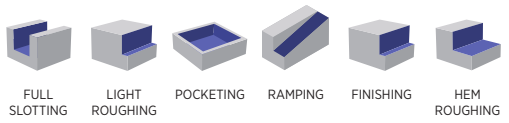
3-Flute | Square & Corner Radius | Reduced Neck | Carbide End Mill

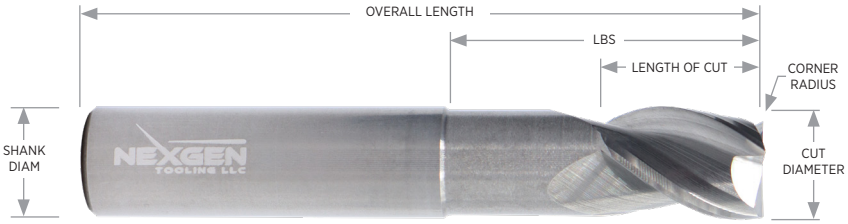
Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.

- 40 Degree Helix
- 3-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Reduced Neck
- Speed/Feed: p.94





STOCK ✓ CHECK

Tool Dimensions							End Construction									
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	5/32	1/2	0.118	2.5	3	37000	37001	37002	37003						
			3/4	0.118	3	3	37004	37005	37006	37007						
			1	0.118	3	3	37008	37009	37010	37011						
3/16	3/16	7/32	1/2	0.178	2.5	3	37012	37013	37014	37015						
			3/4	0.178	3	3	37016	37017	37018	37019						
			1	0.178	3	3	37020	37021	37022	37023						
1/4	1/4	3/8	3/4	0.237	2.5	3	37024	37025	37026	37027	37028					
			1-1/8	0.237	3	3	37029	37030	37031	37032	37033					
			1-3/8	0.237	3	3	37034	37035	37036	37037	37038					
			1-5/8	0.237	3	3	37039	37040	37041	37042	37043					
			1-7/8	0.237	4	3	37044	37045	37046	37047	37048					
			2-1/8	0.237	4	3	37049	37050	37051	37052	37053					
			2-1/2	0.237	4	3	37054	37055	37056	37057	37058					
5/16	5/16	7/16	1-1/8	0.297	4	3	37059	37060	37061	37062	37063					
			1-3/4	0.297	4	3	37064	37065	37066	37067	37068					
			2-1/8	0.297	4	3	37069	37070	37071	37072	37073					
3/8	3/8	1/2	1-1/8	0.356	3	3	37074	37075	37076	37077	37078	37079				
			1-5/8	0.356	3	3	37080	37081	37082	37083	37084	37085				
			2-1/8	0.356	4	3	37086	37087	37088	37089	37090	37091				
			2-1/2	0.356	5	3	37092	37093	37094	37095	37096	37097				
			3-1/8	0.356	6	3	37098	37099	37100	37101	37102	37103				

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

NXG-3V-RN

3-Flute | Square & Corner Radius | Reduced Neck | Carbide End Mill

continued from previous page

Tool Dimensions							End Construction									
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	1-3/8	0.475	3	3	37104	37105	37106	37107	37108	37109	37218	37110		
			2-1/4	0.475	4	3	37111	37112	37113	37114	37115	37116	37219	37117		
			3-3/8	0.475	5	3	37118	37119	37120	37121	37122	37123	37220	37124		
			3-3/4	0.475	6	3	37125	37126	37127	37128	37129	37130	37221	37131		
5/8	5/8	3/4	2-3/8	0.593	4	3	37132	37133	37134	37135	37136	37137	37222	37138		
			3-3/8	0.593	6	3	37139	37140	37141	37142	37143	37144	37223	37145		
3/4	3/4	1	2	0.712	4	3	37146	37147	37148	37149	37150	37151	37224	37152	37153	37154
			2-1/2	0.712	5	3	37155	37156	37157	37158	37159	37160	37225	37161	37162	37163
			3-3/8	0.712	6	3	37164	37165	37166	37167	37168	37169	37226	37170	37171	37172
			4-1/8	0.712	7	3	37173	37174	37175	37176	37177	37178	37227	37179	37180	37181
1	1	1-1/4	2-5/8	0.950	5	3	37182	37183	37184	37185	37186	37187	37228	37188	37189	37190
			3-3/8	0.950	6	3	37191	37192	37193	37194	37195	37196	37229	37197	37198	37199
			4-3/8	0.950	7	3	37200	37201	37202	37203	37204	37205	37230	37206	37207	37208
			6	0.950	9	3	37209	37210	37211	37212	37213	37214	37231	37215	37216	37217

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
h6	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

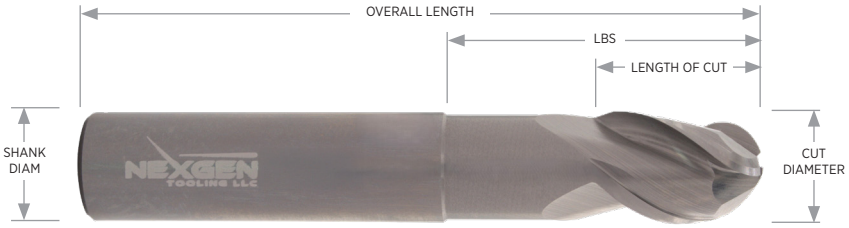
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

3-Flute | Ball | Reduced Neck | Carbide End Mill

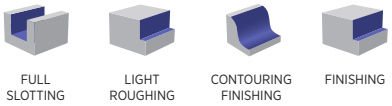
Premium high performance carbide end mill for Non-Ferrous materials.

Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



- 40 Degree Helix
- 3-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Reduced Neck
- Speed/Feed: p.94



STOCK CHECK

Tool Dimensions							End Construction
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	BALL
1/8	1/8	5/32	1/2	0.118	2-1/2	3	37500
			3/4	0.118	3	3	37501
			1	0.118	3	3	37502
3/16	3/16	7/32	1/2	0.178	2-1/2	3	37503
			3/4	0.178	3	3	37504
			1	0.178	3	3	37505
1/4	1/4	3/8	3/4	0.237	2-1/2	3	37506
			1-1/8	0.237	3	3	37507
			1-3/8	0.237	3	3	37508
			1-5/8	0.237	3	3	37509
			1-7/8	0.237	4	3	37510
			2-1/8	0.237	4	3	37511
			2-1/2	0.237	4	3	37512
5/16	5/16	7/16	1-1/8	0.297	4	3	37513
			1-3/4	0.297	4	3	37514
			2-1/8	0.297	4	3	37515
3/8	3/8	1/2	1-1/8	0.356	3	3	37516
			1-5/8	0.356	3	3	37517
			2-1/8	0.356	4	3	37518
			2-1/2	0.356	5	3	37519
			3-1/8	0.356	6	3	37520

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions							End Construction
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	BALL
1/2	1/2	5/8	1-3/8	0.475	3	3	37521
			2-1/4	0.475	4	3	37522
			3-3/8	0.475	5	3	37523
			3-3/4	0.475	6	3	37524
5/8	5/8	3/4	2-3/8	0.593	4	3	37525
			3-3/8	0.593	6	3	37526
3/4	3/4	1	2	0.712	4	3	37527
			2-1/2	0.712	5	3	37528
			3-3/8	0.712	6	3	37529
			4-1/8	0.712	7	3	37530
1	1	1-1/4	2-5/8	0.950	5	3	37531
			3-3/8	0.950	6	3	37532
			4-3/8	0.950	7	3	37533
			6	0.950	9	3	37534

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
h6	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

3-Flute | Square & Corner Radius | Reduced Neck | Carbide End Mill

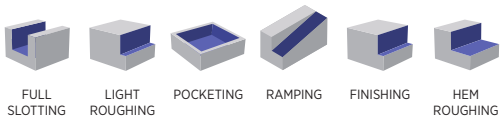
Premium high performance carbide end mill for Non-Ferrous materials.

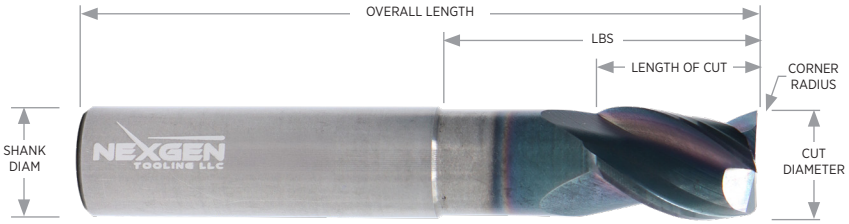
X-ProMAX coating for extended tool life in ultra-high production settings.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.

X-PROMAX

- 40 Degree Helix
- 3-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Reduced Neck
- Speed/Feed: p.94





STOCK CHECK

Tool Dimensions							End Construction									
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	5/32	1/2	0.118	2-1/2	3	38000	38001	38002	38003						
			3/4	0.118	3	3	38004	38005	38006	38007						
			1	0.118	3	3	38008	38009	38010	38011						
3/16	3/16	7/32	1/2	0.178	2-1/2	3	38012	38013	38014	38015						
			3/4	0.178	3	3	38016	38017	38018	38019						
			1	0.178	3	3	38020	38021	38022	38023						
1/4	1/4	3/8	3/4	0.237	2-1/2	3	38024	38025	38026	38027	38028					
			1-1/8	0.237	3	3	38029	38030	38031	38032	38033					
			1-3/8	0.237	3	3	38034	38035	38036	38037	38038					
			1-5/8	0.237	3	3	38039	38040	38041	38042	38043					
			1-7/8	0.237	4	3	38044	38045	38046	38047	38048					
			2-1/8	0.237	4	3	38049	38050	38051	38052	38053					
			2-1/2	0.237	4	3	38054	38055	38056	38057	38058					
5/16	5/16	7/16	1-1/8	0.297	4	3	38059	38060	38061	38062	38063					
			1-3/4	0.297	4	3	38064	38065	38066	38067	38068					
			2-1/8	0.297	4	3	38069	38070	38071	38072	38073					
3/8	3/8	1/2	1-1/8	0.356	3	3	38074	38075	38076	38077	38078	38079				
			1-5/8	0.356	3	3	38080	38081	38082	38083	38084	38085				
			2-1/8	0.356	4	3	38086	38087	38088	38089	38090	38091				
			2-1/2	0.356	5	3	38092	38093	38094	38095	38096	38097				
			3-1/8	0.356	6	3	38098	38099	38100	38101	38102	38103				

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

NXG-3V-RN

3-Flute | Square & Corner Radius | Reduced Neck | Carbide End Mill

continued from previous page

Tool Dimensions							End Construction									
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	1-3/8	0.475	3	3	38104	38105	38106	38107	38108	38109	38218	38110		
			2-1/4	0.475	4	3	38111	38112	38113	38114	38115	38116	38219	38117		
			3-3/8	0.475	5	3	38118	38119	38120	38121	38122	38123	38220	38124		
			3-3/4	0.475	6	3	38125	38126	38127	38128	38129	38130	38221	38131		
5/8	5/8	3/4	2-3/8	0.593	4	3	38132	38133	38134	38135	38136	38137	38222	38138		
			3-3/8	0.593	6	3	38139	38140	38141	38142	38143	38144	38223	38145		
3/4	3/4	1	2	0.712	4	3	38146	38147	38148	38149	38150	38151	38224	38152	38153	38154
			2-1/2	0.712	5	3	38155	38156	38157	38158	38159	38160	38225	38161	38162	38163
			3-3/8	0.712	6	3	38164	38165	38166	38167	38168	38169	38226	38170	38171	38172
			4-1/8	0.712	7	3	38173	38174	38175	38176	38177	38178	38227	38179	38180	38181
1	1	1-1/4	2-5/8	0.950	5	3	38182	38183	38184	38185	38186	38187	38228	38188	38189	38190
			3-3/8	0.950	6	3	38191	38192	38193	38194	38195	38196	38229	38197	38198	38199
			4-3/8	0.950	7	3	38200	38201	38202	38203	38204	38205	38230	38206	38207	38208
			6	0.950	9	3	38209	38210	38211	38212	38213	38214	38231	38215	38216	38217

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
h6	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

3-Flute | Ball | Reduced Neck | Carbide End Mill

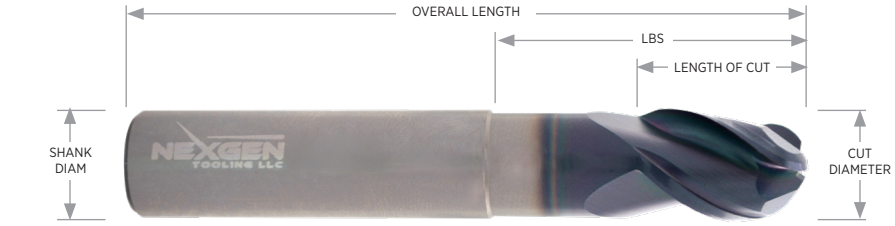
Premium high performance carbide end mill for Non-Ferrous materials.

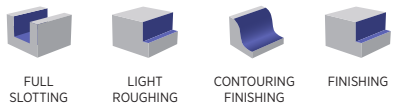
Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.

X-PROMAX

- 40 Degree Helix
- 3-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Reduced Neck
- Speed/Feed: p.94





STOCK CHECK

Tool Dimensions							End Construction
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	BALL
1/8	1/8	5/32	1/2	0.118	2-1/2	3	38500
			3/4	0.118	3	3	38501
			1	0.118	3	3	38502
3/16	3/16	7/32	1/2	0.178	2-1/2	3	38503
			3/4	0.178	3	3	38504
			1	0.178	3	3	38505
1/4	1/4	3/8	3/4	0.237	2-1/2	3	38506
			1-1/8	0.237	3	3	38507
			1-3/8	0.237	3	3	38508
			1-5/8	0.237	3	3	38509
			1-7/8	0.237	4	3	38510
			2-1/8	0.237	4	3	38511
			2-1/2	0.237	4	3	38512
5/16	5/16	7/16	1-1/8	0.297	4	3	38513
			1-3/4	0.297	4	3	38514
			2-1/8	0.297	4	3	38515
3/8	3/8	1/2	1-1/8	0.356	3	3	38516
			1-5/8	0.356	3	3	38517
			2-1/8	0.356	4	3	38518
			2-1/2	0.356	5	3	38519
			3-1/8	0.356	6	3	38520

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

continued from previous page

Tool Dimensions							End Construction
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	BALL
1/2	1/2	5/8	1-3/8	0.475	3	3	38521
			2-1/4	0.475	4	3	38522
			3-3/8	0.475	5	3	38523
			3-3/4	0.475	6	3	38524
5/8	5/8	3/4	2-3/8	0.593	4	3	38525
			3-3/8	0.593	6	3	38526
3/4	3/4	1	2	0.712	4	3	38527
			2-1/2	0.712	5	3	38528
			3-3/8	0.712	6	3	38529
			4-1/8	0.712	7	3	38530
1	1	1-1/4	2-5/8	0.950	5	3	38531
			3-3/8	0.950	6	3	38532
			4-3/8	0.950	7	3	38533
			6	0.950	9	3	38534

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
h6	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

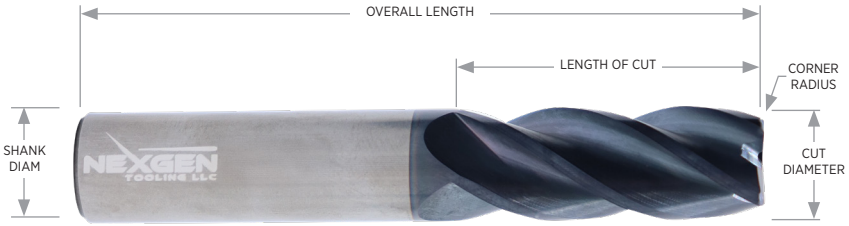
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**									

4-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 4-flute carbide end mills for Ferrous materials.

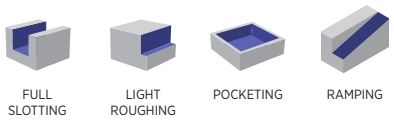
With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



A-PROMAX

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.95



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	4	40001	41000	41019	41235	41020						
		1/2	2	4	40002	41001	41021	41236	41022						
		3/4	2-1/2	4	40020	41023	41024	41237	41025						
3/16	3/16	5/16	2	4	40040	41026	41027	41238	41241						
		5/16	2-1/2	4	40003	41002									
		9/16	2-1/2	4	40004	41003	41028	41239	41029						
		3/4	2-1/2	4	40021	41030	41031	41240	41032						
1/4	1/4	3/8	2	4	40041	41033	41034	41242	41035	41036					
		3/8	2-1/2	4	40005			41004							
		1/2	2-1/2	4	40023	41037	41038	41039	41040	41041					
		3/4	2-1/2	4	40006	41042	41043	41005	41044	41045					
		1	3	4	40007	41046	41047	41006	41289	41048					
		1-1/4	3	4	40024	41049	41050	41051	41052	41053					
5/16	5/16	7/16	2	4	40025	41054	41055	41056	41057	41058					
		13/16	2-1/2	4	40026	41059	41060	41061	41062	41063					
3/8	3/8	1/2	2	4	40008	41064	41065	41007	41066	41067	41068	41069	41070		
		3/4	2-1/2	4	40043	41281	41282	41283	41284	41285	41286	41287	41288		
		1	3	4	40009	41071	41072	41008	41073	41074	41075	41076	41077		
		1-1/4	3	4	40027	41078	41079	41080	41081	41082	41083	41084	41085		
		1-1/2	3-1/2	4	40028	41086	41087	41088	41089	41090	41091	41092	41093		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	R.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	4	40010	41094	41095	41096	41009	41097	41098	41099	41100		
		1	3	4	40011	41101	41102	41103	41010	41104	41105	41106	41107		
		1-1/4	3	4	40012	41108	41109	41110	41011	41111	41112	41113	41114		
		1-5/8	4	4	40013	41115	41116	41117	41012	41118	41119	41120	41121		
		2	4	4	40029	41122	41123	41124	41125	41126	41127	41128	41129		
5/8	5/8	3/4	3	4	40030	41243	41244	41245	41130	41131	41132	41133	41134		
		1	3	4	40014	41246	41247	41248	41013	41249	41250	41251	41252		
		1-1/4	3-1/2	4	40031	41253	41254	41255	41135	41136	41137	41138	41139		
		1-5/8	3-1/2	4	40015	41256	41257	41258	41014	41140	41141	41142	41143		
		2-1/8	4	4	40032	41259	41260	41261	41144	41145	41146	41147	41148		
		2-1/2	5	4	40033	41262	41263	41264	41149	41150	41151	41152	41153		
3/4	3/4	1	3	4	40042	41154	41155	41156	41280	41157	41158	41159	41160	41161	41162
		1	4	4	40016				41015						
		1-5/8	4	4	40017	41163	41164	41165	41016	41166	41167	41168	41169	41170	41171
		2-1/4	5	4	40034	41172	41173	41174	41175	41176	41177	41178	41179	41180	41181
		2-3/4	5	4	40035	41182	41183	41184	41185	41186	41187	41188	41189	41190	41191
		3-1/4	6	4	40036	41192	41193	41194	41195	41196	41197	41198	41199	41200	41201
1	1	1-1/4	4-1/2	4	40018	41265	41266	41267	41017	41202	41203	41204	41205	41206	41207
		2	4-1/2	4	40019	41268	41269	41270	41018	41208	41209	41210	41211	41212	41213
		2-5/8	5	4	40037	41271	41272	41273	41214	41215	41216	41217	41218	41219	41220
		3-1/4	6	4	40038	41274	41275	41276	41221	41222	41223	41224	41225	41226	41227
		4-1/4	7	4	40039	41277	41278	41279	41228	41229	41230	41231	41232	41233	41234

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

4-Flute | Ball | Carbide End Mill

Premium high performance 4-flute carbide end mills for Ferrous materials.

With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.

A-PROMAX

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.95

STOCK CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
1/8	1/8	1/4	1-1/2	4	42000
		1/2	2	4	42001
		3/4	2-1/2	4	42014
3/16	3/16	5/16	2	4	42002
		9/16	2-1/2	4	42003
		3/4	2-1/2	4	42015
1/4	1/4	3/8	2	4	42004
		1/2	2-1/2	4	42016
		3/4	2-1/2	4	42005
		1	3	4	42017
		1-1/4	3	4	42018
5/16	5/16	7/16	2	4	42019
		13/16	2-1/2	4	42020
3/8	3/8	1/2	2	4	42006
		3/4	2-1/2	4	42039
		1	3	4	42007
		1-1/4	3	4	42021
		1-1/2	3-1/2	4	42022
1/2	1/2	5/8	2-1/2	4	42008
		1	3	4	42009
		1-1/4	3	4	42010
		1-5/8	4	4	42023
		2	4	4	42024

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
5/8	5/8	3/4	3	4	42025
		1	3	4	42011
		1-1/4	3-1/2	4	42026
		1-5/8	3-1/2	4	42027
		2-1/8	4	4	42028
		2-1/2	5	4	42029
3/4	3/4	1	3	4	42038
		1	4	4	42012
		1-5/8	4	4	42030
		2-1/4	5	4	42031
		2-3/4	5	4	42032
		3-1/4	6	4	42033
1	1	1-1/4	4-1/2	4	42013
		2	4-1/2	4	42034
		2-5/8	5	4	42035
		3-1/4	6	4	42036
		4-1/4	7	4	42037

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

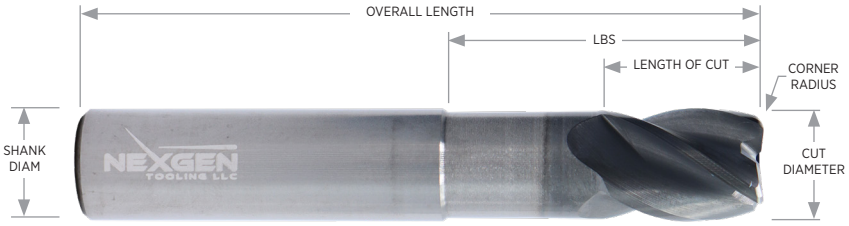
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

4-Flute | Square & Corner Radius | Reduced Neck | Carbide End Mill

Premium high performance carbide end mills for Ferrous materials.

With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



A-PROMAX

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Reduced Neck
- Speed/Feed: p.95

STOCK CHECK

Tool Dimensions							End Construction								
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.125	R.190	R.250
1/8	1/8	5/32	1/2	0.118	2-1/2	4	47000	47001	47002	47003					
			3/4	0.118	3	4	47004	47005	47006	47007					
			1	0.118	3	4	47008	47009	47010	47011					
3/16	3/16	7/32	1/2	0.178	2-1/2	4	47012	47013	47014	47015					
			3/4	0.178	3	4	47016	47017	47018	47019					
			1	0.178	3	4	47020	47021	47022	47023					
1/4	1/4	3/8	3/4	0.237	3	4	47024	47025	47026	47027	47028				
			1-1/8	0.237	3	4	47029	47030	47031	47032	47033				
			1-5/8	0.237	3	4	47034	47035	47036	47037	47038				
			2-1/8	0.237	4	4	47039	47040	47041	47042	47043				
			2-1/2	0.237	4	4	47044	47045	47046	47047	47048				
5/16	5/16	7/16	1-1/8	0.297	4	4	47049	47050	47051	47052	47053				
			1-3/4	0.297	4	4	47054	47055	47056	47057	47058				
			2-1/8	0.297	4	4	47059	47060	47061	47062	47063				
3/8	3/8	1/2	1-1/8	0.356	3	4	47064	47065	47066	47067	47068	47069			
			1-5/8	0.356	3	4	47070	47071	47072	47073	47074	47075			
			2-1/8	0.356	4	4	47076	47077	47078	47079	47080	47081			
			2-1/2	0.356	5	4	47082	47083	47084	47085	47086	47087			
			3-1/8	0.356	6	4	47088	47089	47090	47091	47092	47093			

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

NXG-4-RN

4-Flute | Square & Corner Radius | Reduced Neck | Carbide End Mill

continued from previous page

Tool Dimensions							End Construction								
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.125	R.190	R.250
1/2	1/2	5/8	1-3/8	0.475	3	4	47094	47095	47096	47097	47098	47099	47100		
			2-1/4	0.475	4	4	47101	47102	47103	47104	47105	47106	47107		
			3-3/8	0.475	5	4	47108	47109	47110	47111	47112	47113	47114		
			3-3/4	0.475	6	4	47115	47116	47117	47118	47119	47120	47121		
5/8	5/8	3/4	2-3/8	0.593	4	4	47122	47123	47124	47125	47126	47127	47128		
			3-3/8	0.593	6	4	47129	47130	47131	47132	47133	47134	47135		
3/4	3/4	1	2	0.712	4	4	47136	47137	47138	47139	47140	47141	47142	47143	47144
			2-1/2	0.712	5	4	47145	47146	47147	47148	47149	47150	47151	47152	47153
			3-3/8	0.712	6	4	47154	47155	47156	47157	47158	47159	47160	47161	47162
			4-1/8	0.712	7	4	47163	47164	47165	47166	47167	47168	47169	47170	47171
1	1	1-1/4	2-5/8	0.950	5	4	47172	47173	47174	47175	47176	47177	47178	47179	47180
			3-3/8	0.950	6	4	47181	47182	47183	47184	47185	47186	47187	47188	47189
			4-3/8	0.950	7	4	47190	47191	47192	47193	47194	47195	47196	47197	47198
			6	0.950	9	4	47199	47200	47201	47202	47203	47204	47205	47206	47207

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

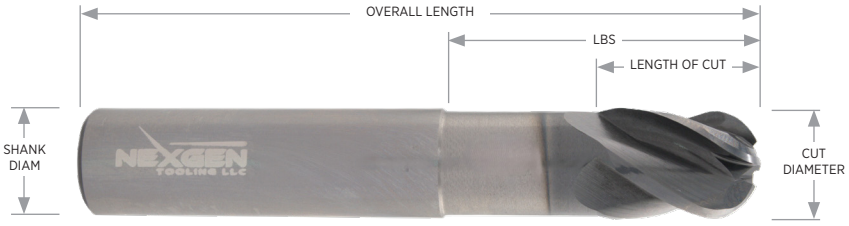
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

4-Flute | Ball | Reduced Neck | Carbide End Mill

Premium high performance carbide end mill for Non-Ferrous materials.

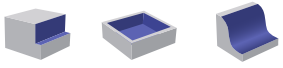
Polished flutes resist built-up-edge (BUE) in Aluminum and Copper Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



ProMax

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Reduced Neck
- Speed/Feed: p.95



STOCK CHECK

Tool Dimensions							End Construction
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	Ball
1/8	1/8	5/32	1/2	0.118	2-1/2	4	47500
			3/4	0.118	3	4	47501
			1	0.118	3	4	47502
3/16	3/16	7/32	1/2	0.178	2-1/2	4	47503
			3/4	0.178	3	4	47504
			1	0.178	3	4	47505
1/4	1/4	3/8	3/4	0.237	3	4	47506
			1-1/8	0.237	3	4	47507
			1-5/8	0.237	3	4	47508
			2-1/8	0.237	4	4	47509
			2-1/2	0.237	4	4	47510
5/16	5/16	7/16	1-1/8	0.297	4	4	47511
			1-3/4	0.297	4	4	47512
			2-1/8	0.297	4	4	47513
3/8	3/8	1/2	1-1/8	0.356	3	4	47514
			1-5/8	0.356	3	4	47515
			2-1/8	0.356	4	4	47516
			2-1/2	0.356	5	4	47517
			3-1/8	0.356	6	4	47518

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

continued from previous page

Tool Dimensions							End Construction
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	Ball
1/2	1/2	5/8	1-3/8	0.475	3	4	47519
			2-1/4	0.475	4	4	47520
			3-3/8	0.475	5	4	47521
			3-3/4	0.475	6	4	47522
5/8	5/8	3/4	2-3/8	0.593	4	4	47523
			3-3/8	0.593	6	4	47524
3/4	3/4	1	2	0.712	4	4	47525
			2-1/2	0.712	5	4	47526
			3-3/8	0.712	6	4	47527
			4-1/8	0.712	7	4	47528
1	1	1-1/4	2-5/8	0.950	5	4	47529
			3-3/8	0.950	6	4	47530
			4-3/8	0.950	7	4	47531
			6	0.950	9	4	47532

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

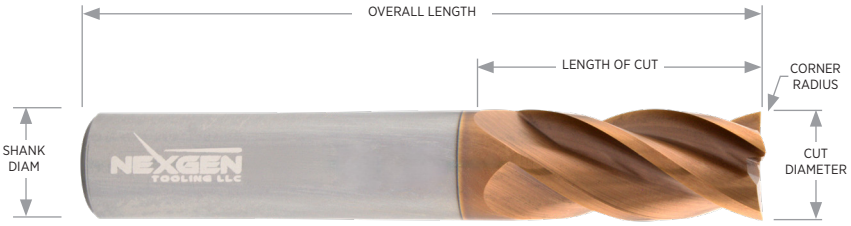
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**		*	*	

4-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 4-flute carbide end mills ideal for Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

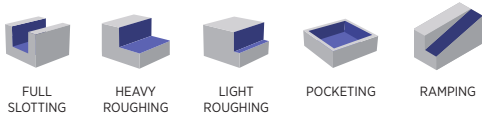
With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



T-ProMAX

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Standard
- Micrograin Carbide
- Speed/Feed: p.95



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	4	43000	43001	43002	43003	43004						
		1/2	2	4	43005	43006	43007	43008	43009						
		3/4	2-1/2	4	43010	43011	43012	43013	43014						
3/16	3/16	5/16	2	4	43015	43016	43017	43018	43019						
		9/16	2-1/2	4	43020	43021	43022	43023	43024						
		3/4	2-1/2	4	43025	43026	43027	43028	43029						
1/4	1/4	3/8	2	4	43030	43031	43032	43033	43034	43035					
		1/2	2-1/2	4	43036	43037	43038	43039	43040	43041					
		3/4	2-1/2	4	43042	43043	43044	43045	43046	43047					
		1	3	4	43048	43049	43050	43051	43052	43053					
		1-1/4	3	4	43054	43055	43056	43057	43058	43059					
5/16	5/16	7/16	2	4	43060	43061	43062	43063	43064	43065					
		13/16	2-1/2	4	43066	43067	43068	43069	43070	43071					
3/8	3/8	1/2	2	4	43072	43073	43074	43075	43076	43077	43078	43079	43080		
		3/4	2-1/2	4	43081	43082	43083	43084	43085	43086	43087	43088	43089		
		1	3	4	43090	43091	43092	43093	43094	43095	43096	43097	43098		
		1-1/4	3	4	43099	43100	43101	43102	43103	43104	43105	43106	43107		
		1-1/2	3-1/2	4	43108	43109	43110	43111	43112	43113	43114	43115	43116		
1/2	1/2	5/8	2-1/2	4	43117	43118	43119	43120	43121	43122	43123	43124	43125		
		1	3	4	43126	43127	43128	43129	43130	43131	43132	43133	43134		
		1-1/4	3	4	43135	43136	43137	43138	43139	43140	43141	43142	43143		
		1-5/8	4	4	43144	43145	43146	43147	43148	43149	43150	43151	43152		
		2	4	4	43153	43154	43155	43156	43157	43158	43159	43160	43161		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
5/8	5/8	3/4	3	4	43162	43163	43164	43165	43166	43167	43168	43169	43170		
		1	3	4	43171	43172	43173	43174	43175	43176	43177	43178	43179		
		1-1/4	3-1/2	4	43180	43181	43182	43183	43184	43185	43186	43187	43188		
		1-5/8	3-1/2	4	43189	43190	43191	43192	43193	43194	43195	43196	43197		
		2-1/8	4	4	43198	43199	43200	43201	43202	43203	43204	43205	43206		
		2-1/2	5	4	43207	43208	43209	43210	43211	43212	43213	43214	43215		
3/4	3/4	1	3	4	43216	43217	43218	43219	43220	43221	43222	43223	43224	43225	43226
		1-5/8	4	4	43227	43228	43229	43230	43231	43232	43233	43234	43235	43236	43237
		2-1/4	5	4	43238	43239	43240	43241	43242	43243	43244	43245	43246	43247	43248
		2-3/4	5	4	43249	43250	43251	43252	43253	43254	43255	43256	43257	43258	43259
		3-1/4	6	4	43260	43261	43262	43263	43264	43265	43266	43267	43268	43269	43270
1	1	1-1/4	4-1/2	4	43271	43272	43273	43274	43275	43276	43277	43278	43279	43280	43281
		2	4-1/2	4	43282	43283	43284	43285	43286	43287	43288	43289	43290	43291	43292
		2-5/8	5	4	43293	43294	43295	43296	43297	43298	43299	43300	43301	43302	43303
		3-1/4	6	4	43304	43305	43306	43307	43308	43309	43310	43311	43312	43313	43314
		4-1/4	7	4	43315	43316	43317	43318	43319	43320	43321	43322	43323	43324	43325

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

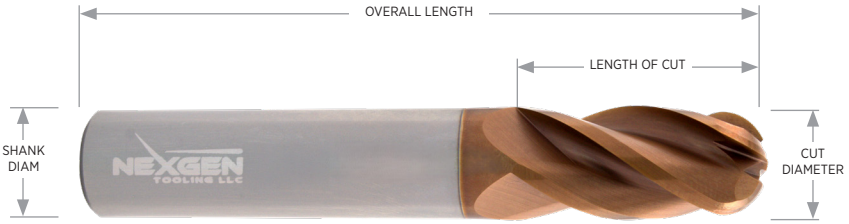
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

4-Flute | Ball | Carbide End Mill

Premium high performance 4-flute carbide end mills ideal for Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

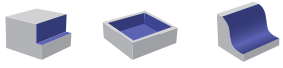
With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



T-ProMAX

- 35 Degree Helix
- 4-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.95



LIGHT ROUGHING | POCKETING | CONTOURING

STOCK CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	BALL
1/8	1/8	1/4	1-1/2	4	44000
		1/2	2	4	44001
		3/4	2-1/2	4	44002
3/16	3/16	5/16	2	4	44003
		9/16	2-1/2	4	44004
		3/4	2-1/2	4	44005
1/4	1/4	3/8	2	4	44006
		1/2	2-1/2	4	44007
		3/4	2-1/2	4	44008
		1	3	4	44009
		1-1/4	3	4	44010
5/16	5/16	7/16	2	4	44011
		13/16	2-1/2	4	44012
3/8	3/8	1/2	2	4	44013
		3/4	2-1/2	4	44014
		1	3	4	44015
		1.25	3	4	44016
		1-1/2	3-1/2	4	44017
1/2	1/2	5/8	2-1/2	4	44018
		1	3	4	44019
		1-1/4	3	4	44020
		1-5/8	4	4	44021
		2	4	4	44022

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	BALL
5/8	5/8	3/4	3	4	44023
		1	3	4	44024
		1-1/4	3-1/2	4	44025
		1-5/8	3-1/2	4	44026
		2-1/8	4	4	44027
		2-1/2	5	4	44028
3/4	3/4	1	3	4	44029
		1-5/8	4	4	44030
		2-1/4	5	4	44031
		2-3/4	5	4	44032
		3-1/4	6	4	44033
1	1	1-1/4	4-1/2	4	44034
		2	4-1/2	4	44035
		2-5/8	5	4	44036
		3-1/4	6	4	44037
		4-1/4	7	4	44038

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

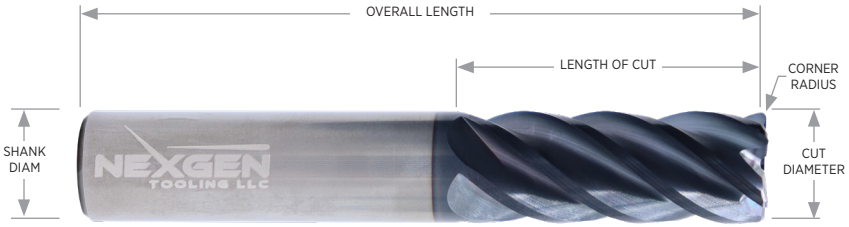
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

5-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 5-flute carbide end mills for Ferrous materials.

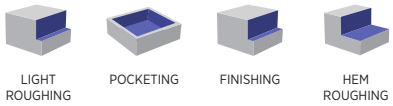
With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



A-ProMAX

- 40 Degree Helix
- 5-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.96



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	5	50025	50001	50026	50280	50027						
		1/2	2	5	50028	50002	50029	50281	50030						
		3/4	2-1/2	5	50031	50032	50033	50282	50034						
3/16	3/16	5/16	2	5	50035	50279	50036	50283	50037						
		5/16	2-1/2	5		50003									
		9/16	2-1/2	5	50038	50004	50039	50284	50040						
		3/4	2-1/2	5	50041	50042	50043	50285	50044						
1/4	1/4	3/8	2	5	50045	50046	50047	50278	50048	50049					
		3/8	2-1/2	5				50005							
		1/2	2-1/2	5	50050	50051	50052	50053	50054	50055					
		3/4	2-1/2	5	50056	50057	50058	50006	50059	50060					
		1	3	5	50061	50062	50063	50007	50064	50065					
		1-1/4	3	5	50066	50067	50068	50069	50070	50071					
5/16	5/16	7/16	2	5	50072	50073	50074	50008	50075	50076					
		13/16	2-1/2	5	50077	50078	50079	50009	50080	50081					
3/8	3/8	1/2	2	5	50082	50083	50084	50010	50085	50086	50087	50088	50089		
		3/4	2-1/2	5	50316	50317	50318	50319	50320	50321	50322	50323	50324		
		1	3	5	50090	50091	50092	50011	50093	50094	50095	50096	50097		
		1-1/4	3	5	50098	50099	50100	50101	50102	50103	50104	50105	50106		
		1-1/2	3-1/2	5	50107	50108	50109	50110	50111	50112	50113	50114	50115		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/2	1/2	5/8	2-1/2	5	50116	50117	50118	50119	50012	50024	50120	50121	50122		
		1	3	5	50123	50124	50125	50126	50013	50127	50128	50129	50130		
		1-1/4	3	5	50131	50132	50133	50134	50014	50135	50136	50137	50138		
		1-5/8	4	5	50139	50140	50141	50142	50015	50143	50144	50145	50146		
		2	4	5	50147	50148	50149	50150	50151	50152	50153	50154	50155		
5/8	5/8	3/4	3	5	50156	50286	50287	50288	50016	50157	50158	50159	50160		
		1-1/4	3-1/2	5	50161	50289	50290	50291	50017	50162	50163	50164	50165		
		1-5/8	3-1/2	5	50166	50292	50293	50294	50018	50167	50168	50169	50170		
		2-1/8	4	5	50171	50295	50296	50297	50172	50173	50174	50175	50176		
		2-1/2	5	5	50177	50298	50299	50300	50178	50179	50180	50181	50182		
3/4	3/4	1	3	5	50183	50184	50185	50186	50019	50187	50188	50189	50190	50191	50192
		1-1/2	4	5	50274				50020						
		1-5/8	4	5	50193	50194	50195	50196	50021	50197	50198	50199	50200	50201	50202
		2-1/4	5	5	50203	50204	50205	50206	50207	50208	50209	50210	50211	50212	50213
		2-3/4	5	5	50214	50215	50216	50217	50218	50219	50220	50221	50222	50223	50224
		3-1/4	6	5	50225	50226	50227	50228	50229	50230	50231	50232	50233	50234	50235
1	1	1-1/4	4-1/2	5	50236	50301	50302	50303	50022	50237	50238	50239	50240	50241	50242
		2	4-1/2	5	50243	50304	50305	50306	50023	50244	50245	50246	50247	50248	50249
		2-5/8	5	5	50250	50307	50308	50309	50251	50252	50253	50254	50255	50256	50257
		3-1/4	6	5	50258	50310	50311	50312	50259	50260	50261	50262	50263	50264	50265
		4-1/4	7	5	50266	50313	50314	50315	50267	50268	50269	50270	50271	50272	50273

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

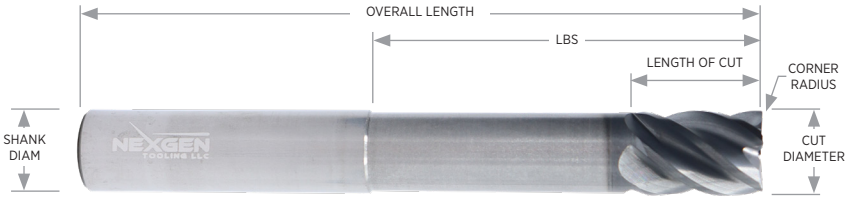
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

5-Flute | Square & Corner Radius | Reduced Neck | Carbide End Mill

Premium high performance 5-flute carbide end mills for Ferrous materials.

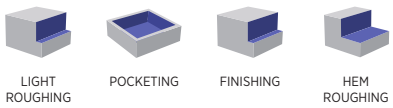
With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



A-ProMAX

- 40 Degree Helix
- 5-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Reduced Neck
- Micrograin Carbide
- Speed/Feed: p.96



STOCK CHECK

Tool Dimensions							End Construction								
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.120	R.190	R.250
1/8	1/8	5/32	1/2	0.118	2-1/2	5	57000	57001	57002	57003					
			3/4	0.118	3	5	57004	57005	57006	57007					
			1	0.118	3	5	57008	57009	57010	57011					
3/16	3/16	7/32	1/2	0.178	2-1/2	5	57012	57013	57014	57015					
			3/4	0.178	3	5	57016	57017	57018	57019					
			1	0.178	3	5	57020	57021	57022	57023					
1/4	1/4	3/8	3/4	0.237	3	5	57024	57025	57026	57027	57028				
			1-1/8	0.237	3	5	57029	57030	57031	57032	57033				
			1-5/8	0.237	3	5	57034	57035	57036	57037	57038				
			2-1/8	0.237	4	5	57039	57040	57041	57042	57043				
			2-1/2	0.237	4	5	57044	57045	57046	57047	57048				
5/16	5/16	7/16	1-1/8	0.297	4	5	57049	57050	57051	57052	57053				
			1-3/4	0.297	4	5	57054	57055	57056	57057	57058				
			2-1/8	0.297	4	5	57059	57060	57061	57062	57063				
3/8	3/8	1/2	1-1/8	0.356	3	5	57064	57065	57066	57067	57068	57069			
			1-5/8	0.356	3	5	57070	57071	57072	57073	57074	57075			
			2-1/8	0.356	4	5	57076	57077	57078	57079	57080	57081			
			2-1/2	0.356	5	5	57082	57083	57084	57085	57086	57087			
			3-1/8	0.356	6	5	57088	57089	57090	57091	57092	57093			
1/2	1/2	5/8	1-3/8	0.475	3	5	57094	57095	57096	57097	57098	57099	57100		
			2-1/4	0.475	4	5	57101	57102	57103	57104	57105	57106	57107		
			3-3/8	0.475	5	5	57108	57109	57110	57111	57112	57113	57114		
			3-3/4	0.475	6	5	57115	57116	57117	57118	57119	57120	57121		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

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Tool Dimensions							End Construction								
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	SQUARE	R.010	R.015	R.030	R.060	R.090	R.120	R.190	R.250
5/8	5/8	3/4	2-3/8	0.593	4	5	57122	57123	57124	57125	57126	57127	57128		
			3-3/8	0.593	6	5	57129	57130	57131	57132	57133	57134	57135		
3/4	3/4	1	2	0.712	4	5	57136	57137	57138	57139	57140	57141	57142	57143	57144
			2-1/2	0.712	5	5	57145	57146	57147	57148	57149	57150	57151	57152	57153
			3-3/8	0.712	6	5	57154	57155	57156	57157	57158	57159	57160	57161	57162
			4-1/8	0.712	7	5	57163	57164	57165	57166	57167	57168	57169	57170	57171
1	1	1-1/4	2-5/8	0.950	5	5	57172	57173	57174	57175	57176	57177	57178	57179	57180
			3-3/8	0.950	6	5	57181	57182	57183	57184	57185	57186	57187	57188	57189
			4-3/8	0.950	7	5	57190	57191	57192	57193	57194	57195	57196	57197	57198
			6	0.950	9	5	57199	57200	57201	57202	57203	57204	57205	57206	57207

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

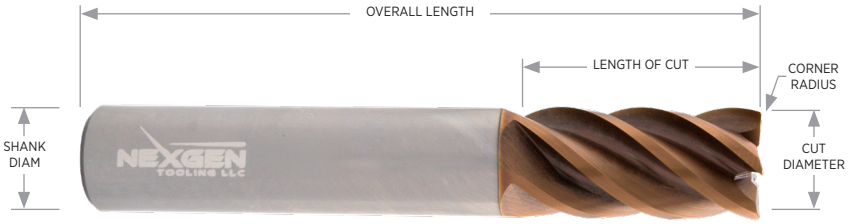
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

5-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 5-flute carbide end mills ideal for Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

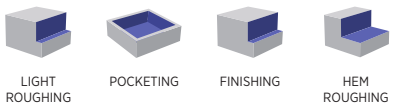
With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



T-ProMAX

- 40 Degree Helix
- 5-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.96



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/8	1/8	1/4	1-1/2	5	53000	53001	53002	53003	53004						
		1/2	2	5	53005	53006	53007	53008	53009						
		3/4	2-1/2	5	53010	53011	53012	53013	53014						
3/16	3/16	5/16	2	5	53015	53016	53017	53018	53019						
		9/16	2-1/2	5	53020	53021	53022	53023	53024						
		3/4	2-1/2	5	53025	53026	53027	53028	53029						
1/4	1/4	3/8	2	5	53030	53031	53032	53033	53034	53035					
		1/2	2-1/2	5	53036	53037	53038	53039	53040	53041					
		3/4	2-1/2	5	53042	53043	53044	53045	53046	53047					
		1	3	5	53048	53049	53050	53051	53052	53053					
		1-1/4	3	5	53054	53055	53056	53057	53058	53059					
5/16	5/16	7/16	2	5	53060	53061	53062	53063	53064	53065					
		13/16	2-1/2	5	53066	53067	53068	53069	53070	53071					
3/8	3/8	1/2	2	5	53072	53073	53074	53075	53076	53077	53078	53079	53080		
		3/4	2-1/2	5	53081	53082	53083	53084	53085	53086	53087	53088	53089		
		1	3	5	53090	53091	53092	53093	53094	53095	53096	53097	53098		
		1-1/4	3	5	53099	53100	53101	53102	53103	53104	53105	53106	53107		
		1-1/2	3-1/2	5	53108	53109	53110	53111	53112	53113	53114	53115	53116		
1/2	1/2	5/8	2-1/2	5	53117	53118	53119	53120	53121	53122	53123	53124	53125		
		1	3	5	53126	53127	53128	53129	53130	53131	53132	53133	53134		
		1-1/4	3	5	53135	53136	53137	53138	53139	53140	53141	53142	53143		
		1-5/8	4	5	53144	53145	53146	53147	53148	53149	53150	53151	53152		
		2	4	5	53153	53154	53155	53156	53157	53158	53159	53160	53161		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
5/8	5/8	3/4	3	5	53162	53163	53164	53165	53166	53167	53168	53169	53170		
		1-1/4	3-1/2	5	53171	53172	53173	53174	53175	53176	53177	53178	53179		
		1-5/8	3-1/2	5	53180	53181	53182	53183	53184	53185	53186	53187	53188		
		2-1/8	4	5	53189	53190	53191	53192	53193	53194	53195	53196	53197		
		2-1/2	5	5	53198	53199	53200	53201	53202	53203	53204	53205	53206		
3/4	3/4	1	3	5	53207	53208	53209	53210	53211	53212	53213	53214	53215	53216	53217
		1-5/8	4	5	53218	53219	53220	53221	53222	53223	53224	53225	53226	53227	53228
		2-1/4	5	5	53229	53230	53231	53232	53233	53234	53235	53236	53237	53238	53239
		2-3/4	5	5	53240	53241	53242	53243	53244	53245	53246	53247	53248	53249	53250
		3-1/4	6	5	53251	53252	53253	53254	53255	53256	53257	53258	53259	53260	53261
1	1	1-1/4	4-1/2	5	53262	53263	53264	53265	53266	53267	53268	53269	53270	53271	53272
		2	4-1/2	5	53273	53274	53275	53276	53277	53278	53279	53280	53281	53282	53283
		2-5/8	5	5	53284	53285	53286	53287	53288	53289	53290	53291	53292	53293	53294
		3-1/4	6	5	53295	53296	53297	53298	53299	53300	53301	53302	53303	53304	53305
		4-1/4	7	5	53306	53307	53308	53309	53310	53311	53312	53313	53314	53315	53316

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

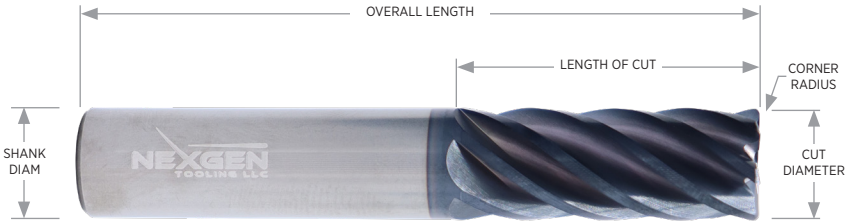
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

6-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 6-flute carbide end mills for Ferrous materials.

With a hardness of 3,500 Hv and an oxidation temperature >1600 degries F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



A-ProMAX

- 37 Degree Helix
- 6-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.97

STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	6	60003	60004	60005	60006	60007	60008					
		1/2	2-1/2	6	60009	60010	60011	60012	60013	60014					
		3/4	2-1/2	6	60015	60016	60017	60018	60019	60020					
		1	3	6	60021	60022	60023	60024	60025	60026					
		1-1/4	3	6	60027	60028	60029	60030	60031	60032					
3/8	3/8	1/2	2	6	60033	60034	60035	60036	60037	60038	60039	60040	60041		
		3/4	2-1/2	6	60042	60043	60044	60045	60046	60047	60048	60002	60049		
		1	3	6	60050	60051	60052	60053	60054	60055	60056	60057	60058		
		1-1/4	3	6	60059	60060	60061	60062	60063	60064	60065	60066	60067		
		1-1/2	3-1/2	6	60068	60069	60070	60071	60072	60073	60074	60075	60076		
1/2	1/2	5/8	2-1/2	6	60077	60078	60079	60080	60081	60082	60083	60084	60085		
		1	3	6	60086	60087	60088	60089	60090	60091	60092	60093	60094		
		1-1/4	3	6	60095	60096	60097	60098	60000	60099	60100	60101	60102		
		1-5/8	4	6	60103	60104	60105	60106	60107	60108	60109	60110	60111		
		2	4	6	60112	60113	60114	60115	60116	60117	60118	60119	60120		
5/8	5/8	3/4	3	6	60121	60122	60123	60124	60125	60126	60127	60128	60129		
		1-1/4	3-1/2	6	60130	60131	60132	60133	60134	60135	60136	60137	60138		
		1-5/8	3-1/2	6	60139	60140	60141	60142	60143	60144	60145	60146	60147		
		2-1/8	4	6	60148	60149	60150	60151	60152	60153	60154	60155	60156		
		2-1/2	5	6	60157	60158	60159	60160	60161	60162	60163	60164	60165		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
3/4	3/4	1	3	6	60166	60167	60168	60169	60170	60171	60172	60173	60174	60175	60176
		1-5/8	4	6	60177	60178	60179	60180	60001	60181	60182	60183	60184	60185	60186
		2-1/4	5	6	60187	60188	60189	60190	60191	60192	60193	60194	60195	60196	60197
		2-3/4	5	6	60198	60199	60200	60201	60202	60203	60204	60205	60206	60207	60208
		3-1/4	6	6	60209	60210	60211	60212	60213	60214	60215	60216	60217	60218	60219
1.0	1.0	1-1/4	4-1/2	6	60220	60221	60222	60223	60224	60225	60226	60227	60228	60229	60230
		2	4-1/2	6	60231	60232	60233	60234	60235	60236	60237	60238	60239	60240	60241
		2-5/8	5	6	60242	60243	60244	60245	60246	60247	60248	60249	60250	60251	60252
		3-1/4	6	6	60253	60254	60255	60256	60257	60258	60259	60260	60261	60262	60263
		4-1/4	7	6	60264	60265	60266	60267	60268	60269	60270	60271	60272	60273	60274

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

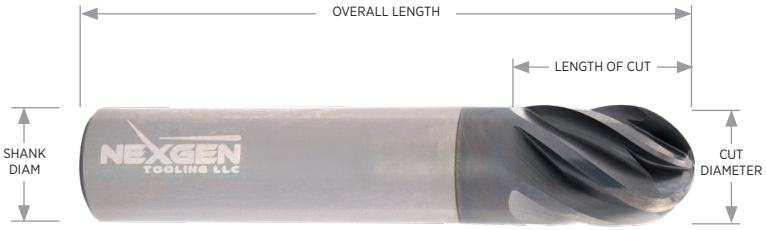
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

6-Flute | Ball | Carbide End Mill

Premium high performance 6-flute carbide end mills for Ferrous materials.

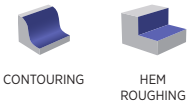
With a hardness of 3,500 Hv and an oxidation temperature >1600 degries F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



A-ProMAX

- 37 Degree Helix
- 6-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.97



STOCK CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
1/4	1/4	3/8	2	6	62000
		1/2	2-1/2	6	62001
		3/4	2-1/2	6	62002
		1	3	6	62003
		1-1/4	3	6	62004
3/8	3/8	1/2	2	6	62005
		3/4	2-1/2	6	62006
		1	3	6	62007
		1-1/4	3	6	62008
		1-1/2	3-1/2	6	62009
1/2	1/2	5/8	2-1/2	6	62010
		1	3	6	62011
		1-1/4	3	6	62012
		1-5/8	4	6	62013
		2	4	6	62014
5/8	5/8	3/4	3	6	62015
		1-1/4	3-1/2	6	62016
		1-5/8	3-1/2	6	62017
		2-1/8	4	6	62018
		2-1/2	5	6	62019

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	Ball
3/4	3/4	1	3	6	62020
		1-5/8	4	6	62021
		2-1/4	5	6	62022
		2-3/4	5	6	62023
		3-1/4	6	6	62024
1.0	1.0	1-1/4	4-1/2	6	62025
		2	4-1/2	6	62026
		2-5/8	5	6	62027
		3-1/4	6	6	62028
		4-1/4	7	6	62029

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	RT
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .001

Materials

* Good ** Best

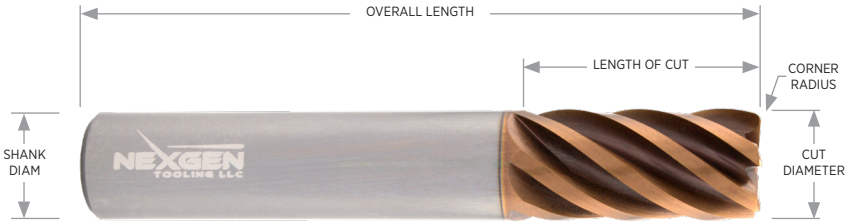
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

6-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 6-flute carbide end mills ideal for Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

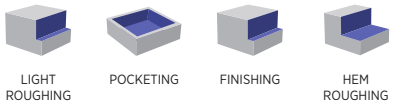
With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



T-ProMAX

- 37 Degree Helix
- 6-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.97



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	6	63000	63001	63002	63003	63004	63005					
		1/2	2-1/2	6	63006	63007	63008	63009	63010	63011					
		3/4	2-1/2	6	63012	63013	63014	63015	63016	63017					
		1	3	6	63018	63019	63020	63021	63022	63023					
		1-1/4	3	6	63024	63025	63026	63027	63028	63029					
3/8	3/8	1/2	2	6	63030	63031	63032	63033	63034	63035	63036	63037	63038		
		3/4	2-1/2	6	63039	63040	63041	63042	63043	63044	63045	63046	63047		
		1	3	6	63048	63049	63050	63051	63052	63053	63054	63055	63056		
		1-1/4	3	6	63057	63058	63059	63060	63061	63062	63063	63064	63065		
		1-1/2	3-1/2	6	63066	63067	63068	63069	63070	63071	63072	63073	63074		
1/2	1/2	5/8	2-1/2	6	63075	63076	63077	63078	63079	63080	63081	63082	63083		
		1	3	6	63084	63085	63086	63087	63088	63089	63090	63091	63092		
		1-1/4	3	6	63093	63094	63095	63096	63097	63098	63099	63100	63101		
		1-5/8	4	6	63102	63103	63104	63105	63106	63107	63108	63109	63110		
		2	4	6	63111	63112	63113	63114	63115	63116	63117	63118	63119		
5/8	5/8	3/4	3	6	63120	63121	63122	63123	63124	63125	63126	63127	63128		
		1-1/4	3-1/2	6	63129	63130	63131	63132	63133	63134	63135	63136	63137		
		1-5/8	3-1/2	6	63138	63139	63140	63141	63142	63143	63144	63145	63146		
		2-1/8	4	6	63147	63148	63149	63150	63151	63152	63153	63154	63155		
		2-1/2	5	6	63156	63157	63158	63159	63160	63161	63162	63163	63164		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
3/4	3/4	1	3	6	63165	63166	63167	63168	63169	63170	63171	63172	63173	63174	63175
		1-5/8	4	6	63176	63177	63178	63179	63180	63181	63182	63183	63184	63185	63186
		2-1/4	5	6	63187	63188	63189	63190	63191	63192	63193	63194	63195	63196	63197
		2-3/4	5	6	63198	63199	63200	63201	63202	63203	63204	63205	63206	63207	63208
		3-1/4	6	6	63209	63210	63211	63212	63213	63214	63215	63216	63217	63218	63219
1	1	1-1/4	4-1/2	6	63220	63221	63222	63223	63224	63225	63226	63227	63228	63229	63230
		2	4-1/2	6	63231	63232	63233	63234	63235	63236	63237	63238	63239	63240	63241
		2-5/8	5	6	63242	63243	63244	63245	63246	63247	63248	63249	63250	63251	63252
		3-1/4	6	6	63253	63254	63255	63256	63257	63258	63259	63260	63261	63262	63263
		4-1/4	7	6	63264	63265	63266	63267	63268	63269	63270	63271	63272	63273	63274

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

6-Flute | Ball | Carbide End Mill

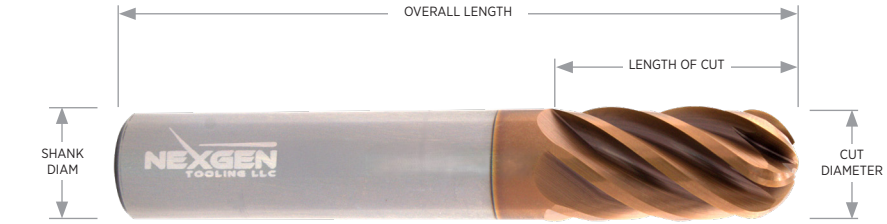
Premium high performance 6-flute carbide end mills ideal for Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.

T-ProMAX

- 37 Degree Helix
- 6-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.97



STOCK CHECK

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	BALL
1/4	1/4	3/8	2	6	64000
		1/2	2-1/2	6	64001
		3/4	2-1/2	6	64002
		1	3	6	64003
		1-1/4	3	6	64004
3/8	3/8	1/2	2	6	64005
		3/4	2-1/2	6	64006
		1	3	6	64007
		1-1/4	3	6	64008
		1-1/2	3-1/2	6	64009
1/2	1/2	5/8	2-1/2	6	64010
		1	3	6	64011
		1-1/4	3	6	64012
		1-5/8	4	6	64013
		2	4	6	64014
5/8	5/8	3/4	3	6	64015
		1-1/4	3-1/2	6	64016
		1-5/8	3-1/2	6	64017
		2-1/8	4	6	64018
		2-1/2	5	6	64019

continued on next page →

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

continued from previous page

Tool Dimensions					End Construction
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	BALL
3/4	3/4	1	3	6	64020
		1-5/8	4	6	64021
		2-1/4	5	6	64022
		2-3/4	5	6	64023
		3-1/4	6	6	64024
1	1	1-1/4	4-1/2	6	64025
		2	4-1/2	6	64026
		2-5/8	5	6	64027
		3-1/4	6	6	64028
		4-1/4	7	6	64029

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

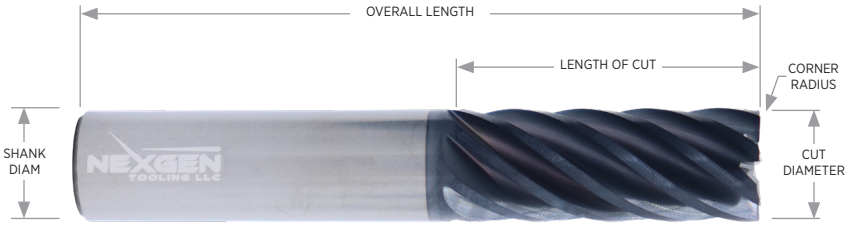
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

7-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 7-flute carbide end mills for Ferrous materials.

With a hardness of 3,500 Hv and an oxidation temperature >1600 degrees F, A-ProMAX coating the ideal tool coating for ferrous steel applications.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



A-ProMAX

- 37 Degree Helix
- 7-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.98

STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	7	70010	70011	70012	70013	70014	70015					
		1/2	2-1/2	7	70016	70017	70018	70019	70020	70021					
		3/4	2-1/2	7	70022	70023	70024	70025	70026	70027					
		1	3	7	70028	70029	70030	70031	70032	70033					
		1-1/4	3	7	70034	70035	70036	70037	70038	70039					
3/8	3/8	1/2	2	7	70040	70041	70042	70043	70044	70045					
		3/4	2-1/2	7	70255	70256	70257	70258	70259	70260					
		1	3	7	70046	70047	70048	70049	70050	70051					
		1-1/4	3	7	70052	70053	70054	70055	70056	70057					
		1-1/2	3-1/2	7	70058	70059	70060	70061	70062	70063					
1/2	1/2	5/8	2-1/2	7	70064	70065	70066	70067	70001	70068	70069	70206	70207		
		1	3	7	70070	70071	70072	70073	70074	70075	70076	70208	70209		
		1-1/4	3	7	70077	70078	70079	70080	70002	70009	70081	70204	70205		
		1-5/8	4	7	70082	70083	70084	70085	70086	70087	70088	70210	70211		
		2	4	7	70089	70090	70091	70092	70003	70093	70094	70212	70213		
5/8	5/8	3/4	3	7	70095	70214	70215	70216	70096	70097	70098	70217	70218		
		1-1/4	3-1/2	7	70099	70219	70220	70221	70100	70101	70102	70222	70223		
		1-5/8	3-1/2	7	70103	70224	70225	70226	70104	70105	70106	70227	70228		
		2-1/8	4	7	70107	70229	70230	70231	70108	70109	70110	70232	70233		
		2-1/2	5	7	70111	70234	70235	70236	70112	70113	70114	70237	70238		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

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Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
3/4	3/4	1	3	7	70115	70116	70117	70118	70254	70119	70120	70121	70122		
		1	4	7					70004						
		1-5/8	4	7	70123	70133	70134	70135	70005	70136	70137	70138	70139		
		2-1/4	5	7	70140	70141	70142	70143	70144	70145	70146	70147	70148		
		2-3/4	5	7	70149	70150	70151	70152	70153	70154	70155	70156	70157		
		3-1/4	6	7	70158	70159	70160	70161	70162	70163	70164	70165	70166		
1	1	1-1/4	4-1/2	7	70167	70239	70240	70241	70006	70168	70169	70170	70171	70172	70173
		2	4-1/2	7	70174	70242	70243	70244	70007	70175	70176	70177	70178	70179	70180
		2-5/8	5	7	70181	70245	70246	70247	70182	70183	70184	70185	70186	70187	70188
		3-1/4	6	7	70189	70248	70249	70250	70190	70191	70192	70193	70194	70195	70196
		4-1/4	7	7	70197	70251	70252	70253	70008	70198	70199	70200	70201	70202	70203

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

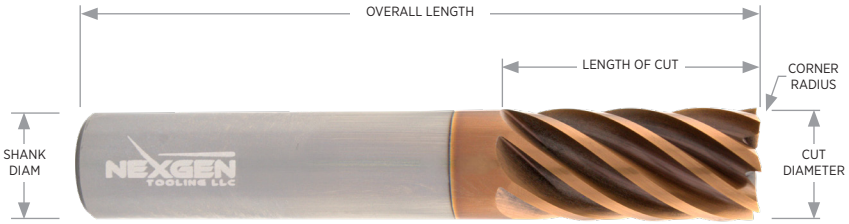
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		**	**	**	*	**	*	**	**	*

7-Flute | Square & Corner Radius | Carbide End Mill

Premium high performance 7-flute carbide end mills ideal for Heat Resistant Super Alloys, Stainless Steels and Hardened Steels.

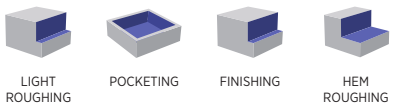
With a hardness of 4,000 Hv and an oxidation temperature >2000 degrees F, T-ProMAX coating is ideal in Stainless Steels, Titanium, and High Temp Alloys.

Variable index design reduced harmonic vibrations, enabling higher metal removal rates via faster speeds and increased depth of cut.



T-ProMAX

- 37 Degree Helix
- 7-Flute
- Center Cutting
- Variable Pitch
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.98



STOCK CHECK

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
1/4	1/4	3/8	2	7	73000	73001	73002	73003	73004	73005					
		1/2	2-1/2	7	73006	73007	73008	73009	73010	73011					
		3/4	2-1/2	7	73012	73013	73014	73015	73016	73017					
		1	3	7	73018	73019	73020	73021	73022	73023					
		1-1/4	3	7	73024	73025	73026	73027	73028	73029					
3/8	3/8	1/2	2	7	73030	73031	73032	73033	73034	73035					
		3/4	2-1/2	7	73036	73037	73038	73039	73040	73041					
		1	3	7	73042	73043	73044	73045	73046	73047					
		1-1/4	3	7	73048	73049	73050	73051	73052	73053					
		1-1/2	3-1/2	7	73054	73055	73056	73057	73058	73059					
1/2	1/2	5/8	2-1/2	7	73060	73061	73062	73063	73064	73065	73066	73067	73068		
		1	3	7	73069	73070	73071	73072	73073	73074	73075	73076	73077		
		1-1/4	3	7	73078	73079	73080	73081	73082	73083	73084	73085	73086		
		1-5/8	4	7	73087	73088	73089	73090	73091	73092	73093	73094	73095		
		2	4	7	73096	73097	73098	73099	73100	73101	73102	73103	73104		
5/8	5/8	3/4	3	7	73105	73106	73107	73108	73109	73110	73111	73112	73113		
		1-1/4	3-1/2	7	73114	73115	73116	73117	73118	73119	73120	73121	73122		
		1-5/8	3-1/2	7	73123	73124	73125	73126	73127	73128	73129	73130	73131		
		2-1/8	4	7	73132	73133	73134	73135	73136	73137	73138	73139	73140		
		2-1/2	5	7	73141	73142	73143	73144	73145	73146	73147	73148	73149		

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Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

continued from previous page

Tool Dimensions					End Construction										
CUT Ø	SHANK Ø	LOC	OAL	FLUTES	SQUARE	R.010	0.015	R.020	R.030	R.060	R.090	R.120	R.125	R.190	R.250
3/4	3/4	1	3	7	73150	73151	73152	73153	73154	73155	73156	73157	73158		
		1-5/8	4	7	73159	73160	73161	73162	73163	73164	73165	73166	73167		
		2-1/4	5	7	73168	73169	73170	73171	73172	73173	73174	73175	73176		
		2-3/4	5	7	73177	73178	73179	73180	73181	73182	73183	73184	73185		
		3-1/4	6	7	73186	73187	73188	73189	73190	73191	73192	73193	73194		
1	1	1-1/4	4-1/2	7	73195	73196	73197	73198	73199	73200	73201	73202	73203	73204	73205
		2	4-1/2	7	73206	73207	73208	73209	73210	73211	73212	73213	73214	73215	73216
		2-5/8	5	7	73217	73218	73219	73220	73221	73222	73223	73224	73225	73226	73227
		3-1/4	6	7	73228	73229	73230	73231	73232	73233	73234	73235	73236	73237	73238
		4-1/4	7	7	73239	73240	73241	73242	73243	73244	73245	73246	73247	73248	73249

Tolerances

CUT Ø	SHANK Ø	LOC	OAL	CR
+.000/-.002	h6	+.032/-.000	+/- .050	+/- .002

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
		*	*	*	**	*	**	**	**	**

CHAMFER TOOLS

CHM-2

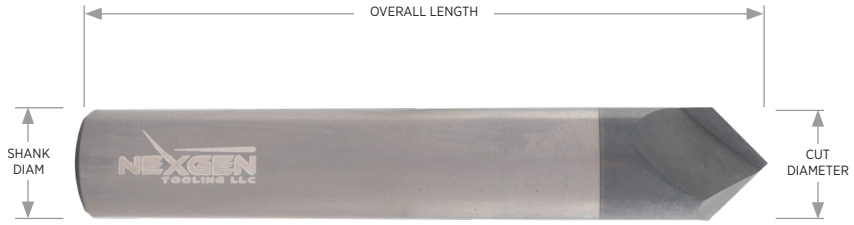
2-Flute | Straight | 60-120 deg. | Chamfer Mill

Premium high performance carbide chamfer mills for use in ferrous and non-ferrous alloys.

Ideal for chamfering, deburring, pocket chamfering and hole chamfering.

A-Z PROMAX

- 0 Degree Helix
- 2-Flute
- Center Cutting
- 60-120 Point Angles
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.99



STOCK CHECK

Tool Dimensions					Point Angle (Incl.) – Center Cutting			
CUT Ø	SHANK Ø	TIP DIA.	OAL	FLUTES	60°	90°	100°	120°
1/8	1/8	N/A	2	2	01000	01001	01002	01003
3/16	3/16	N/A	2	2	01004	01005	01006	01007
1/4	1/4	N/A	2-1/2	2	01008	01009	01010	01011
3/8	3/8	N/A	2-1/2	2	01012	01013	01014	01015
1/2	1/2	N/A	3	2	01016	01017	01018	01019

Tolerances

CUT Ø	SHANK Ø	LOC	OAL
+.000/-.002	h6	+.032/-.000	+/- .050

Materials

* Good ** Best

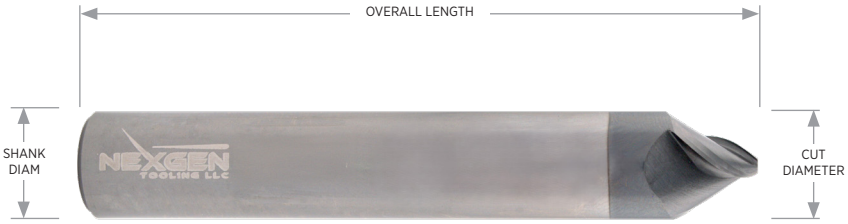
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**	**	**	**	*	**			*	

3-Flute | Helical | 60-120 deg. | Chamfer Mill

Premium high performance carbide chamfer mills for use in ferrous and non-ferrous alloys.

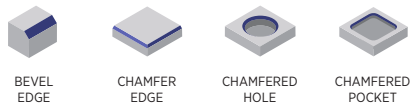
Ideal for chamfering, deburring, pocket chamfering and hole chamfering.

Helical design for freer cutting action in tougher materials.



A-PROMAX

- 35 Degree Helix
- 3-Flute
- Non-Center Cutting
- 60-120 Point Angles
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.99



STOCK CHECK

Tool Dimensions					Point Angle (Incl.) – Non-Center Cutting			
CUT Ø	SHANK Ø	TIP DIA.	OAL	FLUTES	60°	90°	100°	120°
1/8	1/8	0.040	2	3	01300	01301	01302	01303
3/16	3/16	0.050	2	3	01304	01305	01306	01307
1/4	1/4	0.060	2-1/2	3	01308	01309	01310	01311
3/8	3/8	0.070	2-1/2	3	01312	01313	01314	01315
1/2	1/2	0.080	3	3	01316	01317	01318	01319
3/4	3/4	0.100	3	3	01320	01321	01322	01323

Tolerances

CUT Ø	SHANK Ø	LOC	OAL
+.000/-.002	h6	+.032/-.000	+/- .050

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**	**	**	**	*	**		*	**	*

CHM-4

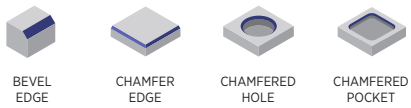
4-Flute | Straight | 60-120 deg. | Chamfer Mill

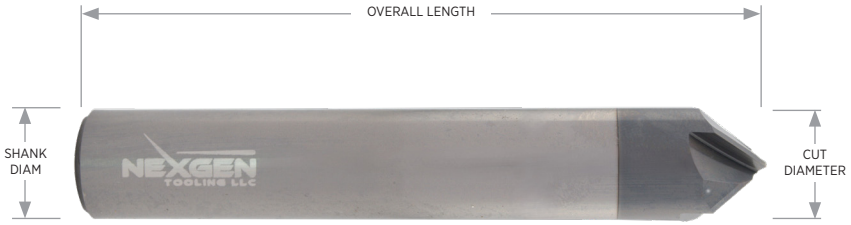
Premium high performance carbide chamfer mills for use in ferrous and non-ferrous alloys.

Ideal for chamfering, deburring, pocket chamfering and hole chamfering.

A-Z PROMAX

- 0 Degree Helix
- 4-Flute
- Center Cutting
- 60-120 Point Angles
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.99





STOCK CHECK

Tool Dimensions					Point Angle (Incl.) – Center Cutting			
CUT Ø	SHANK Ø	TIP DIA.	OAL	FLUTES	60°	90°	100°	120°
3/16	3/16	N/A	2	4	01020	01021	01022	01023
1/4	1/4	N/A	2-1/2	4	01024	01025	01026	01027
3/8	3/8	N/A	2-1/2	4	01028	01029	01030	01031
1/2	1/2	N/A	3	4	01032	01033	01034	01035
3/4	3/4	N/A	3	4	01036	01037	01038	01039

Tolerances

CUT Ø	SHANK Ø	LOC	OAL
+.000/-.002	h6	+.032/-.000	+/- .050

Materials

* Good ** Best

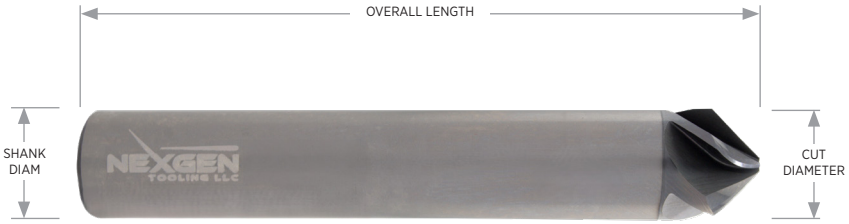
Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**	**	**	**	*	**			*	

5-Flute | Helical | 60-120 deg. | Chamfer Mill

Premium high performance carbide chamfer mills for use in ferrous and non-ferrous alloys.

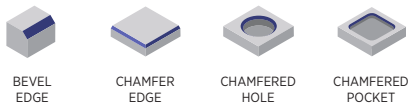
Ideal for chamfering, deburring, pocket chamfering and hole chamfering.

Helical design for freer cutting action in tougher materials.



PROMAX

- 35 Degree Helix
- 5-Flute
- Non-Center Cutting
- 60-120 Point Angles
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.99



STOCK CHECK

Tool Dimensions					Point Angle (Incl.) – Non-Center Cutting			
CUT Ø	SHANK Ø	TIP DIA.	OAL	FLUTES	60°	90°	100°	120°
1/4	1/4	0.060	2-1/2	5	01500	01501	01502	01503
3/8	3/8	0.070	2-1/2	5	01504	01505	01506	01507
1/2	1/2	0.080	3	5	01508	01509	01510	01511
3/4	3/4	0.100	3	5	01512	01513	01514	01515

Tolerances

CUT Ø	SHANK Ø	LOC	OAL
+.000/-.002	h6	+.032/-.000	+/- .050

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**	**	**	**	*	**		*	**	*

CHM-DA

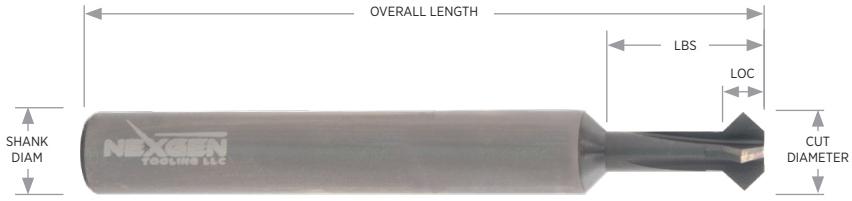
Multi-flute | Straight | Double Angle | Chamfer Mill

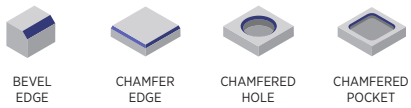
Premium high performance carbide double-angle chamfer mills for use in ferrous and non-ferrous alloys.

Ideal for chamfering, deburring, pocket chamfering and hole chamfering.

A-Z PROMAX

- 0 Degree Helix
- 4-6-Flute
- Double Angle
- 60-120 Point Angles
- h6 Shank
- Micrograin Carbide
- Speed/Feed: p.99





STOCK CHECK

Tool Dimensions							Point Angle (Incl.) – Non-Center Cutting
CUT Ø	SHANK Ø	LOC	LBS	NECK Ø	OAL	FLUTES	90°
1/8	1/8	1/16	0.25	0.062	1-1/2	4	10000
3/16	3/16	3/32	0.313	0.094	2	4	10001
1/4	1/4	1/8	0.438	0.125	2	4	10002
5/16	5/16	1/8	0.5	0.188	2-1/2	6	10003
3/8	3/8	1/8	0.625	0.250	2-1/2	6	10004
1/2	1/2	3/16	0.75	0.313	3	6	10005
5/8	5/8	1/4	1.25	0.375	3-1/2	6	10006
3/4	3/4	1/4	1.5	0.500	4	6	10007

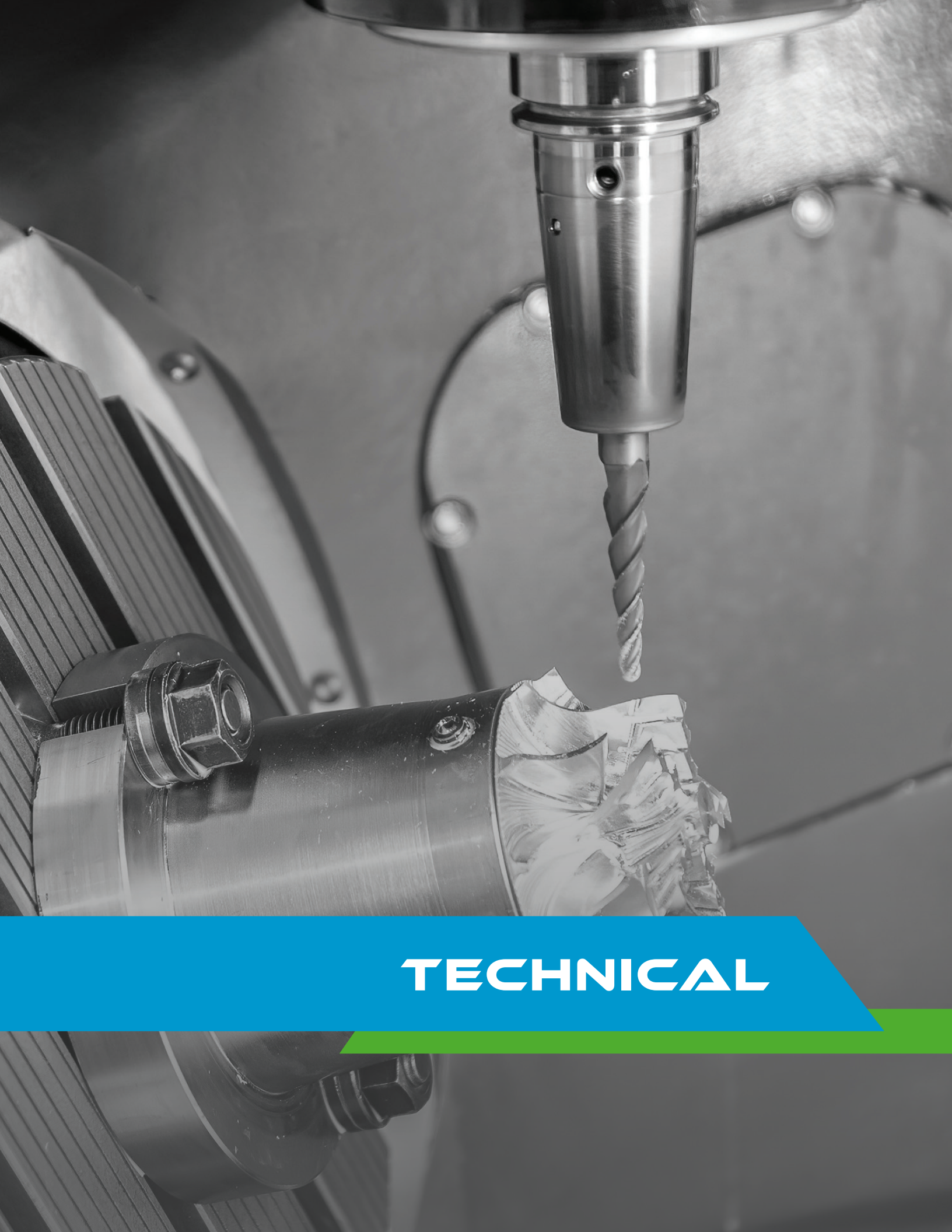
Tolerances

CUT Ø	SHANK Ø	LOC	OAL
+.000/-.002	h6	+.032/-.000	+/- .050

Materials

* Good ** Best

Non-Ferrous		Steel		Cast Iron	Stainless		HSRA		Hardened Steel	
Alloyed	Casting	Carbon	Alloyed	Grey, Ductile	300-400	PH	NI-Alloy	Titanium	<50 HRC	> 50 HRC
**	**	**	**	**	*	**	*	*	*	*



TECHNICAL

NXG-2 & NXG-3 Series End Mills - Speeds & Feeds

Square, Corner Radius, Ball, Corner Break Series

NXG-2

MATERIAL		SIDE MILLING		SLOTTING	SFM		IPT								
		ADOC	RDOC	ADOC	MIN	MAX	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
N	Casting	1.5 x D	0.5 x D	1.0 x D	750	1500	0.0018	0.0027	0.0035	0.0051	0.0062	0.0075	0.0085	0.0100	0.0150
	Wrought	1.5 x D	0.5 x D	1.0 x D	1000	2400	0.0021	0.0031	0.0040	0.0059	0.0071	0.0086	0.0098	0.0115	0.0173
	Copper, Brass	1.5 x D	0.5 x D	1.0 x D	250	1000	0.0010	0.0015	0.0020	0.0025	0.0030	0.0041	0.0051	0.0061	0.0081

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For slotting (B), reduce IPT by 20%
- With X-PROMAX coating, increase SFM 25%
- For tools >3D reach, reduce feed rate by 20-30%

NXG-3

MATERIAL		SIDE MILLING		SLOTTING	SFM		IPT								
		ADOC	RDOC	ADOC	MIN	MAX	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
N	Casting	1.5 x D	0.5 x D	0.5 x D	750	1500	0.0018	0.0027	0.0035	0.0051	0.0062	0.0075	0.0085	0.0100	0.0150
	Wrought	1.5 x D	0.5 x D	0.5 x D	1000	2400	0.0021	0.0031	0.0040	0.0059	0.0071	0.0086	0.0098	0.0115	0.0173
	Copper, Brass	1.5 x D	0.5 x D	0.5 x D	250	1000	0.0010	0.0015	0.0020	0.0025	0.0030	0.0041	0.0051	0.0061	0.0081

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For slotting (B), reduce IPT by 20%
- With X-PROMAX coating, increase SFM 25%
- For tools >3D reach, reduce feed rate by 20-30%

NXG-3-CB

MATERIAL		SIDE MILLING		SLOTTING	SFM		IPT								
		ADOC	RDOC	ADOC	MIN	MAX	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
N	Casting	1.5 x D	0.5 x D	0.6 x D	750	1500	0.0021	0.0031	0.0040	0.0059	0.0071	0.0086	0.098	0.0115	0.0173
	Wrought	1.5 x D	0.5 x D	0.6 x D	1000	2400	0.0024	0.0036	0.0046	0.0067	0.0082	0.0099	0.0112	0.0132	0.0198
	Copper, Brass	1.5 x D	0.5 x D	0.6 x D	250	1000	0.0012	0.0017	0.0023	0.0029	0.0035	0.0047	0.0059	0.0070	0.0093

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For slotting (B), reduce IPT by 20%
- With X-PROMAX coating, increase SFM 25%
- For tools >3D reach, reduce feed rate by 20-30%

NXG-3-CB FEED MULTIPLIER

RDOC/D1	2.00%	5.00%	10.00%	20.00%	30.00%	40.00%	50.00%
Max ADOC	ADOC Max	ADOC Max	ADOC Max	ADOC Max	2.0 x D	1.0 x D	0.5 x D
Feed Multiplier	3.6	2.3	1.7	1.25	1.09	1.02	1

NXG-4 Series End Mills - Speeds & Feeds

Square, Corner Radius, Ball, Corner Break Series

CONVENTIONAL MILLING																
MATERIAL		SIDE MILLING		SLOTTING	SFM		IPT									
		ADOC	RDOC	ADOC	MIN	MAX	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	1-1/4
P	Carbon Steel	1.5 x D	0.5 x D	1.25 x D	441	561	0.0010	0.0015	0.0020	0.0026	0.0030	0.0037	0.0043	0.0048	0.0054	0.0054
	Alloyed Steel	1.5 x D	0.5 x D	1.25 x D	351	442	0.0008	0.0012	0.0017	0.0021	0.0025	0.0032	0.0038	0.0042	0.0050	0.0053
	Tool Steel	1.5 x D	0.5 x D	1.25 x D	270	417	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0033	0.0037	0.0042	0.0044
M	Austenitic	1.5 x D	0.5 x D	1.25 x D	270	323	0.0008	0.0012	0.0017	0.0021	0.0025	0.0032	0.0038	0.0042	0.0050	0.0053
	Martensitic, Ferritic	1.5 x D	0.5 x D	1.25 x D	180	221	0.0007	0.0010	0.0014	0.0017	0.0020	0.0025	0.0030	0.0034	0.0040	0.0043
	PH Stainless	1.5 x D	0.5 x D	1.00 x D	180	196	0.0006	0.0008	0.0011	0.0014	0.0017	0.0021	0.0025	0.0027	0.0031	0.0032
K	Gray Cast	1.5 x D	0.5 x D	1.00 x D	351	417	0.0010	0.0015	0.0020	0.0026	0.0030	0.0037	0.0043	0.0048	0.0054	0.0054
	Nodular	1.5 x D	0.5 x D	1.00 x D	324	391	0.0008	0.0012	0.0017	0.0021	0.0025	0.0032	0.0038	0.0042	0.0050	0.0053
	Ductile	1.5 x D	0.5 x D	1.00 x D	324	366	0.0007	0.0010	0.0014	0.0017	0.0020	0.0025	0.0030	0.0034	0.0040	0.0043
S	Co, Fe Alloys	1.5 x D	0.3 x D	0.75 x D	144	221	0.0007	0.0010	0.0014	0.0017	0.0020	0.0025	0.0030	0.0034	0.0040	0.0043
	Ni-Based Alloys	1.5 x D	0.5 x D	0.50 x D	72	111	0.0004	0.0007	0.0009	0.0011	0.0013	0.0017	0.0020	0.0023	0.0027	0.0029
	Titanium Alloys	1.5 x D	0.5 x D	1.25 x D	144	170	0.0005	0.0008	0.0012	0.0016	0.0019	0.0023	0.0028	0.0031	0.0036	0.0039
H	45 - 50 HRC	1.5 x D	0.5 x D	0.3 x D	234	391	0.0007	0.0011	0.0015	0.0019	0.0022	0.0028	0.0033	0.0037	0.0042	0.0044
	> 50 HRC	1.5 x D	0.2 x D	0.05 x D	207	332	0.0006	0.0008	0.0011	0.0014	0.0017	0.0021	0.0025	0.0027	0.0031	0.0032

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For slotting (B), reduce IPT by 20%
- For tools >3D reach, reduce feed rate by 20-30%
- For corner break end mills, increase IPT by 15%

For high efficiency machining (HEM) suggestions and starting parameters, give us a call at **855-263-2328**.

NXG-5 Series End Mills - Speeds & Feeds

Square, Corner Radius, Ball, Corner Break Series

CONVENTIONAL MILLING

MATERIAL		SIDE MILLING		SLOTTING	SFM		IPT						
		ADOC	RDOC	ADOC	MIN	MAX	1/8	1/4	3/8	1/2	5/8	3/4	1
P	Carbon Steel	1.5 x D	0.5 x D	1 x D	441	561	0.0009	0.0018	0.0027	0.0034	0.0039	0.0044	0.0049
	Alloyed Steel	1.5 x D	0.5 x D	1 x D	351	442	0.0008	0.0015	0.0023	0.0029	0.0034	0.0039	0.0045
	Tool Steel	1.5 x D	0.5 x D	0.75 x D	270	417	0.0007	0.0014	0.0020	0.0026	0.0030	0.0034	0.0039
M	Austenitic	1.5 x D	0.5 x D	1 x D	270	323	0.0008	0.0015	0.0023	0.0029	0.0034	0.0039	0.0045
	Martensitic, Ferritic	1.5 x D	0.5 x D	1 x D	180	221	0.0006	0.0012	0.0018	0.0023	0.0027	0.0031	0.0036
	PH Stainless	1.5 x D	0.5 x D	1 x D	180	196	0.0005	0.001	0.0015	0.0019	0.0022	0.0025	0.0028
K	Gray Cast	1.5 x D	0.5 x D	1 x D	351	417	0.0009	0.0018	0.0027	0.0034	0.0039	0.0044	0.0049
	Nodular	1.5 x D	0.5 x D	1 x D	324	391	0.0008	0.0015	0.0023	0.0029	0.0034	0.0039	0.0045
	Ductile	1.5 x D	0.5 x D	1 x D	324	366	0.0006	0.0012	0.0018	0.0023	0.0027	0.0031	0.0036
S	Co, Fe Alloys	1.5 x D	0.3 x D	0.3 x D	144	221	0.0004	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024
	Ni-Based Alloys	1.5 x D	0.3 x D	0.3 x D	72	111	0.0004	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024
	Titanium Alloys	1.5 x D	0.5 x D	1 x D	144	170	0.0006	0.0011	0.0017	0.0021	0.0025	0.0028	0.0033
H	45 - 50 HRC	1.5 x D	0.5 x D	0.03 x D	234	391	0.0007	0.0014	0.0020	0.0026	0.0030	0.0034	0.0039
	> 50 HRC	1.5 x D	0.5 x D	0.05 x D	207	332	0.0007	0.0014	0.0020	0.0026	0.0030	0.0034	0.0039

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For slotting (B), reduce IPT by 20%
- For tools >3D reach, reduce feed rate by 20-30%
- For corner break end mills, increase IPT by 15%

HIGH EFFICIENCY MILLING (HEM)

MATERIAL		SIDE MILLING		SFM		IPT						
		ADOC	RDOC	MIN	MAX	1/8	1/4	3/8	1/2	5/8	3/4	1
P	Carbon Steel	3 x D	0.1 x D	500	1440	0.0011	0.0022	0.0033	0.0041	0.0047	0.0053	0.0059
	Alloyed Steel	3 x D	0.1 x D	400	1150	0.0009	0.0018	0.0027	0.0036	0.0041	0.0046	0.0054
	Tool Steel	3 x D	0.1 x D	300	1080	0.0009	0.0017	0.0025	0.0031	0.0036	0.0040	0.0046
M	Austenitic	3 x D	0.1 x D	300	830	0.0009	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Martensitic, Ferritic	3 x D	0.1 x D	200	580	0.0008	0.0015	0.0022	0.0028	0.0033	0.0037	0.0043
	PH Stainless	3 x D	0.1 x D	200	510	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0034
K	Gray Cast	3 x D	0.1 x D	400	1080	0.0011	0.0022	0.0033	0.0041	0.0047	0.0053	0.0059
	Nodular	3 x D	0.1 x D	370	1010	0.0009	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Ductile	3 x D	0.1 x D	370	940	0.0008	0.0015	0.0022	0.0028	0.0033	0.0037	0.0043
S	Co, Fe Alloys	3 x D	0.1 x D	80	580	0.0008	0.0015	0.0022	0.0028	0.0033	0.0037	0.0043
	Ni-Based Alloys	3 x D	0.1 x D	80	290	0.0005	0.0010	0.0015	0.0018	0.0022	0.0025	0.0029
	Titanium Alloys	3 x D	0.1 x D	170	430	0.0007	0.0013	0.0020	0.0026	0.0030	0.0034	0.0040
H	45 - 50 HRC	3 x D	0.1 x D	270	1010	0.0009	0.0017	0.0025	0.0031	0.0036	0.0040	0.0046
	> 50 HRC	3 x D	0.1 x D	230	870	0.0006	0.0012	0.0018	0.0023	0.0027	0.0030	0.0034

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For slotting (B), reduce IPT by 20%
- For tools >3D reach, reduce feed rate by 20-30%
- For corner break end mills, increase IPT by 15%

HEM SPEED FACTOR

RDOC/D1		0.5%	1.00%	1.50%	2.00%	4.00%	5.00%	8.00%	10.00%
Speed Multiplier	SFM	2.15	2.11	2.07	1.48	1.11	1.07	1	
Feed Multiplier	IPT	1.65	1.53	1.47	1.41	1.35	1.29	1	

NXG-6 Series End Mills - Speeds & Feeds

Square, Corner Radius, Ball, Corner Break Series

CONVENTIONAL MILLING

MATERIAL		SIDE MILLING		SFM		IPT							
		ADOC	RDOC	MIN	MAX	1/4	3/8	1/2	5/8	3/4	1	1-1/4	1-1/2
P	Alloyed Steel	ADOC max	0.4 x D	300	490	0.0013	0.0020	0.0026	0.0030	0.0034	0.0039	0.0040	0.0040
	Tool Steel	ADOC max	0.4 x D	200	330	0.0012	0.0018	0.0023	0.0027	0.0031	0.0036	0.0039	0.0039
M	Austenitic	ADOC max	0.4 x D	300	380	0.0015	0.0023	0.0029	0.0034	0.0039	0.0045	0.0048	0.0048
	Martensitic, Ferritic	ADOC max	0.4 x D	200	260	0.0012	0.0018	0.0023	0.0027	0.0031	0.0036	0.0039	0.0039
	PH Stainless	ADOC max	0.4 x D	200	230	0.0010	0.0015	0.0019	0.0022	0.0025	0.0028	0.0029	0.0029
S	Co, Fe Alloys	ADOC max	0.4 x D	80	160	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0026	0.0026
	Ni-Based Alloys	ADOC max	0.4 x D	80	130	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0026	0.0026
	Titanium Alloys	ADOC max	0.4 x D	160	200	0.0011	0.0017	0.0021	0.0025	0.0028	0.0033	0.0036	0.0036
H	45 - 50 HRC	ADOC max	0.4 x D	260	460	0.0013	0.0020	0.0026	0.0030	0.0034	0.0039	0.0040	0.0040
	> 50 HRC	ADOC max	0.4 x D	230	390	0.0010	0.0015	0.0019	0.0022	0.0025	0.0028	0.0029	0.0029

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For tools >3D reach, reduce feed rate by 20-30%
- For corner break end mills, increase IPT by 15%

HIGH EFFICIENCY MILLING (HEM)

MATERIAL		SIDE MILLING		SFM		IPT					
		ADOC	RDOC	MIN	MAX	1/4	3/8	1/2	5/8	3/4	1
P	Carbon Steel	3 x D	0.1 x D	500	1440	0.0021	0.0033	0.0041	0.0047	0.0053	0.0059
	Alloyed Steel	3 x D	0.1 x D	400	1150	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Tool Steel	3 x D	0.1 x D	300	1080	0.0016	0.0025	0.0031	0.0036	0.0040	0.0046
M	Austenitic	3 x D	0.1 x D	300	830	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Martensitic, Ferritic	3 x D	0.1 x D	200	580	0.0014	0.0022	0.0028	0.0033	0.0037	0.0043
	PH Stainless	3 x D	0.1 x D	200	510	0.0012	0.0018	0.0023	0.0027	0.0030	0.0034
K	Gray Cast	3 x D	0.1 x D	400	1080	0.0021	0.0033	0.0041	0.0047	0.0053	0.0059
	Nodular	3 x D	0.1 x D	370	1010	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Ductile	3 x D	0.1 x D	370	940	0.0014	0.0022	0.0028	0.0033	0.0037	0.0043
S	Co, Fe Alloys	3 x D	0.1 x D	80	580	0.0014	0.0022	0.0028	0.0033	0.0037	0.0043
	Ni-Based Alloys	3 x D	0.1 x D	80	290	0.0009	0.0015	0.0018	0.0022	0.0025	0.0029
	Titanium Alloys	3 x D	0.1 x D	170	430	0.0013	0.0020	0.0026	0.0030	0.0034	0.0040
H	45 - 50 HRC	3 x D	0.1 x D	270	1010	0.0016	0.0025	0.0031	0.0036	0.0040	0.0046
	> 50 HRC	3 x D	0.1 x D	230	870	0.0012	0.0018	0.0023	0.0027	0.0030	0.0034

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For tools >3D reach, reduce feed rate by 20-30%
- For corner break end mills, increase IPT by 15%

HEM SPEED FACTOR

RDOC/D1	0.5%	1.00%	1.50%	2.00%	4.00%	5.00%	8.00%	10.00%
Speed Multiplier	SFM	2.15	2.11	2.07	1.48	1.11	1.07	1
Feed Multiplier	IPT	1.65	1.53	1.47	1.41	1.35	1.29	1

NXG-7 Series End Mills - Speeds & Feeds

Square, Corner Radius, Ball, Corner Break Series

CONVENTIONAL MILLING

MATERIAL		SIDE MILLING		SFM		IPT							
		ADOC	RDOC	MIN	MAX	1/4	3/8	1/2	5/8	3/4	1	1-1/4	1-1/2
P	Alloyed Steel	ADOC max	0.4 x D	300	490	0.0013	0.0020	0.0026	0.0030	0.0034	0.0039	0.0040	0.0040
	Tool Steel	ADOC max	0.4 x D	200	330	0.0012	0.0018	0.0023	0.0027	0.0031	0.0036	0.0039	0.0039
M	Austenitic	ADOC max	0.4 x D	300	380	0.0015	0.0023	0.0029	0.0034	0.0039	0.0045	0.0048	0.0048
	Martensitic, Ferritic	ADOC max	0.4 x D	200	260	0.0012	0.0018	0.0023	0.0027	0.0031	0.0036	0.0039	0.0039
	PH Stainless	ADOC max	0.4 x D	200	230	0.0010	0.0015	0.0019	0.0022	0.0025	0.0028	0.0029	0.0029
S	Co, Fe Alloys	ADOC max	0.4 x D	80	160	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0026	0.0026
	Ni-Based Alloys	ADOC max	0.4 x D	80	130	0.0008	0.0012	0.0015	0.0018	0.0021	0.0024	0.0026	0.0026
	Titanium Alloys	ADOC max	0.4 x D	160	200	0.0011	0.0017	0.0021	0.0025	0.0028	0.0033	0.0036	0.0036
H	45 - 50 HRC	ADOC max	0.4 x D	260	460	0.0013	0.0020	0.0026	0.0030	0.0034	0.0039	0.0040	0.0040
	> 50 HRC	ADOC max	0.4 x D	230	390	0.0010	0.0015	0.0019	0.0022	0.0025	0.0028	0.0029	0.0029

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For tools >3D reach, reduce feed rate by 20-30%
- For corner break end mills, increase IPT by 15%

HIGH EFFICIENCY MILLING (HEM)

MATERIAL		SIDE MILLING		SFM		IPT					
		ADOC	RDOC	MIN	MAX	1/4	3/8	1/2	5/8	3/4	1
P	Carbon Steel	3 x D	0.1 x D	500	1440	0.0021	0.0033	0.0041	0.0047	0.0053	0.0059
	Alloyed Steel	3 x D	0.1 x D	400	1150	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Tool Steel	3 x D	0.1 x D	300	1080	0.0016	0.0025	0.0031	0.0036	0.0040	0.0046
M	Austenitic	3 x D	0.1 x D	300	830	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Martensitic, Ferritic	3 x D	0.1 x D	200	580	0.0014	0.0022	0.0028	0.0033	0.0037	0.0043
	PH Stainless	3 x D	0.1 x D	200	510	0.0012	0.0018	0.0023	0.0027	0.0030	0.0034
K	Gray Cast	3 x D	0.1 x D	400	1080	0.0021	0.0033	0.0041	0.0047	0.0053	0.0059
	Nodular	3 x D	0.1 x D	370	1010	0.0018	0.0027	0.0035	0.0041	0.0046	0.0054
	Ductile	3 x D	0.1 x D	370	940	0.0014	0.0022	0.0028	0.0033	0.0037	0.0043
S	Co, Fe Alloys	3 x D	0.1 x D	80	580	0.0014	0.0022	0.0028	0.0033	0.0037	0.0043
	Ni-Based Alloys	3 x D	0.1 x D	80	290	0.0009	0.0015	0.0018	0.0022	0.0025	0.0029
	Titanium Alloys	3 x D	0.1 x D	170	430	0.0013	0.0020	0.0026	0.0030	0.0034	0.0040
H	45 - 50 HRC	3 x D	0.1 x D	270	1010	0.0016	0.0025	0.0031	0.0036	0.0040	0.0046
	> 50 HRC	3 x D	0.1 x D	230	870	0.0012	0.0018	0.0023	0.0027	0.0030	0.0034

- All posted speed and feed parameters are suggested starting values that may be increased or decreased
- For tools >3D reach, reduce feed rate by 20-30%
- For corner break end mills, increase IPT by 15%

HEM SPEED FACTOR

RDOC/D1	0.5%	1.00%	1.50%	2.00%	4.00%	5.00%	8.00%	10.00%
Speed Multiplier	SFM	2.15	2.11	2.07	1.48	1.11	1.07	1
Feed Multiplier	IPT	1.65	1.53	1.47	1.41	1.35	1.29	1

CHM Series Chamfer Mills - Speeds & Feeds

MATERIAL		SFM		IPT by Effective Diameter										
		MIN	MAX	0.015	.031	.047	.062	.078	.093	.125	.187	0.25	0.312	.375	0.500
N	Casting	450	750	0.00011	0.00023	0.00035	0.00047	0.00059	0.00070	0.00094	0.00140	0.00188	0.00234	0.00281	0.00375
	Wrought	750	1000	0.00010	0.00021	0.00032	0.00042	0.00053	0.00063	0.00084	0.00126	0.00169	0.00211	0.00253	0.00338
	Copper, Brass	250	500	0.00009	0.00019	0.00028	0.00037	0.00047	0.00047	0.00075	0.00112	0.00150	0.00187	0.00225	0.00300
P	Carbon Steel	450	600	0.00004	0.00009	0.00013	0.00018	0.00022	0.00026	0.00035	0.00053	0.00071	0.00088	0.00106	0.00142
	Alloyed Steel	250	375	0.00004	0.00008	0.00012	0.00016	0.00020	0.00024	0.00032	0.00048	0.00065	0.00081	0.00097	0.00130
	Tool Steel	150	250	0.00004	0.00008	0.00012	0.00016	0.00020	0.00024	0.00032	0.00048	0.00065	0.00081	0.00097	0.00130
M	Austenitic	250	400	0.00004	0.00009	0.00013	0.00018	0.00022	0.00026	0.00035	0.00053	0.00071	0.00088	0.00106	0.00142
	Martensitic, Ferritic	150	200	0.00004	0.00008	0.00012	0.00016	0.00020	0.00024	0.00032	0.00048	0.00065	0.00081	0.00097	0.00130
	PH Stainless	150	200	0.00002	0.00005	0.00008	0.00010	0.00013	0.00015	0.00020	0.00030	0.00041	0.00051	0.00061	0.00081
K	Gray Cast	300	400	0.00006	0.00012	0.00018	0.00023	0.00029	0.00035	0.00047	0.00071	0.00095	0.00118	0.00142	0.00189
	Nodular	275	375	0.00004	0.00009	0.00013	0.00018	0.00022	0.00026	0.00035	0.00053	0.00071	0.00088	0.00106	0.00142
	Ductile	275	375	0.00004	0.00009	0.00013	0.00018	0.00022	0.00026	0.00035	0.00053	0.00071	0.00088	0.00106	0.00142
S	Co, Fe Alloys	120	150	0.00002	0.00005	0.00008	0.00010	0.00013	0.00015	0.00020	0.00030	0.00041	0.00051	0.00061	0.00081
	Ni-Based Alloys	65	80	0.00002	0.00005	0.00008	0.00010	0.00013	0.00015	0.00020	0.00030	0.00041	0.00051	0.00061	0.00081
	Titanium Alloys	120	150	0.00002	0.00005	0.00008	0.00010	0.00013	0.00015	0.00020	0.00030	0.00041	0.00051	0.00061	0.00081
H	45 - 50 HRC	80	100	0.00002	0.00005	0.00008	0.00010	0.00013	0.00015	0.00020	0.00030	0.00041	0.00051	0.00061	0.00081
	> 50 HRC	50	75	0.00002	0.00005	0.00008	0.00010	0.00013	0.00015	0.00020	0.00030	0.00041	0.00051	0.00061	0.00081

- Chip loads based on full chamfer engagement
- For machining on two sides, reduce Chip Loads to 60%-80% depending on contact length and finish For vertical plunging, reduce Chip Loads to 40%-50% depending on finish
- All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions
- Chip Loads within table pertain to machining on one side of workpiece
- For machining on two sides, reduce Chip Loads to 60%-80% depending on contact length and finish For vertical plunging, reduce Chip Loads to 40%-50% depending on finish

DEPTH OF CUT GUIDELINES

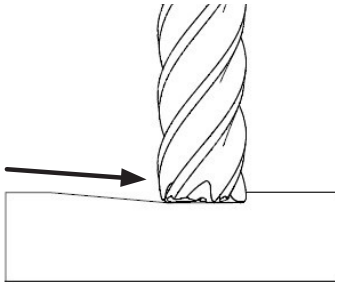
Finishing

1. Shoot for around 3%-to-5% of dia. RDOC, no matter how many flutes are on the tool
2. Quick Troubleshooting
   a. Are you experiencing poor surface finish?
   - » Check your RDOC, it may be too light of a cut (see #1 above)
   - » Lower your IPM, Increase your RPM
   - » Check your tool runout (at end/corner of tool — with tool mounted in the holder, in the machine) shoot for .0005 TIR max.

   b. Tool Life Issues
   - » Spring passes allow for tool rubbing (lowers tool life) and material work hardening — avoid (or at least minimize # of) if possible.

Ramping Angles

NXG-2: 5-10°
NXG-3: 5-10°
NXG-4: 1-10°
NXG-5: 1-8°
NXG-6: 1-5°
NXG-7: 1-3° (caution here)

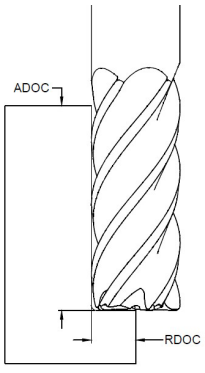


Note: Lower angles will experience chip thinning and thus allow for higher feed adjustments.

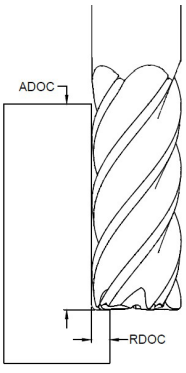
Radial (RDOC) & Axial (ADOC) Depth of Cut

	Traditional		HEM	
	RDOC	ADOC	RDOC	ADOC
NXG-2:	5% to 50%xD	up to 1.00xD	NR	NR
NXG-3:	5% to 50%xD	up to 1.00xD	8% to 40%xD	up to 3.00xD
NXG-4:	5% to 50%xD	up to 1.00xD	NR	NR
NXG-5:	5% to 40%xD	up to 1.50xD	8% to 30%xD	up to 3.50xD
NXG-6:	5% to 30%xD	up to 1.75xD	8% to 20%xD	up to 3.75xD
NXG-7:	5% to 10%xD	up to 2.00xD	7% to 10%xD	up to 4.00XD

D = Tool Cut Diameter



Heavy Profiling



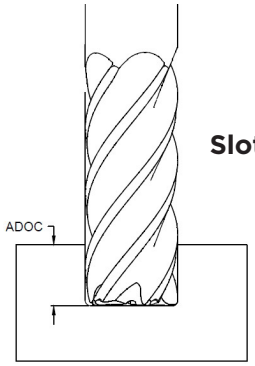
Light Profiling
(Finishing/HEM)

Slot Depth Ranges

NXG-2: up to 2.00xD
NXG-3: up to 2.00xD
NXG-4: up to 1.50xD
NXG-5: up to 0.50xD
NXG-6: up to 0.25xD
NXG-7: Not Recommended

Tips for slotting:

1. Follow the chart above.
2. Use chip-breaker tools to manage chip evacuation.
3. Ensure good coolant flush, in direction of the tool's chip throw.
4. Are you less then these listed ranges? If so, then there could be room for feed increase adjustments.



Slotting

END MILL SELECTION GUIDELINE

We often receive questions pertaining to properly selecting an end mill while programming a part. The following are great guidelines that could be helpful with those important questions & answers. Of course, we are always available to help assist you in selecting the correct product.

STEP 1 – MATERIAL

Identify: Know the exact material you are cutting, material condition (billet, forging etc.), and material hardness (HRC).

Outcome: This will guide you to our Non-Ferrous or Ferrous section of our catalog.

STEP 2 – OPERATION

Identify: Determine if you will be roughing, finishing, or both with this tool.

Outcome: This will help you determine the number of flutes needed and the need (or not) for chipbreakers.

STEP 3 – PROGRAMMING

Identify: Will you be utilizing traditional programming, high efficiency programming (HEM), or a combination of both?

Outcome: This will help you decide on number of flutes in Step 8.

STEP 4 – ADOC (Axial Depth of Cut)

Identify: Determine the maximum axial depth of cut tool will experience in the part.

Outcome: This dimension (+1/2 x Dia. of tool) will help you determine the length of cut (LOC) to deploy.

STEP 5 – REACH

Identify: Do you have any obstacles to clear (fixturing, part features, etc.) or deep depths to reach (6x tool diameter or deeper)?

Outcome: Consider using a reduced-neck tool to maintain a reasonable length of cut while allowing the tool to reach deeper positions by stepping down (LOC max at a time) to a desired part depth.

STEP 6 – TOOL DIAMETER

Identify: Diameter selection takes a formulative consideration of programming type, machine taper, cut depth, reach, and part geometry (wall-to-wall corner requirements).

Outcome: Here are some helpful tips while deciding on and selecting the proper diameter.

- If you're using a 40-taper machine, try and keep tool diameter <3/4" as this will extend your spindle life expectancy.
- Determine what programming style (Step 3) you're using as HEM can employ smaller diameters than you may be used to.
- Decide on your cut depth (Step 4). For traditional programming keep it <2xDia., for HEM keep it below 4xDia.
- Decide on your total reach depth (Step 5). If needing to machine 4xDia. look at a necked tool to maintain strength and minimize deflection.
- Use a tool with a radius smaller than the part's internal corner radius requirement (typically half the tool diameter). For instance, for a .250-part corner radius constraint utilize a .375 or .437 Tool and generate the radius. Do not run a ½" end mill into a .250 corner it will chatter, squawk, and possibly break.

STEP 7 – CORNER RADIUS

Identify: Does your part require a corner radius specification to meet between wall and the floor?

Outcome: Running a corner radius on an end mill will increase its corner life. If your part requires one then great, if not, consider one for pre-finishing (aka roughing) as it will help to extend tool life!

STEP 8 – FLUTE COUNT

Identify: The cutting material (Step 1) and the type of programming in use (Step 3)

Outcome:

- For Non-Ferrous machining (excl. Titanium)
  Traditional Programming = 2-3 flutes, HEM = 3-5 Flutes
- For Ferrous machining (incl. Titanium)
  Traditional Programming = 4-5 flutes, HEM = 5-7 Flutes

Tip: the harder or tougher the material is, the greater number of flutes will help to increase tool life.

STEP 9 – TOOL HOLDER

Identify: Always try and use the most rigid and accurate tool holder proving the least amount of runout as possible. If you are planning to use a side lock holder, see the outcome below.

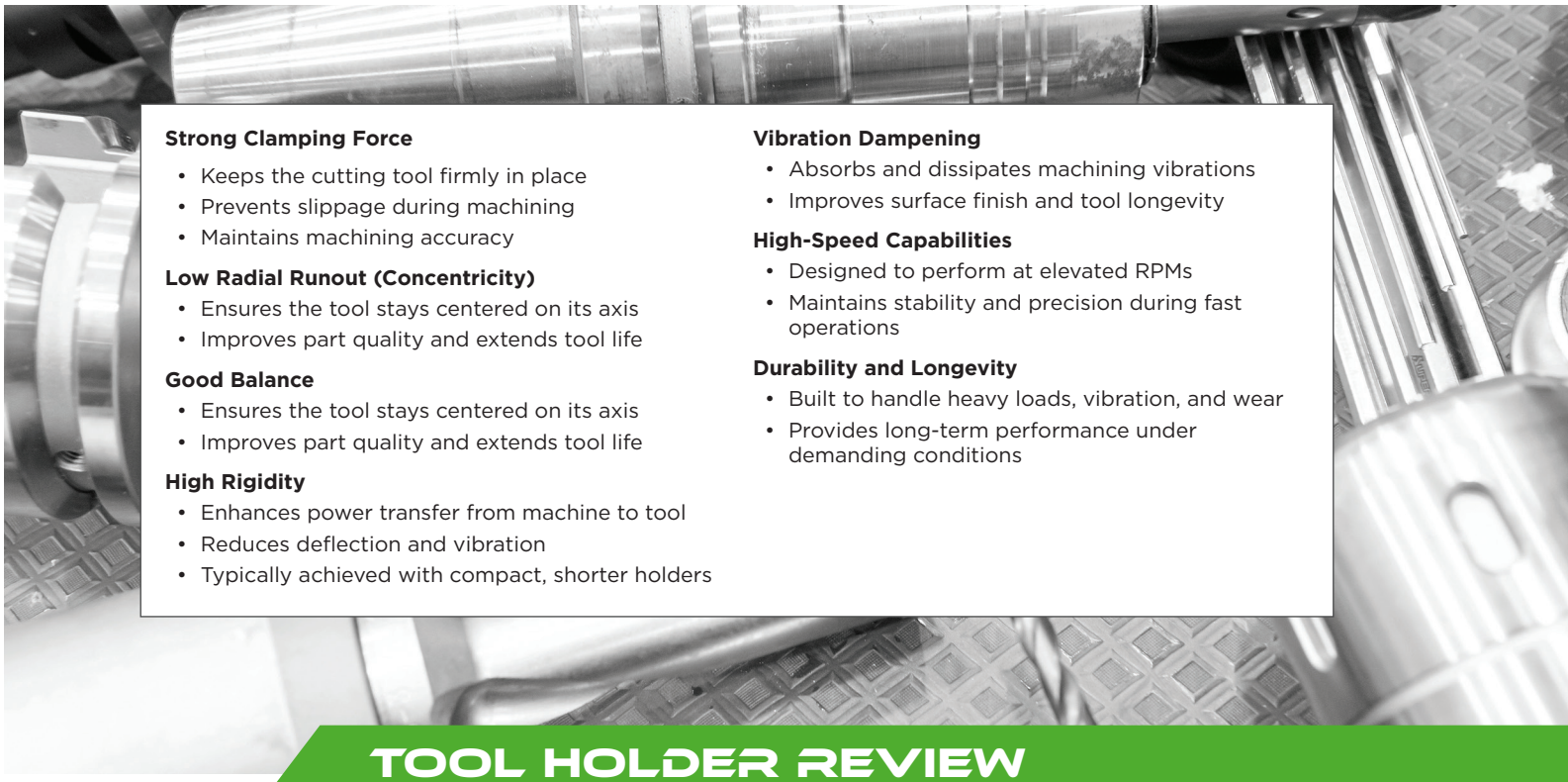
Outcome: It is best to keep TIR < 0.0005" at the tip of the tool (in the holder, in the machine) for optimum tool life and application success. Our tools come with cylindrical shanks. A Weldon Flat can be put on the tool by us quickly. Just order the tool by placing a "W" at the end of the EDP#. For example, EDP 60000 with a Weldon flat needed would be ordered as 60000W.

STEP 10 – Select & Pick the NEXGEN tool you need!

» For **Roughing** tools go to pages **7-19.**
» For **Non-ferrous** Tooling go to pages **21-35.**
» For **Ferrous** tooling go to pages **37-49.**

KEY ELEMENTS OF A GOOD TOOL HOLDER

A high-quality tool holder is essential for accurate, efficient, and reliable machining. It should securely grip the tool, minimize vibration, and maintain concentricity. Below are the critical elements to consider:



Strong Clamping Force

- Keeps the cutting tool firmly in place
- Prevents slippage during machining
- Maintains machining accuracy

Low Radial Runout (Concentricity)

- Ensures the tool stays centered on its axis
- Improves part quality and extends tool life

Good Balance

- Ensures the tool stays centered on its axis
- Improves part quality and extends tool life

High Rigidity

- Enhances power transfer from machine to tool
- Reduces deflection and vibration
- Typically achieved with compact, shorter holders

Vibration Dampening

- Absorbs and dissipates machining vibrations
- Improves surface finish and tool longevity

High-Speed Capabilities

- Designed to perform at elevated RPMs
- Maintains stability and precision during fast operations

Durability and Longevity

- Built to handle heavy loads, vibration, and wear
- Provides long-term performance under demanding conditions

TOOL HOLDER REVIEW

TYPE	PROs	CONs	COMMENTS
Side Lock	Rigidity Budget Friendly Clamp Force	Balance Accuracy	Balance and runout issues created by clamping screw and Weldon flat tools make this a less than ideal solution, especially in high speed applications.
Collet Chuck	Cost-effective Versatile Ease of Use	Clamp Force Accuracy	Great for general purpose applications, and easy to use. However collets wear out over time leading to runout issues. And clamping force is fair at best.
Mill Chuck	Clamp force Vibration dampening Rigidity	Reach Micro Maintenance	Great solution for roughing with medium and larger diameter tools. Large nose diameter and construction not ideal for long reach applications and micro tools.
Hydraulic Chuck	Accuracy Balance	Clamp Force Rigidity Cost $$	Excellent balance and concentricity, and ideal solution for hole making operations and finish milling operations. Due to gripping force, not recommended for heavy roughing or slotting.
Shrink Fit	Accuracy Balance Clamp Force	Vibration Cost $$$	Excellent runout accuracy and balance (no moving mechanical parts), with very high gripping strength. Ideal for hole making and milling operations. Initial cost of shrink equipment is a barrier, and overheating of holders can damage holders.

Different tool path strategies, like contouring, pocketing, and slotting, are chosen based on the shape of the part and how it needs to be machined. Techniques such as trochoidal milling, adaptive milling, and helical milling help remove material more efficiently, extend tool life, and create a better surface finish.

TOOL PATH CONSIDERATIONS

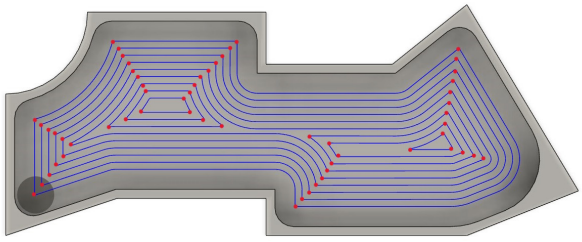
Option 1: Contour Parallel Offset Tool Path

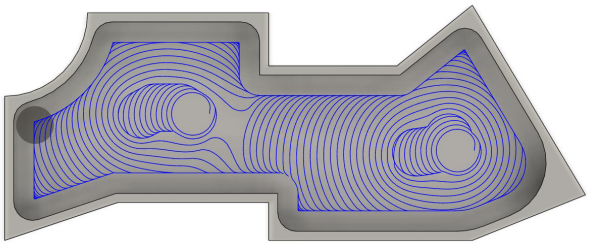
- **Traditional:** Commonly used in the industry and generally effective.
- **Tool Life:** Unpredictable and inconsistent, leading to uncertainty in performance.
- **Red Dot Zones:** Indicate areas of tool overload, chatter (squawk), or potential breakage.
- **Risk Factor:** Each red zone is a gamble—posing a threat to tool integrity.
- **Efficiency Loss:** Forces conservative speeds and feeds, reducing overall machining efficiency.

Option 2: High Efficiency Milling (HEM)

High-efficiency tool paths like Adaptive Clearing in Autodesk® Fusion 360™ are designed for smooth, controlled roughing, reducing stress on tools and machines.

- **Tool Life:** Increased tool life
- **Efficiency:** Higher Metal Removal Rates (MRR)
- **Productivity:** Faster part throughput
- **Tool Failure:** Lower scrap rates
- **Spindle Wear:** Reduced spindle loads





AUTODESK® FUSION 360™

*Illustrations created using Autodesk® Fusion 360™

PART ENTRY

How a tool initially engages the workpiece can play a critical role in machining success. From plunging and ramping to helical engagement and arcing, the strategy deployed is dependent upon the work material itself and the desired part shape.

Here are a few tips to help guide your machining strategy when needing to enter features from the inside of the part, working out.

PART ENTRY CONSIDERATIONS

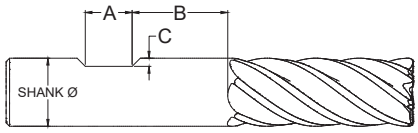
1. **Plunging:** Simple , but extremely detrimental to tool life for most end mills. Avoid this method unless the tool is specifically designed
plunging.
2. **Linear Ramping:** A “Zigzag” toolpath into the part. Simple to program, recommend only in materials under 35 HRC, as uneven engagement in harder materials can lead to breakage.
3. **Helical Ramping:** Tool spirals axially into the part, creating a hole. Cutter engagement is constant and controlled. Recommend in any material, but especially materials > 35HRC.
4. **Arcing (Finishing):** An effective strategy for finishing on curved parts to avoid start and stop marks, whereby the tool path mirrors the arc of the part and gradually progress radially into the feature.
5. **Slotting:** If entering from off the part, recommend a slower approach (speed) until the tool is fully engaged.

WELDON FLAT GUIDELINES

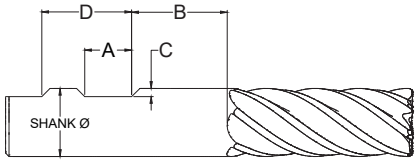
Proper tool position within the Weldon side-lock holder is very important to us. It's imperative not to have the tool flutes chucked up inside the holder, nor sticking out too far from the nose of the holder. Therefore, instead of using old High Speed Steel Weldon specs that are based on old overall lengths, we have calculated our own Weldon Flat positional specifications based on flute wash positioning or reduced neck/shank transition.

SHANK Ø	A +/- .004	B +/-.015	C +.015/-.000	D +/-.008
0.1250	0.155	0.500	0.020	—
0.1875	0.155	0.500	0.025	—
0.2500	0.155	0.500	0.030	—
0.3125	0.295	0.750	0.040	—
0.3750	0.295	0.750	0.050	—
0.4375	0.345	0.850	0.060	—
0.5000	0.345	0.850	0.060	—
0.6250	0.415	0.900	0.065	—
0.7500	0.470	0.900	0.075	—
1.0000	0.530	1.000	0.075	0.900
1.2500	0.530	1.000	0.095	0.900

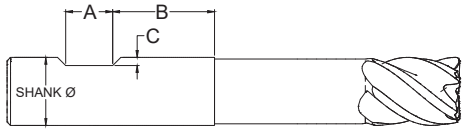
Single Weldon



Double Weldon



Weldon Flat (on reduced neck tool)

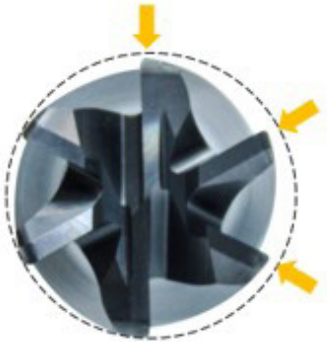


Call for pricing*

Tool Runout (TIR)

Tool runout, (with tool in holder and holder in spindle) is a very critical variance affecting tool life and success of your milling operation.

- Radial Runout is vital to minimize
- Strive for the lowest possible TIR you can get, hopefully keeping TIR to .0005 max.
- Utilize higher accuracy and full-shank-contact tool holders
- Avoid hand-ground flats on shanks, they will induce runout



Radial Runout

FAQ

NEXGEN FAQ

1. What products and services does Nexgen Tooling LLC offer?
Nexgen Tooling LLC specializes in high-quality, tight-tolerance carbide cutting tools—both custom and standard. Our product range includes end mills, drills, reamers, and chamfer tools. We proudly serve critical industries such as aerospace, power generation, medical, defense, and automotive manufacturing.

2. Does NEXGEN offer custom tool manufacturing services?
Yes! NEXGEN specializes in high-quality, custom carbide cutting tool solutions. Our capabilities include taper ball nose end mills, drill mills, countersink combo tools, dovetail cutters, form tools, lens cutters, key slot cutters, and step reamers and drills. To request a quote, contact us directly or submit your request on-line, with the option to upload drawings, at **www.nexgentooling.com/custom-tooling/**

3. Does NEXGEN offer tool coating services?
Yes. NEXGEN possesses advanced PVD coating technology in-house, offering several of our proprietary coatings like X-ProMAX, A-ProMAX and T-ProMAX to our customers. Additional coatings not available in-house can be sourced upon request.

4. How can I place an order with Nexgen Tooling LLC?
Orders can be placed through approved NEXGEN Tooling distributors. For a distributor near you, please call us at **(855) 263-2328** or email us at **sales@nexgentooling.com**.

5. What are your business hours?
Our business hours are Monday through Friday, from 8:00 AM to 5:00 PM EST. We are closed on weekends and major holidays. Shipping cutoff is 4 PM EST.

6. What is your return policy?
We accept returns for defective or incorrect items within 30 days of purchase. Please contact our customer service team to initiate a return and receive a return merchandise authorization (RMA) number.

7. Do you offer international shipping?
Yes, we offer international shipping to select countries. Please contact our customer service team for more information on international shipping options and rates.

8. How can I contact customer support?
Our customer support team can be reached via email at **sales@nexgentooling.com** or by phone at **(855) 263-2328**. We strive to respond to all inquiries within 24 hours during business days.

9. Do you offer any warranties on your products?
Yes, our products come with a one-year warranty against manufacturing defects. Please refer to our warranty policy for more details.

10. How can I stay updated on new products and promotions?
You can follow us on social media (Facebook, X, Instagram or LinkedIn) to receive updates on new products, promotions, and industry news.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NOTES

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