

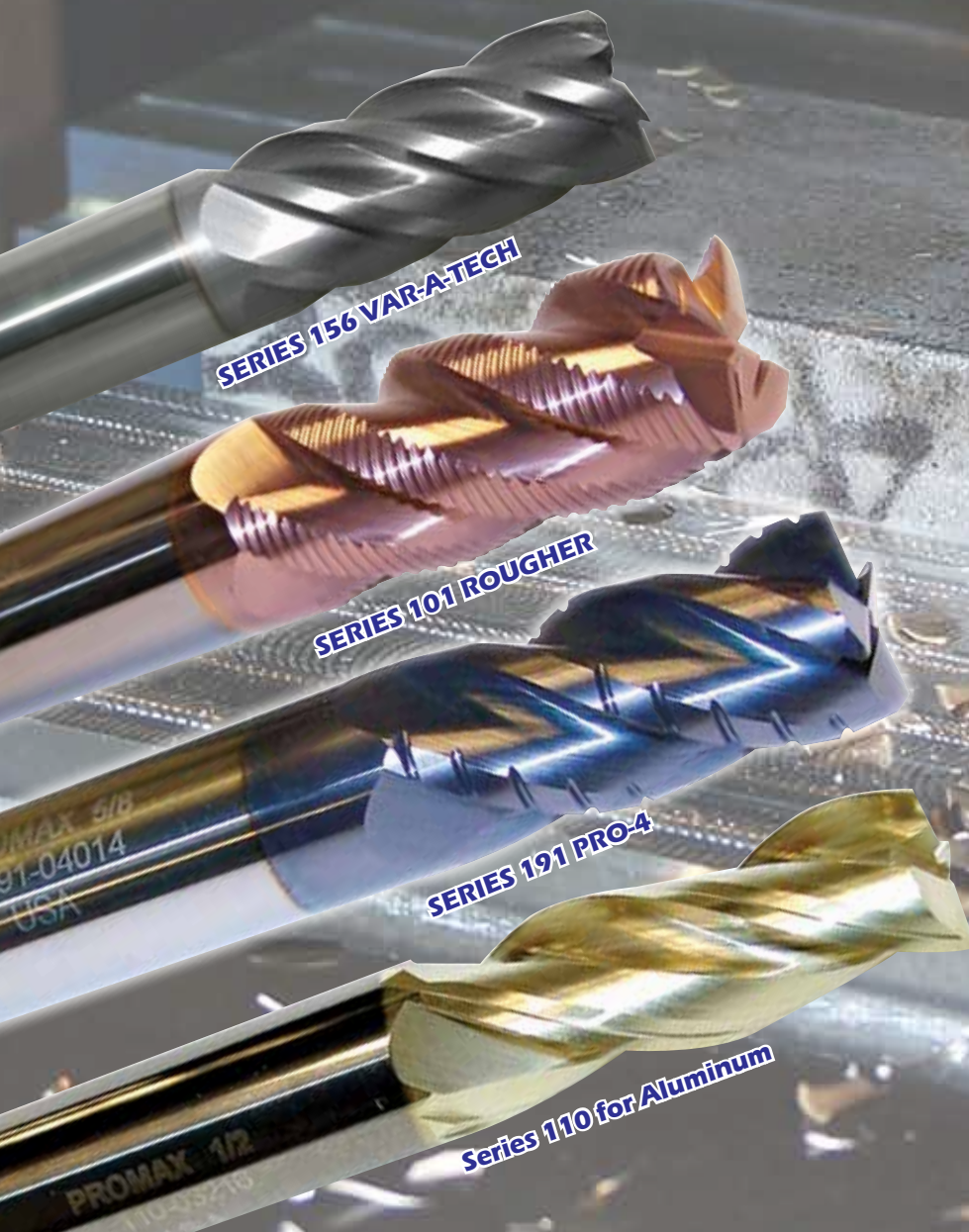


PROMAX Tools

"Feel The Edge"

Specializing In High Performance Solid Carbide Cutting Tools

**High Performance Products
For Shops That Seek Productivity**



Vol. 0213



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2011 BUILDING EXPANSION



36,000 SQUARE FEET OF MANUFACTURING SPACE

Roughing-Finishing End Mills

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GENERAL TOOL DESIGN AND USE FOR PROMAX TOOLS.

PROMAX End Mills

- Climb milling is the recommended technique of milling.
- Work piece rigidity is necessary for optimum cutting results.
- Correct coolant placement and pressure is essential for lubrication through the cut and to assure efficient chip evacuation and a longer tool life.
- Horsepower to cubic inch removal ratio should be checked for optimal performance.



PROMAX Roughers

- The minimum radial width of cut should not be less than the corner radius of the end mill.
- When slotting, the axial depth of cut should not exceed the diameter of the end mill.
- Feeds and speeds are recommendations and should be considered as starting points with possible variations to achieve optimum results.
- Work piece rigidity should be checked to assure there is no vibration.
- Check the horsepower available to cubic inch of material removal.
- The proper coolant flow and placement will wash the chips out of the cut, thus eliminating the recutting of chips, and damage to the end mill.



PROMAX Rougher-Finishers

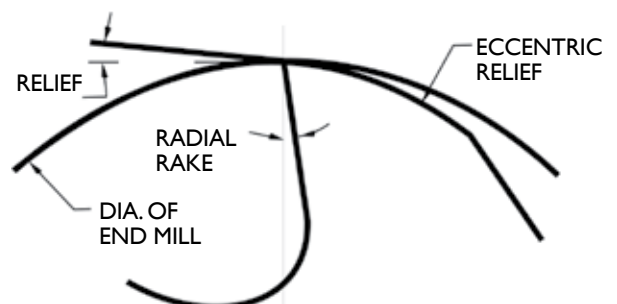
- PROMAX Rougher-Finishers bridge the gap between full roughing and finishing.
- The PROMAX Rougher-Finisher can be used with any radial depth of cut.
- Surface footage generally can be increased with the rougher-finisher when light radial depths of cuts are made.

“FEEL THE EDGE”

PROMAX's EDGE PREP is standard on all our End Mills. This allows you to forgo the tedious and long break-in periods needed on most tools in order to receive the most production out of your tool. Combining our edge prep with our superior coatings and the results are clear – longer running tools with fewer tool changes per run equaling significant cost effectiveness.

SUPERIOR TOOL DESIGN:

PROMAX end mills are manufactured from high strength, ultra fine and submicron grain carbide with a high cobalt content to produce an extra tough end mill which has a transverse rupture strength (TRS) as high as 650,000 psi. Our end mills are eccentric relieved giving them the strongest cutting edge while running cooler and smoother to produce better finishes. We offer TiCN, AlTiN, nACRo® & ZrN hard coatings which increase tool life while enhancing chip flow and lubricity through the cut. With the advanced PROMAX end mill design, you can expect your productivity to increase 2 to 5 times over conventional carbide end mills.



Series 160

7 Flute for High Speed Machining - Square End

7 FLUTE

New



High Speed Machining of High Tech Materials

Specifically designed for High Speed Finishing of Aerospace materials - - Titanium, Stainless Steel and Nickle based Super Alloys. Unequal indexed to reduce chatter. Available in square end and with standard corner radius sizes. Complete with PROMAX's NEW extremely heat resistant nACRo® coating and special edge prep.

HELIX ANGLE:

- 1/8" thru 1" = 40 degrees

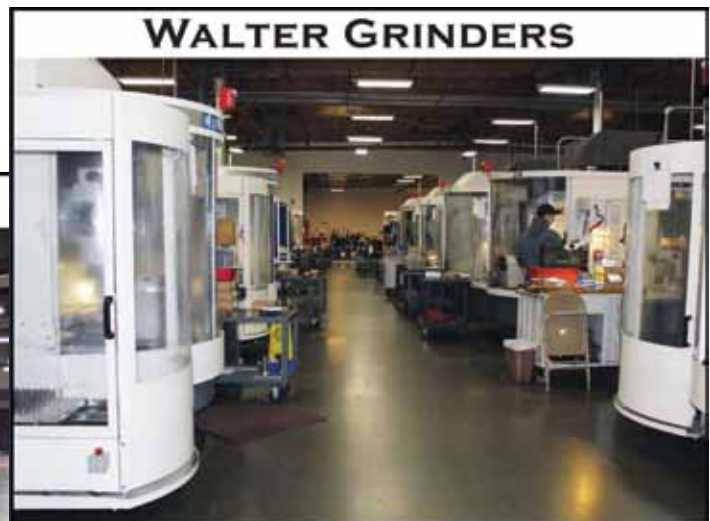
TOLERANCES:

- Shank: -.0001/- .0004
- Cutting Diameter:
1/8" thru 1" = +.000/- .002

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

DIA	SHANK	LOC	OAL	LOR	NECK DIA	FLUTES	nACRo®
1/4	1/4	3/4	2-1/2			7	160-01615
1/4	1/4	1-1/8	3			7	160-01645
1/4	1/4	3/8	4	2-1/2	.236	7	160-01675
3/8	3/8	7/8	2-1/2			7	160-02415
3/8	3/8	1-1/4	3			7	160-02445
3/8	3/8	1/2	6	3-1/8	.355	7	160-02485
1/2	1/2	1-1/4	3			7	160-03215
1/2	1/2	1-5/8	4			7	160-03245
1/2	1/2	5/8	6	3-1/8	.470	7	160-03275
5/8	5/8	1-5/8	3-1/2			7	160-04015
5/8	5/8	2-1/8	4			7	160-04045
5/8	5/8	3/4	6	3-1/8	.593	7	160-04075
3/4	3/4	1-5/8	4			7	160-04815
3/4	3/4	2-1/4	5			7	160-04845
3/4	3/4	1	6	3-1/8	.715	7	160-04875
1	1	2	4			7	160-06415
1	1	2-5/8	5			7	160-06445
1	1	1-1/4	6	3-1/8	.955	7	160-06475



Series 161

7 Flute for High Speed Machining - Corner Radius



New

7 FLUTE

DIA	SHANK	LOC	OAL	RADIUS	LOR	NECK DIA	FLUTES	nACRo®
1/4	1/4	3/4	2-1/2	.020			7	161-31615
1/4	1/4	3/4	2-1/2	.030			7	161-41615
1/4	1/4	1-1/8	3	.020			7	161-31645
1/4	1/4	1-1/8	3	.030			7	161-41645
1/4	1/4	3/8	4	.020	2-1/2	.236	7	161-31675
1/4	1/4	3/8	4	.030	2-1/2	.236	7	161-41675
3/8	3/8	7/8	2-1/2	.020			7	161-32415
3/8	3/8	7/8	2-1/2	.030			7	161-42415
3/8	3/8	1-1/4	3	.020			7	161-32445
3/8	3/8	1-1/4	3	.030			7	161-42445
3/8	3/8	1/2	6	.020	3-1/8	.355	7	161-32485
3/8	3/8	1/2	6	.030	3-1/8	.355	7	161-42485
1/2	1/2	1-1/4	3	.020			7	161-33215
1/2	1/2	1-1/4	3	.030			7	161-43215
1/2	1/2	1-5/8	4	.020			7	161-33245
1/2	1/2	1-5/8	4	.030			7	161-43245
1/2	1/2	5/8	6	.020	3-1/8	.470	7	161-33275
1/2	1/2	5/8	6	.030	3-1/8	.470	7	161-43275
5/8	5/8	1-5/8	3-1/2	.030			7	161-44015
5/8	5/8	2-1/8	4	.030			7	161-44045
5/8	5/8	3/4	6	.030	3-1/8	.593	7	161-44075
3/4	3/4	1-5/8	4	.030			7	161-44815
3/4	3/4	2-1/4	5	.030			7	161-44845
3/4	3/4	1	6	.030	3-1/8	.715	7	161-44875
1	1	2	4	.030			7	161-46415
1	1	2-5/8	5	.030			7	161-46445
1	1	1-1/4	6	.030	3-1/8	.955	7	161-46475

High Speed Machining of High Tech Materials

Specifically designed for High Speed Finishing of Aerospace materials - - Titanium, Stainless Steel and Nickle based Super Alloys. Unequal indexed to reduce chatter. Available in square end and with standard corner radius sizes. Complete with PROMAX's NEW extremely heat resistant nACRo® coating and special edge prep.

HELIX ANGLE:

- 1/8" thru 1" = 40 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1" = +.000/-0.002

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

Series 112

5 Flute for Super Finishing

5 FLUTE



“Feel The Edge”

FOR CHALLENGING MATERIAL

This high performance end mill designed for maximum production capabilities is eccentric relieved for a smoother running end mill when profiling at maximum speeds. Engineered to accommodate high temperature, alloy & other more difficult materials while improving the surface finish while reducing harmonics with 5 flute geometry.

HELIX ANGLE:

- 1/8" thru 1" = 40 degrees

TOLERANCES:

- Shank: -.0001/-0.0004
- Cutting Diameter:
1/8" thru 1" = +.000/-0.002

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"



Coolant Slot

DIA	SHANK	LOC	OAL	FLUTES	TiCN	AlTiN	nACRo®
1/8	1/8	1/4	1-1/2	5	112-00822	112-00824	112-00825
1/8	1/8	1/2	1-1/2	5	112-00812	112-00814	112-00815
5/32	3/16	3/8	2	5	112-01022	112-01024	112-01025
5/32	3/16	1/2	2	5	112-01012	112-01014	112-01015
3/16	3/16	3/8	2	5	112-01222	112-01224	112-01225
3/16	3/16	5/8	2	5	112-01212	112-01214	112-01215
7/32	1/4	3/8	2	5	112-01422	112-01424	112-01425
7/32	1/4	3/4	2-1/2	5	112-01412	112-01414	112-01415
1/4	1/4	3/8	2	5	112-01622	112-01624	112-01625
1/4	1/4	3/4	2-1/2	5	112-01612	112-01614	112-01615
1/4	1/4	1-1/4	3	5	112-01632	112-01634	112-01635
1/4	1/4	1-1/2	3-1/2	5	112-01642	112-01644	112-01645
9/32	5/16	1/2	2-1/2	5	112-01822	112-01824	112-01825
9/32	5/16	3/4	2-1/2	5	112-01812	112-01814	112-01815
5/16	5/16	1/2	2-1/2	5	112-02022	112-02024	112-02025
5/16	5/16	3/4	2-1/2	5	112-02012	112-02014	112-02015
11/32	3/8	5/8	2	5	112-02222	112-02224	112-02225
11/32	3/8	7/8	2-1/2	5	112-02212	112-02214	112-02215
3/8	3/8	5/8	2	5	112-02422	112-02424	112-02425
3/8	3/8	7/8	2-1/2	5	112-02412	112-02414	112-02415
3/8	3/8	1-1/2	3-1/2	5	112-02432	112-02434	112-02435
7/16	7/16	1	2-3/4	5	112-02812	112-02814	112-02815
1/2	1/2	5/8	2-1/2	5	112-03222	112-03224	112-03225
1/2	1/2	1-1/4	3	5	112-03212	112-03214	112-03215
1/2	1/2	1-1/2	3-1/2	5	112-03232	112-03234	112-03235
1/2	1/2	2	4	5	112-03242	112-03244	112-03245
9/16	9/16	1-1/4	3-1/2	5	112-03612	112-03614	112-03615
5/8	5/8	7/8	3	5	112-04022	112-04024	112-04025
5/8	5/8	1-1/4	3-1/2	5	112-04012	112-04014	112-04015
5/8	5/8	1-3/4	4	5	112-04032	112-04034	112-04035
5/8	5/8	2-1/2	5	5	112-04042	112-04044	112-04045
3/4	3/4	1	3	5	112-04822	112-04824	112-04825
3/4	3/4	1-5/8	4	5	112-04812	112-04814	112-04815
3/4	3/4	2-1/2	5	5	112-04832	112-04834	112-04835
3/4	3/4	3-1/4	6	5	112-04842	112-04844	112-04845
1	1	1-3/4	4	5	112-06412	112-06414	112-06415
1	1	2-3/4	5	5	112-06432	112-06434	112-06435
1	1	3-3/8	6	5	112-06442	112-06444	112-06445

Series 158

5 Flute VAR-A-TECH - Square End



New

DIA	SHANK	LOC	OAL	FLUTES	AlTiN	nACRo®
1/8	1/8	1/2	1-1/2	5	158-00814	158-00815
5/32	3/16	1/2	2	5	158-01014	158-01015
3/16	3/16	3/8	2	5	158-01224	158-01225
3/16	3/16	5/8	2	5	158-01214	158-01215
7/32	1/4	3/4	2-1/2	5	158-01414	158-01415
1/4	1/4	3/8	2	5	158-01624	158-01625
1/4	1/4	3/4	2-1/2	5	158-01614	158-01615
1/4	1/4	1-1/4	3	5	158-01634	158-01635
5/16	5/16	3/4	2-1/2	5	158-02014	158-02015
3/8	3/8	5/8	2	5	158-02424	158-02425
3/8	3/8	7/8	2-1/2	5	158-02414	158-02415
3/8	3/8	1-1/2	3-1/2	5	158-02434	158-02435
7/16	7/16	1	2-3/4	5	158-02814	158-02815
1/2	1/2	5/8	2-1/2	5	158-03224	158-03225
1/2	1/2	1-1/4	3	5	158-03214	158-03215
1/2	1/2	1-1/2	3-1/2	5	158-03234	158-03235
1/2	1/2	2	4	5	158-03244	158-03245
9/16	9/16	1-1/4	3-1/2	5	158-03614	158-03615
5/8	5/8	7/8	3	5	158-04024	158-04025
5/8	5/8	1-1/4	3-1/2	5	158-04014	158-04015
5/8	5/8	1-3/4	4	5	158-04034	158-04035
5/8	5/8	2-1/2	5	5	158-04044	158-04045
3/4	3/4	1	3	5	158-04824	158-04825
3/4	3/4	1-5/8	4	5	158-04814	158-04815
3/4	3/4	2-1/2	5	5	158-04834	158-04835
3/4	3/4	3-1/4	6	5	158-04844	158-04845
1	1	1-3/4	4	5	158-06414	158-06415
1	1	2-3/4	5	5	158-06434	158-06435
1	1	3-3/8	6	5	158-06444	158-06445

**Reduced Vibration
with Special Edge Prep**

5 Flute VAR-A-TECH by PROMAX

Introducing the Newest member of the VAR-A-TECH, the 5 Flute. Designed with the same Vibration Reducing Flute Geometry as the 4 Flute it too has a longer tool life resulting in greater productivity. Users will benefit from the reduction in chatter as it allows for more aggressive machining with greater depths-of-cut and heavier feeds in comparison to standard 5 flute end mills. This New and exciting tool achieves great results in Titanium, other High Temperature Alloys as well as Steels, Stainless Steels, High Strength Alloys and Cast Iron while leaving an impressive surface finish.

TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter:
1/8" thru 1": $+0.000/-0.002$

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"



VAR-A-TECH

**Special Needs ...
Special Tools ...
Modifications ...**

Let PROMAX help you.

Contact our Technical Service & Quotes Department
at 800-878-0502

and receive your Specials with

PROMAX Quality.

Series 155

VAR-A-TECH Vibration Reducing - Square End

New
Additional
Sizes Added



Extended Reach

“Feel The Edge”

**Reduced Vibration
with Special Edge Prep**

TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter:
1/8" thru 1": $+0.000/-0.002$

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	AlTiN	nACRo®
1/8	1/8	1/4			1-1/2	4	155-00824	155-00825
1/8	1/8	1/2			1-1/2	4	155-00814	155-00815
5/32	3/16	3/8			2	4	155-01024	155-01025
5/32	3/16	1/2			2	4	155-01014	155-01015
3/16	3/16	3/8			2	4	155-01224	155-01225
3/16	3/16	5/8			2	4	155-01214	155-01215
7/32	1/4	3/8			2	4	155-01424	155-01425
7/32	1/4	3/4			2-1/2	4	155-01414	155-01415
1/4	1/4	3/8			2	4	155-01624	155-01625
1/4	1/4	3/4			2-1/2	4	155-01614	155-01615
1/4	1/4	1-1/4			3	4	155-01634	155-01635
1/4	1/4	3/4	2-1/8	.235	4	4	155-01664	155-01665
9/32	5/16	3/4			2-1/2	4	155-01814	155-01815
5/16	5/16	1/2			2-1/2	4	155-02024	155-02025
5/16	5/16	3/4			2-1/2	4	155-02014	155-02015
11/32	3/8	7/8			2-1/2	4	155-02214	155-02215
3/8	3/8	5/8			2	4	155-02424	155-02425
3/8	3/8	7/8			2-1/2	4	155-02414	155-02415
3/8	3/8	1-1/2			3-1/2	4	155-02434	155-02435
3/8	3/8	7/8	2-3/8	.355	4	4	155-02464	155-02465
3/8	3/8	7/8	3-3/8	.355	6	4	155-02474	155-02475
7/16	7/16	5/8			2-3/4	4	155-02824	155-02825
7/16	7/16	1			2-3/4	4	155-02814	155-02815
1/2	1/2	5/8			2-1/2	4	155-03224	155-03225
1/2	1/2	1-1/4			3	4	155-03214	155-03215
1/2	1/2	2			4	4	155-03244	155-03245
1/2	1/2	1	2-3/8	.475	6	4	155-03264	155-03265
1/2	1/2	1	3-3/8	.475	6	4	155-03274	155-03275
9/16	9/16	1-1/4			3-1/2	4	155-03614	155-03615
5/8	5/8	7/8			3	4	155-04024	155-04025
5/8	5/8	1-1/4			3-1/2	4	155-04014	155-04015
5/8	5/8	2-1/2			5	4	155-04044	155-04045
5/8	5/8	1-1/4	2-3/8	.590	6	4	155-04064	155-04065
5/8	5/8	1-1/4	3-3/8	.590	6	4	155-04074	155-04075
3/4	3/4	1			3	4	155-04824	155-04825
3/4	3/4	1-5/8			4	4	155-04814	155-04815
3/4	3/4	2-1/2			5	4	155-04834	155-04835
3/4	3/4	1-5/8	2-1/2	.715	6	4	155-04864	155-04865
3/4	3/4	1-5/8	3-3/8	.715	6	4	155-04874	155-04875
1	1	1-3/4			4	4	155-06414	155-06415
1	1	2-3/4			5	4	155-06434	155-06435
1	1	3-3/8			6	4	155-06444	155-06445
1	1	1-7/8	2-1/2	.960	6	4	155-06464	155-06465
1	1	1-7/8	3-3/8	.960	6	4	155-06474	155-06475

Series 157

VAR-A-TECH Vibration Reducing - Ball End

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	AITiN	nACRo®
1/8	1/8	1/4			1-1/2	4	157-00824	157-00825
1/8	1/8	1/2			1-1/2	4	157-00814	157-00815
5/32	3/16	3/8			2	4	157-01024	157-01025
5/32	3/16	1/2			2	4	157-01014	157-01015
3/16	3/16	3/8			2	4	157-01224	157-01225
3/16	3/16	5/8			2	4	157-01214	157-01215
7/32	1/4	3/8			2	4	157-01424	157-01425
7/32	1/4	3/4			2-1/2	4	157-01414	157-01415
1/4	1/4	3/8			2	4	157-01624	157-01625
1/4	1/4	3/4			2-1/2	4	157-01614	157-01615
1/4	1/4	3/4	2-1/8	.235	4	4	157-01664	157-01665
5/16	5/16	1/2			2-1/2	4	157-02024	157-02025
5/16	5/16	3/4			2-1/2	4	157-02014	157-02015
3/8	3/8	5/8			2	4	157-02424	157-02425
3/8	3/8	7/8			2-1/2	4	157-02414	157-02415
3/8	3/8	7/8	2-3/8	.355	4	4	157-02464	157-02465
3/8	3/8	7/8	3-3/8	.355	6	4	157-02474	157-02475
1/2	1/2	5/8			2-1/2	4	157-03224	157-03225
1/2	1/2	1-1/4			3	4	157-03214	157-03215
1/2	1/2	1	2-3/8	.475	6	4	157-03264	157-03265
1/2	1/2	1	3-3/8	.475	6	4	157-03274	157-03275
9/16	9/16	1-1/4			3-1/2	4	157-03614	157-03615
5/8	5/8	1-1/4			3-1/2	4	157-04014	157-04015
5/8	5/8	1-1/4	2-3/8	.590	6	4	157-04064	157-04065
5/8	5/8	1-1/4	3-3/8	.590	6	4	157-04074	157-04075
3/4	3/4	1-5/8			4	4	157-04814	157-04815
3/4	3/4	1-5/8	2-1/2	.715	6	4	157-04864	157-04865
3/4	3/4	1-5/8	3-3/8	.715	6	4	157-04874	157-04875
1	1	1-3/4			4	4	157-06414	157-06415
1	1	2-3/4			5	4	157-06434	157-06435
1	1	1-7/8	2-1/2	.960	6	4	157-06464	157-06465
1	1	1-7/8	3-3/8	.960	6	4	157-06474	157-06475

"Feel The Edge"



Extended Reach

VAR-A-TECH

VAR-A-TECH by PROMAX

with Vibration Reducing Flute Geometry has a longer tool life resulting in greater productivity. Users will benefit from a reduction in chatter as it allows for more aggressive machining with greater depths-of-cut and heavier feeds. This exciting tool allows roughing and finishing at the same time while achieving improved surface finishes. Enjoy great results in Titanium, other High Temperature Alloys as well as Steels, Stainless Steels, High Strength Alloys and Cast Iron.

TOLERANCES:

- Shank: -.0001/-0.0004
- Cutting Diameter:
1/8" thru 1": +.000/-0.002
- Cutting Radius:
1/8" thru 1": +.001/-0.001

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

Series 156

VAR-A-TECH Vibration Reducing - Corner Radius

VAR-A-TECH



.060 Radius



DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AlTiN	nACRo®
1/8	1/8	1/4			.010	1-1/2	4	156-10824	156-10825
1/8	1/8	1/4			.020	1-1/2	4	156-30824	156-30825
1/8	1/8	1/2			.010	1-1/2	4	156-10814	156-10815
1/8	1/8	1/2			.015	1-1/2	4	156-20814	156-20815
1/8	1/8	1/2			.020	1-1/2	4	156-30814	156-30815
5/32	3/16	3/8			.010	2	4	156-11024	156-11025
5/32	3/16	3/8			.015	2	4	156-21024	156-21025
5/32	3/16	3/8			.020	2	4	156-31024	156-31025
5/32	3/16	1/2			.010	2	4	156-11014	156-11015
5/32	3/16	1/2			.015	2	4	156-21014	156-21015
5/32	3/16	1/2			.020	2	4	156-31014	156-31015
3/16	3/16	3/8			.010	2	4	156-11224	156-11225
3/16	3/16	3/8			.015	2	4	156-21224	156-21225
3/16	3/16	3/8			.020	2	4	156-31224	156-31225
3/16	3/16	3/8			.030	2	4	156-41224	156-41225
3/16	3/16	5/8			.010	2	4	156-11214	156-11215
3/16	3/16	5/8			.015	2	4	156-21214	156-21215
3/16	3/16	5/8			.020	2	4	156-31214	156-31215
3/16	3/16	5/8			.030	2	4	156-41214	156-41215
7/32	1/4	3/8			.015	2	4	156-21424	156-21425
7/32	1/4	3/8			.020	2	4	156-31424	156-31425
7/32	1/4	3/4			.015	2-1/2	4	156-21414	156-21415
7/32	1/4	3/4			.020	2-1/2	4	156-31414	156-31415
1/4	1/4	3/8			.010	2	4	156-11624	156-11625
1/4	1/4	3/8			.015	2	4	156-21624	156-21625
1/4	1/4	3/8			.020	2	4	156-31624	156-31625
1/4	1/4	3/8			.030	2	4	156-41624	156-41625
1/4	1/4	3/4			.010	2-1/2	4	156-11614	156-11615
1/4	1/4	3/4			.015	2-1/2	4	156-21614	156-21615
1/4	1/4	3/4			.020	2-1/2	4	156-31614	156-31615
1/4	1/4	3/4			.030	2-1/2	4	156-41614	156-41615
1/4	1/4	1-1/4			.010	3	4	156-11634	156-11635
1/4	1/4	1-1/4			.015	3	4	156-21634	156-21635
1/4	1/4	1-1/4			.020	3	4	156-31634	156-31635
1/4	1/4	1-1/4			.030	3	4	156-41634	156-41635
1/4	1/4	3/4	2-1/8	.235	.010	4	4	156-11664	156-11665
1/4	1/4	3/4	2-1/8	.235	.015	4	4	156-21664	156-21665
1/4	1/4	3/4	2-1/8	.235	.020	4	4	156-31664	156-31665
1/4	1/4	3/4	2-1/8	.235	.030	4	4	156-41664	156-41665
9/32	5/16	3/4			.020	2-1/2	4	156-31814	156-31815
5/16	5/16	1/2			.010	2-1/2	4	156-12024	156-12025
5/16	5/16	1/2			.020	2-1/2	4	156-32024	156-32025
5/16	5/16	1/2			.030	2-1/2	4	156-42024	156-42025

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1": +.000/-.002
- Radius:
1/8" thru 1": +.000/-.001

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

Series 156

VAR-A-TECH Vibration Reducing - Corner Radius

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AlTiN	nACRo®
5/16	5/16	3/4			.010	2-1/2	4	156-12014	156-12015
5/16	5/16	3/4			.020	2-1/2	4	156-32014	156-32015
5/16	5/16	3/4			.030	2-1/2	4	156-42014	156-42015
3/8	3/8	5/8			.010	2	4	156-12424	156-12425
3/8	3/8	5/8			.015	2	4	156-22424	156-22425
3/8	3/8	5/8			.020	2	4	156-32424	156-32425
3/8	3/8	5/8			.030	2	4	156-42424	156-42425
3/8	3/8	7/8			.010	2-1/2	4	156-12414	156-12415
3/8	3/8	7/8			.015	2-1/2	4	156-22414	156-22415
3/8	3/8	7/8			.020	2-1/2	4	156-32414	156-32415
3/8	3/8	7/8			.030	2-1/2	4	156-42414	156-42415
3/8	3/8	1-1/2			.010	3-1/2	4	156-12434	156-12435
3/8	3/8	1-1/2			.015	3-1/2	4	156-22434	156-22435
3/8	3/8	1-1/2			.020	3-1/2	4	156-32434	156-32435
3/8	3/8	1-1/2			.030	3-1/2	4	156-42434	156-42435
3/8	3/8	7/8	2-3/8	.355	.010	4	4	156-12464	156-12465
3/8	3/8	7/8	2-3/8	.355	.015	4	4	156-22464	156-22465
3/8	3/8	7/8	2-3/8	.355	.020	4	4	156-32464	156-32465
3/8	3/8	7/8	2-3/8	.355	.030	4	4	156-42464	156-42465
3/8	3/8	7/8	3-3/8	.355	.010	6	4	156-12474	156-12475
3/8	3/8	7/8	3-3/8	.355	.015	6	4	156-22474	156-22475
3/8	3/8	7/8	3-3/8	.355	.020	6	4	156-32474	156-32475
3/8	3/8	7/8	3-3/8	.355	.030	6	4	156-42474	156-42475
7/16	7/16	5/8			.020	2-3/4	4	156-32824	156-32825
7/16	7/16	1			.020	2-3/4	4	156-32814	156-32815
1/2	1/2	5/8			.010	2-1/2	4	156-13224	156-13225
1/2	1/2	5/8			.015	2-1/2	4	156-23224	156-23225
1/2	1/2	5/8			.020	2-1/2	4	156-33224	156-33225
1/2	1/2	5/8			.030	2-1/2	4	156-43224	156-43225
1/2	1/2	5/8			.060	2-1/2	4	156-63224	156-63225
1/2	1/2	1-1/4			.010	3	4	156-13214	156-13215
1/2	1/2	1-1/4			.015	3	4	156-23214	156-23215
1/2	1/2	1-1/4			.020	3	4	156-33214	156-33215
1/2	1/2	1-1/4			.030	3	4	156-43214	156-43215
1/2	1/2	1-1/4			.060	3	4	156-63214	156-63215
1/2	1/2	2			.010	4	4	156-13244	156-13245
1/2	1/2	2			.015	4	4	156-23244	156-23245
1/2	1/2	2			.020	4	4	156-33244	156-33245
1/2	1/2	2			.030	4	4	156-43244	156-43245
1/2	1/2	2			.060	4	4	156-63244	156-63245
1/2	1/2	1	2-3/8	.475	.010	6	4	156-13264	156-13265
1/2	1/2	1	3-3/8	.475	.010	6	4	156-13274	156-13275
1/2	1/2	1	2-3/8	.475	.015	6	4	156-23264	156-23265

Reduced Vibration
with
Special Edge Prep

VAR-A-TECH



Extended Reach

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1": +.000/-.002
- Radius:
1/8" thru 1": +.000/-.001

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still
available on 6" OAL

Series 156

VAR-A-TECH Vibration Reducing - Corner Radius

VAR-A-TECH



.060 Radius



DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AlTiN	nACRo®
1/2	1/2	1	3-3/8	.475	.015	6	4	156-23274	156-23275
1/2	1/2	1	2-3/8	.475	.020	6	4	156-33264	156-33265
1/2	1/2	1	3-3/8	.475	.020	6	4	156-33274	156-33275
1/2	1/2	1	2-3/8	.475	.030	6	4	156-43264	156-43265
1/2	1/2	1	3-3/8	.475	.030	6	4	156-43274	156-43275
1/2	1/2	1	2-3/8	.475	.060	6	4	156-63264	156-63265
1/2	1/2	1	3-3/8	.475	.060	6	4	156-63274	156-63275
9/16	9/16	1-1/4			.030	3-1/2	4	156-43614	156-43615
5/8	5/8	7/8			.030	3	4	156-44024	156-44025
5/8	5/8	7/8			.060	3	4	156-64024	156-64025
5/8	5/8	1-1/4			.010	3-1/2	4	156-14014	156-14015
5/8	5/8	1-1/4			.015	3-1/2	4	156-24014	156-24015
5/8	5/8	1-1/4			.020	3-1/2	4	156-34014	156-34015
5/8	5/8	1-1/4			.030	3-1/2	4	156-44014	156-44015
5/8	5/8	1-1/4			.060	3-1/2	4	156-64014	156-64015
5/8	5/8	2-1/2			.030	5	4	156-44044	156-44045
5/8	5/8	2-1/2			.060	5	4	156-64044	156-64045
5/8	5/8	1-1/4	2-3/8	.590	.010	6	4	156-14064	156-14065
5/8	5/8	1-1/4	3-3/8	.590	.010	6	4	156-14074	156-14075
5/8	5/8	1-1/4	2-3/8	.590	.015	6	4	156-24064	156-24065
5/8	5/8	1-1/4	3-3/8	.590	.015	6	4	156-24074	156-24075
5/8	5/8	1-1/4	2-3/8	.590	.020	6	4	156-34064	156-34065
5/8	5/8	1-1/4	3-3/8	.590	.020	6	4	156-34074	156-34075
5/8	5/8	1-1/4	2-3/8	.590	.030	6	4	156-44064	156-44065
5/8	5/8	1-1/4	3-3/8	.590	.030	6	4	156-44074	156-44075
5/8	5/8	1-1/4	2-3/8	.590	.060	6	4	156-64064	156-64065
5/8	5/8	1-1/4	3-3/8	.590	.060	6	4	156-64074	156-64075
3/4	3/4	1			.010	3	4	156-14824	156-14825
3/4	3/4	1			.015	3	4	156-24824	156-24825
3/4	3/4	1			.020	3	4	156-34824	156-34825
3/4	3/4	1			.030	3	4	156-44824	156-44825
3/4	3/4	1			.060	3	4	156-64824	156-64825
3/4	3/4	1			.090	3	4	156-74824	156-74825
3/4	3/4	1			.125	3	4	156-84824	156-84825
3/4	3/4	1-5/8			.010	4	4	156-14814	156-14815
3/4	3/4	1-5/8			.015	4	4	156-24814	156-24815
3/4	3/4	1-5/8			.020	4	4	156-34814	156-34815
3/4	3/4	1-5/8			.030	4	4	156-44814	156-44815
3/4	3/4	1-5/8			.060	4	4	156-64814	156-64815
3/4	3/4	1-5/8			.090	4	4	156-74814	156-74815
3/4	3/4	1-5/8			.125	4	4	156-84814	156-84815
3/4	3/4	2-1/2			.030	5	4	156-44834	156-44835
3/4	3/4	2-1/2			.060	5	4	156-64834	156-64835

TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter:
1/8" thru 1": $+.000/-0.002$
- Radius:
1/8" thru 1": $+.000/-0.001$

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

Series 156

VAR-A-TECH Vibration Reducing - Corner Radius

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AlTiN	nACRo®
3/4	3/4	1-5/8	2-1/2	.715	.010	6	4	156-14864	156-14865
3/4	3/4	1-5/8	3-3/8	.715	.010	6	4	156-14874	156-14875
3/4	3/4	1-5/8	2-1/2	.715	.015	6	4	156-24864	156-24865
3/4	3/4	1-5/8	3-3/8	.715	.015	6	4	156-24874	156-24875
3/4	3/4	1-5/8	2-1/2	.715	.020	6	4	156-34864	156-34865
3/4	3/4	1-5/8	3-3/8	.715	.020	6	4	156-34874	156-34875
3/4	3/4	1-5/8	2-1/2	.715	.030	6	4	156-44864	156-44865
3/4	3/4	1-5/8	3-3/8	.715	.030	6	4	156-44874	156-44875
3/4	3/4	1-5/8	2-1/2	.715	.060	6	4	156-64864	156-64865
3/4	3/4	1-5/8	3-3/8	.715	.060	6	4	156-64874	156-64875
3/4	3/4	1-5/8	2-1/2	.715	.090	6	4	156-74864	156-74865
3/4	3/4	1-5/8	3-3/8	.715	.090	6	4	156-74874	156-74875
3/4	3/4	1-5/8	2-1/2	.715	.125	6	4	156-84864	156-84865
3/4	3/4	1-5/8	3-3/8	.715	.125	6	4	156-84874	156-84875
1	1	1-3/4			.030	4	4	156-46414	156-46415
1	1	1-3/4			.060	4	4	156-66414	156-66415
1	1	1-3/4			.090	4	4	156-76414	156-76415
1	1	1-3/4			.125	4	4	156-86414	156-86415
1	1	2-3/4			.030	5	4	156-46434	156-46435
1	1	2-3/4			.060	5	4	156-66434	156-66435
1	1	2-3/4			.090	5	4	156-76434	156-76435
1	1	2-3/4			.125	5	4	156-86434	156-86435
1	1	3-3/8			.030	6	4	156-46444	156-46445
1	1	3-3/8			.060	6	4	156-66444	156-66445
1	1	1-7/8	2-1/2	.960	.030	6	4	156-46464	156-46465
1	1	1-7/8	3-3/8	.960	.030	6	4	156-46474	156-46475
1	1	1-7/8	2-1/2	.960	.060	6	4	156-66464	156-66465
1	1	1-7/8	3-3/8	.960	.060	6	4	156-66474	156-66475
1	1	1-7/8	2-1/2	.960	.090	6	4	156-76464	156-76465
1	1	1-7/8	3-3/8	.960	.090	6	4	156-76474	156-76475
1	1	1-7/8	2-1/2	.960	.125	6	4	156-86464	156-86465
1	1	1-7/8	3-3/8	.960	.125	6	4	156-86474	156-86475



Extended Reach

VAR-A-TECH

VAR-A-TECH by PROMAX

Designed with Vibration Reducing Flute Geometry, the VAR-A-TECH has a longer tool life resulting in greater productivity. Users will benefit from the reduction in chatter as it allows for more aggressive machining with greater depths-of-cut and heavier feeds. This exciting tool allows roughing and finishing at the same time while achieving improved surface finishes. Enjoy outstanding results in Titanium, other High Temperature Alloys as well as Steels, Stainless Steels, High Strength Alloys and Cast Iron.

TOLERANCES:

- Shank: -.0001/-0.0004
- Cutting Diameter:
1/8" thru 1": +.000/-0.002
- Radius:
1/8" thru 1": +.000/-0.001

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

Series 190

PRO-4 Vibration Reducing - Square End



Patented

PRO-4

The Patented PRO-4 solid carbide hybrid cutter combines the best elements of our Finishing End Mill and our Rougher-Finisher. With 8 geometries on 4 flutes, the PRO-4 presents an entirely unique approach to common problems in high-performance machining.

Unique Hybrid Geometry

Cutting edge chip-breakers and finishing geometry appear in an alternating pattern on either the lower or upper half of each flute. In the resulting cutting action, a chip-breaking edge on one half of the tool on one flute is followed by a finishing edge in the same region on the following flute. This geometry accomplishes what other geometries attempt through unequal indexing or multiple helixes.

TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter:
3/16" thru 1": $+0.000/-0.002$

UPON REQUEST:

- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	AlTiN	nACRo®
3/16	3/16	5/8			2	4	190-01214	190-01215
1/4	1/4	3/8			2	4	190-01624	190-01625
1/4	1/4	3/4			2-1/2	4	190-01614	190-01615
1/4	1/4	3/4	2-1/8	.235	4	4	190-01664	190-01665
5/16	5/16	3/4			2-1/2	4	190-02014	190-02015
3/8	3/8	5/8			2	4	190-02424	190-02425
3/8	3/8	7/8			2-1/2	4	190-02414	190-02415
3/8	3/8	7/8	2-1/8	.355	4	4	190-02464	190-02465
3/8	3/8	7/8	3-3/8	.355	6	4	190-02474	190-02475
1/2	1/2	5/8			2-1/2	4	190-03224	190-03225
1/2	1/2	1-1/4			3	4	190-03214	190-03215
1/2	1/2	2			4	4	190-03234	190-03235
1/2	1/2	1	2-3/8	.475	6	4	190-03264	190-03265
1/2	1/2	1	3-3/8	.475	6	4	190-03274	190-03275
5/8	5/8	7/8			3	4	190-04024	190-04025
5/8	5/8	1-1/4			3-1/2	4	190-04014	190-04015
5/8	5/8	1-1/4	2-3/8	.590	6	4	190-04064	190-04065
5/8	5/8	1-1/4	3-3/8	.590	6	4	190-04074	190-04075
3/4	3/4	1			3	4	190-04824	190-04825
3/4	3/4	1-5/8			4	4	190-04814	190-04815
3/4	3/4	1-5/8	2-1/2	.715	6	4	190-04864	190-04865
3/4	3/4	1-5/8	3-3/8	.715	6	4	190-04874	190-04875
1	1	1-3/4			4	4	190-06414	190-06415
1	1	2-3/4			5	4	190-06434	190-06435
1	1	1-3/4	2-1/2	.960	6	4	190-06464	190-06465
1	1	1-3/4	3-3/8	.960	6	4	190-06474	190-06475

- Eliminates Chatter & Vibration
 - Relieves Cutting Pressure Against The Tool With OD Chip-Breakers While Delivering An Excellent Finish
 - Easy & Inexpensive To Regrind
- Equally indexed flutes require standard face regrinding only. No OD or special Indexing.
- Ready For Shrink-Fit Holders
 - Standard With The Most Advanced Aluminum-Titanium-Nitride (AlTiN) Coating

Series 192

PRO-4 Vibration Reducing - Ball End



Patented

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	AlTiN	nACRo®
3/16	3/16	5/8			2	4	192-01214	192-01215
1/4	1/4	3/4			2-1/2	4	192-01614	192-01615
1/4	1/4	3/4	2-1/8	.235	4	4	192-01664	192-01665
5/16	5/16	3/4			2-1/2	4	192-02014	192-02015
3/8	3/8	7/8			2-1/2	4	192-02414	192-02415
3/8	3/8	7/8	2-1/8	.355	4	4	192-02464	192-02465
3/8	3/8	7/8	3-3/8	.355	6	4	192-02474	192-02475
1/2	1/2	1-1/4			3	4	192-03214	192-03215
1/2	1/2	2			4	4	192-03234	192-03235
1/2	1/2	1	2-3/8	.475	6	4	192-03264	192-03265
1/2	1/2	1	3-3/8	.475	6	4	192-03274	192-03275
5/8	5/8	7/8			3	4	192-04024	192-04025
5/8	5/8	1-1/4			3-1/2	4	192-04014	192-04015
5/8	5/8	1-1/4	2-3/8	.590	6	4	192-04064	192-04065
5/8	5/8	1-1/4	3-3/8	.590	6	4	192-04074	192-04075
3/4	3/4	1			3	4	192-04824	192-04825
3/4	3/4	1-5/8			4	4	192-04814	192-04815
3/4	3/4	1-5/8	2-1/2	.715	6	4	192-04864	192-04865
3/4	3/4	1-5/8	3-3/8	.715	6	4	192-04874	192-04875
1	1	1-3/4			4	4	192-06414	192-06415
1	1	1-3/4	2-1/2	.960	6	4	192-06464	192-06465
1	1	1-3/4	3-3/8	.960	6	4	192-06474	192-06475

- Eliminates Chatter & Vibration
- Relieves Cutting Pressure Against The Tool With OD Chip-Breakers While Delivering An Excellent Finish
- Easy & Inexpensive To Regrind
Equally indexed flutes require standard face regrinding only. No OD or special Indexing.
- Ready For Shrink-Fit Holders
- Standard With The Most Advanced Aluminum-Titanium-Nitride (AlTiN) Coating

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
3/16" thru 1": +.000/-.002
- Ball Radius: +.001/-.001

UPON REQUEST:

- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

See Page 14 For PRO-4 Square End

See Pages 16 - 19 For PRO-4 Corner Radius

See Pages 22 - 23 For Series 120 4 Flute Rougher-Finishers

See Page 9 For Series 157 4 Flute Ball End Mills

PRO-4

Series 191

PRO-4 Vibration Reducing - Corner Radius

PRO-4



Patented

Extended Reach

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AlTiN	nACRo®
3/16	3/16	5/8			.010	2	4	191-11214	191-11215
3/16	3/16	5/8			.015	2	4	191-21214	191-21215
3/16	3/16	5/8			.020	2	4	191-31214	191-31215
3/16	3/16	5/8			.030	2	4	191-41214	191-41215
7/32	1/4	3/4			.010	2-1/2	4	191-11414	191-11415
7/32	1/4	3/4			.015	2-1/2	4	191-21414	191-21415
7/32	1/4	3/4			.020	2-1/2	4	191-31414	191-31415
1/4	1/4	3/8			.010	2	4	191-11624	191-11625
1/4	1/4	3/8			.015	2	4	191-21624	191-21625
1/4	1/4	3/8			.020	2	4	191-31624	191-31625
1/4	1/4	3/8			.030	2	4	191-41624	191-41625
1/4	1/4	3/4			.010	2-1/2	4	191-11614	191-11615
1/4	1/4	3/4			.015	2-1/2	4	191-21614	191-21615
1/4	1/4	3/4			.020	2-1/2	4	191-31614	191-31615
1/4	1/4	3/4			.030	2-1/2	4	191-41614	191-41615
1/4	1/4	3/4	2-1/8	.235	.010	4	4	191-11664	191-11665
1/4	1/4	3/4	2-1/8	.235	.015	4	4	191-21664	191-21665
1/4	1/4	3/4	2-1/8	.235	.020	4	4	191-31664	191-31665
1/4	1/4	3/4	2-1/8	.235	.030	4	4	191-41664	191-41665
5/16	5/16	3/4			.010	2-1/2	4	191-12014	191-12015
5/16	5/16	3/4			.015	2-1/2	4	191-22014	191-22015
5/16	5/16	3/4			.020	2-1/2	4	191-32014	191-32015
5/16	5/16	3/4			.030	2-1/2	4	191-42014	191-42015
3/8	3/8	5/8			.010	2	4	191-12424	191-12425
3/8	3/8	5/8			.015	2	4	191-22424	191-22425
3/8	3/8	5/8			.020	2	4	191-32424	191-32425
3/8	3/8	5/8			.030	2	4	191-42424	191-42425
3/8	3/8	7/8			.010	2-1/2	4	191-12414	191-12415
3/8	3/8	7/8			.015	2-1/2	4	191-22414	191-22415
3/8	3/8	7/8			.020	2-1/2	4	191-32414	191-32415
3/8	3/8	7/8			.030	2-1/2	4	191-42414	191-42415
3/8	3/8	7/8	2-1/8	.355	.010	4	4	191-12464	191-12465
3/8	3/8	7/8	2-1/8	.355	.015	4	4	191-22464	191-22465
3/8	3/8	7/8	2-1/8	.355	.020	4	4	191-32464	191-32465
3/8	3/8	7/8	2-1/8	.355	.030	4	4	191-42464	191-42465
3/8	3/8	7/8	3-3/8	.355	.010	6	4	191-12474	191-12475
3/8	3/8	7/8	3-3/8	.355	.015	6	4	191-22474	191-22475
3/8	3/8	7/8	3-3/8	.355	.020	6	4	191-32474	191-32475
3/8	3/8	7/8	3-3/8	.355	.030	6	4	191-42474	191-42475
1/2	1/2	5/8			.010	2-1/2	4	191-13224	191-13225
1/2	1/2	5/8			.015	2-1/2	4	191-23224	191-23225
1/2	1/2	5/8			.020	2-1/2	4	191-33224	191-33225

TOLERANCES:

- Shank: -.0001/-0.0004
- Cutting Diameter:
3/16" thru 1": +.000/-0.002

UPON REQUEST:

- Coolant, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

Series 191

PRO-4 Vibration Reducing - Corner Radius

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AlTiN	nACRo®
1/2	1/2	5/8			.030	2-1/2	4	191-43224	191-43225
1/2	1/2	5/8			.045	2-1/2	4	191-53224	191-53225
1/2	1/2	5/8			.060	2-1/2	4	191-63224	191-63225
1/2	1/2	1-1/4			.010	3	4	191-13214	191-13215
1/2	1/2	1-1/4			.015	3	4	191-23214	191-23215
1/2	1/2	1-1/4			.020	3	4	191-33214	191-33215
1/2	1/2	1-1/4			.030	3	4	191-43214	191-43215
1/2	1/2	1-1/4			.045	3	4	191-53214	191-53215
1/2	1/2	1-1/4			.060	3	4	191-63214	191-63215
1/2	1/2	2			.010	4	4	191-13234	191-13235
1/2	1/2	2			.015	4	4	191-23234	191-23235
1/2	1/2	2			.020	4	4	191-33234	191-33235
1/2	1/2	2			.030	4	4	191-43234	191-43235
1/2	1/2	2			.045	4	4	191-53234	191-53235
1/2	1/2	2			.060	4	4	191-63234	191-63235
1/2	1/2	1	2-3/8	.475	.010	6	4	191-13264	191-13265
1/2	1/2	1	3-3/8	.475	.010	6	4	191-13274	191-13275
1/2	1/2	1	2-3/8	.475	.015	6	4	191-23264	191-23265
1/2	1/2	1	3-3/8	.475	.015	6	4	191-23274	191-23275
1/2	1/2	1	2-3/8	.475	.020	6	4	191-33264	191-33265
1/2	1/2	1	3-3/8	.475	.020	6	4	191-33274	191-33275
1/2	1/2	1	2-3/8	.475	.030	6	4	191-43264	191-43265
1/2	1/2	1	3-3/8	.475	.030	6	4	191-43274	191-43275
1/2	1/2	1	2-3/8	.475	.045	6	4	191-53264	191-53265
1/2	1/2	1	3-3/8	.475	.045	6	4	191-53274	191-53275
1/2	1/2	1	2-3/8	.475	.060	6	4	191-63264	191-63265
1/2	1/2	1	3-3/8	.475	.060	6	4	191-63274	191-63275
5/8	5/8	7/8			.010	3	4	191-14024	191-14025
5/8	5/8	7/8			.015	3	4	191-24024	191-24025
5/8	5/8	7/8			.020	3	4	191-34024	191-34025
5/8	5/8	7/8			.030	3	4	191-44024	191-44025
5/8	5/8	7/8			.060	3	4	191-64024	191-64025
5/8	5/8	1-1/4			.010	3-1/2	4	191-14014	191-14015
5/8	5/8	1-1/4			.015	3-1/2	4	191-24014	191-24015
5/8	5/8	1-1/4			.020	3-1/2	4	191-34014	191-34015
5/8	5/8	1-1/4			.030	3-1/2	4	191-44014	191-44015
5/8	5/8	1-1/4			.060	3-1/2	4	191-64014	191-64015
5/8	5/8	1-1/4	2-3/8	.590	.010	6	4	191-14064	191-14065
5/8	5/8	1-1/4	3-3/8	.590	.010	6	4	191-14074	191-14075
5/8	5/8	1-1/4	2-3/8	.590	.015	6	4	191-24064	191-24065
5/8	5/8	1-1/4	3-3/8	.590	.015	6	4	191-24074	191-24075
5/8	5/8	1-1/4	2-3/8	.590	.020	6	4	191-34064	191-34065



Patented

PRO-4

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
3/16" thru 1": +.000/-.002

UPON REQUEST:

- Coolant, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

Series 191

PRO-4 Vibration Reducing - Corner Radius

PRO-4



Patented

Extended Reach

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AITiN	nACRo®
5/8	5/8	1-1/4	3-3/8	.590	.020	6	4	191-34074	191-34075
5/8	5/8	1-1/4	2-3/8	.590	.030	6	4	191-44064	191-44065
5/8	5/8	1-1/4	3-3/8	.590	.030	6	4	191-44074	191-44075
5/8	5/8	1-1/4	2-3/8	.590	.060	6	4	191-64064	191-64065
5/8	5/8	1-1/4	3-3/8	.590	.060	6	4	191-64074	191-64075
3/4	3/4	1			.010	3	4	191-14824	191-14825
3/4	3/4	1			.015	3	4	191-24824	191-24825
3/4	3/4	1			.020	3	4	191-34824	191-34825
3/4	3/4	1			.030	3	4	191-44824	191-44825
3/4	3/4	1			.060	3	4	191-64824	191-64825
3/4	3/4	1			.090	3	4	191-74824	191-74825
3/4	3/4	1			.125	3	4	191-84824	191-84825
3/4	3/4	1-5/8			.010	4	4	191-14814	191-14815
3/4	3/4	1-5/8			.015	4	4	191-24814	191-24815
3/4	3/4	1-5/8			.020	4	4	191-34814	191-34815
3/4	3/4	1-5/8			.030	4	4	191-44814	191-44815
3/4	3/4	1-5/8			.060	4	4	191-64814	191-64815
3/4	3/4	1-5/8			.090	4	4	191-74814	191-74815
3/4	3/4	1-5/8			.125	4	4	191-84814	191-84815
3/4	3/4	1-5/8	2-1/2	.715	.010	6	4	191-14864	191-14865
3/4	3/4	1-5/8	3-3/8	.715	.010	6	4	191-14874	191-14875
3/4	3/4	1-5/8	2-1/2	.715	.015	6	4	191-24864	191-24865
3/4	3/4	1-5/8	3-3/8	.715	.015	6	4	191-24874	191-24875
3/4	3/4	1-5/8	2-1/2	.715	.020	6	4	191-34864	191-34865
3/4	3/4	1-5/8	3-3/8	.715	.020	6	4	191-34874	191-34875
3/4	3/4	1-5/8	2-1/2	.715	.030	6	4	191-44864	191-44865
3/4	3/4	1-5/8	3-3/8	.715	.030	6	4	191-44874	191-44875
3/4	3/4	1-5/8	2-1/2	.715	.060	6	4	191-64864	191-64865
3/4	3/4	1-5/8	3-3/8	.715	.060	6	4	191-64874	191-64875
3/4	3/4	1-5/8	2-1/2	.715	.090	6	4	191-74864	191-74865
3/4	3/4	1-5/8	3-3/8	.715	.090	6	4	191-74874	191-74875
3/4	3/4	1-5/8	2-1/2	.715	.125	6	4	191-84864	191-84865
3/4	3/4	1-5/8	3-3/8	.715	.125	6	4	191-84874	191-84875
1	1	1-3/4			.030	4	4	191-46414	191-46415
1	1	1-3/4			.060	4	4	191-66414	191-66415
1	1	1-3/4			.090	4	4	191-76414	191-76415
1	1	1-3/4			.125	4	4	191-86414	191-86415
1	1	2-3/4			.030	5	4	191-46434	191-46435
1	1	2-3/4			.060	5	4	191-66434	191-66435
1	1	2-3/4			.090	5	4	191-76434	191-76435
1	1	2-3/4			.125	5	4	191-86434	191-86435
1	1	1-3/4	2-1/2	.960	.030	6	4	191-46464	191-46465

TOLERANCES:

- Shank: -.0001/- .0004
- Cutting Diameter:
3/16" thru 1": +.000/- .002

UPON REQUEST:

- Coolant, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"
- 4-1/8" LOR still available on 6" OAL

Series 191

PRO-4 Vibration Reducing - Corner Radius

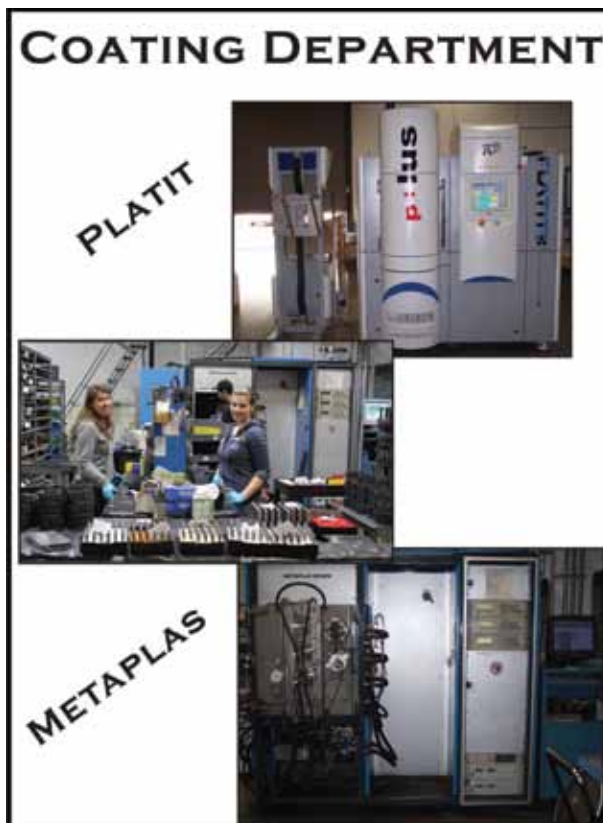
DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTE	AlTiN	nACRo®
1	1	1-3/4	3-3/8	.960	.030	6	4	191-46474	191-46475
1	1	1-3/4	2-1/2	.960	.060	6	4	191-66464	191-66465
1	1	1-3/4	3-3/8	.960	.060	6	4	191-66474	191-66475
1	1	1-3/4	2-1/2	.960	.090	6	4	191-76464	191-76465
1	1	1-3/4	3-3/8	.960	.090	6	4	191-76474	191-76475
1	1	1-3/4	2-1/2	.960	.125	6	4	191-86464	191-86465
1	1	1-3/4	3-3/8	.960	.125	6	4	191-86474	191-86475



Patented

PRO-4

- Eliminates Chatter & Vibration
 - Relieves Cutting Pressure Against The Tool With OD Chip-Breakers While Delivering An Excellent Finish
 - Easy & Inexpensive To Regrind
- Equally indexed flutes require standard face regrinding only. No OD or special Indexing.
- Ready For Shrink-Fit Holders
 - Standard With The Most Advanced Aluminum-Titanium-Nitride (AlTiN) Coating



TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter:
 $3/16''$ thru $1''$: $+0.000/-0.002$

UPON REQUEST:

- Coolant, $3/8''$ thru $1''$
- Set screw flats, $3/8''$ thru $1''$
- $4-1/8''$ LOR still available on $6''$ OAL

With our own coating chambers, we are better able to meet our customer needs, including faster turn around times on specials as well as making sure the inventory is on hand.

Series 111

4 Flute End Mills For Steels & Alloys



4 FLUTE

“Feel The Edge”

HIGHER CHIP LOADS

The Series 111, 4 flute finishing tool for low and high carbon steels, stainless steel and high temperature alloys, was designed with eccentric relief, creating a 25% stronger cutting edge while running smoother at maximum speeds. Improved surface finish at higher chip loads. Due to the balance of the geometry, substrate and coatings this high performance end mill will achieve levels never thought to be attainable..

TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter:
 - $1/32''$ thru $7/64'' = +.000/-0.0005$
 - $1/8''$ thru $1'' = +.000/-0.002$

HELIX ANGLE:

- $1/32''$ thru $7/64'' = 30$ degrees
- $1/8''$ thru $1'' = 40$ degrees

UPON REQUEST:

- Coolant, $3/8''$ thru $1''$
- Set screw flats, $3/8''$ thru $1''$
- 4- $1/8''$ LOR still available on 6" OAL

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	TiCN	AlTiN
1/32	1/8	3/32			1-1/2	4	111-00212	111-00214
3/64	1/8	9/64			1-1/2	4	111-00312	111-00314
1/16	1/8	1/8			1-1/2	4	111-00422	111-00424
1/16	1/8	3/16			1-1/2	4	111-00412	111-00414
5/64	1/8	1/4			1-1/2	4	111-00512	111-00514
3/32	1/8	3/16			1-1/2	4	111-00622	111-00624
3/32	1/8	9/32			1-1/2	4	111-00612	111-00614
7/64	1/8	3/16			1-1/2	4	111-00722	111-00724
7/64	1/8	3/8			1-1/2	4	111-00712	111-00714
1/8	1/8	1/4			1-1/2	4	111-00822	111-00824
1/8	1/8	1/2			1-1/2	4	111-00812	111-00814
5/32	3/16	3/8			2	4	111-01022	111-01024
5/32	3/16	1/2			2	4	111-01012	111-01014
3/16	3/16	3/8			2	4	111-01222	111-01224
3/16	3/16	5/8			2	4	111-01212	111-01214
7/32	1/4	3/8			2	4	111-01422	111-01424
7/32	1/4	3/4			2-1/2	4	111-01412	111-01414
1/4	1/4	3/8			2	4	111-01622	111-01624
1/4	1/4	3/4			2-1/2	4	111-01612	111-01614
1/4	1/4	1-1/4			3	4	111-01632	111-01634
1/4	1/4	1-1/2			3-1/2	4	111-01642	111-01644
1/4	1/4	3/8	2-1/8	.235	4	4	111-01662	111-01664
9/32	5/16	1/2			2-1/2	4	111-01822	111-01824
9/32	5/16	3/4			2-1/2	4	111-01812	111-01814
5/16	5/16	1/2			2-1/2	4	111-02022	111-02024
5/16	5/16	3/4			2-1/2	4	111-02012	111-02014
5/16	5/16	7/16	2-1/8	.297	4	4	111-02062	111-02064
11/32	3/8	5/8			2	4	111-02222	111-02224
11/32	3/8	7/8			2-1/2	4	111-02212	111-02214
3/8	3/8	5/8			2	4	111-02422	111-02424
3/8	3/8	7/8			2-1/2	4	111-02412	111-02414
3/8	3/8	1-1/2			3-1/2	4	111-02432	111-02434
3/8	3/8	2			4	4	111-02442	111-02444
3/8	3/8	1/2	2-1/8	.355	6	4	111-02462	111-02464
3/8	3/8	1/2	3-3/8	.355	6	4	111-02472	111-02474
7/16	7/16	1			2-3/4	4	111-02812	111-02814

Series 111

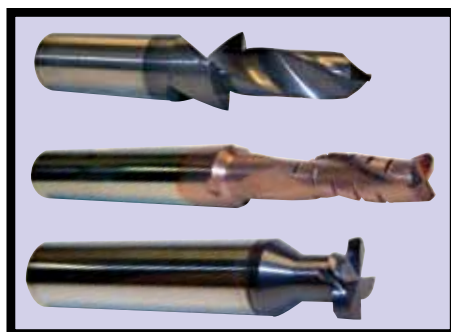
4 Flute End Mills For Steels & Alloys

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	TiCN	AlTiN
1/2	1/2	5/8			2-1/2	4	111-03222	111-03224
1/2	1/2	1-1/4			3	4	111-03212	111-03214
1/2	1/2	1-1/2			3-1/2	4	111-03232	111-03234
1/2	1/2	2			4	4	111-03242	111-03244
1/2	1/2	5/8	2-3/8	.475	6	4	111-03262	111-03264
1/2	1/2	5/8	3-3/8	.475	6	4	111-03272	111-03274
9/16	9/16	1-1/4			3-1/2	4	111-03612	111-03614
5/8	5/8	7/8			3	4	111-04022	111-04024
5/8	5/8	1-1/4			3-1/2	4	111-04012	111-04014
5/8	5/8	1-3/4			4	4	111-04032	111-04034
5/8	5/8	2-1/2			5	4	111-04042	111-04044
5/8	5/8	3/4	2-3/8	.590	6	4	111-04062	111-04064
5/8	5/8	3/4	3-3/8	.590	6	4	111-04072	111-04074
3/4	3/4	1			3	4	111-04822	111-04824
3/4	3/4	1-5/8			4	4	111-04812	111-04814
3/4	3/4	2-1/2			5	4	111-04832	111-04834
3/4	3/4	1	2-1/2	.715	6	4	111-04862	111-04864
3/4	3/4	1	3-3/8	.715	6	4	111-04872	111-04874
3/4	3/4	3-1/4			6	4	111-04842	111-04844
1	1	1-3/4			4	4	111-06412	111-06414
1	1	2-3/4			5	4	111-06432	111-06434
1	1	1-1/4	2-1/2	.960	6	4	111-06462	111-06464
1	1	1-1/4	3-3/8	.960	6	4	111-06472	111-06474



Extended Reach

4 FLUTE



Our experienced and quality Specials Department, with state-of-the-art equipment, is ready to meet your specific requests.



See Page 10 - 13 For 4 Flute Corner Radius Tools

See Page 9 For 4 Flute Ball Nose Tools

Series 120

4 Flute Rougher-Finisher for All Material Types

**With Special
Edge Prep
For Longer Tool Life**



DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTES	TiCN	AlTiN	nACRo®
1/8	1/8	1/4			.010	1-1/2	4	120-00822	120-00824	120-00825
1/8	1/8	1/2			.010	1-1/2	4	120-00812	120-00814	120-00815
5/32	3/16	3/8			.010	2	4	120-01022	120-01024	120-01025
5/32	3/16	1/2			.010	2	4	120-01012	120-01014	120-01015
3/16	3/16	3/8			.010	2	4	120-01222	120-01224	120-01225
3/16	3/16	5/8			.010	2	4	120-01212	120-01214	120-01215
7/32	1/4	3/8			.020	2	4	120-01422	120-01424	120-01425
7/32	1/4	3/4			.020	2-1/2	4	120-01412	120-01414	120-01415
1/4	1/4	3/8			.020	2	4	120-01622	120-01624	120-01625
1/4	1/4	3/4			.020	2-1/2	4	120-01612	120-01614	120-01615
1/4	1/4	1-1/4			.020	3	4	120-01632	120-01634	120-01635
1/4	1/4	1-1/2			.020	3-1/2	4	120-01642	120-01644	120-01645
1/4	1/4	3/4	2-1/8	.235	.020	4	4	120-01662	120-01664	120-01665
9/32	5/16	1/2			.020	2-1/2	4	120-01822	120-01824	120-01825
9/32	5/16	3/4			.020	2-1/2	4	120-01812	120-01814	120-01815
5/16	5/16	1/2			.020	2-1/2	4	120-02022	120-02024	120-02025
5/16	5/16	3/4			.020	2-1/2	4	120-02012	120-02014	120-02015
11/32	3/8	5/8			.020	2	4	120-02222	120-02224	120-02225
11/32	3/8	7/8			.020	2-1/2	4	120-02212	120-02214	120-02215
3/8	3/8	5/8			.020	2	4	120-02422	120-02424	120-02425
3/8	3/8	7/8			.020	2-1/2	4	120-02412	120-02414	120-02415
3/8	3/8	1-1/2			.020	3-1/2	4	120-02432	120-02434	120-02435
3/8	3/8	7/8	2-1/8	.355	.020	4	4	120-02462	120-02464	120-02465
3/8	3/8	2			.020	4	4	120-02442	120-02444	120-02445
3/8	3/8	7/8	3-3/8	.355	.020	6	4	120-02472	120-02474	120-02475
7/16	7/16	1			.020	2-3/4	4	120-02812	120-02814	120-02815
1/2	1/2	5/8			.020	2-1/2	4	120-03222	120-03224	120-03225
1/2	1/2	1-1/4			.020	3	4	120-03212	120-03214	120-03215
1/2	1/2	1-1/2			.020	3-1/2	4	120-03232	120-03234	120-03235
1/2	1/2	2			.020	4	4	120-03242	120-03244	120-03245
1/2	1/2	1	2-3/8	.475	.020	6	4	120-03262	120-03264	120-03265
1/2	1/2	1	3-3/8	.475	.020	6	4	120-03272	120-03274	120-03275
1/2	1/2	1	4-1/8	.475	.020	6	4	120-03282	120-03284	120-03285
9/16	9/16	1-1/4			.030	3-1/2	4	120-03612	120-03614	120-03615
5/8	5/8	7/8			.030	3	4	120-04022	120-04024	120-04025
5/8	5/8	1-1/4			.030	3-1/2	4	120-04012	120-04014	120-04015
5/8	5/8	1-3/4			.030	4	4	120-04032	120-04034	120-04035
5/8	5/8	2-1/2			.030	5	4	120-04042	120-04044	120-04045

4 FLUTE

Series 120

4 Flute Rougher-Finisher for All Material Types

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTES	TiCN	AlTiN	nACRo®
5/8	5/8	1-1/4	2-3/8	.590	.030	6	4	120-04062	120-04064	120-04065
5/8	5/8	1-1/4	3-3/8	.590	.030	6	4	120-04072	120-04074	120-04075
5/8	5/8	1-1/4	4-1/8	.590	.030	6	4	120-04082	120-04084	120-04085
3/4	3/4	1			.030	3	4	120-04822	120-04824	120-04825
3/4	3/4	1-5/8			.030	4	4	120-04812	120-04814	120-04815
3/4	3/4	1-5/8	2-1/2	.715	.030	6	4	120-04862	120-04864	120-04865
3/4	3/4	1-5/8	3-3/8	.715	.030	6	4	120-04872	120-04874	120-04875
3/4	3/4	1-5/8	4-1/8	.715	.030	6	4	120-04882	120-04884	120-04885
1	1	1-3/4			.030	4	4	120-06412	120-06414	120-06415
1	1	1-3/4	2-1/2	.960	.030	6	4	120-06462	120-06464	120-06465
1	1	1-3/4	3-3/8	.960	.030	6	4	120-06472	120-06474	120-06475
1	1	1-3/4	4-1/8	.960	.030	6	4	120-06482	120-06484	120-06485

GREAT SURFACE FINISH:

Bridging the gap between full roughing & finishing applications while maintaining an exceptional part surface finish, our Series 120 & 121 end mills relieve tool pressure during machining. A corner radius is standard for improved edge protection. These tools are perfect when machining Inconel, Titanium & Stainless Steel.

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1/4": +.000/-.002
9/32" thru 1": +.000/-.003

HELIX ANGLE:

- 1/8" thru 1" = 40 degrees

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

SET SCREW FLATS:

- Standard on 3/8" thru 1"
- Flats NOT included on tools with LOR

4 FLUTE

Series 121

5 Flute for Steels & High Strength Alloys



DIA	SHANK	LOC	RADIUS	OAL	FLUTES	TiCN	AlTiN	nACRo®
3/4	3/4	2-1/2	.030	5	5	121-04832	121-04834	121-04835
3/4	3/4	3-1/4	.030	6	5	121-04842	121-04844	121-04845
1	1	2-3/4	.030	5	5	121-06432	121-06434	121-06435
1	1	3-3/8	.030	6	5	121-06442	121-06444	121-06445

5 FLUTE

Series 100

General Purpose Roughing End Mill



ROUGHING APPLICATIONS

Series 100 Roughing End Mills are recommended for general purpose applications in material up to 50 Rc, including normalized carbon & alloy steels, cast steels, stainless steels, cast irons, brass and bronze.

HELIX ANGLE:

- 1/4" thru 1" = 30 degrees

TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter: $+.000/-0.005$

CORNER RADIUS:

(To strengthen end teeth)

- 3/16" = .025/.035
- 1/4" thru 5/16" = .040/.050
- 3/8" thru 1" = .055/.065

SET SCREW FLATS:

- Standard on 3/8" thru 1"

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

DIA	SHANK	LOC	OAL	FLUTES	TiCN	AlTiN	nACRo®
3/16	3/16	3/8	2	3	100-01222	100-01224	100-01225
3/16	3/16	5/8	2	3	100-01212	100-01214	100-01215
1/4	1/4	3/8	2	4	100-01622	100-01624	100-01625
1/4	1/4	3/4	2-1/2	4	100-01612	100-01614	100-01615
5/16	5/16	1/2	2-1/2	4	100-02022	100-02024	100-02025
5/16	5/16	3/4	2-1/2	4	100-02012	100-02014	100-02015
3/8	3/8	5/8	2	4	100-02422	100-02424	100-02425
3/8	3/8	7/8	2-1/2	4	100-02412	100-02414	100-02415
7/16	7/16	1	2-3/4	4	100-02812	100-02814	100-02815
1/2	1/2	5/8	2-1/2	4	100-03222	100-03224	100-03225
1/2	1/2	1-1/4	3	4	100-03212	100-03214	100-03215
1/2	1/2	1-1/2	3-1/2	4	100-03232	100-03234	100-03235
9/16	9/16	1-1/4	3-1/2	4	100-03612	100-03614	100-03615
5/8	5/8	7/8	3	4	100-04022	100-04024	100-04025
5/8	5/8	1-1/4	3-1/2	4	100-04012	100-04014	100-04015
5/8	5/8	2	4	4	100-04032	100-04034	100-04035
3/4	3/4	1	3	4	100-04822	100-04824	100-04825
3/4	3/4	1-5/8	4	4	100-04812	100-04814	100-04815
3/4	3/4	2-1/4	5	4	100-04832	100-04834	100-04835
1	1	1-3/4	4	5	100-06412	100-06414	100-06415
1	1	2-5/8	5	5	100-06432	100-06434	100-06435

MULTI-FLUTE



Each PROMAX Tool has Special Edge Prep to reduce or even eliminate the timely Break-In process.

"FEEL THE EDGE"

Series 101

Roughing End Mills for Space Age Exotics



DIA	SHANK	LOC	OAL	FLUTES	TiCN	AlTiN	nACRo®
3/16	3/16	3/8	2	3	101-01222	101-01224	101-01225
3/16	3/16	5/8	2	3	101-01212	101-01214	101-01215
1/4	1/4	3/8	2	4	101-01622	101-01624	101-01625
1/4	1/4	3/4	2-1/2	4	101-01612	101-01614	101-01615
5/16	5/16	1/2	2-1/2	4	101-02022	101-02024	101-02025
5/16	5/16	3/4	2-1/2	4	101-02012	101-02014	101-02015
3/8	3/8	5/8	2	4	101-02422	101-02424	101-02425
3/8	3/8	7/8	2-1/2	4	101-02412	101-02414	101-02415
7/16	7/16	1	2-3/4	4	101-02812	101-02814	101-02815
1/2	1/2	5/8	2-1/2	4	101-03222	101-03224	101-03225
1/2	1/2	1-1/4	3	4	101-03212	101-03214	101-03215
1/2	1/2	1-1/2	3-1/2	4	101-03232	101-03234	101-03235
9/16	9/16	1-1/4	3-1/2	4	101-03612	101-03614	101-03615
5/8	5/8	7/8	3	4	101-04022	101-04024	101-04025
5/8	5/8	1-1/4	3-1/2	4	101-04012	101-04014	101-04015
5/8	5/8	2	4	4	101-04032	101-04034	101-04035
3/4	3/4	1	3	4	101-04822	101-04824	101-04825
3/4	3/4	1-5/8	4	4	101-04812	101-04814	101-04815
3/4	3/4	2-1/4	5	4	101-04832	101-04834	101-04835
1	1	1-3/4	4	6	101-06412	101-06414	101-06415
1	1	2-5/8	5	6	101-06432	101-06434	101-06435

ROUGHING THE EXOTICS

Series 101 Roughing End Mills are designed for space age exotic materials, like titanium & nickel based/high temperature alloys (inconel, rene, waspoy, etc). Its hi-helix & fine profile geometry reduces tool pressure & generates less heat while allowing heavier cuts at increased feed rates.

HELIX ANGLE:

- 3/16" thru 1" = 40 degrees

TOLERANCES:

- Shank: -.0001/-0.0004
- Cutting Diameter: +.000/-0.005

CORNER RADIUS:

(To strengthen end teeth)

- 3/16" = .025/.035
- 1/4" thru 5/16" = .040/.050
- 3/8" thru 1" = .055/.065

SET SCREW FLATS:

- Standard on 3/8" thru 1"

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

See Page 29 For Series 102 Rougher for Light Alloys

See Page 44 for Series 103 Rougher for Harden Materials

See Page 14 For PRO-4 Square End

See Pages 22 - 23 For Series 120 4 Flute Rougher-Finishers

MULTI-FLUTE

Series 110

3 Flute for High Speed Machining of Aluminum



Standard Length



Extended Reach

3 FLUTE

VERY AGGRESSIVE

Series 110, with 3 Flute geometry, is designed for high speed machining of Aluminum and Light Alloys. Standard with corner radius.

HELIX:

- 1/4" thru 1": 35 Degree

TOLERANCES:

- Shank: -.0001/-0.0004
- Cutting Diameter:
1/4" thru 1": +.000/-0.002

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTES	ZrN
1/4	1/4	3/8			.015	2	3	110-01626
1/4	1/4	3/4			.015	2-1/2	3	110-01616
1/4	1/4	3/8	2-1/8	.235	.015	4	3	110-01666
3/8	3/8	5/8			.015	2	3	110-02426
3/8	3/8	7/8			.015	2-1/2	3	110-02416
3/8	3/8	5/8	2-3/8	.355	.015	4	3	110-02466
1/2	1/2	5/8			.025	2-1/2	3	110-03226
1/2	1/2	1			.025	3	3	110-03216
1/2	1/2	5/8	2-3/4	.475	.025	4	3	110-03266
5/8	5/8	1-1/4			.030	3-1/2	3	110-04016
5/8	5/8	3/4	3-1/2	.590	.030	6	3	110-04076
3/4	3/4	1-5/8			.030	4	3	110-04816
3/4	3/4	1	3-1/2	.715	.030	6	3	110-04876
1	1	1-3/4			.030	4	3	110-06416
1	1	1-1/4	3-1/2	.960	.030	6	3	110-06476



Our team works hard, so your jobs run smooth. The use of CNC grinding machines keep each tool we make consistent with the next. Our inspectors verify consistency and geometry so that our customers are sure to get the same tool every time they order.

Series 109

3 Flute for Aluminum

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	AlTiN	ZrN
1/8	1/8	1/4			1-1/2	3	109-00824	109-00826
1/8	1/8	1/2			1-1/2	3	109-00814	109-00816
5/32	3/16	3/8			2	3	109-01024	109-01026
5/32	3/16	1/2			2	3	109-01014	109-01016
3/16	3/16	3/8			2	3	109-01224	109-01226
3/16	3/16	5/8			2	3	109-01214	109-01216
7/32	1/4	3/8			2	3	109-01424	109-01426
7/32	1/4	3/4			2-1/2	3	109-01414	109-01416
1/4	1/4	3/8			2	3	109-01624	109-01626
1/4	1/4	3/4			2-1/2	3	109-01614	109-01616
1/4	1/4	1-1/4			3	3	109-01634	109-01636
1/4	1/4	1-1/2			3-1/2	3	109-01644	109-01646
1/4	1/4	3/4	2-1/8	.235	4	3	109-01664	109-01666
9/32	5/16	1/2			2-1/2	3	109-01824	109-01826
9/32	5/16	3/4			2-1/2	3	109-01814	109-01816
5/16	5/16	1/2			2-1/2	3	109-02024	109-02026
5/16	5/16	3/4			2-1/2	3	109-02014	109-02016
11/32	3/8	5/8			2	3	109-02224	109-02226
11/32	3/8	7/8			2-1/2	3	109-02214	109-02216
3/8	3/8	5/8			2	3	109-02424	109-02426
3/8	3/8	7/8			2-1/2	3	109-02414	109-02416
3/8	3/8	1-1/2			3-1/2	3	109-02434	109-02436
3/8	3/8	2			4	3	109-02444	109-02446
3/8	3/8	1	2-3/8	.355	6	3	109-02464	109-02466
7/16	7/16	1			2-3/4	3	109-02814	109-02816
1/2	1/2	5/8			2-1/2	3	109-03224	109-03226
1/2	1/2	1-1/4			3	3	109-03214	109-03216
1/2	1/2	1-1/2			3-1/2	3	109-03234	109-03236
1/2	1/2	2			4	3	109-03244	109-03246
1/2	1/2	1-1/4	2-3/8	.475	6	3	109-03264	109-03266
1/2	1/2	1-1/4	3-3/8	.475	6	3	109-03274	109-03276
9/16	9/16	1-1/4			3-1/2	3	109-03614	109-03616
5/8	5/8	7/8			3	3	109-04024	109-04026
5/8	5/8	1-1/4			3-1/2	3	109-04014	109-04016
5/8	5/8	1-3/4			4	3	109-04034	109-04036
5/8	5/8	2-1/2			5	3	109-04044	109-04046
3/4	3/4	1			3	3	109-04824	109-04826
3/4	3/4	1-5/8			4	3	109-04814	109-04816
3/4	3/4	2-1/2			5	3	109-04834	109-04836
3/4	3/4	3-1/4			6	3	109-04844	109-04846
3/4	3/4	1-5/8	3-3/8	.715	6	3	109-04874	109-04876
1	1	1-3/4			4	3	109-06414	109-06416
1	1	2-3/4			5	3	109-06434	109-06436
1	1	3-3/8			6	3	109-06444	109-06446

New
Extended Reach
Sizes Added



3 FLUTE

ALUMINUM & LIGHT ALLOY FINISHING

This high helix, 3 flute finisher is designed for aluminum and light alloy finishing applications.

HELIX ANGLE:

- 1/8" thru 1" = 40 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1": +.000/-0.002

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

Series 119

3 Flute Rougher-Finisher for Aluminum

New
Extended Reach
Sizes Added



3 FLUTE

PROFILE and POCKET ROUGHER- FINISHING

Series 119 is designed to improve performance in profiling and pocketing rougher-finishing applications in aluminum and light alloys.

HELIX ANGLE:

- 1/8" thru 1" = 40 degrees

TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter:
1/8" thru 1": $+.000/-0.002$

SET SCREW FLATS:

- Standard on 3/8" thru 1"

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTES	AlTiN	ZrN
1/8	1/8	1/4			.010	1-1/2	3	119-00824	119-00826
1/8	1/8	1/2			.010	1-1/2	3	119-00814	119-00816
5/32	3/16	3/8			.010	2	3	119-01024	119-01026
5/32	3/16	1/2			.010	2	3	119-01014	119-01016
3/16	3/16	3/8			.010	2	3	119-01224	119-01226
3/16	3/16	5/8			.010	2	3	119-01214	119-01216
7/32	1/4	3/8			.020	2	3	119-01424	119-01426
7/32	1/4	3/4			.020	2-1/2	3	119-01414	119-01416
1/4	1/4	3/8			.020	2	3	119-01624	119-01626
1/4	1/4	3/4			.020	2-1/2	3	119-01614	119-01616
1/4	1/4	1-1/4			.020	3	3	119-01634	119-01636
1/4	1/4	1-1/2			.020	3-1/2	3	119-01644	119-01646
1/4	1/4	3/4	2-1/8	.235	.020	4	3	119-01664	119-01666
9/32	5/16	1/2			.020	2-1/2	3	119-01824	119-01826
9/32	5/16	3/4			.020	2-1/2	3	119-01814	119-01816
5/16	5/16	1/2			.020	2-1/2	3	119-02024	119-02026
5/16	5/16	3/4			.020	2-1/2	3	119-02014	119-02016
11/32	3/8	5/8			.020	2	3	119-02224	119-02226
11/32	3/8	7/8			.020	2-1/2	3	119-02214	119-02216
3/8	3/8	5/8			.020	2	3	119-02424	119-02426
3/8	3/8	7/8			.020	2-1/2	3	119-02414	119-02416
3/8	3/8	1-1/2			.020	3-1/2	3	119-02434	119-02436
3/8	3/8	2			.020	4	3	119-02444	119-02446
3/8	3/8	1	2-3/8	.355	.020	6	3	119-02464	119-02466
7/16	7/16	1			.020	2-3/4	3	119-02814	119-02816
1/2	1/2	5/8			.020	2-1/2	3	119-03224	119-03226
1/2	1/2	1-1/4			.020	3	3	119-03214	119-03216
1/2	1/2	1-1/2			.020	3-1/2	3	119-03234	119-03236
1/2	1/2	2			.020	4	3	119-03244	119-03246
1/2	1/2	1-1/4	2-3/8	.475	.020	6	3	119-03264	119-03266
1/2	1/2	1-1/4	3-3/8	.475	.020	6	3	119-03274	119-03276
9/16	9/16	1-1/4			.030	3-1/2	3	119-03614	119-03616
5/8	5/8	7/8			.030	3	3	119-04024	119-04026
5/8	5/8	1-1/4			.030	3-1/2	3	119-04014	119-04016
5/8	5/8	1-3/4			.030	4	3	119-04034	119-04036
5/8	5/8	2-1/2			.030	5	3	119-04044	119-04046
3/4	3/4	1			.030	3	3	119-04824	119-04826
3/4	3/4	1-5/8			.030	4	3	119-04814	119-04816
3/4	3/4	2-1/2			.030	5	3	119-04834	119-04836
3/4	3/4	3-1/4			.030	6	3	119-04844	119-04846
3/4	3/4	1-5/8	3-3/8	.715	.030	6	3	119-04874	119-04876
1	1	1-3/4			.030	4	3	119-06414	119-06416
1	1	2-3/4			.030	5	3	119-06434	119-06436
1	1	3-3/8			.030	6	3	119-06444	119-06446

Series 102

3 Flute Rougher for Light Alloys



DIA	SHANK	LOC	OAL	FLUTES	AlTiN	ZrN
3/16	3/16	3/8	2	3	102-01224	102-01226
3/16	3/16	5/8	2	3	102-01214	102-01216
1/4	1/4	3/8	2	3	102-01624	102-01626
1/4	1/4	3/4	2-1/2	3	102-01614	102-01616
5/16	5/16	1/2	2-1/2	3	102-02024	102-02026
5/16	5/16	3/4	2-1/2	3	102-02014	102-02016
3/8	3/8	5/8	2	3	102-02424	102-02426
3/8	3/8	7/8	2-1/2	3	102-02414	102-02416
7/16	7/16	1	2-3/4	3	102-02814	102-02816
1/2	1/2	5/8	2-1/2	3	102-03224	102-03226
1/2	1/2	1-1/4	3	3	102-03214	102-03216
1/2	1/2	1-1/2	3-1/2	3	102-03234	102-03236
9/16	9/16	1-1/4	3-1/2	3	102-03614	102-03616
5/8	5/8	1-1/4	3-1/2	3	102-04014	102-04016
3/4	3/4	1-5/8	4	3	102-04814	102-04816
3/4	3/4	2-1/4	5	3	102-04834	102-04836
1	1	1-3/4	4	3	102-06414	102-06416
1	1	2-5/8	5	3	102-06434	102-06436

“Feel The Edge”

ROUGHING APPLICATIONS

Series 102 Roughing End Mills are designed for light materials like aluminum, brass, copper, etc. The 3 flute hi-helix roughing geometry produces a manageable chip that allows for maximum feed rates in profiling and slotting applications. Also used in general purpose applications for deep slots and pockets.

HELIX ANGLE:

- 3/16" thru 1" = 40 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter: +.000/-0.005

CORNER RADIUS:

(To strengthen end teeth)

- 3/16" = .025/.035
- 1/4" thru 5/16" = .040/.050
- 3/8" thru 1" = .055/.065

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

SET SCREW FLATS:

- Standard on 3/8" thru 1"

3 FLUTE

SHIPPING DEPARTMENT



Automatic Shelving makes shipping our product a more efficient process.



Series 106

3 Flute for Slotting & General Purpose



DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTES	TiCN	AlTiN	nACRo®
1/8	1/8	1/4			.010	1-1/2	3	106-00822	106-00824	106-00825
1/8	1/8	1/2			.010	1-1/2	3	106-00812	106-00814	106-00815
3/16	3/16	3/8			.010	2	3	106-01222	106-01224	106-01225
3/16	3/16	5/8			.010	2	3	106-01212	106-01214	106-01215
1/4	1/4	3/8			.020	2	3	106-01622	106-01624	106-01625
1/4	1/4	3/4			.020	2-1/2	3	106-01612	106-01614	106-01615
1/4	1/4	3/8	2-1/8	.235	.020	4	3	106-01662	106-01664	106-01665
5/16	5/16	3/4			.020	2-1/2	3	106-02012	106-02014	106-02015
5/16	5/16	7/16	2-1/8	.297	.020	4	3	106-02062	106-02064	106-02065
3/8	3/8	5/8			.020	2	3	106-02422	106-02424	106-02425
3/8	3/8	7/8			.020	2-1/2	3	106-02412	106-02414	106-02415
3/8	3/8	1/2	2-1/8	.355	.020	6	3	106-02462	106-02464	106-02465
3/8	3/8	1/2	3-3/8	.355	.020	6	3	106-02472	106-02474	106-02475
7/16	7/16	1			.020	2-3/4	3	106-02812	106-02814	106-02815
1/2	1/2	5/8			.020	2-1/2	3	106-03222	106-03224	106-03225
1/2	1/2	1-1/4			.020	3	3	106-03212	106-03214	106-03215
1/2	1/2	5/8	2-3/8	.475	.020	6	3	106-03262	106-03264	106-03265
1/2	1/2	5/8	3-3/8	.475	.020	6	3	106-03272	106-03274	106-03275
1/2	1/2	5/8	4-1/8	.475	.020	6	3	106-03282	106-03284	106-03285
5/8	5/8	1-1/4			.030	3-1/2	3	106-04012	106-04014	106-04015
5/8	5/8	3/4	2-3/8	.590	.030	6	3	106-04062	106-04064	106-04065
5/8	5/8	3/4	3-3/8	.590	.030	6	3	106-04072	106-04074	106-04075
5/8	5/8	3/4	4-1/8	.590	.030	6	3	106-04082	106-04084	106-04085
3/4	3/4	1-5/8			.030	4	3	106-04812	106-04814	106-04815
3/4	3/4	1	2-1/2	.715	.030	6	3	106-04862	106-04864	106-04865
3/4	3/4	1	3-3/8	.715	.030	6	3	106-04872	106-04874	106-04875
3/4	3/4	1	4-1/8	.715	.030	6	3	106-04882	106-04884	106-04885
1	1	1-3/4			.030	4	3	106-06412	106-06414	106-06415
1	1	1-1/4	2-1/2	.960	.030	6	3	106-06462	106-06464	106-06465
1	1	1-1/4	3-3/8	.960	.030	6	3	106-06472	106-06474	106-06475
1	1	1-1/4	4-1/8	.960	.030	6	3	106-06482	106-06484	106-06485

HELIX ANGLE:

- 1/8" thru 1" = 35 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1": +.000/-0.002

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

Series 113

3 Flute Ball for Slotting & General Purpose



DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	TiCN	AlTiN	nACRo®
1/8	1/8	1/4			1-1/2	3	113-00822	113-00824	113-00824
1/8	1/8	1/2			1-1/2	3	113-00812	113-00814	113-00814
3/16	3/16	5/8			2	3	113-01212	113-01214	113-01214
1/4	1/4	3/4			2-1/2	3	113-01612	113-01614	113-01614
1/4	1/4	3/8	2-1/8	.235	4	3	113-01662	113-01664	113-01664
5/16	5/16	3/4			2-1/2	3	113-02012	113-02014	113-02014
5/16	5/16	7/16	2-1/8	.297	4	3	113-02062	113-02064	113-02064
3/8	3/8	7/8			2-1/2	3	113-02412	113-02414	113-02414
3/8	3/8	1/2	2-1/8	.355	6	3	113-02462	113-02464	113-02464
3/8	3/8	1/2	3-3/8	.355	6	3	113-02472	113-02474	113-02474
1/2	1/2	1-1/4			3	3	113-03212	113-03214	113-03214
1/2	1/2	5/8	2-3/8	.475	6	3	113-03262	113-03264	113-03264
1/2	1/2	5/8	3-3/8	.475	6	3	113-03272	113-03274	113-03274
1/2	1/2	5/8	4-1/8	.475	6	3	113-03282	113-03284	113-03284
5/8	5/8	1-1/4			3-1/2	3	113-04012	113-04014	113-04014
5/8	5/8	3/4	2-3/8	.590	6	3	113-04062	113-04064	113-04064
5/8	5/8	3/4	3-3/8	.590	6	3	113-04072	113-04074	113-04074
5/8	5/8	3/4	4-1/8	.590	6	3	113-04082	113-04084	113-04084
3/4	3/4	1-5/8			4	3	113-04812	113-04814	113-04814
3/4	3/4	1	2-1/2	.715	6	3	113-04862	113-04864	113-04864
3/4	3/4	1	3-3/8	.715	6	3	113-04872	113-04874	113-04874
3/4	3/4	1	4-1/8	.715	6	3	113-04882	113-04884	113-04884
1	1	1-3/4			4	3	113-06412	113-06414	113-06414
1	1	1-1/4	2-1/2	.960	6	3	113-06462	113-06464	113-06464
1	1	1-1/4	3-3/8	.960	6	3	113-06472	113-06474	113-06474
1	1	1-1/4	4-1/8	.960	6	3	113-06482	113-06484	113-06484

3 FLUTE

SLOTting & POCKETING APPLICATIONS

The 3 flute Series 106 & 113 with their 35 degree helix were engineered for slotting of stainless steel and alloy materials. Designed with an eccentric relief, these Series have a 25% stronger cutting edge that runs extremely smooth at maximum speeds. With the addition of AlTiN coating, for high heat applications, these tools combine chip clearance and strength for the most difficult slotting and pocketing applications.

HELIX ANGLE:

- 1/8" thru 1" = 35 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1" = +.000/-.002
- Ball Radius: +.001/-.001

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

Series 117

3 Flute Rougher-Finisher for Slotting

With Special
Edge Prep
For Longer Tool Life



3 FLUTE

DIA	SHANK	LOC	RADIUS	OAL	FLUTES	TiCN	AlTiN	nACRo®
1/8	1/8	1/4	.010	1-1/2	3	117-00822	117-00824	117-00825
1/8	1/8	1/2	.010	1-1/2	3	117-00812	117-00814	117-00815
3/16	3/16	3/8	.010	2	3	117-01222	117-01224	117-01225
3/16	3/16	5/8	.010	2	3	117-01212	117-01214	117-01215
7/32	1/4	3/4	.020	2-1/2	3	117-01412	117-01414	117-01415
1/4	1/4	3/8	.020	2	3	117-01622	117-01624	117-01625
1/4	1/4	3/4	.020	2-1/2	3	117-01612	117-01614	117-01615
5/16	5/16	3/4	.020	2-1/2	3	117-02012	117-02014	117-02015
3/8	3/8	5/8	.020	2	3	117-02422	117-02424	117-02425
3/8	3/8	7/8	.020	2-1/2	3	117-02412	117-02414	117-02415
7/16	7/16	5/8	.020	2-3/4	3	117-02822	117-02824	117-02825
7/16	7/16	1	.020	2-3/4	3	117-02812	117-02814	117-02815
1/2	1/2	5/8	.020	2-1/2	3	117-03222	117-03224	117-03225
1/2	1/2	1-1/4	.020	3	3	117-03212	117-03214	117-03215
5/8	5/8	7/8	.030	3	3	117-04022	117-04024	117-04025
5/8	5/8	1-1/4	.030	3-1/2	3	117-04012	117-04014	117-04015
3/4	3/4	1-5/8	.030	4	3	117-04812	117-04814	117-04815
1	1	1-3/4	.030	4	3	117-06412	117-06414	117-06415

AGGRESSIVE SLOTTING & POCKET MILLING

Same high performance geometry as the Series 106 end mill, only with advanced chip breakers designed for aggressive slotting and pocket milling in low and high carbon steels, stainless steels, titanium and high temperature alloys. K-land corner radius is standard for corner edge protection. An eccentric relief cutting edge for 25% more strength makes these tools run extremely smooth at maximum speeds.

HELIX ANGLE:

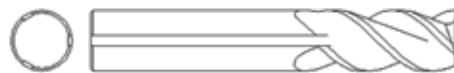
- 1/8" thru 1" = 35 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1": +.000/-.002

SET SCREW FLATS:

- Standard on 3/8" thru 1"



Coolant
Slot

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

See Page 28 For 3 Flute Rougher-Finisher for Aluminum

Series 122

3 Flute Ball Rougher-Finisher for Slotting



DIA	SHANK	LOC	OAL	FLUTES	TiCN	AlTiN	nACRo®
1/8	1/8	1/2	1-1/2	3	122-00812	122-00814	122-00815
3/16	3/16	5/8	2	3	122-01212	122-01214	122-01215
1/4	1/4	3/4	2-1/2	3	122-01612	122-01614	122-01615
5/16	5/16	3/4	2-1/2	3	122-02012	122-02014	122-02015
3/8	3/8	7/8	2-1/2	3	122-02412	122-02414	122-02415
1/2	1/2	1-1/4	3	3	122-03212	122-03214	122-03215
5/8	5/8	1-1/4	3-1/2	3	122-04012	122-04014	122-04015
3/4	3/4	1-5/8	4	3	122-04812	122-04814	122-04815
1	1	1-3/4	4	3	122-06412	122-06414	122-06415

AGGRESSIVE SLOTting & BALL POCKET MILLING

Like the Series 117, the Series 122 has the same high performance geometry as the Series 113 end mill, only with advanced chip breakers designed for aggressive slotting and pocket milling in low and high carbon steels, stainless steels, titanium & high temperature alloys. An eccentric relief cutting edge for 25% more strength makes these tools run extremely smooth at maximum speeds.

HELIX ANGLE:

- 1/8" thru 1" = 35 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter:
1/8" thru 1": +.000/-0.002
- Ball Radius: +.001/-0.001

SET SCREW FLATS:

- Standard on 3/8" thru 1"

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

3 FLUTE



PROMAX networks automatic grinding machines with an optical measuring system that accurately uses multiple light sensors to measure complex tool geometries without human contact. This process establishes a system that focuses on precision and consistency in our manufacturing environment.

Series 108

2 Flute End Mill for Aluminum



New
Extended Reach
Sizes Added

"Feel The Edge"

2 Flute

FOR ALUMINUM

The **SERIES 108** end mill was designed to be a workhorse in milling **ALUMINUM** and other non-ferrous materials. This tool comes standard with Zirconium Nitrate (ZrN) coating.

HELIX ANGLE:

- 1/8" thru 1" = 40 degrees

TOLERANCES:

- Shank: -.0001/- .0004
- Cutting Diameter:
1/8" thru 1": +.000/- .002

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	ZrN
1/8	1/8	1/4			1-1/2	2	108-00826
1/8	1/8	3/8			1-1/2	2	108-00816
5/32	3/16	5/16			2	2	108-01026
5/32	3/16	9/16			2	2	108-01016
3/16	3/16	5/16			2	2	108-01226
3/16	3/16	9/16			2	2	108-01216
7/32	1/4	3/8			2	2	108-01426
7/32	1/4	3/4			2-1/2	2	108-01416
1/4	1/4	3/8			2	2	108-01626
1/4	1/4	3/4			2-1/2	2	108-01616
1/4	1/4	1-1/4			3-1/2	2	108-01636
1/4	1/4	3/4	2-1/8	.235	4	2	108-01666
9/32	5/16	7/16			2-1/2	2	108-01826
9/32	5/16	13/16			2-1/2	2	108-01816
5/16	5/16	7/16			2-1/2	2	108-02026
5/16	5/16	13/16			2-1/2	2	108-02016
5/16	5/16	1-1/4			4	2	108-02036
5/16	5/16	2-1/8			4	2	108-02046
11/32	3/8	1/2			2-1/2	2	108-02226
11/32	3/8	1			2-1/2	2	108-02216
3/8	3/8	1/2			2-1/2	2	108-02426
3/8	3/8	1			2-1/2	2	108-02416
3/8	3/8	1-1/2			4	2	108-02436
3/8	3/8	2-1/2			6	2	108-02446
3/8	3/8	1	2-3/8	.355	6	2	108-02466
13/32	7/16	9/16			2-3/4	2	108-02626
13/32	7/16	1			2-3/4	2	108-02616
7/16	7/16	9/16			2-3/4	2	108-02826
7/16	7/16	1			2-3/4	2	108-02816
7/16	7/16	2			4	2	108-02836
15/32	1/2	5/8			2-1/2	2	108-03026
15/32	1/2	1-1/4			3	2	108-03016
1/2	1/2	5/8			2-1/2	2	108-03226
1/2	1/2	1-1/4			3	2	108-03216
1/2	1/2	2			4	2	108-03236
1/2	1/2	3			6	2	108-03246
1/2	1/2	1-1/4	2-3/8	.475	6	2	108-03266
1/2	1/2	1-1/4	3-3/8	.475	6	2	108-03276
5/8	5/8	3/4			3	2	108-04026
5/8	5/8	1-5/8			3-1/2	2	108-04016
5/8	5/8	2-1/2			5	2	108-04036
5/8	5/8	3-3/4			6	2	108-04046
3/4	3/4	1			4	2	108-04826
3/4	3/4	1-5/8			4	2	108-04816

Series 108

2 Flute End Mill for Aluminum

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	ZrN
3/4	3/4	3			6	2	108-04836
3/4	3/4	4			7	2	108-04846
3/4	3/4	1-5/8	3-3/8	.715	6	2	108-04876
1	1	1-1/4			4	2	108-06426
1	1	2			5	2	108-06416
1	1	3			6	2	108-06436
1	1	4-1/8			7	2	108-06446

Series 115

2 Flute Ball for Aluminum

DIA	SHANK	LOC	LOR	NECK DIA	OAL	FLUTES	ZrN
1/4	1/4	3/8			2	2	115-01626
1/4	1/4	3/4			2-1/2	2	115-01616
1/4	1/4	1-1/4			3-1/2	2	115-01636
1/4	1/4	3/4	2-1/8	.235	4	2	115-01666
5/16	5/16	7/16			2-1/2	2	115-02026
5/16	5/16	13/16			2-1/2	2	115-02016
5/16	5/16	1-1/4			4	2	115-02036
3/8	3/8	1/2			2-1/2	2	115-02426
3/8	3/8	1			2-1/2	2	115-02416
3/8	3/8	1-1/2			4	2	115-02436
3/8	3/8	1	2-3/8	.355	6	2	115-02466
7/16	7/16	9/16			2-3/4	2	115-02826
7/16	7/16	1			2-3/4	2	115-02816
7/16	7/16	2			4	2	115-02836
1/2	1/2	5/8			2-1/2	2	115-03226
1/2	1/2	1-1/4			3	2	115-03216
1/2	1/2	2			4	2	115-03236
1/2	1/2	1-1/4	2-3/8	.475	6	2	115-03266
1/2	1/2	1-1/4	3-3/8	.475	6	2	115-03276
5/8	5/8	3/4			3	2	115-04026
5/8	5/8	1-5/8			3-1/2	2	115-04016
5/8	5/8	2-1/2			5	2	115-04036
3/4	3/4	1			4	2	115-04826
3/4	3/4	1-5/8			4	2	115-04816
3/4	3/4	3			6	2	115-04836
3/4	3/4	1-5/8	3-3/8	.715	6	2	115-04876
1	1	1-1/4			4	2	115-06426
1	1	2			5	2	115-06416
1	1	3			6	2	115-06436



2 Flute

HELIX ANGLE:

- 1/4" thru 1" = 40 degrees

TOLERANCES:

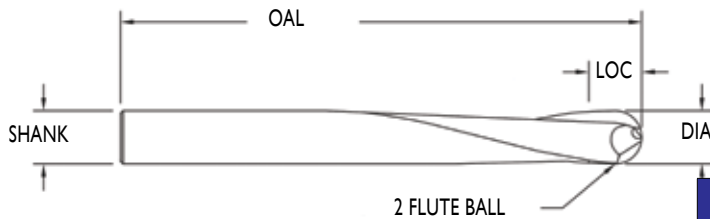
- Shank: -.0001/-0.0004
- Cutting Diameter:
1/4" thru 1": +.000/-0.002
- Ball Radius: +/-0.01

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"
- Set screw flats, 3/8" thru 1"

Series 250, 251 & 252

2 Flute Ball End Die and Mold Tools

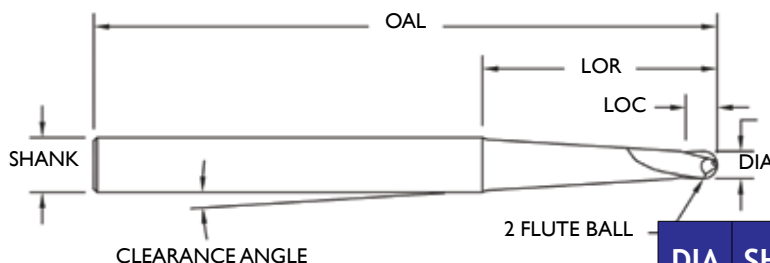
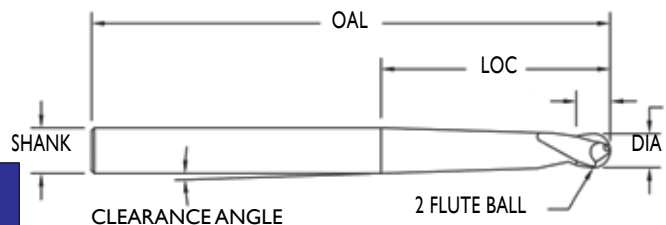


Series 250 0 Degree

DIA	SHANK	LOC	OAL	FLUTES	AITiN
1/8	1/8	1/8	3	2	250-00814
3/16	3/16	3/16	3	2	250-01214
1/4	1/4	1/4	4	2	250-01614
3/8	3/8	3/8	4	2	250-02414
3/8	3/8	3/8	6	2	250-02444
1/2	1/2	1/2	4	2	250-03214
1/2	1/2	1/2	6	2	250-03244

Series 251 1 Degree

DIA	SHANK	LOC	LOR	OAL	FLUTES	AITiN
1/32	1/4	1/32	0.625	4	2	251-00214
.060	1/4	.060	1.250	4	2	251-00414
.080	1/4	.080	1.625	4	2	251-00514
3/32	1/4	3/32	1.875	4	2	251-00614
1/8	1/4	1/8	2.500	4	2	251-00814
3/16	1/4	3/16	2.265	4	2	251-01214

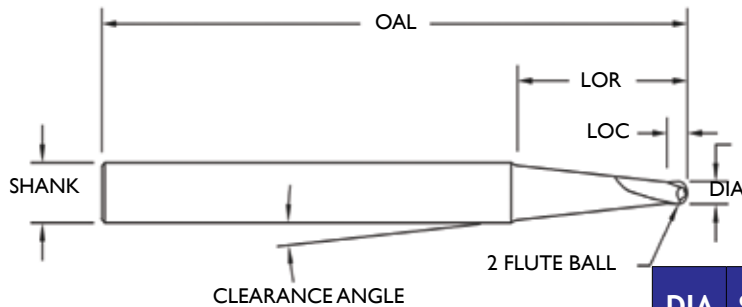


Series 252 3 Degree

DIA	SHANK	LOC	LOR	OAL	FLUTES	AITiN
1/32	1/4	1/32	2.112	4	2	252-00214
.060	1/4	.060	1.875	4	2	252-00414
.080	1/4	.080	1.704	4	2	252-00514
3/32	1/4	3/32	1.584	4	2	252-00614
1/8	1/4	1/8	1.324	4	2	252-00814
3/16	1/4	3/16	0.786	4	2	252-01214

Series 253 & 254

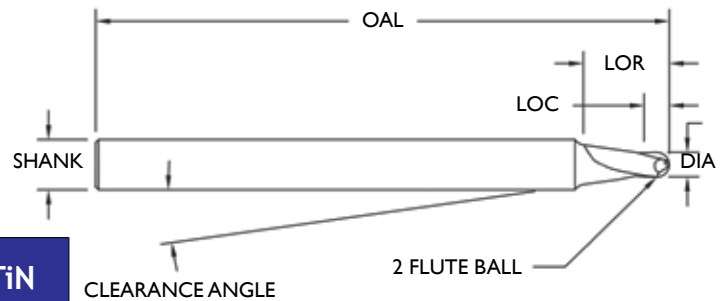
2 Flute Ball End Die and Mold Tools



Series 253 5 Degree

DIA	SHANK	LOC	LOR	OAL	FLUTES	AlTiN
1/32	1/4	1/32	1.282	4	2	253-00214
.060	1/4	.060	1.175	4	2	253-00414
.080	1/4	.080	1.084	4	2	253-00514
3/32	1/4	3/32	1.018	4	2	253-00614
1/8	1/4	1/8	0.897	4	2	253-00814
3/16	1/4	3/16	0.680	4	2	253-01214

Series 254 8 Degree



DIA	SHANK	LOC	LOR	OAL	FLUTES	AlTiN
1/32	1/4	1/32	0.851	4	2	254-00214
.060	1/4	.060	0.773	4	2	254-00414
.080	1/4	.080	0.726	4	2	254-00514
3/32	1/4	3/32	0.690	4	2	254-00614
1/8	1/4	1/8	0.636	4	2	254-00814
3/16	1/4	3/16	0.454	4	2	254-01214

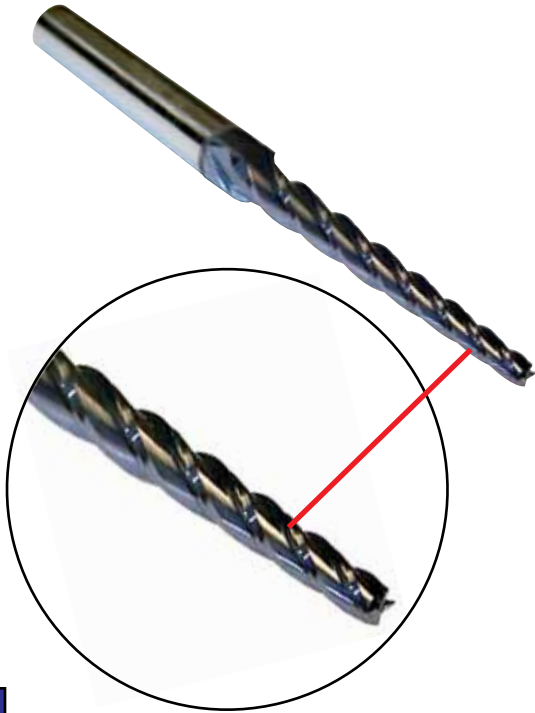
TOLERANCES:

- Shank: $-.0001/-0.0004$
- Cutting Diameter: $1/32''$ thru $1/2''$: $+.000/-0.0008$
- Ball Radius: $+.000/-0.0004$

- Improve your production with Die & Mold End Mills designed to run at faster speeds and feeds resulting in reduced cycle times.
- Standard with the most advanced Aluminum-Titanium-Nitride (AlTiN) coating which allows for dry machining and extends the life of the tool.
- Ultrafine carbide grade for longer tool life.

Series 260 & 261

4 Flute Corner Radius Rib Tool



Series 260

0 Degree Taper

DIA	SHANK	LOC	RADIUS	OAL	FLUTES	AITiN
.030	3/16	.210	.010	3	4	260-03024
.030	3/16	.420	.010	3	4	260-03014
.040	3/16	.280	.010	3	4	260-04024
.040	3/16	.560	.010	3	4	260-04014
.050	3/16	.350	.010	3	4	260-05024
.050	3/16	.700	.010	3	4	260-05014
.060	3/16	.420	.010	3	4	260-06024
.060	3/16	.840	.010	3	4	260-06014
.070	3/16	.490	.010	3	4	260-07024
.070	3/16	.980	.010	3	4	260-07014
.080	3/16	.560	.010	3	4	260-08024
.080	3/16	1.120	.010	3	4	260-08014
.090	3/16	.630	.010	3	4	260-09024
.090	3/16	1.260	.010	3	4	260-09014
.100	3/16	.700	.010	3	4	260-10024
.100	3/16	1.400	.010	3	4	260-10014
.125	3/16	.875	.010	3	4	260-12524
.125	3/16	1.750	.010	3	4	260-12514

Series 261

1/2 Degree Taper

DIA	SHANK	LOC	RADIUS	OAL	FLUTES	AITiN
.030	3/16	.210	.010	3	4	261-03024
.030	3/16	.420	.010	3	4	261-03014
.040	3/16	.280	.010	3	4	261-04024
.040	3/16	.560	.010	3	4	261-04014
.050	3/16	.350	.010	3	4	261-05024
.050	3/16	.700	.010	3	4	261-05014
.060	3/16	.420	.010	3	4	261-06024
.060	3/16	.840	.010	3	4	261-06014
.070	3/16	.490	.010	3	4	261-07024
.070	3/16	.980	.010	3	4	261-07014
.080	3/16	.560	.010	3	4	261-08024
.080	3/16	1.120	.010	3	4	261-08014
.090	3/16	.630	.010	3	4	261-09024
.090	3/16	1.260	.010	3	4	261-09014
.100	3/16	.700	.010	3	4	261-10024
.100	3/16	1.400	.010	3	4	261-10014
.125	3/16	.875	.010	3	4	261-12524
.125	3/16	1.750	.010	3	4	261-12514

DIE & MOLD

Series 262 & 263

4 Flute Corner Radius Rib Tool

Series 262

1 Degree Taper

DIA	SHANK	LOC	RADIUS	OAL	FLUTES	AITiN
.030	3/16	.210	.010	3	4	262-03024
.030	3/16	.420	.010	3	4	262-03014
.040	3/16	.280	.010	3	4	262-04024
.040	3/16	.560	.010	3	4	262-04014
.050	3/16	.350	.010	3	4	262-05024
.050	3/16	.700	.010	3	4	262-05014
.060	3/16	.420	.010	3	4	262-06024
.060	3/16	.840	.010	3	4	262-06014
.070	3/16	.490	.010	3	4	262-07024
.070	3/16	.980	.010	3	4	262-07014
.080	3/16	.560	.010	3	4	262-08024
.080	3/16	1.120	.010	3	4	262-08014
.090	3/16	.630	.010	3	4	262-09024
.090	3/16	1.260	.010	3	4	262-09014
.100	3/16	.700	.010	3	4	262-10024
.100	3/16	1.400	.010	3	4	262-10014
.125	3/16	.875	.010	3	4	262-12524
.125	3/16	1.750	.010	3	4	262-12514

RIB TOOL APPLICATIONS

PROMAX's series of Tapered Rib Tools are specifically designed to improve production in hi-speed machining of deep, tight grooves in plastic injection molds, eliminating time-consuming EDM burning operations resulting in a bench free rib. In addition, our tools reduce cycle times with faster speeds and feeds while our advanced Aluminum-Titanium-Nitride (AITiN) coating allows for dry machining and extends the life of the tool.

DEGREE TAPER:

- Degree is Per Side

HELIX ANGLE:

- 30 degree

TOLERANCES:

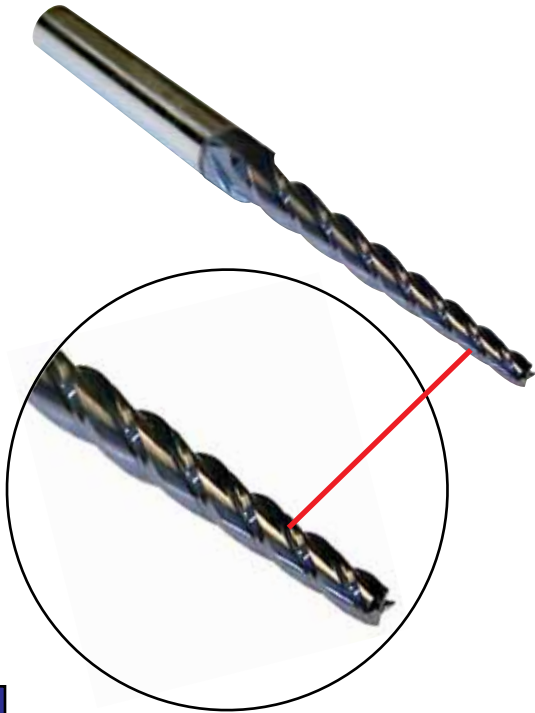
- Tip Diameter Tolerance: +.000/- .001
- Taper: Series 260 = No Taper
Series 261- 265 = +/- .10'
- Radius: +.000/- .0005

Series 263 1-1/2 Degree Taper

DIA	SHANK	LOC	RADIUS	OAL	FLUTES	AITiN
.030	3/16	.210	.010	3	4	263-03024
.030	3/16	.420	.010	3	4	263-03014
.040	3/16	.280	.010	3	4	263-04024
.040	3/16	.560	.010	3	4	263-04014
.050	3/16	.350	.010	3	4	263-05024
.050	3/16	.700	.010	3	4	263-05014
.060	3/16	.420	.010	3	4	263-06024
.060	3/16	.840	.010	3	4	263-06014
.070	3/16	.490	.010	3	4	263-07024
.070	3/16	.980	.010	3	4	263-07014
.080	3/16	.560	.010	3	4	263-08024
.080	3/16	1.120	.010	3	4	263-08014
.090	3/16	.630	.010	3	4	263-09024
.090	3/16	1.260	.010	3	4	263-09014
.100	3/16	.700	.010	3	4	263-10024
.100	3/16	1.400	.010	3	4	263-10014
.125	3/16	.875	.010	3	4	263-12524
.125	1/4	1.750	.010	3	4	263-12514

Series 264 & 265

4 Flute Corner Radius Rib Tool



Series 264

2 Degree Taper

DIA	SHANK	LOC	RADIUS	OAL	FLUTES	AITiN
.030	3/16	.210	.010	3	4	264-03024
.030	3/16	.420	.010	3	4	264-03014
.040	3/16	.280	.010	3	4	264-04024
.040	3/16	.560	.010	3	4	264-04014
.050	3/16	.350	.010	3	4	264-05024
.050	3/16	.700	.010	3	4	264-05014
.060	3/16	.420	.010	3	4	264-06024
.060	3/16	.840	.010	3	4	264-06014
.070	3/16	.490	.010	3	4	264-07024
.070	3/16	.980	.010	3	4	264-07014
.080	3/16	.560	.010	3	4	264-08024
.080	3/16	1.120	.010	3	4	264-08014
.090	3/16	.630	.010	3	4	264-09024
.090	3/16	1.260	.010	3	4	264-09010
.100	3/16	.700	.010	3	4	264-10024
.100	1/4	1.400	.010	3	4	264-10014
.125	3/16	.875	.010	3	4	264-12524
.125	1/4	1.750	.010	3	4	264-12514

Series 265

3 Degree Taper

DIA	SHANK	LOC	RADIUS	OAL	FLUTES	AITiN
.030	3/16	.210	.010	3	4	265-03024
.030	3/16	.420	.010	3	4	265-03014
.040	3/16	.280	.010	3	4	265-04024
.040	3/16	.560	.010	3	4	265-04014
.050	3/16	.350	.010	3	4	265-05024
.050	3/16	.700	.010	3	4	265-05014
.060	3/16	.420	.010	3	4	265-06024
.060	3/16	.840	.010	3	4	265-06014
.070	3/16	.490	.010	3	4	265-07024
.070	3/16	.980	.010	3	4	265-07014
.080	3/16	.560	.010	3	4	265-08024
.080	1/4	1.120	.010	3	4	265-08014
.090	3/16	.630	.010	3	4	265-09024
.090	1/4	1.260	.010	3	4	265-09014
.100	3/16	.700	.010	3	4	265-10024
.100	1/4	1.400	.010	3	4	265-10014
.125	1/4	.875	.010	3	4	265-12524

DIE & MOLD

Series 270 & 271

4 Flute Ball End Rib Tool

Series 270 0 Degree Taper

DIA	SHANK	LOC	OAL	FLUTES	AlTiN
.030	3/16	.210	3	4	270-03024
.030	3/16	.420	3	4	270-03014
.040	3/16	.280	3	4	270-04024
.040	3/16	.560	3	4	270-04014
.050	3/16	.350	3	4	270-05024
.050	3/16	.700	3	4	270-05014
.060	3/16	.420	3	4	270-06024
.060	3/16	.840	3	4	270-06014
.070	3/16	.490	3	4	270-07024
.070	3/16	.980	3	4	270-07014
.080	3/16	.560	3	4	270-08024
.080	3/16	1.120	3	4	270-08014
.090	3/16	.630	3	4	270-09024
.090	3/16	1.260	3	4	270-09014
.100	3/16	.700	3	4	270-10024
.100	3/16	1.400	3	4	270-10014
.125	3/16	.875	3	4	270-12524
.125	3/16	1.750	3	4	270-12514

RIB TOOL APPLICATIONS

PROMAX's series of Tapered Rib Tools are specifically designed to improve production in hi-speed machining of deep, tight grooves in plastic injection molds, eliminating time-consuming EDM burning operations resulting in a bench free rib. In addition, our tools reduce cycle times with faster speeds and feeds while our advanced Aluminum-Titanium-Nitride (AlTiN) coating allows for dry machining and extends the life of the tool.

DEGREE TAPER:

- Degree is Per Side

HELIX ANGLE:

- 30 degree

TOLERANCES:

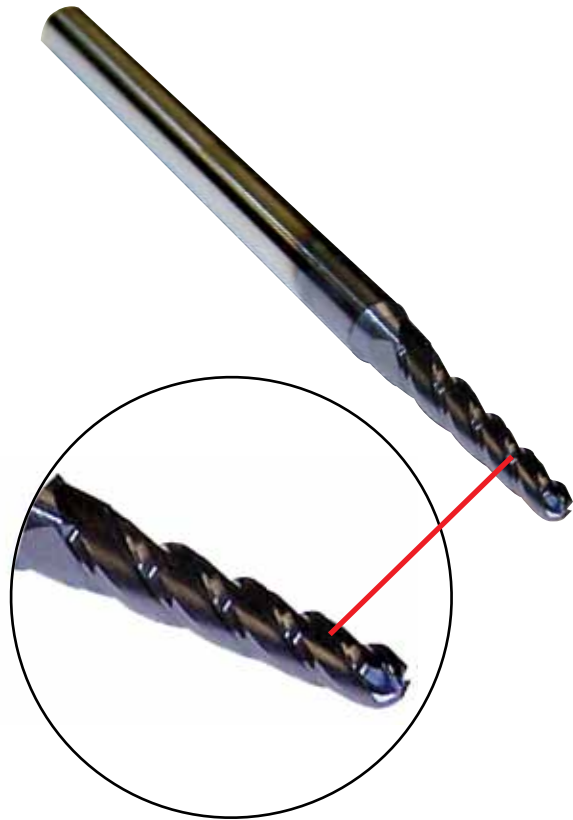
- Tip Diameter Tolerance: +.000/- .001
- Taper: Series 270 = No Taper
Series 271- 275 = +/- .10'
- Ball Radius: +.000/- .0005

Series 271 1/2 Degree Taper

DIA	SHANK	LOC	OAL	FLUTES	AlTiN
.030	3/16	.210	3	4	271-03024
.030	3/16	.420	3	4	271-03014
.040	3/16	.280	3	4	271-04024
.040	3/16	.560	3	4	271-04014
.050	3/16	.350	3	4	271-05024
.050	3/16	.700	3	4	271-05014
.060	3/16	.420	3	4	271-06024
.060	3/16	.840	3	4	271-06014
.070	3/16	.490	3	4	271-07024
.070	3/16	.980	3	4	271-07014
.080	3/16	.560	3	4	271-08024
.080	3/16	1.120	3	4	271-08014
.090	3/16	.630	3	4	271-09024
.090	3/16	1.260	3	4	271-09014
.100	3/16	.700	3	4	271-10024
.100	3/16	1.400	3	4	271-10014
.125	3/16	.875	3	4	271-12524
.125	3/16	1.750	3	4	271-12514

Series 272 & 273

4 Flute Ball End Rib Tool



Series 272

1 Degree Taper

DIA	SHANK	LOC	OAL	FLUTES	AITiN
.030	3/16	.210	3	4	272-03024
.030	3/16	.420	3	4	272-03014
.040	3/16	.280	3	4	272-04024
.040	3/16	.560	3	4	272-04014
.050	3/16	.350	3	4	272-05024
.050	3/16	.700	3	4	272-05014
.060	3/16	.420	3	4	272-06024
.060	3/16	.840	3	4	272-06014
.070	3/16	.490	3	4	272-07024
.070	3/16	.980	3	4	272-07014
.080	3/16	.560	3	4	272-08024
.080	3/16	1.120	3	4	272-08014
.090	3/16	.630	3	4	272-09024
.090	3/16	1.260	3	4	272-09014
.100	3/16	.700	3	4	272-10024
.100	3/16	1.400	3	4	272-10014
.125	3/16	.875	3	4	272-12524
.125	3/16	1.750	3	4	272-12514

Series 273 1-1/2 Degree Taper

DIA	SHANK	LOC	OAL	FLUTES	AITiN
.030	3/16	.210	3	4	273-03024
.030	3/16	.420	3	4	273-03014
.040	3/16	.280	3	4	273-04024
.040	3/16	.560	3	4	273-04014
.050	3/16	.350	3	4	273-05024
.050	3/16	.700	3	4	273-05014
.060	3/16	.420	3	4	273-06024
.060	3/16	.840	3	4	273-06014
.070	3/16	.490	3	4	273-07024
.070	3/16	.980	3	4	273-07014
.080	3/16	.560	3	4	273-08024
.080	3/16	1.120	3	4	273-08014
.090	3/16	.630	3	4	273-09024
.090	3/16	1.260	3	4	273-09014
.100	3/16	.700	3	4	273-10024
.100	3/16	1.400	3	4	273-10014
.125	3/16	.875	3	4	273-12524
.125	1/4	1.750	3	4	273-12514

DIE & MOLD

Series 274 & 275

4 Flute Ball End Rib Tool

Series 274 2 Degree Taper

DIA	SHANK	LOC	OAL	FLUTES	AlTiN
.030	3/16	.210	3	4	274-03024
.030	3/16	.420	3	4	274-03014
.040	3/16	.280	3	4	274-04024
.040	3/16	.560	3	4	274-04014
.050	3/16	.350	3	4	274-05024
.050	3/16	.700	3	4	274-05014
.060	3/16	.420	3	4	274-06024
.060	3/16	.840	3	4	274-06014
.070	3/16	.490	3	4	274-07024
.070	3/16	.980	3	4	274-07014
.080	3/16	.560	3	4	274-08024
.080	3/16	1.120	3	4	274-08014
.090	3/16	.630	3	4	274-09024
.090	3/16	1.260	3	4	274-09014
.100	3/16	.700	3	4	274-10024
.100	1/4	1.400	3	4	274-10014
.125	3/16	.875	3	4	274-12524
.125	1/4	1.750	3	4	274-12514

RIB TOOL

APPLICATIONS

PROMAX's series of Tapered Rib Tools are specifically designed to improve production in hi-speed machining of deep, tight grooves in plastic injection molds, eliminating time-consuming EDM burning operations resulting in a bench free rib. In addition, our tools reduce cycle times with faster speeds and feeds while our advanced Aluminum-Titanium-Nitride (AlTiN) coating allows for dry machining and extends the life of the tool.

DEGREE TAPER:

- Degree is Per Side

HELIX ANGLE:

- 30 degree

TOLERANCES:

- Tip Diameter Tolerance: +.000/- .001
- Taper: Series 270 = No Taper
Series 271- 275 = +/- .10'
- Ball Radius: +.000/- .0005

Series 275 3 Degree Taper

DIA	SHANK	LOC	OAL	FLUTES	AlTiN
.030	3/16	.210	3	4	275-03024
.030	3/16	.420	3	4	275-03014
.040	3/16	.280	3	4	275-04024
.040	3/16	.560	3	4	275-04014
.050	3/16	.350	3	4	275-05024
.050	3/16	.700	3	4	275-05014
.060	3/16	.420	3	4	275-06024
.060	3/16	.840	3	4	275-06014
.070	3/16	.490	3	4	275-07024
.070	3/16	.980	3	4	275-07014
.080	3/16	.560	3	4	275-08024
.080	1/4	1.120	3	4	275-08014
.090	3/16	.630	3	4	275-09024
.090	1/4	1.260	3	4	275-09014
.100	3/16	.700	3	4	275-10024
.100	1/4	1.400	3	4	275-10014
.125	1/4	.875	3	4	275-12524

Series 103

Roughing End Mill for Hardened Materials



SERIES 103

This Rougher is designed for use on extremely tough to machine materials with a 60+ Rc hardness and high temperature alloys.

HELIX ANGLE:

- 1/4" thru 1" = 20 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter: +.000/-.005

CORNER RADIUS:

(To strengthen end teeth)

- 3/16" = .025/.035
- 1/4" thru 5/16" = .040/.050
- 3/8" thru 1" = .055/.065

SET SCREW FLATS:

- Standard on 3/8" thru 1"

UPON REQUEST:

- Coolant Slots, 3/8" thru 1"

DIA	SHANK	LOC	OAL	FLUTES	AlTiN	nACRo®
1/4	1/4	3/8	2	4	103-01624	103-01625
1/4	1/4	3/4	2-1/2	4	103-01614	103-01615
5/16	5/16	1/2	2-1/2	4	103-02024	103-02025
5/16	5/16	3/4	2-1/2	4	103-02014	103-02015
3/8	3/8	1/2	2	4	103-02424	103-02425
3/8	3/8	1	2-1/2	4	103-02414	103-02415
7/16	7/16	1	2-3/4	4	103-02814	103-02815
1/2	1/2	5/8	2-1/2	4	103-03224	103-03225
1/2	1/2	1-1/4	3	4	103-03214	103-03215
5/8	5/8	1-1/2	3-1/2	4	103-04014	103-04015
3/4	3/4	1-5/8	4	4	103-04814	103-04815
1	1	1-3/4	4	4	103-06414	103-06415

Series 154

Multi Flute for Hardened Materials



SERIES 154

Designed for Superb Finishes on hardened materials up to 65 Rc.

HELIX ANGLE:

- 1/4" thru 3/4" = 40 degrees

TOLERANCES:

- Shank: -.0001/-.0004
- Cutting Diameter: +.000/-.002

DIA	SHANK	LOC	LOR	NECK DIA	RADIUS	OAL	FLUTES	AlTiN	nACRo®
1/4	1/4	1/4	1/2	.235	.010	2-1/2	5	154-01614	154-01615
5/16	5/16	5/16		.297	.010	2-1/2	5	154-02014	154-02015
3/8	3/8	3/8		.355	.015	3	5	154-02414	154-02415
1/2	1/2	1/2	1	.475	.020	3-1/2	6	154-03214	154-03215
5/8	5/8	5/8	1-1/4	.590	.020	3-1/2	8	154-04014	154-04015
3/4	3/4	3/4	1.400	.715	.020	4	8	154-04814	154-04815

Series 332 & 333

4 Flute Decimal End Mills



Series 332 - Square End



Series 333 - Ball End

TOLERANCES:

- Shank: +.0000/-0.0003
- Cutting Diameter: +.000/-0.0005

COATINGS AVAILABLE UPON REQUEST:

nACRo®
AlTiN
TiCN
ZrN

4 FLUTE UNCOATED

DIA	SHANK	LOC	OAL	SQUARE END	BALL END
0.005	1/8	.008	1-1/2	332-00520	
0.005	1/8	.015	1-1/2	332-00510	
0.010	1/8	.015	1-1/2	332-01020	333-01020
0.010	1/8	.030	1-1/2	332-01010	333-01010
0.015	1/8	.023	1-1/2	332-01520	333-01520
0.015	1/8	.045	1-1/2	332-01510	333-01510
0.020	1/8	.030	1-1/2	332-02020	333-02020
0.020	1/8	.060	1-1/2	332-02010	333-02010
0.025	1/8	.038	1-1/2	332-02520	333-02520
0.025	1/8	.075	1-1/2	332-02510	333-02510
0.030	1/8	.045	1-1/2	332-03020	333-03020
0.030	1/8	.090	1-1/2	332-03010	333-03010
0.040	1/8	.060	1-1/2	332-04020	333-04020
0.040	1/8	.120	1-1/2	332-04010	333-04010
0.050	1/8	.075	1-1/2	332-05020	333-05020
0.050	1/8	.150	1-1/2	332-05010	333-05010
0.060	1/8	.090	1-1/2	332-06020	333-06020
0.060	1/8	.180	1-1/2	332-06010	333-06010
0.070	1/8	.105	1-1/2	332-07020	333-07020
0.070	1/8	.210	1-1/2	332-07010	333-07010
0.080	1/8	.120	1-1/2	332-08020	333-08020
0.080	1/8	.240	1-1/2	332-08010	333-08010
0.090	1/8	.135	1-1/2	332-09020	333-09020
0.090	1/8	.270	1-1/2	332-09010	333-09010
0.100	1/8	.150	1-1/2	332-10020	333-10020
0.100	1/8	.300	1-1/2	332-10010	333-10010
0.110	1/8	.165	1-1/2	332-11020	333-11020
0.110	1/8	.330	1-1/2	332-11010	333-11010
0.120	1/8	.180	1-1/2	332-12020	333-12020
0.120	1/8	.360	1-1/2	332-12010	333-12010



400 POWER ELECTRONIC MICROSCOPE



CYBER GRINDING



HELITool CHECK

WALTER

DECIMAL

At PROMAX we know that Accuracy and Precision are key in producing a quality end product that customers can depend on. That is why we invest in the most current measuring equipment - so our customers can depend on us and their customers can depend on them.

Series 137 & 138

2 & 4 Flute Corner Rounders



Series 137

STRONGER CUTTING EDGE

With full form relief, resharpenings incur minimal change in geometry and provide a stronger cutting edge for extended tool life in both our 2 flute and 4 flute Corner Rounders. PROMAX's 2 flute Corner Rounders produce a convex form on materials ranging from aluminum to high temperature alloys, while 4 flute tools produce a convex form on low and high carbon steels, stainless steel and high temperature alloys. The 4 flute tools also maintain a minor diameter of .250 for ease of programming.

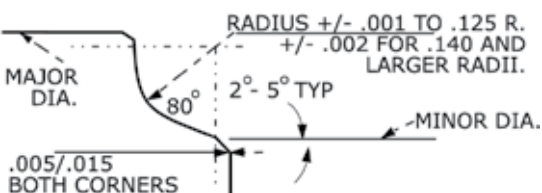
SHANK	RADIUS	MINOR DIA	OAL	FLUTES	UNCOATED	TiCN	AlTiN
1/8	.010	.105	1-1/2	2	137-00810	137-00812	137-00814
1/8	.015	.095	1-1/2	2	137-00820	137-00822	137-00824
1/8	.020	.085	1-1/2	2	137-00830	137-00832	137-00834
1/8	.025	.075	1-1/2	2	137-00840	137-00842	137-00844
1/8	.031	.063	1-1/2	2	137-00850	137-00852	137-00854
1/8	.035	.055	1-1/2	2	137-00860	137-00862	137-00864
1/8	.040	.045	1-1/2	2	137-00870	137-00872	137-00874
3/16	.046	.095	2	2	137-01210	137-01212	137-01214
3/16	.050	.087	2	2	137-01220	137-01222	137-01224
3/16	.055	.077	2	2	137-01230	137-01232	137-01234
3/16	.062	.062	2	2	137-01240	137-01242	137-01244
1/4	.072	.106	2-1/2	2	137-01610	137-01612	137-01614
1/4	.078	.094	2-1/2	2	137-01620	137-01622	137-01624
1/4	.085	.080	2-1/2	2	137-01630	137-01632	137-01634
1/4	.094	.062	2-1/2	2	137-01640	137-01642	137-01644
1/4	.100	.050	2-1/2	2	137-01650	137-01652	137-01654
5/16	.109	.094	2-1/2	2	137-02010	137-02012	137-02014
5/16	.118	.076	2-1/2	2	137-02020	137-02022	137-02024
5/16	.125	.063	2-1/2	2	137-02030	137-02032	137-02034
3/8	.140	.095	2-1/2	2	137-02410	137-02412	137-02414
3/8	.156	.063	2-1/2	2	137-02420	137-02422	137-02424

Series 138



CORNER ROUNDERS

SHANK	RADIUS	OAL	FLUTES	UNCOATED	TiCN	AlTiN
3/8	.010	2-1/2	4	138-02400	138-02402	138-02404
3/8	.015	2-1/2	4	138-02410	138-02412	138-02414
3/8	.020	2-1/2	4	138-02420	138-02422	138-02424
3/8	.025	2-1/2	4	138-02430	138-02432	138-02434
3/8	.031	2-1/2	4	138-02440	138-02442	138-02444
3/8	.035	2-1/2	4	138-02450	138-02452	138-02454
3/8	.040	2-1/2	4	138-02460	138-02462	138-02464
3/8	.046	2-1/2	4	138-02470	138-02472	138-02474
3/8	.050	2-1/2	4	138-02480	138-02482	138-02484
3/8	.055	2-1/2	4	138-02490	138-02492	138-02494
1/2	.062	3	4	138-03200	138-03202	138-03204
1/2	.072	3	4	138-03210	138-03212	138-03214
1/2	.078	3	4	138-03220	138-03222	138-03224
1/2	.085	3	4	138-03230	138-03232	138-03234
1/2	.093	3	4	138-03240	138-03242	138-03244
1/2	.100	3	4	138-03250	138-03252	138-03254
1/2	.109	3	4	138-03260	138-03262	138-03264
1/2	.120	3	4	138-03270	138-03272	138-03274



*.250 minor diameter on 4 Flute corner rounders.

Chamfer Spotting Tools

2 & 4 Flute

Series 132 & 133

60 Degree Included Angle

DIA	OAL	CUT "A"	CUT "B"	FLUTES	UNCOATED	TiCN	AlTiN
*1/8	1-1/2	.098	.085	2	132-00820	132-00822	132-00824
*3/16	2	.147	.127	2	132-01220	132-01222	132-01224
1/4	2-1/2	.200	.173	4	133-01520	133-01522	133-01524
1/4	2-1/2	.200	.173	2	132-01520	132-01522	132-01524
3/8	2-1/2	.313	.271	2	132-02420	132-02422	132-02424
3/8	2-1/2	.313	.271	4	133-02420	133-02422	133-02424
1/2	3	.430	.372	4	133-03220	133-03222	133-03224
1/2	3	.430	.372	2	132-03220	132-03222	132-03224
3/4	4	.670	.580	4	133-04820	133-04822	133-04824



Series 134 & 135

90 Degree Included Angle

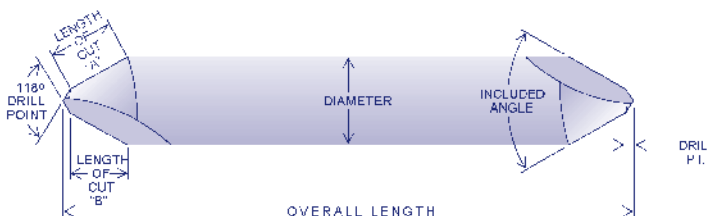
DIA	OAL	CUT "A"	CUT "B"	FLUTES	UNCOATED	TiCN	AlTiN
*1/8	1-1/2	.071	.050	2	134-00830	134-00832	134-00834
*3/16	2	.107	.076	2	134-01230	134-01232	134-01234
1/4	2-1/2	.141	.100	4	135-01530	135-01532	135-01534
1/4	2-1/2	.141	.100	2	134-01530	134-01532	134-01534
3/8	2-1/2	.221	.157	4	135-02430	135-02432	135-02434
3/8	2-1/2	.221	.157	2	134-02430	134-02432	134-02434
1/2	3	.304	.215	4	135-03230	135-03232	135-03234
1/2	3	.304	.215	2	134-03230	134-03232	134-03234
3/4	4	.474	.335	4	135-04830	135-04832	135-04834

*Series 130 & 131

120 Degree Included Angle

DIA	OAL	CUT "A"	CUT "B"	FLUTES	UNCOATED	TiCN	AlTiN
1/4	2-1/2	.124	.062	2	130-01510	130-01512	130-01514
1/4	2-1/2	.144	.072	4	131-01510	131-01512	131-01514
3/8	2-1/2	.217	.108	4	131-02410	131-02412	131-02414
3/8	2-1/2	.199	.100	2	130-02410	130-02412	130-02414
1/2	3	.289	.144	4	131-03210	131-03212	131-03214
1/2	3	.266	.133	2	130-03210	130-03212	130-03214

*No 118° Drill Point



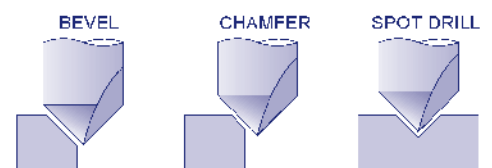
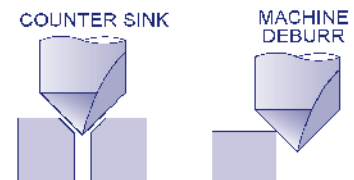
MAXIMUM PRODUCTIVITY

Maximize your productivity with our combination chamfer and spotting drill. This dual-purpose tool, with a standard 118 degree drill point, reduces your cost by performing the job of two separate tools. Our chamfering angles have a constant form relief that allows for more resharpenings as well as a stronger, longer tool life.

TOLERANCES:

- Shank: -.0001/-.0004

*No 118° Drill Point
On 1/8" & 3/16"



CHAMFER SPOTTING

Recommended Feeds & Speeds & Tool Selection Guidelines For ROUGHING Applications

MATERIAL	RECOMMENDED TOOL STYLE	RECOMMENDED COATING	BHN	SFM	FPT 1/4" - 3/8" DIA	FPT 1/2" - 5/8" DIA	FPT 3/4" - 1" DIA
ALUMINUM	SER 102 SER 119 SER 110	ZrN, TiCN	80	1200 To Max	.001 - .004	.004 - .008	.008 - .020
ALUMINUM - HIGH SILICONE CONTENT	SER 102 SER 119 SER 110	ZrN, TiCN, AlTiN	100	600	.001 - .003	.003 - .005	.005 - .008
CAST IRON	SER 100 SER 120 SER 117 SER 122	TiCN, AlTiN	160	500	.001 - .002	.002 - .004	.005 - .006
COPPER, BRASS	SER 102 SER 119 SER 110	TiCN, ZrN	100	750	.001	.002	.004 - .006
HIGH TEMP ALLOYS - NICKEL BASE (INCONEL, WASPALLOY, RENE, HASTALOY)	SER 101 SER 103 SER 120 SER 103	TiCN, AlTiN	200	60	.0008 - .0012	.0012 - .0018	.0018 - .0025
PLASTIC - HIGH GLASS CONTENT	SER 100 SER 102 SER 120	AlTiN, ZrN	--	550	.002 - .003	.004 - .005	.006 - .008
PLASTIC AND COMPOSITES	SER 100 SER 102 SER 120	TiCN, ZrN	--	1000+	.002 - .003	.004 - .007	.008 - .012
STEEL	SER 100 SER 120 SER 121	TiCN, AlTiN	200	275	.001 - .002	.002 - .003	.003 - .004
STEEL, STAINLESS	SER 100 SER 101 SER 103 SER 117 SER 120 SER 122	TiCN, AlTiN	200	200	.001 - .002	.002 - .003	.003 - .004
STEEL, TOOL	SER 101 SER 103 SER 120 SER 121	TiCN, AlTiN	200	200	.001	.002	.003 - .004
TITANIUM	SER 101 SER 103 SER 120	TiCN, AlTiN	275	160	.001	.002 - .003	.004 - .006

Roughing Application Formulas

Speeds and Feeds to be considered as a starting point. Values calculated at:

Axial Cut (depth) = Diameter x 1.0

Radial Cut (width) = Diameter x .5 to Diameter x 1.0 (Full Slot)

Formulas:

Spindle Speed (RPM) = (3.82 x SFM) / Diameter

Feed (Inches Per Minute) = FPT (Feed per Tooth) x RPM x Number of Flutes

Example: For starting speed using a 1/2" 4 flute end mill cutting Titanium at a hardness of around 275 BHN, find SFM on above chart (SFM=160) and calculate RPM using formula as follows: $RPM = 3.82 \times 160 \text{ (SFM)} / .5 \text{ (DIA)} = 1222 \text{ RPM}$.

For starting feed: $.002 \text{ (FPT)} \times 1222 \text{ (RPM)} \times 4 \text{ (Flutes)} = 9\text{-}3/4 \text{ IPM}$.

Recommended Feeds & Speeds & Tool Selection Guidelines For FINISHING Applications

Material	RECOMMENDED TOOL STYLE	RECOMMENDED COATING	BHN	SFM	FPT 1/4" - 3/8" DIA	FPT 1/2" - 5/8" DIA	FPT 3/4" - 1" DIA
ALUMINUM	SER 108 SER 115 SER 109 SER 110	TiCN, ZrN	80	1200 to MAX	.001 - .003	.003 - .006	.006 - .012
ALUMINUM - HIGH SILICONE CONTENT	SER 108 SER 115 SER 109 SER 110	TiCN, ZrN	100	800	.001 - .003	.003 - .005	.006 - .008
CAST IRON	PRO-4 VAR-A-TECH SER 106/113 SER 112 SER 111/116/129	TiCN, AlTiN	160	600	.001	.002 - .004	.005 - .006
COPPER, BRASS	SER 108 SER 115 SER 109 SER 110 SER 111 SER 116 SER 129	TiCN, ZrN	100	900	.001 - .002	.003 - .004	.005 - .007
GRAPHITE	SER 108 SER 115 SER 109 SER 111 SER 116 SER 129	AlTiN, ZrN	—	1000+	.002 - .004	.006 - .008	.010 - .012
HIGH TEMP ALLOYS - NICKEL BASE (INCOLOY, INCONEL, WASPALOY, RENE, HASTALOY)	PRO-4 VAR-A-TECH SER 111 SER 116 SER 112 SER 129	AlTiN, TiCN	200	80	.0008 - .0012	.0012 - .0018	.0018 - .0025
PLASTIC AND COMPOSITES	SER 108 SER 115 SER 109 SER 110 SER 111 SER 116 SER 129	TiCN, ZrN	—	1200+	.003 - .004	.005 - .008	.010 - .014
PLASTIC WITH HIGH GLASS CONTENT	SER 111 SER 116 SER 129 SER 110 SER 109 SER 112	AlTiN, ZrN	—	550	.003 - .004	.005 - .006	.007 - .010
STEEL	PRO-4 VAR-A-TECH SER 129 SER 111/116 SER 112	TiCN, AlTiN	200	400	.001 - .0015	.0015 - .003	.003 - .004
STEEL, STAINLESS	PRO-4 VAR-A-TECH SER 106/113 SER 111/116/129 SER 112	TiCN, AlTiN	200	350	.001 - .0015	.0015 - .003	.003 - .004
STEEL, TOOL	VAR-A-TECH SER 112 SER 111/116/129	TiCN, AlTiN	200	320	.001 - .0015	.0015 - .003	.003 - .004
STEEL/HARDENED	VAR-A-TECH SER 112 SER 111/116/129	TiCN, AlTiN	52 - 60 RC	30 - 60	.0008 - .001	.001 - .002	.002 - .003
TITANIUM	PRO-4 VAR-A-TECH SER 112 SER 111/116/129	TiCN, AlTiN	275	400	.001 - .015	.002 - .004	.004 - .006

Finishing Application Formulas

Speeds and Feeds to be considered as a starting point. Values calculated at:
Axial Cut (depth) = Diameter x 1.5 • Radial Cut (width) = .020 to .040

Formulas:

Spindle Speed (RPM) = (3.82 x SFM) / Diameter • Feed (Inches Per Minute) = FPT (Feed per Tooth) x RPM x Number of Flutes

Example: For starting speed using a 1/2" 4 flute end mill cutting Stainless at a hardness of around 200 BHN, find SFM on above chart (SFM=350) and calculate RPM using formula as follows: RPM = 3.82 x 350 (SFM) / .5 (DIA) = 2674 RPM. • For starting feed: .002 (FPT) x (RPM) x 4 (Flutes) = 21 IPM.

PROMAX FOR PERFORMANCE:

All materials are not alike, that's why PROMAX Tools developed the performance series of carbide end mills. Using the latest in carbide tool technology and ultra fine and submicron grain carbide, PROMAX engineered the right geometries to produce maximum metal removal for all of your applications.

PROMAX Coatings

TiCN

(Titanium Carbonitride)



A performance coating is used for milling in general purpose applications in which excessive mechanically stressed cutting is encountered. It is also ideal where high feed and speed rates are desirable.

AlTiN

(Aluminum Titanium Nitride)



Designed specifically for use on carbide end mills, this single layer coating is used in machining hardened steel and high temperature alloy work pieces. Its excellent oxidation resistance allows high speed in semi-dry or dry machining operations where increased heat is generated.

ZrN

(Zirconium Nitride)



The next generation of coating developed specifically for machining aluminum yet excellent when machining all non-ferrous materials. Also, highly recommended for machining fiberglass, nylon and most polymer materials.

nACRo®

(Aluminum-Chromium-Silicon)



nACRo®: Our newest addition to our coatings, this Aluminum-Chromium-Silicon nanocomposite is Extremely Heat and Scratch Resistant making it the perfect coating for "Tough" Difficult to Cut Materials where temperatures dramatically increase during the cutting process.

PROMAX CUSTOMER SERVICE

At PROMAX, we will provide the highest quality cutting tools to best suit your application. In addition, our customers receive both an excellent tool and the knowledge and assistance of our Technical Support and other departments. PROMAX Tools is built on the foundation that customer service is just as important as the product being sold. Our customers receive the answers they seek and the information they need in a more than timely manner. You can feel comfortable knowing that quality products and customer satisfaction are at the center of every decision PROMAX Tools makes.

Call the knowledgeable PROMAX Tech Line at 800-878-0502 for all of your cutting tool needs and questions.

LIMITED WARRANTY

PROMAX Tools warrants each new product manufactured and sold by PROMAX or one of our authorized dealers against defects in workmanship and/or materials. Our obligation is limited to the repair or replacement of defective products. At our discretion, we may refund the purchase price of a defective product. This warranty does not cover products that are damaged as a result of negligence or misuse including improper operating conditions and machine set up or any items that have been repaired or altered. This warranty excludes all other warranties, expressed or implied, including any implied warranties of merchant ability or fitness for a particular purpose. In no event will PROMAX be liable for any incidental, special or consequential damages of any nature.

RETURN POLICY

Returned products must be accompanied by a PROMAX Tools authorized Returned Goods Authorization number (RGA). Warranty claims should be made through the distributor from whom the product was purchased. Distributors may call PROMAX at 1-800-878-0502 to receive an RGA number. Returned goods may be subject to a restocking fee. Special, modified, non-catalog or altered tools are not acceptable for return.

TEST TOOL POLICY

Take the PROMAX Challenge: Throw it on the spindle and prove it to yourself. Higher production rates and longer tool life are your goals and ours. PROMAX Tools will authorize a test tool credit only when the proper procedures of the existing GUARANTEED TEST TOOL ORDER (GTO) are followed. For details on this program, please call our TECH LINE at 1-800-878-0502.

SAFETY PRECAUTIONS

Carbide cutting tools can break or shatter under improper or severe use. Always wear the proper personal protective equipment when performing metal cutting operations. Carbide cutting tools have sharp edges. Use caution while handling cutting tools to avoid injury.



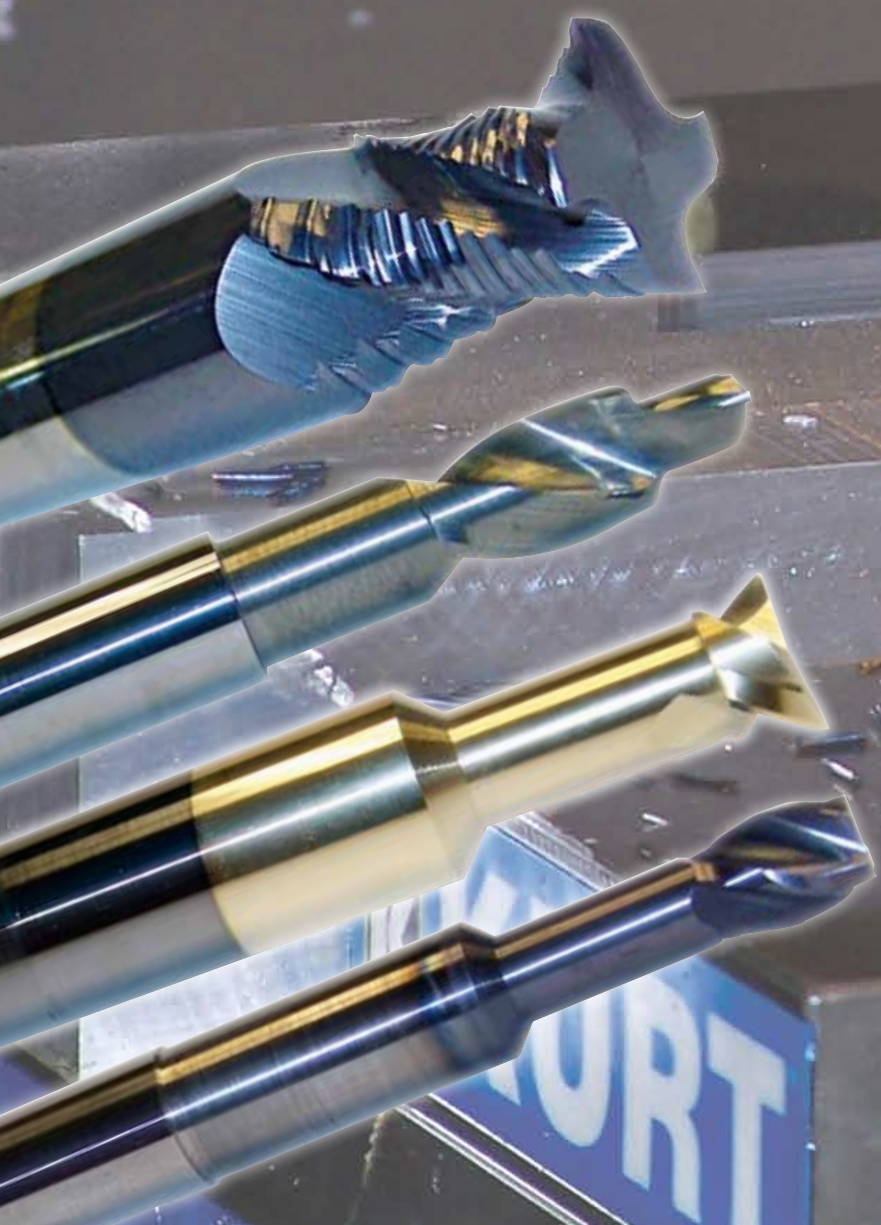
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