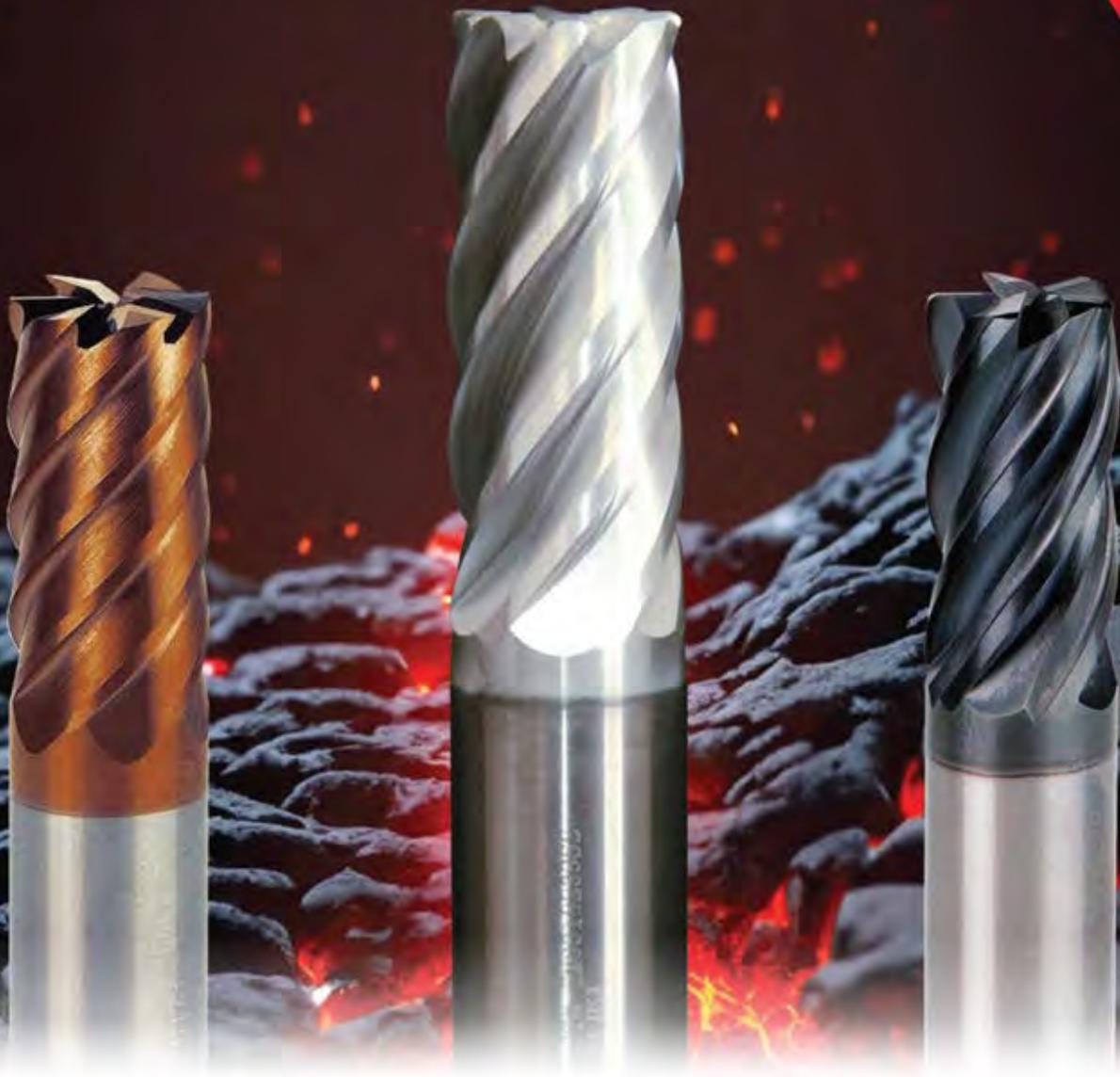


# Ultra Performance Carbide End Mills

Aerospace • Automotive • Defense • Medical • Oil & Gas • Firearms



MADE IN THE  
**USA**

## About **SUPERMILL**



### Ultra Performance Carbide End Mills Designed for maximum productivity when machining difficult workpiece materials

Our company was founded in 1990 under the name Primary Cutter Grinding in Berlin, Connecticut where we started out as a regrind/recondition facility, our customers were predominantly involved in the Aerospace, Defense, and Firearm Manufacturing Industries and soon realized there was a market for a new line of carbide endmills. With our success in the industry and knowledge of market needs it has led us to introduce top performance **Solid Carbide END MILLS** under the brand name **SUPERMILL**.

**SUPERMILL** has grown and expanded our customer base across the country where we have developed a network of distributors and end users by working together and having the same goal in mind, providing the best solution possible.

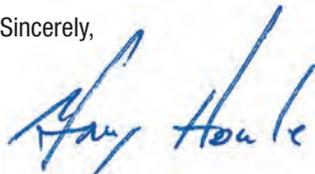
We are pleased to now be a member of the **IMC Group** (International Metalworking Companies) where we have access to additional support and guidance to improve and develop our manufacturing technologies as well as continue to provide top customer service and technical support. We are proud and excited to join this very respected metalworking group of companies and believe this will support and accelerate the growth of **SUPERMILL** in this rapidly changing market of solid carbide endmills.

Our lines have grown and will continue to expand on Ultra Performance end mills with geometries and in-house PVD tool coating designed to address specific applications and deliver maximum productivity. We design tools to handle your specific applications and material requirements.

Please feel free to contact us at any time. Our promise to provide you with the best service and support continues to remain our top priority!

We look forward to our continued growth together,

Sincerely,



**Gary Houle**  
*President*

## Table of CONTENTS

### EXTREME PERFORMANCE

**6**   
**Series SX4F:** 4 Flute end mill for difficult to machine  
**AEROSPACE ALLOYS**

**10**   
**Series SX5F:** 5 Flute end mill for difficult to machine  
**AEROSPACE ALLOYS**

**14**   
**Series SX6F:** 6 Flute end mill for difficult to machine  
**AEROSPACE ALLOYS**

**18**   
**Series SXB:** 4 & 6 Flute end mill for difficult to machine  
**AEROSPACE ALLOYS**

**19**   
**Series SX7F:** 7 Flute end mill for difficult to machine  
**AEROSPACE ALLOYS**

**20**   
**Series SXT:** 5 & 7 Flute end mill for difficult to machine  
**TITANIUM ALLOYS**

**22** **Cutting Parameters for  
 Extreme Performance End Mills**

### ULTRA PERFORMANCE

**24**   
**Series HM:** 6 Flute end mill for hard milling  
**STEELS UP TO 62 RC**

**28**   
**Series TC5F — The Tomcat:** 5 flute end mill for High  
 Speed Machining programs (HSM) & finishing applications in  
**STEEL & STAINLESS ALLOYS**

**32**   
**Series XPV:** 4 Flute end mill for roughing or finishing  
**TITANIUM ALLOYS**

**38**   
**Series XPVB:** 4 Flute ball nose end mill for roughing or  
 finishing **TITANIUM ALLOYS**

**42**   
**Series SM7F:** 7 flute end mill for High Speed Machining  
 programs (HSM) & finishing applications in **TITANIUM ALLOYS**

### ULTRA PERFORMANCE (CONT'D)

**46**   
**Series XPVS:** 4 flute end mill for roughing or finishing  
**STEEL & STAINLESS ALLOYS**

**52**   
**Series XPVSB:** 4 flute ball nose end mill for roughing or  
 finishing **STEEL & STAINLESS ALLOYS**

**Cutting Parameters for Ultra Performance  
 End Mills after each Series**

### HIGH PERFORMANCE

**56**   
**Series XP (Inch Sizes):** 4 flute end mill for slotting &  
 heavy profiling **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**60**   
**Series MXP (Metric Sizes):** 4 flute end mill for slotting &  
 heavy profiling **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**62**   
**Series XPB:** 4 flute ball nose end mill for slotting & heavy  
 profiling **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**63**   
**Series XPR:** 4 flute end mill with chipbreakers for slotting &  
 heavy profiling **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**64** **Cutting Parameters for High  
 Performance XP, MXP, XPB & XPR**

**66**   
**Series SM3F:** 3 flute end mill for slotting & heavy profiling  
**NON-FERROUS and FERROUS MATERIALS < 45 HRC**

**68**   
**Series SR3F:** 3 flute roughing end mill with chipbreakers  
 for slotting & heavy profiling **NON-FERROUS and FERROUS**  
**MATERIALS < 45 HRC**

**70**   
**Series SM4F:** 4 flute end mill for medium profiling and  
 finishing **FERROUS MATERIALS < 45 HRC**

# Table of CONTENTS

## HIGH PERFORMANCE (CONT'D)

**72**   
**Series SR4F:** 4 flute roughing end mill with chipbreakers for medium profiling **FERROUS MATERIALS < 45 HRC**

**74**   
**Series SMR4F:** Fine pitched knuckle style center cutting roughing end mill. Increased chip loads in steel, stainless steel & high temperature alloys for **FERROUS AND NON FERROUS MATERIAL < 45 HRC**

**76**   
**Series SM5F (Inch Sizes):** 5 flute end mill for medium profiling and finishing **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**83**   
**Series MSM5F (Metric Sizes):** 5 flute end mill for medium profiling and finishing **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**86**   
**Series SM6F:** 6 flute end mill for light profiling and finishing **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**92**   
**AL3F:** 3 flute, end mill for roughing or finishing **ALUMINUM ALLOYS**

**Cutting Parameters for High Performance End Mills after each Series**

## ALL PURPOSE

**96**   
**Series CHAMFER MILL:** 4 flute Chamfer Tool for **FERROUS & NON FERROUS MATERIAL** chamfer operations

**98**   
**Series SAP:** 4 flute end mill for universal machining applications in **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**106**   
**Series SAPB:** 4 flute ball nose end mill for universal ball nose machining applications in **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**108**   
**Series SAPBR:** 4 flute ball nose end mill with chipbreakers for slotting & heavy profiling **FERROUS MATERIALS < 45 HRC**  
**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

**109** Performance Reviews

**110** Cutting Parameters for All Purpose End Mills

**112** Speed Calculations (SFM to RPM)

**113** Test Tool Performance Form

### Supermill's Standard Tolerances

Dimension	Tolerance
Cutting Diameter	+0.000 / -0.002
Shank Diameter	H6 Tolerance
Length Of Cut	-0.000 / +0.025
Overall Length	-0.000 / +0.050
Corner Radius	-0.001 / +0.001
TIR	Exceeds industry standard

### Material Group ISO Codes

	ISO Code	Material
Ferrous Materials	P	Steels
	H	Hardened Steels
	M	Stainless Steels
	S	High Temperature Alloys
	K	Cast Iron
Non-Ferrous Materials	S	Titanium Alloys
	N	Aluminum, Copper, Brass

## Series Selector

Reference the chart below to select the best series for your application

Material Group	ISO Code	Material Examples	Finish Cuts	Medium D.O.C.	Heavy D.O.C.	Slotting	Facing	Circular Interpolation	High Feed / High Speed Machining (HSM)	Roughing
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	SM5F SM4F	SM4F	XPVS	XPVS	SAP	XPVS XP	TC5F	SMR4F
Steel Alloys	P	4140 thru 8820 Steel Alloys <45 HRC, Cobalt Chrome	SM5F							
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	SM6F	XP	XP	XP	SM5F SAP	XP	TC5F	
	H	AR-450, Steels >45 HRC	SM6F	SM5F XP			SAP	XP		
Stainless Steel	M	303,304, 316	SM3F	SM3F	XPVS XP	XPVS XP	SAP	XPVS	TC5F	
		410, 420, 440, 13-8, 15-5, 17-4 Ph	SM5F	XPVS			SM5F	XP		
High Temp Titanium Alloys	S	6Al4V, 5553, 99	SM7F SM5F SXT7F	XPV SXT5F	XPV SXT5F	XPV SXT5F	XPV SXT5F	XPV SXT5F	SM7F	
High Temp Nickel Based Alloys	S	Inconel 100, 625, 718, 925, Hastelloy-B, Rene 77, Jethete M252, Haynes 75, Waspalloy, Monel 400	SM6F SM5F SAP SX5F SX6F	SM5F XP SX5F	XP SX4F	XP SX4F	SM5F SM6F SAP SX5F SX6F	XP SX4F	SM6F	SMR4F
High Temp Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	SM5F SM6F	SM5F SM6F						
High Temp Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF-12								
Cast Iron	K	Gray Cast, Malleable & Ductile Iron	SM6F	XP	XPVS	XPVS	SM5F SAP	XPVS XP	TC5F	
Non-Ferrous Materials	N	Alumnum, Copper, Brass, Bronze	AL3F	AL3F	AL3F	AL3F	AL3F	AL3F	AL3F	
		Plastics, Fibreglass	SM3F	SM3F	SM3F	SM3F	SM3F	SM3F	SM3F	

**NOTE:** For best results when facing, use tools with a corner radius or a chamfer

# Series **SX4F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**



- 4 Flute design
- 37° Helix Angle
- Variable Index / Variable Helix
- Eccentric Relief
- Sharp or Corner Radius
- S2 (Silver) Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
5/32	3/16	9/16	2	0.03	SX4F156-030	5255356
3/16	3/16	3/8	1 1/2		SX4F187S	5252630
3/16	3/16	9/16	2		SX4F187	5252629
1/4	1/4	1/2	2		SX4F250S	5252635
1/4	1/4	1/2	2	0.015	SX4F250S-015	5252636
1/4	1/4	1/2	2	0.03	SX4F250S-030	5252637
1/4	1/4	3/4	2 1/2		SX4F250	5252632
1/4	1/4	3/4	2 1/2	0.015	SX4F250-015	5252633
1/4	1/4	3/4	2 1/2	0.03	SX4F250-030	5252634
5/16	5/16	1/2	2		SX4F312S	5252642
5/16	5/16	1/2	2	0.015	SX4F312S-015	5252643
5/16	5/16	1/2	2	0.03	SX4F312S-030	5252644
5/16	5/16	13/16	2 1/2		SX4F312	5252638
5/16	5/16	13/16	2 1/2	0.015	SX4F312-015	5252639
5/16	5/16	13/16	2 1/2	0.03	SX4F312-030	5252640
5/16	5/16	7/8	2 1/2	0.03	SX4F312M-030	5252641
3/8	3/8	1/2	2		SX4F375S	5252655
3/8	3/8	1/2	2	0.015	SX4F375S-015	5252657
3/8	3/8	1/2	2	0.03	SX4F375S-030	5252659
3/8	3/8	1/2	2	0.06	SX4F375S-060	5252661
3/8	3/8	5/8	2		SX4F375MS	5252654
3/8	3/8	7/8	2 1/2		SX4F375	5252646

See page 22 for Cutting Parameters

## Series **SX4F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
3/8	3/8	7/8	2 1/2	0.015	SX4F375-015	5252648
3/8	3/8	7/8	2 1/2	0.03	SX4F375-030	5252649
3/8	3/8	7/8	2 1/2	0.06	SX4F375-060	5252651
7/16	7/16	7/8	2 3/4	0.025	SX4F437A-025	5252663
1/2	1/2	5/8	2 1/2		SX4F500S	5252692
1/2	1/2	5/8	2 1/2	0.01	SX4F500S-010	5252694
1/2	1/2	5/8	2 1/2	0.015	SX4F500S-015	5252696
1/2	1/2	5/8	2 1/2	0.02	SX4F500S-020	5252698
1/2	1/2	5/8	2 1/2	0.03	SX4F500S-030	5252700
1/2	1/2	5/8	2 1/2	0.06	SX4F500S-060	5252701
1/2	1/2	5/8	2 1/2	0.125	SX4F500S-125	5252703
1/2	1/2	1	3		SX4F500	5252664
1/2	1/2	1	3	0.01	SX4F500-010	5252666
1/2	1/2	1	3	0.015	SX4F500-015	5252667
1/2	1/2	1	3	0.02	SX4F500-020	5252668
1/2	1/2	1	3	0.03	SX4F500-030	5252670
1/2	1/2	1	3	0.06	SX4F500-060	5252673
1/2	1/2	1	3	0.125	SX4F500-125	5252674
1/2	1/2	1 1/4	3		SX4F500M	5252682
1/2	1/2	1 1/4	3	0.01	SX4F500M-010	5252684
1/2	1/2	1 1/4	3	0.015	SX4F500M-015	5252686
1/2	1/2	1 1/4	3	0.02	SX4F500M-020	5252687
1/2	1/2	1 1/4	3	0.03	SX4F500M-030	5252688
1/2	1/2	1 1/4	3	0.06	SX4F500M-060	5252690
1/2	1/2	1 1/4	3	0.125	SX4F500M-125	5252691
1/2	1/2	1 5/8	4		SX4F500L	5252675
1/2	1/2	1 5/8	4	0.01	SX4F500L-010	5252676
1/2	1/2	1 5/8	4	0.015	SX4F500L-015	5252677
1/2	1/2	1 5/8	4	0.02	SX4F500L-020	5252678
1/2	1/2	1 5/8	4	0.03	SX4F500L-030	5252679
1/2	1/2	1 5/8	4	0.06	SX4F500L-060	5252680
1/2	1/2	1 5/8	4	0.125	SX4F500L-125	5252681



*Continued on next page*

# Series **SX4F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
5/8	5/8	3/4	3		SX4F625S	5252718
5/8	5/8	3/4	3	0.015	SX4F625S-015	5252719
5/8	5/8	3/4	3	0.03	SX4F625S-030	5252720
5/8	5/8	3/4	3	0.06	SX4F625S-060	5252722
5/8	5/8	3/4	3	0.125	SX4F625S-125	5252723
5/8	5/8	1 1/4	3 1/2		SX4F625	5252705
5/8	5/8	1 1/4	3 1/2	0.015	SX4F625-015	5252707
5/8	5/8	1 1/4	3 1/2	0.03	SX4F625-030	5252708
5/8	5/8	1 1/4	3 1/2	0.06	SX4F625-060	5252710
5/8	5/8	1 1/4	3 1/2	0.125	SX4F625-125	5252711
5/8	5/8	2 1/4	5		SX4F625L	5252712
5/8	5/8	2 1/4	5	0.015	SX4F625L-015	5252713
5/8	5/8	2 1/4	5	0.03	SX4F625L-030	5252714
5/8	5/8	2 1/4	5	0.06	SX4F625L-060	5252716
5/8	5/8	2 1/4	5	0.125	SX4F625L-125	5252717
3/4	3/4	1	3		SX4F750S	5252736
3/4	3/4	1	3	0.015	SX4F750S-015	5252737
3/4	3/4	1	3	0.03	SX4F750S-030	5252738
3/4	3/4	1	3	0.06	SX4F750S-060	5252739
3/4	3/4	1	3	0.125	SX4F750S-125	5252740

*Continued on next page*

## Series **SX4F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
3/4	3/4	1 1/2	4		SX4F750	5252724
3/4	3/4	1 1/2	4	0.015	SX4F750-015	5252725
3/4	3/4	1 1/2	4	0.03	SX4F750-030	5252726
3/4	3/4	1 1/2	4	0.06	SX4F750-060	5252728
3/4	3/4	1 1/2	4	0.125	SX4F750-125	5252729
3/4	3/4	2 1/4	5		SX4F750L	5252731
3/4	3/4	2 1/4	5	0.015	SX4F750L-015	5252732
3/4	3/4	2 1/4	5	0.03	SX4F750L-030	5252733
3/4	3/4	2 1/4	5	0.06	SX4F750L-060	5252734
3/4	3/4	2 1/4	5	0.125	SX4F750L-125	5252735
1	1	1 1/2	4		SX4F1.0	5252619
1	1	1 1/2	4	0.015	SX4F1.0-015	5252620
1	1	1 1/2	4	0.03	SX4F1.0-030	5252621
1	1	1 1/2	4	0.06	SX4F1.0-060	5252622
1	1	1 1/2	4	0.125	SX4F1.0-125	5252623
1	1	2 1/4	5		SX4F1.0L	5252624
1	1	2 1/4	5	0.015	SX4F1.0L-015	5252625
1	1	2 1/4	5	0.03	SX4F1.0L-030	5252626
1	1	2 1/4	5	0.06	SX4F1.0L-060	5252627
1	1	2 1/4	5	0.125	SX4F1.0L-125	5252628



## Series **SX5F**

### Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys

ISO CODE  
**S**



- 5 Flute design
- 37° Helix Angle
- Variable Index / Variable Helix
- Eccentric Relief
- Sharp or Corner Radius
- S2 (Silver) Coating

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
1/4	1/4	3/8	2		SX5F250XS	5252762
1/4	1/4	3/8	2	0.015	SX5F250XS-015	5252763
1/4	1/4	3/8	2	0.03	SX5F250XS-030	5252764
1/4	1/4	1/2	2		SX5F250S	5252757
1/4	1/4	1/2	2	0.01	SX5F250S-010	5252758
1/4	1/4	1/2	2	0.015	SX5F250S-015	5252759
1/4	1/4	1/2	2	0.03	SX5F250S-030	5252760
1/4	1/4	3/4	2 1/2		SX5F250	5252753
1/4	1/4	3/4	2 1/2	0.015	SX5F250-015	5252754
1/4	1/4	3/4	2 1/2	0.03	SX5F250-030	5252756
1/4	1/4	1 1/4	3		SX5F250XL	5252761
5/16	5/16	1/2	2		SX5F312S	5252769
5/16	5/16	1/2	2	0.015	SX5F312S-015	5252770
5/16	5/16	1/2	2	0.03	SX5F312S-030	5252771
5/16	5/16	1/2	2	0.06	SX5F312S-060	5252772
5/16	5/16	13/16	2 1/2		SX5F312	5252765
5/16	5/16	13/16	2 1/2	0.015	SX5F312-015	5252766
5/16	5/16	13/16	2 1/2	0.03	SX5F312-030	5252767
5/16	5/16	13/16	2 1/2	0.06	SX5F312-060	5252768
3/8	3/8	1/2	2		SX5F375XS	5252782
3/8	3/8	1/2	2	0.015	SX5F375XS-015	5252783
3/8	3/8	1/2	2	0.03	SX5F375XS-030	5252784

See page 22 for Cutting Parameters

## Series **SX5F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
3/8	3/8	1/2	2	0.06	SX5F375XS-060	5252785
3/8	3/8	5/8	2		SX5F375S	5252778
3/8	3/8	5/8	2	0.015	SX5F375S-015	5252779
3/8	3/8	5/8	2	0.03	SX5F375S-030	5252780
3/8	3/8	5/8	2	0.06	SX5F375S-060	5252781
3/8	3/8	5/8	2	0.09	SX5F375S-090	5255267
3/8	3/8	1	2 1/2		SX5F375	5252773
3/8	3/8	1	2 1/2	0.015	SX5F375-015	5252774
3/8	3/8	1	2 1/2	0.03	SX5F375-030	5252775
3/8	3/8	1	2 1/2	0.06	SX5F375-060	5252776
3/8	3/8	1 1/4	2 1/2	0.08	SX5F375L-080	5252777
1/2	1/2	5/8	2 1/2		SX5F500S	5252813
1/2	1/2	5/8	2 1/2	0.015	SX5F500S-015	5252815
1/2	1/2	5/8	2 1/2	0.03	SX5F500S-030	5252816
1/2	1/2	5/8	2 1/2	0.06	SX5F500S-060	5252817
1/2	1/2	5/8	2 1/2	0.09	SX5F500S-090	5252818
1/2	1/2	5/8	2 1/2	0.125	SX5F500S-125	5252819
1/2	1/2	1	3		SX5F500	5252787
1/2	1/2	1	3	0.015	SX5F500-015	5252788
1/2	1/2	1	3	0.03	SX5F500-030	5252789
1/2	1/2	1	3	0.06	SX5F500-060	5252790
1/2	1/2	1	3	0.09	SX5F500-090	5252791
1/2	1/2	1	3	0.125	SX5F500-125	5252792
1/2	1/2	1 1/4	3		SX5F500M	5252799
1/2	1/2	1 1/4	3	0.015	SX5F500M-015	5252800
1/2	1/2	1 1/4	3	0.03	SX5F500M-030	5252801
1/2	1/2	1 1/4	3	0.06	SX5F500M-060	5252802
1/2	1/2	1 1/4	3	0.08	SX5F500MA-080	5252805
1/2	1/2	1 1/4	3	0.09	SX5F500M-090	5252803
1/2	1/2	1 1/4	3	0.125	SX5F500M-125	5252804
1/2	1/2	1 1/2	4		SX5F500ML	5252806
1/2	1/2	1 1/2	4	0.015	SX5F500ML-015	5252807



*Continued on next page*

# Series **SX5F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
1/2	1/2	1 1/2	4	0.03	SX5F500ML-030	5252808
1/2	1/2	1 1/2	4	0.06	SX5F500ML-060	5252809
1/2	1/2	1 1/2	4	0.09	SX5F500ML-090	5252810
1/2	1/2	1 1/2	4	0.125	SX5F500ML-125	5252811
1/2	1/2	1 3/4	4		SX5F500L	5252793
1/2	1/2	1 3/4	4	0.015	SX5F500L-015	5252794
1/2	1/2	1 3/4	4	0.03	SX5F500L-030	5252795
1/2	1/2	1 3/4	4	0.06	SX5F500L-060	5252796
1/2	1/2	1 3/4	4	0.09	SX5F500L-090	5252797
1/2	1/2	1 3/4	4	0.125	SX5F500L-125	5252798
1/2	1/2	2	4	0.03	SX5F500MML-030	5252812
5/8	5/8	3/4	3		SX5F625S	5252833
5/8	5/8	3/4	3	0.015	SX5F625S-015	5252834
5/8	5/8	3/4	3	0.03	SX5F625S-030	5252836
5/8	5/8	3/4	3	0.06	SX5F625S-060	5252837
5/8	5/8	3/4	3	0.09	SX5F625S-090	5252838
5/8	5/8	3/4	3	0.125	SX5F625S-125	5252839
5/8	5/8	1 1/4	3 1/2		SX5F625	5252820
5/8	5/8	1 1/4	3 1/2	0.015	SX5F625-015	5252822
5/8	5/8	1 1/4	3 1/2	0.03	SX5F625-030	5252823
5/8	5/8	1 1/4	3 1/2	0.06	SX5F625-060	5252824
5/8	5/8	1 1/4	3 1/2	0.09	SX5F625-090	5252825
5/8	5/8	1 1/4	3 1/2	0.125	SX5F625-125	5252826
5/8	5/8	1 3/4	4		SX5F625M	5252827
5/8	5/8	1 3/4	4	0.015	SX5F625M-015	5252828
5/8	5/8	1 3/4	4	0.03	SX5F625M-030	5252829
5/8	5/8	1 3/4	4	0.06	SX5F625M-060	5252830
5/8	5/8	1 3/4	4	0.09	SX5F625M-090	5252831
5/8	5/8	1 3/4	4	0.125	SX5F625M-125	5252832
3/4	3/4	7/8	3		SX5F750S	5252858
3/4	3/4	7/8	3	0.015	SX5F750S-015	5252859
3/4	3/4	7/8	3	0.03	SX5F750S-030	5252860

*Continued on next page*

## Series **SX5F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
3/4	3/4	7/8	3	0.06	SX5F750S-060	5252861
3/4	3/4	7/8	3	0.09	SX5F750S-090	5252862
3/4	3/4	7/8	3	0.125	SX5F750S-125	5252863
3/4	3/4	1	3	0.06	SX5F750MS-060	5252857
3/4	3/4	1	4	0.06	SX5F750M-060	5252856
3/4	3/4	1 1/2	4		SX5F750	5252840
3/4	3/4	1 1/2	4	0.015	SX5F750-015	5252841
3/4	3/4	1 1/2	4	0.03	SX5F750-030	5252842
3/4	3/4	1 1/2	4	0.06	SX5F750-060	5252844
3/4	3/4	1 1/2	4	0.09	SX5F750-090	5252845
3/4	3/4	1 1/2	4	0.12	SX5F750-120	5252846
3/4	3/4	1 1/2	4	0.125	SX5F750-125	5252847
3/4	3/4	1 1/2	4	0.25	SX5F750-250	5252848
3/4	3/4	1 1/2	4	0.312	SX5F750-312	5252849
3/4	3/4	2 1/4	5		SX5F750L	5252850
3/4	3/4	2 1/4	5	0.015	SX5F750L-015	5252851
3/4	3/4	2 1/4	5	0.03	SX5F750L-030	5252852
3/4	3/4	2 1/4	5	0.06	SX5F750L-060	5252853
3/4	3/4	2 1/4	5	0.09	SX5F750L-090	5252854
3/4	3/4	2 1/4	5	0.125	SX5F750L-125	5252855
1	1	1 1/2	4		SX5F1.0	5252741
1	1	1 1/2	4	0.015	SX5F1.0-015	5252742
1	1	1 1/2	4	0.03	SX5F1.0-030	5252743
1	1	1 1/2	4	0.06	SX5F1.0-060	5252744
1	1	1 1/2	4	0.09	SX5F1.0-090	5252745
1	1	1 1/2	4	0.125	SX5F1.0-125	5252746
1	1	2 1/4	5		SX5F1.0L	5252747
1	1	2 1/4	5	0.015	SX5F1.0L-015	5252748
1	1	2 1/4	5	0.03	SX5F1.0L-030	5252749
1	1	2 1/4	5	0.06	SX5F1.0L-060	5252750
1	1	2 1/4	5	0.09	SX5F1.0L-090	5252751
1	1	2 1/4	5	0.125	SX5F1.0L-125	5252752



# Series *SX6F*

## Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys

ISO CODE  
**S**



- 6 Flute design
- 37° Helix Angle
- Variable Index / Variable Helix
- Eccentric Relief
- Sharp or Corner Radius
- S2 (Silver) Coating

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
5/32	3/16	9/16	2		SX6F156	5252882
1/4	1/4	1/2	2		SX6F250S	5252888
1/4	1/4	1/2	2	0.005	SX6F250S-005	5255176
1/4	1/4	1/2	2	0.015	SX6F250S-015	5252889
1/4	1/4	1/2	2	0.03	SX6F250S-030	5252890
1/4	1/4	3/4	2 1/2		SX6F250	5252883
1/4	1/4	3/4	2 1/2	0.015	SX6F250-015	5252884
1/4	1/4	3/4	2 1/2	0.03	SX6F250-030	5252885
1/4	1/4	3/4	2 1/2	0.05	SX6F250-050	5252886
3/8	3/8	9/16	2		SX6F375S	5252903
3/8	3/8	9/16	2	0.015	SX6F375S-015	5252905
3/8	3/8	9/16	2	0.03	SX6F375S-030	5252906
3/8	3/8	9/16	2	0.04	SX6F375S-040	5252907
3/8	3/8	9/16	2	0.06	SX6F375S-060	5252908
3/8	3/8	9/16	2	0.09	SX6F375S-090	5252909
3/8	3/8	1	2 1/2		SX6F375	5252894
3/8	3/8	1	2 1/2	0.015	SX6F375-015	5252895
3/8	3/8	1	2 1/2	0.03	SX6F375-030	5252896
3/8	3/8	1	2 1/2	0.035	SX6F375-035	5252897
3/8	3/8	1	2 1/2	0.06	SX6F375-060	5252898
3/8	3/8	1	2 1/2	0.08	SX6F375-080	5252899
3/8	3/8	1	2 1/2	0.09	SX6F375-090	5252901

See page 22 for Cutting Parameters

## Series **SX6F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
3/8	3/8	1	2 1/2	0.125	SX6F375-125	5252902
1/2	1/2	5/8	2 1/2		SX6F500S	5252940
1/2	1/2	5/8	2 1/2	0.015	SX6F500S-015	5252942
1/2	1/2	5/8	2 1/2	0.03	SX6F500S-030	5252943
1/2	1/2	5/8	2 1/2	0.06	SX6F500S-060	5252945
1/2	1/2	5/8	2 1/2	0.09	SX6F500S-090	5252946
1/2	1/2	5/8	2 1/2	0.125	SX6F500S-125	5252947
1/2	1/2	1	3		SX6F500MS	5252929
1/2	1/2	1	3	0.015	SX6F500MS-015	5252930
1/2	1/2	1	3	0.025	SX6F500MS-025	5252931
1/2	1/2	1	3	0.03	SX6F500MS-030	5252932
1/2	1/2	1	3	0.045	SX6F500MS-045	5252933
1/2	1/2	1	3	0.05	SX6F500MS-050	5252934
1/2	1/2	1	3	0.06	SX6F500MS-060	5252935
1/2	1/2	1	3	0.09	SX6F500MS-090	5252936
1/2	1/2	1	3	0.125	SX6F500MS-125	5252938
1/2	1/2	1	3	0.15	SX6F500MS-150	5252939
1/2	1/2	1 1/4	3		SX6F500	5252911
1/2	1/2	1 1/4	3	0.01	SX6F500-010	5252913
1/2	1/2	1 1/4	3	0.015	SX6F500-015	5252914
1/2	1/2	1 1/4	3	0.03	SX6F500-030	5252915
1/2	1/2	1 1/4	3	0.06	SX6F500-060	5252918
1/2	1/2	1 1/4	3	0.09	SX6F500-090	5252919
1/2	1/2	1 1/4	3	0.125	SX6F500-125	5252920
1/2	1/2	2	4		SX6F500L	5252922
1/2	1/2	2	4	0.015	SX6F500L-015	5252923
1/2	1/2	2	4	0.03	SX6F500L-030	5252924
1/2	1/2	2	4	0.06	SX6F500L-060	5252925
1/2	1/2	2	4	0.09	SX6F500L-090	5252927
1/2	1/2	2	4	0.125	SX6F500L-125	5252928
5/8	5/8	3/4	3		SX6F625S	5252962
5/8	5/8	3/4	3	0.015	SX6F625S-015	5252963



*Continued on next page*

# Series **SX6F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
5/8	5/8	3/4	3	0.03	SX6F625S-030	5252964
5/8	5/8	3/4	3	0.06	SX6F625S-060	5252965
5/8	5/8	3/4	3	0.09	SX6F625S-090	5252966
5/8	5/8	3/4	3	0.125	SX6F625S-125	5252967
5/8	5/8	1 1/4	3 1/2		SX6F625	5252948
5/8	5/8	1 1/4	3 1/2	0.015	SX6F625-015	5252949
5/8	5/8	1 1/4	3 1/2	0.03	SX6F625-030	5252950
5/8	5/8	1 1/4	3 1/2	0.06	SX6F625-060	5252952
5/8	5/8	1 1/4	3 1/2	0.09	SX6F625-090	5252953
5/8	5/8	1 1/4	3 1/2	0.125	SX6F625-125	5252954
5/8	5/8	1 3/4	4		SX6F625M	5252955
5/8	5/8	1 3/4	4	0.015	SX6F625M-015	5252956
5/8	5/8	1 3/4	4	0.03	SX6F625M-030	5252957
5/8	5/8	1 3/4	4	0.06	SX6F625M-060	5252958
5/8	5/8	1 3/4	4	0.09	SX6F625M-090	5252959
5/8	5/8	1 3/4	4	0.125	SX6F625M-125	5252960
3/4	3/4	1	3		SX6F750S	5252980
3/4	3/4	1	3	0.015	SX6F750S-015	5252981
3/4	3/4	1	3	0.03	SX6F750S-030	5252982
3/4	3/4	1	3	0.06	SX6F750S-060	5252983
3/4	3/4	1	3	0.09	SX6F750S-090	5252984
3/4	3/4	1	3	0.125	SX6F750S-125	5252985
3/4	3/4	1 3/4	4		SX6F750M	5252974
3/4	3/4	1 3/4	4	0.015	SX6F750M-015	5252975
3/4	3/4	1 3/4	4	0.03	SX6F750M-030	5252976
3/4	3/4	1 3/4	4	0.06	SX6F750M-060	5256416
3/4	3/4	1 3/4	4	0.09	SX6F750M-090	5252978
3/4	3/4	1 3/4	4	0.125	SX6F750M-125	5252979
3/4	3/4	1 1/2	4		SX6F750	5252968
3/4	3/4	1 1/2	4	0.015	SX6F750-015	5252969
3/4	3/4	1 1/2	4	0.03	SX6F750-030	5252970
3/4	3/4	1 1/2	4	0.06	SX6F750-060	5252971

*Continued on next page*

## Series **SX6F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
3/4	3/4	1 1/2	4	0.09	SX6F750-090	5252972
3/4	3/4	1 1/2	4	0.125	SX6F750-125	5252973
1	1	1 1/4	4		SX6F1.0S	5252876
1	1	1 1/4	4	0.015	SX6F1.0S-015	5252877
1	1	1 1/4	4	0.03	SX6F1.0S-030	5252878
1	1	1 1/4	4	0.06	SX6F1.0S-060	5252879
1	1	1 1/4	4	0.09	SX6F1.0S-090	5252880
1	1	1 1/4	4	0.125	SX6F1.0S-125	5252881
1	1	1 1/4	4	0.25	SX6F1.0S-250	5255857
1	1	1 1/2	4		SX6F1.0	5252864
1	1	1 1/2	4	0.015	SX6F1.0-015	5252865
1	1	1 1/2	4	0.03	SX6F1.0-030	5252866
1	1	1 1/2	4	0.06	SX6F1.0-060	5252867
1	1	1 1/2	4	0.09	SX6F1.0-090	5252868
1	1	1 1/2	4	0.125	SX6F1.0-125	5252869
1	1	2 1/4	5		SX6F1.0L	5252870
1	1	2 1/4	5	0.015	SX6F1.0L-015	5252871
1	1	2 1/4	5	0.03	SX6F1.0L-030	5252872
1	1	2 1/4	5	0.06	SX6F1.0L-060	5252873
1	1	2 1/4	5	0.09	SX6F1.0L-090	5252874
1	1	2 1/4	5	0.125	SX6F1.0L-125	5252875



# Series **SXB**

## Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys

ISO CODE  
**S**

- 4 & 6 Flute design
- Ball Nose
- 37° Helix Angle
- Variable Index / Variable Helix
- Eccentric Relief
- S2 (Silver) Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
<b>4 Flute</b>						
5/32	3/16	9/16	2	Ball 4 FL	SXB4F156	5252547
1/4	1/4	1/2	2	Ball 4 FL	SXB4F250S	5252549
1/4	1/4	3/4	2 1/2	Ball 4 FL	SXB4F250	5252548
3/8	3/8	7/8	2 1/2	Ball 4 FL	SXB4F375	5252550
1/2	1/2	1	3	Ball 4 FL	SXB4F500	5252551
1/2	1/2	1 1/4	3	Ball 4 FL	SXB4F500M	5252552
<b>6 Flute</b>						
1/4	1/4	1/2	2	Ball 6 FL	SXB6F250S	5252555
1/4	1/4	3/4	2 1/2	Ball 6 FL	SXB6F250	5252554
3/8	3/8	9/16	2	Ball 6 FL	SXB6F375S	5252557
3/8	3/8	7/8	2 1/2	Ball 6 FL	SXB6F375	5252556
1/2	1/2	5/8	2	Ball 6 FL	SXB6F500S	5252560
1/2	1/2	1	3	Ball 6 FL	SXB6F500MS	5252559
1/2	1/2	1 1/4	3	Ball 6 FL	SXB6F500	5252558
5/8	5/8	3/4	3	Ball 6 FL	SXB6F625S	5252564
5/8	5/8	1 1/4	3 1/2	Ball 6 FL	SXB6F625	5252561
5/8	5/8	1 3/4	5	Ball 6 FL	SXB6F625M	5252563
5/8	5/8	2 1/4	5	Ball 6 FL	SXB6F625L	5252562
3/4	3/4	2 1/4	5	Ball 6 FL	SXB6F750L	5252565

See page 22 for Cutting Parameters

## Series **SX7F**

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Aerospace Alloys**

ISO CODE  
**S**



- 7 Flute design
- 37° Helix Angle
- Variable Index / Variable Helix
- Eccentric Relief
- Sharp or Corner Radius
- S2 (Silver) Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	S2 (Silver) Coated	
					Tool Name	EDP #
3/8	3/8	3/4	2	0.05	SX7F375-050	5252986
1/2	1/2	5/8	2 1/2		SX7F500S	5252997
1/2	1/2	5/8	2 1/2	0.015	SX7F500S-015	5252998
1/2	1/2	5/8	2 1/2	0.03	SX7F500S-030	5252999
1/2	1/2	1	3		SX7F500MS	5252993
1/2	1/2	1	3	0.015	SX7F500MS-015	5252995
1/2	1/2	1	3	0.06	SX7F500MS-060	5252996
1/2	1/2	1 1/4	3	0.015	SX7F500-015	5252988
1/2	1/2	1 1/4	3	0.03	SX7F500-030	5252989
1/2	1/2	1 1/4	3	0.06	SX7F500-060	5252990
1/2	1/2	1 1/2	4	0.015	SX7F500L-015	5252991
1/2	1/2	1 1/2	4	0.03	SX7F500L-030	5252992
1/2	1/2	2	4	0.015	SX7F500XL-015	5253000
1/2	1/2	2	4	0.06	SX7F500XL-060	5253001
5/8	5/8	1 5/8	4		SX7F625	5253002



See page 22 for Cutting Parameters

# Series SXT

## Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Titanium Alloys

ISO CODE  
**S**



- 5 & 7 Flute design
- 37° Helix Angle
- Variable Index / Variable Helix
- Eccentric Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
<b>5 Flute</b>						
1/4	1/4	3/8	2	0.01	SXT5F250XS-010	5255433
1/4	1/4	1/2	2	0.01	SXT5F250S-010	5255434
1/4	1/4	5/8	2 1/2	0.01	SXT5F250M-010	5255435
1/4	1/4	1 1/4	3		SXT5F250XL	5252568
1/2	1/2	1	3	0.03	SXT5F500-030	5252569
1/2	1/2	1	3	0.09	SXT5F500-090	5252570
1/2	1/2	1 1/4	3 1/2	0.03	SXT5F500M-030	5255432
3/4	3/4	1 1/2	4	0.19	SXT5F750-190	5252574
3/4	3/4	1 5/8	4		SXT5F750	5252571
3/4	3/4	1 5/8	4	0.03	SXT5F750-030	5252572
3/4	3/4	1 5/8	4	0.06	SXT5F750-060	5252573
3/4	3/4	2	5	0.25	SXT5F750XL-250	5252576
3/4	3/4	2 1/4	5	0.06	SXT5F750L-060	5252575
3/4	3/4	4	7	0.03	SXT5F750XXXL-030	5255792
<b>7 Flute</b>						
3/8	3/8	1 5/8	3		SXT7F375XL	5252577
1/2	1/2	5/8	2 1/2		SXT7F500S	5252604
1/2	1/2	5/8	2 1/2	0.01	SXT7F500S-010	5252605
1/2	1/2	5/8	2 1/2	0.015	SXT7F500S-015	5252606
1/2	1/2	5/8	2 1/2	0.02	SXT7F500S-020	5252607
1/2	1/2	5/8	2 1/2	0.03	SXT7F500S-030	5252608

See page 22 for Cutting Parameters

## Series *SXT*

**Extreme Performance Carbide End Mill For Today's Difficult-To-Machine Titanium Alloys**

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/2	1/2	5/8	2 1/2	0.06	SXT7F500S-060	5252609
1/2	1/2	1	3		SXT7F500MS	5252597
1/2	1/2	1	3	0.01	SXT7F500MS-010	5252599
1/2	1/2	1	3	0.015	SXT7F500MS-015	5252600
1/2	1/2	1	3	0.02	SXT7F500MS-020	5252601
1/2	1/2	1	3	0.03	SXT7F500MS-030	5252602
1/2	1/2	1	3	0.06	SXT7F500MS-060	5252603
1/2	1/2	1 1/4	3		SXT7F500	5252578
1/2	1/2	1 1/4	3	0.01	SXT7F500-010	5252579
1/2	1/2	1 1/4	3	0.015	SXT7F500-015	5252580
1/2	1/2	1 1/4	3	0.02	SXT7F500-020	5252581
1/2	1/2	1 1/4	3	0.03	SXT7F500-030	5252582
1/2	1/2	1 1/4	3	0.06	SXT7F500-060	5252584
1/2	1/2	1 1/2	4		SXT7F500M	5252591
1/2	1/2	1 1/2	4	0.01	SXT7F500M-010	5252592
1/2	1/2	1 1/2	4	0.015	SXT7F500M-015	5252593
1/2	1/2	1 1/2	4	0.02	SXT7F500M-020	5252594
1/2	1/2	1 1/2	4	0.03	SXT7F500M-030	5252595
1/2	1/2	1 1/2	4	0.06	SXT7F500M-060	5252596
1/2	1/2	2	4		SXT7F500L	5252585
1/2	1/2	2	4	0.01	SXT7F500L-010	5252586
1/2	1/2	2	4	0.015	SXT7F500L-015	5252587
1/2	1/2	2	4	0.02	SXT7F500L-020	5252588
1/2	1/2	2	4	0.03	SXT7F500L-030	5252589
1/2	1/2	2	4	0.06	SXT7F500L-060	5252590
1/2	1/2	2 1/4	5	0.03	SXT7F500XL-030	5252610
3/4	3/4	1 1/2	4	0.06	SXT7F750-060	5252612
3/4	3/4	2 1/4	5	0.06	SXT7F750L-060	5252613



# Series *SX4F, SX5F, SX6F, SXB, SX7F & SXT*

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates & Recommended Chip Loads

Material Group	ISO Code	Material Examples	Depth of Cut				
			3/16 ø 10% radial	1/4 ø 15% radial	3/8 ø 15% radial	1/2 ø 25% radial	3/4 ø 25% radial
<b>Inconel 718</b>	<b>P</b>	Inco 718, Hastelloy, Rene 77, Jethite M252, Haynes 75	SFM - 90 CPT - .0006	SFM - 90 CPT - .0008	SFM - 90 CPT - .0013	SFM - 90 CPT - .002	SFM - 90 CPT - .003
<b>Monel</b>	<b>P</b>	Inco 625, Waspalloy, Monel	SFM - 150 CPT - .0007	SFM - 150 CPT - .0008	SFM - 150 CPT - .0013	SFM - 150 CPT - .002	SFM - 150 CPT - .003
<b>Stainless Steel 38 -44Rc</b>	<b>M</b>	420, 17-4, 15-5, Stainless Steel	SFM - 350 CPT - .0008	SFM - 350 CPT - .0008	SFM - 350 CPT - .0013	SFM - 350 CPT - .0022	SFM - 350 CPT - .0032

**EXTREME PERFORMANCE**




**INTRODUCING THE NEW SX SERIES**

For all of your difficult-to-machine Aerospace alloys.

Contact Us Today



Made in the USA

Tel: 860-828-9703 Fax: 860-828-9573



**THE NEW SX SERIES**

The answer to today's difficult-to-machine Aerospace materials

**SX4F**  
4 flute-designed to machine difficult Aerospace alloys with up to 25% radial engagement, and 2 x  $\phi$  axial engagement.

**SXT5F**  
5 flute-designed to machine titanium and titanium alloys at exceptional feeds and speeds due, in part, to special geometry and new coatings.

**SX5F**  
This 5-flute version outperforms its competition in all difficult-to-machine inconel applications.

**SX6F**  
6 flute-designed to machine inconel and stainless steels with more aggressive feed rates when semi-finishing or finishing.

**SX7F**  
7 flute-designed for <10% radial cuts where peel milling or high efficiency milling is required, and finish profiling.



**Supermill, LLC**  
Tel: 860-828-9703 Fax: 860-828-9573 [www.supermill.com](http://www.supermill.com) [info@supermill.com](mailto:info@supermill.com)

Download .pdf file at [www.supermill.com](http://www.supermill.com)

# Series HM

## Ultra Performance Carbide End Mill for Hard Milling Steels Up To 62 Rc

ISO CODE  
**H**



- 6 Flute
- 45° Helix Angle
- Full Eccentric Relief
- Sharp or Corner Radius
- Tixco Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	Tixco Coated	
					Tool Name	EDP #
3/16	3/16	5/8	2		HM6F187	5256358
1/4	1/4	1/2	2 1/2		HM6F250S	5250638
1/4	1/4	1/2	2 1/2	0.015	HM6F250S-015	5250639
1/4	1/4	1/2	2 1/2	0.03	HM6F250S-030	5250640
1/4	1/4	3/4	2 1/2		HM6F250	5250635
1/4	1/4	3/4	2 1/2	0.015	HM6F250-015	5250636
1/4	1/4	3/4	2 1/2	0.03	HM6F250-030	5250637
5/16	5/16	13/16	2 1/2		HM6F312	5256359
3/8	3/8	1/2	2 1/2		HM6F375S	5250644
3/8	3/8	1/2	2 1/2	0.015	HM6F375S-015	5250645
3/8	3/8	1/2	2 1/2	0.03	HM6F375S-030	5250646
3/8	3/8	1	2 1/2		HM6F375	5250641
3/8	3/8	1	2 1/2	0.015	HM6F375-015	5250642
3/8	3/8	1	2 1/2	0.03	HM6F375-030	5250643

See page 26 for Cutting Parameters

## Series *HM*

### Ultra Performance Carbide End Mill for Hard Milling Steels Up To 62 Rc

ISO CODE  
**H**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	Tixco Coated	
					Tool Name	EDP #
7/16	7/16	7/8	2 3/4		HM6F437	5256360
1/2	1/2	5/8	3		HM6F500S	5250654
1/2	1/2	5/8	3	0.015	HM6F500S-015	5250655
1/2	1/2	5/8	3	0.03	HM6F500S-030	5250656
1/2	1/2	1	3		HM6F500	5250647
1/2	1/2	1	3	0.015	HM6F500-015	5250648
1/2	1/2	1	3	0.03	HM6F500-030	5250649
1/2	1/2	1 1/8	3		HM6F500MS	5250653
1/2	1/2	1 1/4	3		HM6F500M	5250650
1/2	1/2	1 1/4	3	0.015	HM6F500M-015	5250651
1/2	1/2	1 1/4	3	0.03	HM6F500M-030	5250652
5/8	5/8	1 1/4	3 1/2		HM6F625	5256362
3/4	3/4	1 1/4	4		HM6F750MS	5250663
3/4	3/4	1 1/4	4	0.015	HM6F750MS-015	5250664
3/4	3/4	1 1/4	4	0.03	HM6F750MS-030	5250665
3/4	3/4	1 1/2	4		HM6F750	5250657
3/4	3/4	1 1/2	4	0.015	HM6F750-015	5250658
3/4	3/4	1 1/2	4	0.03	HM6F750-030	5250659
3/4	3/4	1 3/4	4		HM6F750L	5250660
3/4	3/4	1 3/4	4	0.015	HM6F750L-015	5250661
3/4	3/4	1 3/4	4	0.03	HM6F750L-030	5250662
1.0	1.0	1 1/2	4		HM6F1.0	5256364



# Series *HM*

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates & Recommended Chip Loads

Material Group	ISO Code	Material Examples	Depth of Cut						
			1/8 ø 8% Radial	3/16 ø 15% Radial	1/4 ø 15% Radial	3/8 ø 15% Radial	1/2 ø 15% Radial	3/4 ø 15% Radial	1 ø 15% Radial
Carbon and Alloy Steels 55-62Rc	P	4140 - 8820	SFM - 80 CPT - .0004	SFM - 80 CPT - .0007	SFM - 80 CPT - .0008	SFM - 80 CPT - .001	SFM - 80 CPT - .0012	SFM - 80 CPT - .0015	SFM - 80 CPT - .0018
Tool and Mold Steels 45-55Rc	P	H13, O1, A-2 D-2, S7, P20, M1	SFM - 175 CPT - .0004	SFM - 175 CPT - .0007	SFM - 175 CPT - .0012	SFM - 175 CPT - .0015	SFM - 175 CPT - .0017	SFM - 175 CPT - .0021	SFM - 175 CPT - .0026
Stainless Steel 38-44Rc	K	420, 17-4, 15-5 Stainless Steel	SFM - 350 CPT - .0005	SFM - 350 CPT - .0007	SFM - 350 CPT - .0010	SFM - 350 CPT - .0015	SFM - 350 CPT - .002	SFM - 350 CPT - .0027	SFM - 350 CPT - .0034

ULTRA PERFORMANCE

**TOMCAT**  
**Barrier Breaker**  
SUPERMILL'S New TOMCAT  
There's nothing else like it!

Break barriers and maximize your productivity with rapid stock removal for high speed machining in alloy steels and most stainless steels.

Roughing feed rates up to 200 ipm!

Time is money.  
Start breaking your own barriers.  
Put TOMCAT on the job.

**TOMCAT** by SUPERMILL

[www.supermill.com](http://www.supermill.com)

**SUPERMILL**  
HIGH PERFORMANCE CARBIDE ENDMILLS

A Product of Primary Cutter LLC  
Tel: 860-828-9703 • Fax: 860-828-9573 sales@supermill.com



Download .pdf file at [www.supermill.com](http://www.supermill.com)

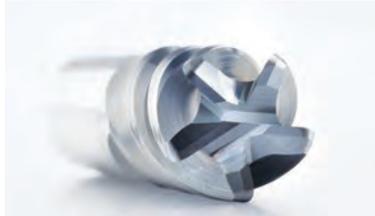
## Series *TC5F* — *The Tomcat*

Ultra Performance Carbide End Mill for High Speed Machining Programs (HSM) & Finishing Applications in Steel & Stainless Alloys

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



- 5 Flute
- Variable Helix
- Variable Index
- Sharp or Corner Radius
- Full Eccentric Relief
- nACRo Coating

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/4	1/4	3/8	2		TC5F250VXS	5253036
1/4	1/4	3/8	2	0.015	TC5F250VXS-015	5253037
1/4	1/4	3/8	2	0.030	TC5F250VXS-030	5253038
1/4	1/4	1/2	2		TC5F250VS	5253033
1/4	1/4	1/2	2	0.015	TC5F250VS-015	5253036
1/4	1/4	1/2	2	0.030	TC5F250VS-030	5253035
1/4	1/4	3/4	2 1/2		TC5F250V	5253030
1/4	1/4	3/4	2 1/2	0.015	TC5F250V-015	5253031
1/4	1/4	3/4	2 1/2	0.030	TC5F250V-030	5253032
5/16	5/16	1/2	2		TC5F312VS	5253049
5/16	5/16	1/2	2	0.015	TC5F312VS-015	5253050
5/16	5/16	1/2	2	0.030	TC5F312VS-030	5253051
5/16	5/16	13/16	2 1/2		TC5F312V	5253039
5/16	5/16	13/16	2 1/2	0.015	TC5F312V-015	5253040
5/16	5/16	13/16	2 1/2	0.030	TC5F312V-030	5253041
3/8	3/8	1/2	2		TC5F375VXS	5253053
3/8	3/8	1/2	2	0.015	TC5F375VXS-015	5253054
3/8	3/8	1/2	2	0.030	TC5F375VXS-030	5253055
3/8	3/8	1/2	2	0.060	TC5F375VXS-060	5253056
3/8	3/8	5/8	2		TC5F375VS	5253049
3/8	3/8	5/8	2	0.015	TC5F375VS-015	5253050
3/8	3/8	5/8	2	0.030	TC5F375VS-030	5253051
3/8	3/8	5/8	2	0.060	TC5F375VS-060	5253052
3/8	3/8	1	2 1/2		TC5F375V	5253045

See page 31 for Cutting Parameters

## Series **TC5F** — The Tomcat

Ultra Performance Carbide End Mill for High Speed Machining Programs (HSM) & Finishing Applications in Steel & Stainless Alloys



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/8	3/8	1	2 1/2	0.015	TC5F375V-015	5253046
3/8	3/8	1	2 1/2	0.030	TC5F375V-030	5253047
3/8	3/8	1	2 1/2	0.060	TC5F375V-060	5253048
1/2	1/2	5/8	2 1/2		TC5F500VS	5253080
1/2	1/2	5/8	2 1/2	0.015	TC5F500VS-015	5253081
1/2	1/2	5/8	2 1/2	0.030	TC5F500VS-030	5253082
1/2	1/2	5/8	2 1/2	0.060	TC5F500VS-060	5253083
1/2	1/2	1	3		TC5F500V	5253057
1/2	1/2	1	3	0.015	TC5F500V-015	5253058
1/2	1/2	1	3	0.030	TC5F500V-030	5253059
1/2	1/2	1	3	0.060	TC5F500V-060	5253060
1/2	1/2	1 1/4	3		TC5F500VM	5253067
1/2	1/2	1 1/4	3	0.015	TC5F500VM-015	5253068
1/2	1/2	1 1/4	3	0.030	TC5F500VM-030	5253069
1/2	1/2	1 1/4	3	0.060	TC5F500VM-060	5253071
1/2	1/2	1 1/2	4		TC5F500VML	5253073
1/2	1/2	1 1/2	4	0.015	TC5F500VML-015	5253074
1/2	1/2	1 1/2	4	0.030	TC5F500VML-030	5253076
1/2	1/2	1 1/2	4	0.060	TC5F500VML-060	5253077
1/2	1/2	1 3/4	4		TC5F500VL	5253062
1/2	1/2	1 3/4	4	0.015	TC5F500VL-015	5253063
1/2	1/2	1 3/4	4	0.030	TC5F500VL-030	5253064
1/2	1/2	1 3/4	4	0.060	TC5F500VL-060	5253065
5/8	5/8	3/4	3		TC5F625VS	5253094
5/8	5/8	3/4	3	0.015	TC5F625VS-015	5253095
5/8	5/8	3/4	3	0.030	TC5F625VS-030	5253096
5/8	5/8	3/4	3	0.060	TC5F625VS-060	5253097
5/8	5/8	1 1/4	3 1/2		TC5F625V	5253085
5/8	5/8	1 1/4	3 1/2	0.015	TC5F625V-015	5253086
5/8	5/8	1 1/4	3 1/2	0.030	TC5F625V-030	5253087
5/8	5/8	1 1/4	3 1/2	0.060	TC5F625V-060	5253088
5/8	5/8	1 1/4	3 1/2	0.090	TC5F625V-090	5253089
5/8	5/8	1 3/4	4		TC5F625VM	5253090
5/8	5/8	1 3/4	4	0.015	TC5F625VM-015	5253091



Continued on next page

## Series *TC5F* — The Tomcat

Ultra Performance Carbide End Mill for High Speed Machining Programs (HSM) & Finishing Applications in Steel & Stainless Alloys

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
5/8	5/8	1 3/4	4	0.030	TC5F625VM-030	5253092
5/8	5/8	1 3/4	4	0.060	TC5F625VM-060	5253093
3/4	3/4	7/8	3		TC5F750VS	5253110
3/4	3/4	7/8	3	0.015	TC5F750VS-015	5253111
3/4	3/4	7/8	3	0.030	TC5F750VS-030	5253112
3/4	3/4	7/8	3	0.060	TC5F750VS-060	5253113
3/4	3/4	1 1/2	4		TC5F750V	5253098
3/4	3/4	1 1/2	4	0.015	TC5F750V-015	5253099
3/4	3/4	1 1/2	4	0.030	TC5F750V-030	5253100
3/4	3/4	1 1/2	4	0.060	TC5F750V-060	5253101
3/4	3/4	1 1/2	4	0.090	TC5F750V-090	5253102
3/4	3/4	1 1/2	4	0.125	TC5F750V-125	5253103
3/4	3/4	2 1/4	5		TC5F750VL	5253104
3/4	3/4	2 1/4	5	0.015	TC5F750VL-015	5253105
3/4	3/4	2 1/4	5	0.030	TC5F750VL-030	5253106
3/4	3/4	2 1/4	5	0.060	TC5F750VL-060	5253107
3/4	3/4	2 1/4	5	0.090	TC5F750VL-090	5253108
1	1	1 1/4	4		TC5F1.0VS	5253025
1	1	1 1/4	4	0.015	TC5F1.0VS-015	5253026
1	1	1 1/4	4	0.030	TC5F1.0VS-030	5253027
1	1	1 1/4	4	0.060	TC5F1.0VS-060	5253028
1	1	1 1/2	4		TC5F1.0V	5253016
1	1	1 1/2	4	0.015	TC5F1.0V-015	5253017
1	1	1 1/2	4	0.030	TC5F1.0V-030	5253018
1	1	1 1/2	4	0.060	TC5F1.0V-060	5253019
1	1	2 1/4	5		TC5F1.0VL	5253020
1	1	2 1/4	5	0.015	TC5F1.0VL-015	5253021
1	1	2 1/4	5	0.030	TC5F1.0VL-030	5253022
1	1	2 1/4	5	0.060	TC5F1.0VL-060	5253023

## Series TC5F — The Tomcat

### Cutting Parameters

#### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	High Feed	
			.1D Radial x 3D Axial	
			SFM	IPM
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	800	150
Steel Alloys	P	4140 thru 8820	700	120
		Steel Alloys <45 HRC, Cobalt Chrome	500	100
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	600	100
Stainless Steel	M	303,304, 316	500	50
		410, 420, 440, 13-8, 15-5, 17-4 Ph	600	60
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	800	150

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter					
			1/4	3/8	1/2	5/8	3/4	1
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	0.0025	0.0037	0.0050	0.0062	0.0075	0.0090
Steel Alloys	P	4140 thru 8820	0.0025	0.0037	0.0050	0.0062	0.0075	0.0090
		Steel Alloys <45 HRC, Cobalt Chrome	0.0025	0.0037	0.0050	0.0062	0.0075	0.0090
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	0.0025	0.0037	0.0050	0.0062	0.0075	0.0090
Stainless Steel	M	303,304, 316	0.0013	0.0020	0.0026	0.0033	0.0040	0.0052
		410, 420, 440, 13-8, 15-5, 17-4 Ph	0.0013	0.0020	0.0026	0.0033	0.0040	0.0052
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	0.0025	0.0037	0.0050	0.0062	0.0075	0.0090

ULTRA PERFORMANCE

## Series *XPV*

### Ultra Performance Carbide End Mill for Roughing or Finishing Titanium Alloys

ISO CODE  
**S**



- 4 Flute
- Variable Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/8	1/8	1/4	1 1/2		XPV125S	5253470
1/8	1/8	1/4	1 1/2	0.010	XPV125S-010	5253471
1/8	1/8	1/2	1 1/2		XPV125	5253467
1/8	1/8	1/2	1 1/2	0.010	XPV125-010	5253468
3/16	3/16	3/8	1 1/2		XPV187S	5253480
3/16	3/16	3/8	1 1/2	0.010	XPV187S-010	5253481
3/16	3/16	3/8	1 1/2	0.015	XPV187S-015	5253482
3/16	3/16	3/8	1 1/2	0.025	XPV187S-025	5253483
3/16	3/16	9/16	2		XPV187	5253476
3/16	3/16	9/16	2	0.010	XPV187-010	5253477
3/16	3/16	9/16	2	0.015	XPV187-015	5253478
3/16	3/16	9/16	2	0.025	XPV187-025	5253479
1/4	1/4	1/2	2		XPV250S	5253496
1/4	1/4	1/2	2	0.015	XPV250S-015	5253497
1/4	1/4	1/2	2	0.030	XPV250S-030	5253498
1/4	1/4	1/2	2	0.060	XPV250S-060	5253499
1/4	1/4	3/4	2 1/2		XPV250	5253485
1/4	1/4	3/4	2 1/2	0.015	XPV250-015	5253486
1/4	1/4	3/4	2 1/2	0.030	XPV250-030	5253487
1/4	1/4	3/4	2 1/2	0.060	XPV250-060	5253488
1/4	1/4	1 1/8	3		XPV250L	5253491
1/4	1/4	1 1/8	3	0.015	XPV250L-015	5253492
1/4	1/4	1 1/8	3	0.030	XPV250L-030	5253493
1/4	1/4	1 1/8	3	0.060	XPV250L-060	5253494

See page 40 for Cutting Parameters

## Series **XPV**

Ultra Performance Carbide End Mill for Roughing or Finishing Titanium Alloys

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
5/16	5/16	1/2	2		XPV312S	5253508
5/16	5/16	1/2	2	0.015	XPV312S-015	5253509
5/16	5/16	1/2	2	0.030	XPV312S-030	5253510
5/16	5/16	1/2	2	0.060	XPV312S-060	5253511
5/16	5/16	13/16	2 1/2		XPV312	5253500
5/16	5/16	13/16	2 1/2	0.015	XPV312-015	5253501
5/16	5/16	13/16	2 1/2	0.030	XPV312-030	5253502
5/16	5/16	13/16	2 1/2	0.060	XPV312-060	5253503
5/16	5/16	1 1/8	3		XPV312L	5253504
5/16	5/16	1 1/8	3	0.015	XPV312L-015	5253505
5/16	5/16	1 1/8	3	0.030	XPV312L-030	5253506
5/16	5/16	1 1/8	3	0.060	XPV312L-060	5253507
3/8	3/8	1/2	2		XPV375S	5253521
3/8	3/8	1/2	2	0.015	XPV375S-015	5253522
3/8	3/8	1/2	2	0.030	XPV375S-030	5253523
3/8	3/8	1/2	2	0.060	XPV375S-060	5253524
3/8	3/8	7/8	2 1/2		XPV375	5253512
3/8	3/8	7/8	2 1/2	0.015	XPV375-015	5253513
3/8	3/8	7/8	2 1/2	0.030	XPV375-030	5253514
3/8	3/8	7/8	2 1/2	0.060	XPV375-060	5253515
3/8	3/8	1 1/8	3		XPV375L	5253517
3/8	3/8	1 1/8	3	0.015	XPV375L-015	5253518
3/8	3/8	1 1/8	3	0.030	XPV375L-030	5253519
3/8	3/8	1 1/8	3	0.060	XPV375L-060	5253520
3/8	3/8	1 1/2	4		XPV375XL	5253526
3/8	3/8	1 1/2	4	0.015	XPV375XL-015	5253527
3/8	3/8	1 1/2	4	0.030	XPV375XL-030	5253528
3/8	3/8	1 1/2	4	0.060	XPV375XL-060	5253529
1/2	1/2	5/8	2 1/2		XPV500S	5253554
1/2	1/2	5/8	2 1/2	0.015	XPV500S-015	5253555
1/2	1/2	5/8	2 1/2	0.030	XPV500S-030	5253556
1/2	1/2	5/8	2 1/2	0.045	XPV500S-045	5253557
1/2	1/2	5/8	2 1/2	0.060	XPV500S-060	5253558
1/2	1/2	5/8	2 1/2	0.090	XPV500S-090	5253559



Continued on next page

# Series *XPV*

## Ultra Performance Carbide End Mill for Roughing or Finishing Titanium Alloys

ISO CODE  
**S**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/2	1/2	5/8	2 1/2	0.125	XPV500S-125	5253560
1/2	1/2	1	3		XPV500	5253533
1/2	1/2	1	3	0.015	XPV500-015	5253534
1/2	1/2	1	3	0.030	XPV500-030	5253535
1/2	1/2	1	3	0.045	XPV500-045	5253536
1/2	1/2	1	3	0.060	XPV500-060	5253537
1/2	1/2	1	3	0.090	XPV500-090	5253538
1/2	1/2	1	3	0.125	XPV500-125	5253539
1/2	1/2	1 1/4	3		XPV500M	5253547
1/2	1/2	1 1/4	3	0.015	XPV500M-015	5253548
1/2	1/2	1 1/4	3	0.030	XPV500M-030	5253549
1/2	1/2	1 1/4	3	0.045	XPV500M-045	5253550
1/2	1/2	1 1/4	3	0.060	XPV500M-060	5253551
1/2	1/2	1 1/4	3	0.090	XPV500M-090	5253552
1/2	1/2	1 1/4	3	0.125	XPV500M-125	5253553
1/2	1/2	1 1/2	4		XPV500L	5253540
1/2	1/2	1 1/2	4	0.015	XPV500L-015	5253541
1/2	1/2	1 1/2	4	0.030	XPV500L-030	5253542
1/2	1/2	1 1/2	4	0.045	XPV500L-045	5253543
1/2	1/2	1 1/2	4	0.060	XPV500L-060	5253544
1/2	1/2	1 1/2	4	0.090	XPV500L-090	5253545
1/2	1/2	1 1/2	4	0.125	XPV500L-125	5253546
1/2	1/2	2	4		XPV500XL	5253561
1/2	1/2	2	4	0.015	XPV500XL-015	5253562
1/2	1/2	2	4	0.030	XPV500XL-030	5253563
1/2	1/2	2	4	0.045	XPV500XL-045	5253564
1/2	1/2	2	4	0.060	XPV500XL-060	5253565
1/2	1/2	2	4	0.090	XPV500XL-090	5253566
1/2	1/2	2	4	0.125	XPV500XL-125	5253567
1/2	1/2	3	6		XPV500XXL	5253568
1/2	1/2	3	6	0.015	XPV500XXL-015	5253569
1/2	1/2	3	6	0.030	XPV500XXL-030	5253570
1/2	1/2	3	6	0.045	XPV500XXL-045	5253571
1/2	1/2	3	6	0.060	XPV500XXL-060	5253572

Continued on next page

## Series *XPV*

### Ultra Performance Carbide End Mill for Roughing or Finishing Titanium Alloys

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/2	1/2	3	6	0.090	XPV500XXL-090	5253573
1/2	1/2	3	6	0.125	XPV500XXL-125	5253574
5/8	5/8	3/4	3		XPV625S	5253589
5/8	5/8	3/4	3	0.015	XPV625S-015	5253590
5/8	5/8	3/4	3	0.030	XPV625S-030	5253591
5/8	5/8	3/4	3	0.045	XPV625S-045	5253592
5/8	5/8	3/4	3	0.060	XPV625S-060	5253593
5/8	5/8	3/4	3	0.090	XPV625S-090	5253594
5/8	5/8	3/4	3	0.125	XPV625S-125	5253595
5/8	5/8	1 1/4	3 1/2		XPV625	5253575
5/8	5/8	1 1/4	3 1/2	0.015	XPV625-015	5253576
5/8	5/8	1 1/4	3 1/2	0.030	XPV625-030	5253577
5/8	5/8	1 1/4	3 1/2	0.045	XPV625-045	5253578
5/8	5/8	1 1/4	3 1/2	0.060	XPV625-060	5253579
5/8	5/8	1 1/4	3 1/2	0.090	XPV625-090	5253580
5/8	5/8	1 1/4	3 1/2	0.125	XPV625-125	5253581
5/8	5/8	2 1/4	5		XPV625L	5253582
5/8	5/8	2 1/4	5	0.015	XPV625L-015	5253583
5/8	5/8	2 1/4	5	0.030	XPV625L-030	5253584
5/8	5/8	2 1/4	5	0.045	XPV625L-045	5253585
5/8	5/8	2 1/4	5	0.060	XPV625L-060	5253586
5/8	5/8	2 1/4	5	0.090	XPV625L-090	5253587
5/8	5/8	2 1/4	5	0.125	XPV625L-125	5253588
3/4	3/4	1	3		XPV750S	5253610
3/4	3/4	1	3	0.015	XPV750S-015	5253611
3/4	3/4	1	3	0.030	XPV750S-030	5253612
3/4	3/4	1	3	0.045	XPV750S-045	5253613
3/4	3/4	1	3	0.060	XPV750S-060	5253614
3/4	3/4	1	3	0.090	XPV750S-090	5253615
3/4	3/4	1	3	0.125	XPV750S-125	5253616
3/4	3/4	1 1/2	4		XPV750	5253596
3/4	3/4	1 1/2	4	0.015	XPV750-015	5253597
3/4	3/4	1 1/2	4	0.030	XPV750-030	5253598
3/4	3/4	1 1/2	4	0.045	XPV750-045	5253599



*Continued on next page*

# Series *XPV*

## Ultra Performance Carbide End Mill for Roughing or Finishing Titanium Alloys

ISO CODE  
**S**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/4	3/4	1 1/2	4	0.060	XPV750-060	5253600
3/4	3/4	1 1/2	4	0.090	XPV750-090	5253601
3/4	3/4	1 1/2	4	0.125	XPV750-125	5253602
3/4	3/4	2 1/4	5		XPV750L	5253603
3/4	3/4	2 1/4	5	0.015	XPV750L-015	5253604
3/4	3/4	2 1/4	5	0.030	XPV750L-030	5253605
3/4	3/4	2 1/4	5	0.045	XPV750L-045	5253606
3/4	3/4	2 1/4	5	0.060	XPV750L-060	5253607
3/4	3/4	2 1/4	5	0.090	XPV750L-090	5253608
3/4	3/4	2 1/4	5	0.125	XPV750L-125	5253609
3/4	3/4	3	6		XPV750XL	5253617
3/4	3/4	3	6	0.015	XPV750XL-015	5253618
3/4	3/4	3	6	0.030	XPV750XL-030	5253619
3/4	3/4	3	6	0.045	XPV750XL-045	5253620
3/4	3/4	3	6	0.060	XPV750XL-060	5253621
3/4	3/4	3	6	0.090	XPV750XL-090	5253622
3/4	3/4	3	6	0.125	XPV750XL-125	5253623
1	1	1 1/2	4		XPV1.0	5253446
1	1	1 1/2	4	0.015	XPV1.0-015	5253447
1	1	1 1/2	4	0.030	XPV1.0-030	5253448
1	1	1 1/2	4	0.045	XPV1.0-045	5253449
1	1	1 1/2	4	0.060	XPV1.0-060	5253450
1	1	1 1/2	4	0.090	XPV1.0-090	5253451
1	1	1 1/2	4	0.125	XPV1.0-125	5253452
1	1	2 1/4	5		XPV1.0L	5253453
1	1	2 1/4	5	0.015	XPV1.0L-015	5253454
1	1	2 1/4	5	0.030	XPV1.0L-030	5253455
1	1	2 1/4	5	0.045	XPV1.0L-045	5253456
1	1	2 1/4	5	0.060	XPV1.0L-060	5253457
1	1	2 1/4	5	0.090	XPV1.0L-090	5253458
1	1	2 1/4	5	0.125	XPV1.0L-125	5253459
1	1	3	6		XPV1.0XL	5253460

Continued on next page

## Series *XPV*

Ultra Performance Carbide End Mill for Roughing or Finishing Titanium Alloys

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1	1	3	6	0.015	XPV1.0XL-015	5253461
1	1	3	6	0.030	XPV1.0XL-030	5253462
1	1	3	6	0.045	XPV1.0XL-045	5253463
1	1	3	6	0.060	XPV1.0XL-060	5253464
1	1	3	6	0.090	XPV1.0XL-090	5253465
1	1	3	6	0.125	XPV1.0XL-125	5253466



## Series *XPVB*

Ultra Performance Carbide End Mill for Ball Nose  
 Roughing or Finishing Titanium Alloys

ISO CODE  
**S**



- 4 Flute
- Ball Nose
- Variable Helix
- Variable Pitch
- Full Eccentric Relief
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/8	1/8	1/4	1 1/2	BallNose	XPVB125S	5253200
1/8	1/8	1/2	1 1/2	BallNose	XPVB125	5253199
3/16	3/16	3/8	1 1/2	BallNose	XPVB187S	5253202
3/16	3/16	9/16	2	BallNose	XPVB187	5253201
1/4	1/4	1/2	2	BallNose	XPVB250S	5253206
1/4	1/4	3/4	2 1/2	BallNose	XPVB250	5253203
1/4	1/4	1 1/8	3	BallNose	XPVB250L	5253205
5/16	5/16	1/2	2	BallNose	XPVB312S	5253210
5/16	5/16	13/16	2 1/2	BallNose	XPVB312	5253208
5/16	5/16	1 1/8	3	BallNose	XPVB312L	5253209
3/8	3/8	1/2	2	BallNose	XPVB375S	5253214
3/8	3/8	7/8	2 1/2	BallNose	XPVB375	5253211
3/8	3/8	1 1/8	3	BallNose	XPVB375L	5253213
3/8	3/8	1 1/2	4	BallNose	XPVB375XL	5253216
1/2	1/2	5/8	2 1/2	BallNose	XPVB500S	5253221
1/2	1/2	1	3	BallNose	XPVB500	5253217
1/2	1/2	1 1/4	3	BallNose	XPVB500M	5253219
1/2	1/2	1 1/2	4	BallNose	XPVB500L	5253218
1/2	1/2	2	4	BallNose	XPVB500XL	5253222
1/2	1/2	3	6	BallNose	XPVB500XXL	5253223

See page 40 for Cutting Parameters

## Series *XPVB*

Ultra Performance Carbide End Mill for Ball Nose  
Roughing or Finishing Titanium Alloys

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
5/8	5/8	3/4	3	BallNose	XPVB625S	5253226
5/8	5/8	1 1/4	3 1/2	BallNose	XPVB625	5253224
5/8	5/8	2 1/4	5	BallNose	XPVB625L	5253225
3/4	3/4	1	3	BallNose	XPVB750S	5253229
3/4	3/4	1 1/2	4	BallNose	XPVB750	5253227
3/4	3/4	2 1/4	5	BallNose	XPVB750L	5253228
3/4	3/4	3	6	BallNose	XPVB750XL	5253230
1	1	1 1/2	4	BallNose	XPVB1.0	5253196
1	1	2 1/4	5	BallNose	XPVB1.0L	5253197
1	1	3	6	BallNose	XPVB1.0XL	5253198



## Series *XPV & XPVB*

### Cutting Parameters

#### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Slotting		Facing		Ramping	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.5D Axial		.75D Radial x .25D Axial		Max. Ramp Angle -7°	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
High Temp - Titanium Alloys	S	6Al4V, 5553, 99	300	20.00	300	18.00	300	14.00	300	10.00	300	18.00	300	14.00

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter							
			1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
High Temp - Titanium Alloys	S	6Al4V, 5553, 99	0.0004	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040

ULTRA PERFORMANCE

Visit us at [www.supermill.com](http://www.supermill.com) and experience the easiest and fastest tool selection navigation in the business!!!

ULTRA PERFORMANCE

**SUPERMILL**  
When Performance Matters

HOME ABOUT RESOURCE CENTER DISTRIBUTORS CONTACT BROWSE CATALOG

**Ultra Performance Carbide End Mills**  
Designed for maximum productivity when machining difficult workpiece materials  
BROWSE CATALOG >

Unique chipbreakers allow higher MRR AND longer tool life

**TOOL SELECTOR**

- ▶ PERFORMANCE LEVEL
  - ▶ Ultra Performance
  - ▶ High Performance
  - ▶ All Purpose
- ▶ MATERIAL GROUPS
- ▶ ISO MATERIAL GROUPS
- ▶ SERIES SELECTION BY OPERATION
- ▶ TOOL SERIES

**TOOL CHARACTERISTICS**

- ▶ NUMBER OF FLUTES
- ▶ BALL NOSE
- ▶ HELIX ANGLE
- ▶ FLUTE STYLE

**RESOURCES**

- ▶ RESOURCE CENTER
- ▶ SERIES SELECTOR
- ▶ DOWNLOADS
- ▶ FIND A DISTRIBUTOR
- ▶ BROWSE CATALOG
- ▶ SPEEDS & FEEDS
- ▶ TESTIMONIALS

**SPECIAL OFFERS**  
Sign up to receive our special offers:  
Name: \_\_\_\_\_  
Email: \_\_\_\_\_  
Subscribe

**When performance matters...choose Supermill**  
"High Performance" has become a generic term in the industrial cutting tool industry. But when you're measuring results by productivity and looking to make a real difference in your output for demanding markets like aerospace, medical and automotive, you'll need the best. That's when you'll want Supermill end mills in your spindle, with geometries and coatings that support extreme cutting capabilities and long tool life. Supermill brings you the highest performance. We call it **Ultra Performance!** See the difference for yourself. Put Supermill end mills in your spindle...especially when performance matters!

**Featured Products**

- Series XPV** for cost-effective machining Titanium Alloys  
Learn more
- Series TCSF (The Tomcat)** for High-Speed Machining programs (HSM) & finishing applications in Steels & Stainless Alloys  
"IT'S A BEAST"  
Learn more
- Series SM7F** for high-feed Machining Titanium Alloys  
Learn more

**Resources**

Finishing Cuts		Medium Cuts	
4FD Round & 2D Angle	2SD Radial & 1SD Axial	4FD Round & 2D Angle	2SD Radial & 1SD Axial
SFM	IPM	SFM	IPM
800	2000	1000	2500
500	50.00	500	45.00
200	30.00	200	25.00
250	30.00	250	25.00

**Order Online Today!**  
SHIPPING DIRECT FROM SUPERMILL

36 Willow Brook Drive  
Berlin, CT 06037  
Phone: (860) 828-9703  
Fax: (860) 828-9573  
Email: [info@supermill.com](mailto:info@supermill.com)

HOME ABOUT RESOURCE CENTER DISTRIBUTORS CONTACT BROWSE CATALOG

## Series SM7F

Ultra Performance Carbide End Mill for High Speed Machining (HSM) Programs & Finishing Applications in Titanium Alloys

ISO CODE  
**S**



- 7 Flute
- 45° Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/16	3/16	3/8	1 1/2		SM7F187S	5252407
3/16	3/16	3/8	1 1/2	0.010	SM7F187S-010	5252408
3/16	3/16	9/16	2		SM7F187	5252403
3/16	3/16	9/16	2	0.010	SM7F187-010	5252404
3/16	3/16	3/4	2 1/2		SM7F187L	5252405
3/16	3/16	3/4	2 1/2	0.010	SM7F187L-010	5252406
1/4	1/4	1/2	2		SM7F250S	5252415
1/4	1/4	1/2	2	0.015	SM7F250S-015	5252416
1/4	1/4	3/4	2 1/2		SM7F250	5252409
1/4	1/4	3/4	2 1/2	0.015	SM7F250-015	5252411
1/4	1/4	1 1/8	3		SM7F250L	5252413
1/4	1/4	1 1/8	3	0.015	SM7F250L-015	5252414
5/16	5/16	1/2	2		SM7F312S	5252421
5/16	5/16	1/2	2	0.015	SM7F312S-015	5252422
5/16	5/16	13/16	2 1/2		SM7F312	5252417
5/16	5/16	13/16	2 1/2	0.015	SM7F312-015	5252418
5/16	5/16	1 1/8	3		SM7F312L	5252419
5/16	5/16	1 1/8	3	0.015	SM7F312L-015	5252420
3/8	3/8	9/16	2		SM7F375S	5252428
3/8	3/8	9/16	2	0.015	SM7F375S-015	5252429
3/8	3/8	1	2 1/2		SM7F375	5252423
3/8	3/8	1	2 1/2	0.015	SM7F375-015	5252424

See page 45 for Cutting Parameters

## Series SM7F

Ultra Performance Carbide End Mill for High Speed Machining (HSM) Programs & Finishing Applications in Titanium Alloys

ISO CODE  
**S**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/8	3/8	1 1/4	3		SM7F375L	5252426
3/8	3/8	1 1/4	3	0.015	SM7F375L-015	5252427
7/16	7/16	1	2 3/4		SM7F437	5252430
7/16	7/16	1	2 3/4	0.015	SM7F437-015	5252431
7/16	7/16	2	4		SM7F437L	5252432
7/16	7/16	2	4	0.015	SM7F437L-015	5252433
1/2	1/2	5/8	2 1/2		SM7F500S	5252447
1/2	1/2	5/8	2 1/2	0.015	SM7F500S-015	5252449
1/2	1/2	5/8	2 1/2	0.030	SM7F500S-030	5252451
1/2	1/2	1	3		SM7F500	5252435
1/2	1/2	1	3	0.015	SM7F500-015	5252437
1/2	1/2	1	3	0.030	SM7F500-030	5252438
1/2	1/2	1 1/4	3		SM7F500M	5252443
1/2	1/2	1 1/4	3	0.015	SM7F500M-015	5252444
1/2	1/2	1 1/4	3	0.030	SM7F500M-030	5252445
1/2	1/2	1 1/2	4		SM7F500L	5252439
1/2	1/2	1 1/2	4	0.015	SM7F500L-015	5252440
1/2	1/2	1 1/2	4	0.030	SM7F500L-030	5252442
1/2	1/2	2	4		SM7F500XL	5252452
1/2	1/2	2	4	0.015	SM7F500XL-015	5252453
1/2	1/2	2	4	0.030	SM7F500XL-030	5252454
5/8	5/8	3/4	3		SM7F625S	5252462
5/8	5/8	3/4	3	0.030	SM7F625S-030	5252463
5/8	5/8	3/4	3	0.060	SM7F625S-060	5252464
5/8	5/8	1 1/2	3 1/2		SM7F625	5252455
5/8	5/8	1 1/2	3 1/2	0.030	SM7F625-030	5252457
5/8	5/8	1 1/2	3 1/2	0.060	SM7F625-060	5252458
5/8	5/8	2 1/4	5		SM7F625L	5252459
5/8	5/8	2 1/4	5	0.030	SM7F625L-030	5252460
5/8	5/8	2 1/4	5	0.060	SM7F625L-060	5252461
3/4	3/4	7/8	3		SM7F750S	5252473
3/4	3/4	7/8	3	0.030	SM7F750S-030	5252474
3/4	3/4	7/8	3	0.060	SM7F750S-060	5252475
3/4	3/4	1 1/2	4		SM7F750	5252465



Continued on next page

## Series **SM7F**

**Ultra Performance Carbide End Mill for High Speed Machining (HSM) Programs & Finishing Applications in Titanium Alloys**

ISO CODE  
**S**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/4	3/4	1 1/2	4	0.030	SM7F750-030	5252467
3/4	3/4	1 1/2	4	0.060	SM7F750-060	5252468
3/4	3/4	2 1/4	5		SM7F750L	5252469
3/4	3/4	2 1/4	5	0.030	SM7F750L-030	5252470
3/4	3/4	2 1/4	5	0.060	SM7F750L-060	5252471
3/4	3/4	3	6		SM7F750XL	5252476
3/4	3/4	3	6	0.030	SM7F750XL-030	5252477
3/4	3/4	3	6	0.060	SM7F750XL-060	5252478
1	1	1 1/2	4		SM7F1.0	5252393
1	1	1 1/2	4	0.030	SM7F1.0-030	5252395
1	1	1 1/2	4	0.060	SM7F1.0-060	5252396
1	1	2 1/4	5		SM7F1.0L	5252397
1	1	2 1/4	5	0.030	SM7F1.0L-030	5252398
1	1	2 1/4	5	0.060	SM7F1.0L-060	5252399
1	1	3	6		SM7F1.0XL	5252400
1	1	3	6	0.030	SM7F1.0XL-030	5252401
1	1	3	6	0.060	SM7F1.0XL-060	5252402

## Series SM7F

### Cutting Parameters

#### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	High Feed	
			.1D Radial x 3D Axial	
			SFM	IPM
High Temp - Titanium Alloys	S	6Al4V, 5553, 99	400	60

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter						
			3/16	1/4	3/8	1/2	5/8	3/4	1
High Temp - Titanium Alloys	S	6Al4V, 5553, 99	0.0010	0.0014	0.0020	0.0028	0.0035	0.0042	0.0056

ULTRA PERFORMANCE

# Series *XPVS*

**Ultra Performance Carbide End Mill for Roughing or Finishing Steel and Stainless Alloys**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



- 4 Flute
- Variable Helix
- Variable Pitch
- Primary & Secondary Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/8	1/8	1/4	1 1/2		XPVS125S	5253286
1/8	1/8	1/4	1 1/2	0.010	XPVS125S-010	5253287
1/8	1/8	1/2	1 1/2		XPVS125	5253284
1/8	1/8	1/2	1 1/2	0.010	XPVS125-010	5253285
3/16	3/16	3/8	1 1/2		XPVS187S	5253294
3/16	3/16	3/8	1 1/2	0.010	XPVS187S-010	5253295
3/16	3/16	3/8	1 1/2	0.015	XPVS187S-015	5253296
3/16	3/16	3/8	1 1/2	0.025	XPVS187S-025	5253297
3/16	3/16	9/16	2		XPVS187	5253290
3/16	3/16	9/16	2	0.010	XPVS187-010	5253291
3/16	3/16	9/16	2	0.015	XPVS187-015	5253292
3/16	3/16	9/16	2	0.025	XPVS187-025	5253293
1/4	1/4	1/2	2		XPVS250S	5253311
1/4	1/4	1/2	2	0.015	XPVS250S-015	5253312
1/4	1/4	1/2	2	0.030	XPVS250S-030	5253313
1/4	1/4	1/2	2	0.060	XPVS250S-060	5253314
1/4	1/4	3/4	2 1/2		XPVS250	5253301
1/4	1/4	3/4	2 1/2	0.015	XPVS250-015	5253303
1/4	1/4	3/4	2 1/2	0.030	XPVS250-030	5253304
1/4	1/4	3/4	2 1/2	0.060	XPVS250-060	5253306
1/4	1/4	1 1/8	3		XPVS250L	5253307
1/4	1/4	1 1/8	3	0.015	XPVS250L-015	5253308
1/4	1/4	1 1/8	3	0.030	XPVS250L-030	5253309
1/4	1/4	1 1/8	3	0.060	XPVS250L-060	5253310

See page 54 for Cutting Parameters

## Series **XPVS**

Ultra Performance Carbide End Mill for Roughing or Finishing Steel and Stainless Alloys



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
5/16	5/16	1/2	2		XPVS312S	5253324
5/16	5/16	1/2	2	0.015	XPVS312S-015	5253325
5/16	5/16	1/2	2	0.030	XPVS312S-030	5253327
5/16	5/16	1/2	2	0.060	XPVS312S-060	5253328
5/16	5/16	13/16	2 1/2		XPVS312	5253316
5/16	5/16	13/16	2 1/2	0.015	XPVS312-015	5253317
5/16	5/16	13/16	2 1/2	0.030	XPVS312-030	5253318
5/16	5/16	13/16	2 1/2	0.060	XPVS312-060	5253319
5/16	5/16	1 1/8	3		XPVS312L	5253320
5/16	5/16	1 1/8	3	0.015	XPVS312L-015	5253321
5/16	5/16	1 1/8	3	0.030	XPVS312L-030	5253322
5/16	5/16	1 1/8	3	0.060	XPVS312L-060	5253323
3/8	3/8	1/2	2		XPVS375S	5253339
3/8	3/8	1/2	2	0.015	XPVS375S-015	5253340
3/8	3/8	1/2	2	0.030	XPVS375S-030	5253341
3/8	3/8	1/2	2	0.060	XPVS375S-060	5253342
3/8	3/8	7/8	2 1/2		XPVS375	5253329
3/8	3/8	7/8	2 1/2	0.015	XPVS375-015	5253330
3/8	3/8	7/8	2 1/2	0.030	XPVS375-030	5253331
3/8	3/8	7/8	2 1/2	0.060	XPVS375-060	5253332
3/8	3/8	1 1/8	3		XPVS375L	5253334
3/8	3/8	1 1/8	3	0.015	XPVS375L-015	5253335
3/8	3/8	1 1/8	3	0.030	XPVS375L-030	5253336
3/8	3/8	1 1/8	3	0.060	XPVS375L-060	5253338
3/8	3/8	1 1/2	4		XPVS375XL	5253344
3/8	3/8	1 1/2	4	0.015	XPVS375XL-015	5253345
3/8	3/8	1 1/2	4	0.030	XPVS375XL-030	5253346
3/8	3/8	1 1/2	4	0.060	XPVS375XL-060	5253347
1/2	1/2	5/8	2 1/2		XPVS500S	5253372
1/2	1/2	5/8	2 1/2	0.015	XPVS500S-015	5253373
1/2	1/2	5/8	2 1/2	0.030	XPVS500S-030	5253374
1/2	1/2	5/8	2 1/2	0.045	XPVS500S-045	5253375
1/2	1/2	5/8	2 1/2	0.060	XPVS500S-060	5253376
1/2	1/2	5/8	2 1/2	0.090	XPVS500S-090	5253377



Continued on next page

# Series *XPVS*

Ultra Performance Carbide End Mill for Roughing or Finishing Steel and Stainless Alloys

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/2	1/2	5/8	2 1/2	0.125	XPVS500S-125	5253378
1/2	1/2	1	3		XPVS500	5253348
1/2	1/2	1	3	0.015	XPVS500-015	5253349
1/2	1/2	1	3	0.030	XPVS500-030	5253350
1/2	1/2	1	3	0.045	XPVS500-045	5253351
1/2	1/2	1	3	0.060	XPVS500-060	5253352
1/2	1/2	1	3	0.090	XPVS500-090	5253353
1/2	1/2	1	3	0.125	XPVS500-125	5253354
1/2	1/2	1 1/4	3		XPVS500M	5253364
1/2	1/2	1 1/4	3	0.015	XPVS500M-015	5253365
1/2	1/2	1 1/4	3	0.030	XPVS500M-030	5253367
1/2	1/2	1 1/4	3	0.045	XPVS500M-045	5253368
1/2	1/2	1 1/4	3	0.060	XPVS500M-060	5253369
1/2	1/2	1 1/4	3	0.090	XPVS500M-090	5253370
1/2	1/2	1 1/4	3	0.125	XPVS500M-125	5253371
1/2	1/2	1 1/2	4		XPVS500L	5253355
1/2	1/2	1 1/2	4	0.015	XPVS500L-015	5253356
1/2	1/2	1 1/2	4	0.030	XPVS500L-030	5253357
1/2	1/2	1 1/2	4	0.045	XPVS500L-045	5253358
1/2	1/2	1 1/2	4	0.060	XPVS500L-060	5253359
1/2	1/2	1 1/2	4	0.090	XPVS500L-090	5253360
1/2	1/2	1 1/2	4	0.125	XPVS500L-125	5253361
1/2	1/2	2	4		XPVS500XL	5253379
1/2	1/2	2	4	0.015	XPVS500XL-015	5253380
1/2	1/2	2	4	0.030	XPVS500XL-030	5253381
1/2	1/2	2	4	0.045	XPVS500XL-045	5253382
1/2	1/2	2	4	0.060	XPVS500XL-060	5253383
1/2	1/2	2	4	0.090	XPVS500XL-090	5253384
1/2	1/2	2	4	0.125	XPVS500XL-125	5253385
1/2	1/2	3	6		XPVS500XXL	5253386
1/2	1/2	3	6	0.015	XPVS500XXL-015	5253387
1/2	1/2	3	6	0.030	XPVS500XXL-030	5253388
1/2	1/2	3	6	0.045	XPVS500XXL-045	5253389
1/2	1/2	3	6	0.060	XPVS500XXL-060	5253390

Continued on next page

## Series **XPVS**

**Ultra Performance Carbide End Mill for Roughing or Finishing Steel and Stainless Alloys**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/2	1/2	3	6	0.090	XPVS500XXL-090	5253391
1/2	1/2	3	6	0.125	XPVS500XXL-125	5253392
5/8	5/8	3/4	3		XPVS625S	5253408
5/8	5/8	3/4	3	0.015	XPVS625S-015	5253409
5/8	5/8	3/4	3	0.030	XPVS625S-030	5253410
5/8	5/8	3/4	3	0.045	XPVS625S-045	5253411
5/8	5/8	3/4	3	0.060	XPVS625S-060	5253412
5/8	5/8	3/4	3	0.090	XPVS625S-090	5253413
5/8	5/8	3/4	3	0.125	XPVS625S-125	5253414
5/8	5/8	1 1/4	3 1/2		XPVS625	5253393
5/8	5/8	1 1/4	3 1/2	0.015	XPVS625-015	5253394
5/8	5/8	1 1/4	3 1/2	0.030	XPVS625-030	5253395
5/8	5/8	1 1/4	3 1/2	0.045	XPVS625-045	5253396
5/8	5/8	1 1/4	3 1/2	0.060	XPVS625-060	5253397
5/8	5/8	1 1/4	3 1/2	0.090	XPVS625-090	5253398
5/8	5/8	1 1/4	3 1/2	0.125	XPVS625-125	5253399
5/8	5/8	2 1/4	5		XPVS625L	5253400
5/8	5/8	2 1/4	5	0.015	XPVS625L-015	5253401
5/8	5/8	2 1/4	5	0.030	XPVS625L-030	5253402
5/8	5/8	2 1/4	5	0.045	XPVS625L-045	5253403
5/8	5/8	2 1/4	5	0.060	XPVS625L-060	5253404
5/8	5/8	2 1/4	5	0.090	XPVS625L-090	5253405
5/8	5/8	2 1/4	5	0.125	XPVS625L-125	5253406
3/4	3/4	1	3		XPVS750S	5253431
3/4	3/4	1	3	0.015	XPVS750S-015	5253432
3/4	3/4	1	3	0.030	XPVS750S-030	5253433
3/4	3/4	1	3	0.045	XPVS750S-045	5253434
3/4	3/4	1	3	0.060	XPVS750S-060	5253435
3/4	3/4	1	3	0.090	XPVS750S-090	5253436
3/4	3/4	1	3	0.125	XPVS750S-125	5253437
3/4	3/4	1 1/2	4		XPVS750	5253415
3/4	3/4	1 1/2	4	0.015	XPVS750-015	5253416
3/4	3/4	1 1/2	4	0.030	XPVS750-030	5253417
3/4	3/4	1 1/2	4	0.045	XPVS750-045	5253418



*Continued on next page*

## Series *XPVS*

### Ultra Performance Carbide End Mill for Roughing or Finishing Steel and Stainless Alloys



ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/4	3/4	1 1/2	4	0.060	XPVS750-060	5253419
3/4	3/4	1 1/2	4	0.090	XPVS750-090	5253420
3/4	3/4	1 1/2	4	0.125	XPVS750-125	5253421
3/4	3/4	2 1/4	5		XPVS750L	5253422
3/4	3/4	2 1/4	5	0.015	XPVS750L-015	5253423
3/4	3/4	2 1/4	5	0.030	XPVS750L-030	5253424
3/4	3/4	2 1/4	5	0.045	XPVS750L-045	5253425
3/4	3/4	2 1/4	5	0.060	XPVS750L-060	5253427
3/4	3/4	2 1/4	5	0.090	XPVS750L-090	5253428
3/4	3/4	2 1/4	5	0.125	XPVS750L-125	5253429
3/4	3/4	3	6		XPVS750XL	5253438
3/4	3/4	3	6	0.015	XPVS750XL-015	5253439
3/4	3/4	3	6	0.030	XPVS750XL-030	5253440
3/4	3/4	3	6	0.045	XPVS750XL-045	5253441
3/4	3/4	3	6	0.060	XPVS750XL-060	5253442
3/4	3/4	3	6	0.090	XPVS750XL-090	5253443
3/4	3/4	3	6	0.125	XPVS750XL-125	5253444
1	1	1 1/2	4		XPVS1.0	5253262
1	1	1 1/2	4	0.015	XPVS1.0-015	5253263
1	1	1 1/2	4	0.030	XPVS1.0-030	5253264
1	1	1 1/2	4	0.045	XPVS1.0-045	5253265
1	1	1 1/2	4	0.060	XPVS1.0-060	5253266
1	1	1 1/2	4	0.090	XPVS1.0-090	5253267
1	1	1 1/2	4	0.125	XPVS1.0-125	5253268
1	1	2 1/4	5		XPVS1.0L	5253269
1	1	2 1/4	5	0.015	XPVS1.0L-015	5253270
1	1	2 1/4	5	0.030	XPVS1.0L-030	5253271
1	1	2 1/4	5	0.045	XPVS1.0L-045	5253272
1	1	2 1/4	5	0.060	XPVS1.0L-060	5253273
1	1	2 1/4	5	0.090	XPVS1.0L-090	5253274
1	1	2 1/4	5	0.125	XPVS1.0L-125	5253275
1	1	3	6		XPVS1.0XL	5253276

*Continued on next page*

## Series *XPVS*

Ultra Performance Carbide End Mill for Roughing or Finishing Steel and Stainless Alloys

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1	1	3	6	0.015	XPVS1.0XL-015	5253277
1	1	3	6	0.030	XPVS1.0XL-030	5253278
1	1	3	6	0.045	XPVS1.0XL-045	5253279
1	1	3	6	0.060	XPVS1.0XL-060	5253280
1	1	3	6	0.090	XPVS1.0XL-090	5253281
1	1	3	6	0.125	XPVS1.0XL-125	5253282

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



## Series *XPVSB*

**Ultra Performance Carbide End Mill for Ball Nose Roughing or Finishing Steel and Stainless Alloys**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



- 4 Flute
- Ball Nose
- Variable Helix
- Variable Pitch
- Primary & Secondary Relief
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/8	1/8	1/4	1 1/2	Ball Nose	XPVSB125S	5253235
1/8	1/8	1/2	1 1/2	Ball Nose	XPVSB125	5253234
3/16	3/16	3/8	1 1/2	Ball Nose	XPVSB187S	5253237
3/16	3/16	9/16	2	Ball Nose	XPVSB187	5253236
1/4	1/4	1/2	2	Ball Nose	XPVSB250S	5253241
1/4	1/4	3/4	2 1/2	Ball Nose	XPVSB250	5253239
1/4	1/4	1 1/8	3	Ball Nose	XPVSB250L	5253240
5/16	5/16	1/2	2	Ball Nose	XPVSB312S	5253244
5/16	5/16	13/16	2 1/2	Ball Nose	XPVSB312	5253242
5/16	5/16	1 1/8	3	Ball Nose	XPVSB312L	5253243
3/8	3/8	1/2	2	Ball Nose	XPVSB375S	5253247
3/8	3/8	7/8	2 1/2	Ball Nose	XPVSB375	5253245
3/8	3/8	1 1/8	3	Ball Nose	XPVSB375L	5253246
3/8	3/8	1 1/2	4	Ball Nose	XPVSB375XL	5253248
1/2	1/2	5/8	2 1/2	Ball Nose	XPVSB500S	5253252
1/2	1/2	1	3	Ball Nose	XPVSB500	5253249
1/2	1/2	1 1/4	3	Ball Nose	XPVSB500M	5253251
1/2	1/2	1 1/2	4	Ball Nose	XPVSB500L	5253250
1/2	1/2	2	4	Ball Nose	XPVSB500XL	5253253
1/2	1/2	3	6	Ball Nose	XPVSB500XXL	5253254
5/8	5/8	3/4	3	Ball Nose	XPVSB625S	5253257
5/8	5/8	1 1/4	3 1/2	Ball Nose	XPVSB625	5253255

See page 54 for Cutting Parameters

## Series *XPVSB*

**Ultra Performance Carbide End Mill for Ball Nose Roughing or Finishing Steel and Stainless Alloys**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
5/8	5/8	2 1/4	5	Ball Nose	XPVSB625L	5253256
3/4	3/4	1	3	Ball Nose	XPVSB750S	5253260
3/4	3/4	1 1/2	4	Ball Nose	XPVSB750	5253258
3/4	3/4	2 1/4	5	Ball Nose	XPVSB750L	5253259
3/4	3/4	3	6	Ball Nose	XPVSB750XL	5253261
1	1	1 1/2	4	Ball Nose	XPVSB1.0	5253231
1	1	2 1/4	5	Ball Nose	XPVSB1.0L	5253232
1	1	3	6	Ball Nose	XPVSB1.0XL	5253233



# Series *XPVS & XPVSB*

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Slotting		Facing		Ramping	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.5D Axial		.75D Radial x .25D Axial		Max. Ramp Angle - 7°	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	800	80.00	800	65.00	800	60.00	800	55.00	800	65.00	800	60.00
Steel Alloys	P	4140 thru 8820	700	70.00	700	60.00	700	55.00	700	50.00	700	60.00	700	55.00
		Steel Alloys <45 HRC, Cobalt Chrome	300	12.00	300	10.00	300	9.00	300	8.00	300	10.00	300	9.00
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	350	45.00	350	40.00	350	30.00	350	25.00	350	40.00	350	30.00
Stainless Steel	M	303, 304, 316	450	40.00	450	35.00	450	30.00	450	25.00	450	35.00	450	30.00
		410, 420, 440, 13-8, 15-5, 17-4 Ph	350	40.00	350	35.00	350	30.00	350	25.00	350	35.00	350	30.00
Cast Iron	K	Gray Cast, Malleable & Ductile Iron	800	80.00	800	65.00	800	60.00	800	55.00	800	65.00	800	60.00

ULTRA PERFORMANCE

## Series *XPVS & XPVSB*

### Cutting Parameters

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter							
			1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	0.0006	0.0010	0.0013	0.0020	0.0027	0.0034	0.0043	0.0052
Steel Alloys	P	4140 thru 8820	0.0007	0.0011	0.0015	0.0022	0.0030	0.0037	0.0047	0.0057
		Steel Alloys <45 HRC, Cobalt Chrome	0.0003	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0030
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	0.0010	0.0014	0.0019	0.0028	0.0037	0.0042	0.0052	0.0062
Stainless Steel	M	303,304, 316	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
		410, 420, 440, 13-8, 15-5, 17-4 Ph	0.0008	0.0014	0.0019	0.0028	0.0037	0.0042	0.0052	0.0062
Cast Iron	K	Gray Cast, Malleable and Ductile	0.0006	0.0010	0.0013	0.0020	0.0027	0.0034	0.0043	0.0052

ULTRA PERFORMANCE

## Series XP (inch sizes)

### High Performance Carbide End Mill for Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys



- 4 Flute
- 45° Helix
- Variable Pitch
- Full Eccentric Relief
- Chamfer, Sharp or Corner Radius
- nACRo Coating



Series XP

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer or Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/8	1/8	1/4	1 1/2	.005 x 45°	XP125SC	5253646	XP125SCA	5253647
1/8	1/8	1/4	1 1/2		XP125S	5253644	XP125SA	5253645
1/8	1/8	1/4	1 1/2	0.008	XP125SR	5253648	XP125SRA	5253649
1/8	1/8	1/2	1 1/2	.005 x 45°	XP125C	5253640	XP125CA	5253641
1/8	1/8	1/2	1 1/2		XP125	5253638	XP125A	5253639
1/8	1/8	1/2	1 1/2	0.008	XP125R	5253642	XP125RA	5253643
3/16	3/16	3/8	1 1/2	.010 x 45°	XP187SC	5253662	XP187SCA	5253663
3/16	3/16	3/8	1 1/2		XP187S	5253660	XP187SA	5253661
3/16	3/16	3/8	1 1/2	0.010	XP187SR	5253664	XP187SRA	5253666
3/16	3/16	9/16	2	.010 x 45°	XP187C	5253652	XP187CA	5253653
3/16	3/16	9/16	2		XP187	5253650	XP187A	5253651
3/16	3/16	9/16	2	0.010	XP187R	5253658	XP187RA	5253659
3/16	3/16	3/4	2 1/2	.010 x 45°	XP187LC	5253656	XP187LCA	5253657
3/16	3/16	3/4	2 1/2		XP187L	5253654	XP187LA	5253655
7/32	1/4	1/2	2	.015 x 45°	XP218SC	5253675	XP218SCA	5253676
7/32	1/4	1/2	2		XP218S	5253673	XP218SA	5253674
7/32	1/4	1/2	2	0.015	XP218SR	5253677	XP218SRA	5253678
7/32	1/4	3/4	2 1/2	.015 x 45°	XP218C	5253669	XP218CA	5253670
7/32	1/4	3/4	2 1/2		XP218	5253667	XP218A	5253668
7/32	1/4	3/4	2 1/2	0.015	XP218R	5253671	XP218RA	5253672

See page 64 for Cutting Parameters

## Series **XP** (inch sizes)

### High Performance Carbide End Mill for Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer or Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/4	1/4	1/2	2	.015 x 45°	XP250SC	5253695	XP250SCA	5253696
1/4	1/4	1/2	2		XP250S	5253692	XP250SA	5253694
1/4	1/4	1/2	2	0.015	XP250SR	5253697	XP250SRA	5253698
1/4	1/4	3/4	2 1/2	.015 x 45°	XP250C	5253681	XP250CA	5253682
1/4	1/4	3/4	2 1/2		XP250	5253679	XP250A	5253680
1/4	1/4	3/4	2 1/2	0.015	XP250R	5253689	XP250RA	5253690
1/4	1/4	1 1/8	3	.015 x 45°	XP250LC	5253685	XP250LCA	5253686
1/4	1/4	1 1/8	3		XP250L	5253683	XP250LA	5253684
1/4	1/4	1 1/2	4	.015 x 45°	XP250XLC	5253701	XP250XLCA	5253702
1/4	1/4	1 1/2	4		XP250XL	5253699	XP250XLA	5253700
5/16	5/16	1/2	2	.015 x 45°	XP312SC	5253715	XP312SCA	5253716
5/16	5/16	1/2	2		XP312S	5253713	XP312SA	5253714
5/16	5/16	1/2	2	0.015	XP312SR	5253717	XP312SRA	5253718
5/16	5/16	13/16	2 1/2	.015 x 45°	XP312C	5253705	XP312CA	5253706
5/16	5/16	13/16	2 1/2		XP312	5253703	XP312A	5253704
5/16	5/16	13/16	2 1/2	0.015	XP312R	5253711	XP312RA	5253712
5/16	5/16	1 1/8	3	.015 x 45°	XP312LC	5253709	XP312LCA	5253710
5/16	5/16	1 1/8	3		XP312L	5253707	XP312LA	5253708
3/8	3/8	1/2	2	.020" x 45°	XP375SC	5253732	XP375SCA	5253733
3/8	3/8	1/2	2		XP375S	5253730	XP375SA	5253731
3/8	3/8	1/2	2	0.015	XP375SR	5253734	XP375SRA	5253735
3/8	3/8	7/8	2 1/2	.020" x 45°	XP375C	5253721	XP375CA	5253722
3/8	3/8	7/8	2 1/2		XP375	5253719	XP375A	5253720
3/8	3/8	7/8	2 1/2	0.015	XP375R	5253728	XP375RA	5253729
3/8	3/8	1 1/8	3	.020" x 45°	XP375LC	5253726	XP375LCA	5253727
3/8	3/8	1 1/8	3		XP375L	5253723	XP375LA	5253724
3/8	3/8	1 3/4	4	.020" x 45°	XP375XLC	5253738	XP375XLCA	5253739
3/8	3/8	1 3/4	4		XP375XL	5253736	XP375XLA	5253737
3/8	3/8	1 3/4	4	0.015	XP375XLR	5253740	XP375XLRA	5253741
7/16	7/16	5/8	2 1/2	.020" x 45°	XP437SC	5253754	XP437SCA	5253755
7/16	7/16	5/8	2 1/2		XP437S	5253752	XP437SA	5253753
7/16	7/16	5/8	2 1/2	0.015	XP437SR	5253756	XP437SRA	5253757



Continued on next page

## Series *XP* (inch sizes)

### High Performance Carbide End Mill for Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer or Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
7/16	7/16	1	2 3/4	.020" x 45°	XP437C	5253744	XP437CA	5253745
7/16	7/16	1	2 3/4		XP437	5253742	XP437A	5253743
7/16	7/16	1	2 3/4	0.015	XP437R	5253750	XP437RA	5253751
7/16	7/16	2	4	.020" x 45°	XP437LC	5253748	XP437LCA	5253749
7/16	7/16	2	4		XP437L	5253746	XP437LA	5253747
1/2	1/2	5/8	2 1/2	.020" x 45°	XP500SC	5253781	XP500SCA	5253782
1/2	1/2	5/8	2 1/2		XP500S	5253779	XP500SA	5253780
1/2	1/2	5/8	2 1/2	0.030	XP500SR	5253783	XP500SRA	5253784
1/2	1/2	1	3	.020" x 45°	XP500C	5253761	XP500CA	5253762
1/2	1/2	1	3		XP500	5253758	XP500A	5253760
1/2	1/2	1	3	0.030	XP500R	5253776	XP500RA	5253778
1/2	1/2	1 1/4	3	.020" x 45°	XP500MC	5253771	XP500MCA	5253772
1/2	1/2	1 1/4	3		XP500M	5253769	XP500MA	5253770
1/2	1/2	1 1/4	3	0.030	XP500MR	5253774	XP500MRA	5253775
1/2	1/2	1 1/2	4	.020" x 45°	XP500LC	5253765	XP500LCA	5253766
1/2	1/2	1 1/2	4		XP500L	5253763	XP500LA	5253764
1/2	1/2	1 1/2	4	0.030	XP500LR	5253767	XP500LRA	5253768
1/2	1/2	2	4	.020" x 45°	XP500XLC	5253788	XP500XLCA	5253789
1/2	1/2	2	4		XP500XL	5253785	XP500XLA	5253786
1/2	1/2	2	4	0.030	XP500XLR	5253790	XP500XLRA	5253791
1/2	1/2	3	6	.020" x 45°	XP500XXLC	5253794	XP500XXLCA	5253795
1/2	1/2	3	6		XP500XXL	5253792	XP500XXLA	5253793
5/8	5/8	3/4	3	.020" x 45°	XP625SC	5253812	XP625SCA	5253813
5/8	5/8	3/4	3		XP625S	5253810	XP625SA	5253811
5/8	5/8	3/4	3	0.030	XP625SR	5253814	XP625SRA	5253815
5/8	5/8	1 1/4	4	.020" x 45°	XP625C	5253801	XP625CA	5253802
5/8	5/8	1 1/4	3 1/2		XP625	5253797	XP625A	5253800
5/8	5/8	1 1/4	3 1/2	0.030	XP625R	5253808	XP625RA	5253809
5/8	5/8	2 1/4	5	.020" x 45°	XP625LC	5253805	XP625LCA	5253806
5/8	5/8	2 1/4	5		XP625L	5253803	XP625LA	5253804

Continued on next page

## Series *XP* (inch sizes)

### High Performance Carbide End Mill for Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer or Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/4	3/4	1	3	.020" x 45°	XP750SC	5253828	XP750SCA	5253829
3/4	3/4	1	3		XP750S	5253826	XP750SA	5253827
3/4	3/4	1	3	0.030	XP750SR	5253830	XP750SRA	5253831
3/4	3/4	1 1/2	4	.020" x 45°	XP750C	5253818	XP750CA	5253819
3/4	3/4	1 1/2	4		XP750	5253816	XP750A	5253817
3/4	3/4	1 1/2	4	0.030	XP750R	5253824	XP750RA	5253825
3/4	3/4	2 1/4	5	.020" x 45°	XP750LC	5253822	XP750LCA	5253823
3/4	3/4	2 1/4	5		XP750L	5253820	XP750LA	5253821
3/4	3/4	3	6	.020" x 45°	XP750XLC	5253834	XP750XLCA	5253835
3/4	3/4	3	6		XP750XL	5253832	XP750XLA	5253833
1	1	1 1/2	4	.020" x 45°	XP1.0C	5253626	XP1.0CA	5253627
1	1	1 1/2	4		XP1.0	5253624	XP1.0A	5253625
1	1	1 1/2	4	0.030	XP1.0R	5253632	XP1.0RA	5253633
1	1	2 1/4	5	.020" x 45°	XP1.0LC	5253630	XP1.0LCA	5253631
1	1	2 1/4	5		XP1.0L	5253628	XP1.0LA	5253629
1	1	3	6	.020" x 45°	XP1.0XLC	5253636	XP1.0XLCA	5253637
1	1	3	6		XP1.0XL	5253634	XP1.0XLA	5253635



## Series MXP (metric sizes)

### High Performance Carbide End Mill for Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys



- 4 Flute
- 45° Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp or Corner Radius
- nACRo Coatings



Series MXP

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer or Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3mm	6mm	8mm	58mm		MXP3	5250758	MXP3A	5250759
3mm	6mm	8mm	58mm	.25mm	MXP3R	5250760	MXP3RA	5250761
4mm	6mm	11mm	58mm		MXP4	5250762	MXP4A	5250763
4mm	6mm	11mm	58mm	.25mm	MXP4R	5250764	MXP4RA	5250765
5mm	6mm	13mm	58mm		MXP5	5250766	MXP5A	5250767
5mm	6mm	13mm	58mm	.25mm	MXP5R	5250768	MXP5RA	5250769
6mm	6mm	13mm	58mm		MXP6	5250770	MXP6A	5250771
6mm	6mm	13mm	58mm	.38mm	MXP6R	5250772	MXP6RA	5250773
7mm	8mm	19mm	64mm		MXP7	5250774	MXP7A	5250775
7mm	8mm	19mm	64mm	.38mm	MXP7R	5250776	MXP7RA	5250777
8mm	8mm	19mm	64mm		MXP8	5250778	MXP8A	5250779
8mm	8mm	19mm	64mm	.38mm	MXP8R	5250780	MXP8RA	5250781
9mm	10mm	22mm	67mm		MXP9	5250782	MXP9A	5250783
9mm	10mm	22mm	67mm	.38mm	MXP9R	5250784	MXP9RA	5250785
10mm	10mm	22mm	67mm		MXP10	5250718	MXP10A	5250719
10mm	10mm	22mm	67mm	.38mm	MXP10R	5250720	MXP10RA	5250721
11mm	12mm	26mm	74mm		MXP11	5250722	MXP11A	5250723
11mm	12mm	26mm	74mm	.64mm	MXP11R	5250724	MXP11RA	5250725
12mm	12mm	26mm	74mm		MXP12	5250726	MXP12A	5250727
12mm	12mm	26mm	74mm	.64mm	MXP12R	5250728	MXP12RA	5250729

See page 64 for Cutting Parameters

## Series **MXP** (metric sizes)

### High Performance Carbide End Mill for Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer or Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
13mm	14mm	26mm	76mm		MXP13	5250730	MXP13A	5250731
13mm	14mm	26mm	76mm	.64mm	MXP13R	5250732	MXP13RA	5250733
14mm	14mm	26mm	76mm		MXP14	5250734	MXP14A	5250735
14mm	14mm	26mm	76mm	.64mm	MXP14R	5250736	MXP14RA	5250737
15mm	16mm	32mm	93mm		MXP15	5250738	MXP15A	5250739
15mm	16mm	32mm	93mm	.75mm	MXP15R	5250740	MXP15RA	5250741
16mm	16mm	32mm	93mm		MXP16	5250742	MXP16A	5250743
16mm	16mm	32mm	93mm	.75mm	MXP16R	5250744	MXP16RA	5250745
18mm	18mm	32mm	93mm		MXP18	5250746	MXP18A	5250747
18mm	18mm	32mm	93mm	.75mm	MXP18R	5250748	MXP18RA	5250749
20mm	20mm	38mm	100mm		MXP20	5250750	MXP20A	5250751
20mm	20mm	38mm	100mm	.75mm	MXP20R	5250752	MXP20RA	5250753
25mm	25mm	38mm	101mm		MXP25	5250754	MXP25A	5250755
25mm	25mm	38mm	101mm	.75mm	MXP25R	5250756	MXP25RA	5250757



## Series XPB

High Performance Carbide End Mill for Ball Nose Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys



- 4 Flute
- Ball Nose
- 45° Helix
- Variable Pitch
- Full Eccentric Relief
- nACRo Coating



Series XPB

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/16	3/16	3/8	1 1/2	Ball Nose	XPB187S	5253118	XPB187SA	5253119
3/16	3/16	9/16	2	Ball Nose	XPB187	5253116	XPB187A	5253117
1/4	1/4	1/2	2	Ball Nose	XPB250S	5253123	XPB250SA	5253124
1/4	1/4	3/4	2 1/2	Ball Nose	XPB250	5253121	XPB250A	5253122
5/16	5/16	1/2	2	Ball Nose	XPB312S	5253127	XPB312SA	5253128
5/16	5/16	13/16	2 1/2	Ball Nose	XPB312	5253125	XPB312A	5253126
3/8	3/8	1/2	2	Ball Nose	XPB375S	5253131	XPB375SA	5253132
3/8	3/8	7/8	2 1/2	Ball Nose	XPB375	5253129	XPB375A	5253130
7/16	7/16	5/8	2 1/2	Ball Nose	XPB437S	5253135	XPB437SA	5253136
7/16	7/16	1	2 3/4	Ball Nose	XPB437	5253133	XPB437A	5253134
1/2	1/2	5/8	2 1/2	Ball Nose	XPB500S	5253143	XPB500SA	5253144
1/2	1/2	1	3	Ball Nose	XPB500	5253137	XPB500A	5253138
1/2	1/2	1 1/4	3	Ball Nose	XPB500L	5253139	XPB500LA	5253140
1/2	1/2	1 1/2	4	Ball Nose	XPB500ML	5253141	XPB500MLA	5253142
5/8	5/8	3/4	3	Ball Nose	XPB625S	5253147	XPB625SA	5253148
5/8	5/8	1 1/4	3 1/2	Ball Nose	XPB625	5253145	XPB625A	5253146
3/4	3/4	1	3	Ball Nose	XPB750S	5253151	XPB750SA	5253152
3/4	3/4	1 1/2	4	Ball Nose	XPB750	5253149	XPB750A	5253150
1	1	1 1/2	4	Ball Nose	XPB1.0	5253114	XPB1.0A	5253115

See page 64 for Cutting Parameters

## Series XPR

High Performance Carbide End Mill with Chipbreakers for Slotting & Heavy Profiling Ferrous Materials & Nickel Based Alloys



- 4 Flute
- 45° Helix
- Variable Pitch with Chipbreakers
- Full Eccentric Relief
- Corner Radius
- nACRo Coating

Series XP

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/16	3/16	3/8	1 1/2	0.010	XPR187SR	5253157	XPR187SRA	5253158
3/16	3/16	9/16	2	0.010	XPR187R	5253155	XPR187RA	5253156
1/4	1/4	1/2	2	0.015	XPR250SR	5253161	XPR250SRA	5253162
1/4	1/4	3/4	2 1/2	0.015	XPR250R	5253159	XPR250RA	5253160
5/16	5/16	1/2	2	0.015	XPR312SR	5253165	XPR312SRA	5253166
5/16	5/16	13/16	2 1/2	0.015	XPR312R	5253163	XPR312RA	5253164
3/8	3/8	1/2	2	0.015	XPR375SR	5253169	XPR375SRA	5253170
3/8	3/8	7/8	2 1/2	0.015	XPR375R	5253167	XPR375RA	5253168
7/16	7/16	5/8	2 1/2	0.015	XPR437SR	5253173	XPR437SRA	5253174
7/16	7/16	1	2 3/4	0.015	XPR437R	5253171	XPR437RA	5253172
1/2	1/2	5/8	2 1/2	0.030	XPR500SR	5253183	XPR500SRA	5253184
1/2	1/2	1	3	0.030	XPR500R	5253180	XPR500RA	5253182
1/2	1/2	1 1/4	3	0.030	XPR500MR	5253178	XPR500MRA	5253179
1/2	1/2	1 1/2	4	0.030	XPR500LR	5253176	XPR500LRA	5253177
1/2	1/2	2	4	0.030	XPR500XLR	5253185	XPR500XLRA	5253186
5/8	5/8	3/4	3	0.030	XPR625SR	5253189	XPR625SRA	5253190
5/8	5/8	1 1/4	3 1/2	0.030	XPR625R	5253187	XPR625RA	5253188
3/4	3/4	1	3	0.030	XPR750SR	5253195	XPR750SRA	5253196
3/4	3/4	1 1/2	4	0.030	XPR750R	5253192	XPR750RA	5253193
1	1	1 1/2	4	0.030	XPR1.0R	5253153	XPR1.0RA	5253154

See page 64 for Cutting Parameters

# Series *XP, MXP, XPB, & XPR*

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Slotting	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.5D Axial	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	600	60.00	600	50.00	600	45.00	600	40.00
Steel Alloys	P	4140 thru 8820	500	50.00	500	45.00	500	40.00	500	35.00
		Steel Alloys <45 HRC, Cobalt Chrome	200	30.00	200	25.00	200	20.00	200	15.00
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	250	30.00	250	25.00	250	20.00	250	15.00
	H*	AR-450, steels > 45 HRC	100	6.00	100	5.00	100	4.00	80	3.00
Stainless Steel	M	303,304, 316	450	40.00	450	35.00	450	30.00	450	25.00
		410, 420, 440, 13-8, 15-5, 17-4 Ph	350	35.00	350	30.00	350	25.00	350	20.00
High Temp - Titanium	S	6Al4V, 5553, 99	200	10.00	200	8.00	200	7.00	200	6.00
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	80	8.00	80	7.00	80	6.00	80	4.00
		Inconel 625, Waspalloy	120	10.00	120	9.00	120	8.00	120	6.00
		Monel 400	250	20.00	250	18.00	250	16.00	250	12.00
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	100	8.00	100	7.00	100	6.00	100	5.00
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF12	70	7.00	70	6.00	70	5.00	70	4.00
Cast Iron	K	Gray Cast, Malleable and Ductile Irons	600	60.00	600	50.00	600	45.00	600	40.00

**HIGH PERFORMANCE**

## Series *XP, MXP, XPB, & XPR*

### Cutting Parameters

#### Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter							
			1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	0.0007	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070
Steel Alloys	P	4140 thru 8820	0.0005	0.0007	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
		Cobalt Chrome	0.0008	0.0010	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100
		Steel Alloys <45 HRC	0.0003	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0030
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	0.0005	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0050
	H*	AR-450, steels >45 HRC	0.0002	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0030
Stainless Steel	M	303,304, 316	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
		410, 420, 440, 13-8, 15-5, 17-4 Ph	0.0005	0.0008	0.0010	0.0015	0.0025	0.0030	0.0040	0.0050
High Temp - Titanium	S	6Al4V, 5553, 99	0.0005	0.0008	0.0010	0.0012	0.0015	0.0020	0.0030	0.0040
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
		Inconel 625, Waspalloy	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
		Monel 400	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040	0.0050
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF12	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	0.0050	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050

HIGH PERFORMANCE

## Series **SM3F**

**High Performance Carbide End Mill for Slotting and Heavy Profiling Non-Ferrous & Ferrous Materials <45 HRC**

ISO CODE  
**M**

ISO CODE  
**N**



- 3 Flute
- 50° Helix
- Variable Pitch
- Full Eccentric Relief
- Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/16	3/16	5/16	1 1/2	0.010	SM3F187SR	5251586
3/16	3/16	9/16	2	0.010	SM3F187R	5251583
7/32	1/4	1/2	2	0.015	SM3F218SR	5251590
7/32	1/4	3/4	2 1/2	0.015	SM3F218R	5251588
1/4	1/4	1/2	2	0.015	SM3F250SR	5251597
1/4	1/4	3/4	2 1/2	0.015	SM3F250R	5251594
1/4	1/4	1 1/8	3	0.015	SM3F250LR	5251592
1/4	1/4	1 1/2	4	0.015	SM3F250XLR	5251599
5/16	5/16	1/2	2	0.015	SM3F312SR	5251605
5/16	5/16	13/16	2 1/2	0.015	SM3F312R	5251603
5/16	5/16	1 1/8	3	0.015	SM3F312LR	5251601
3/8	3/8	9/16	2	0.015	SM3F375SR	5251613
3/8	3/8	1	2 1/2	0.015	SM3F375R	5251610
3/8	3/8	1 1/4	3	0.015	SM3F375LR	5251608
7/16	7/16	1	2 3/4	0.015	SM3F437R	5251618
7/16	7/16	2	4	0.015	SM3F437LR	5251616
1/2	1/2	5/8	2 1/2	0.030	SM3F500SR	5251627
1/2	1/2	1 1/4	3	0.030	SM3F500R	5251624
1/2	1/2	1 1/2	4	0.030	SM3F500MR	5251623
1/2	1/2	2	4	0.030	SM3F500LR	5251621
1/2	1/2	3	6	0.030	SM3F500XLR	5251629
5/8	5/8	3/4	3	0.030	SM3F625SR	5251635

See page 69 for Cutting Parameters

## Series **SM3F**

High Performance Carbide End Mill for Slotting and Heavy Profiling Non-Ferrous & Ferrous Materials <45 HRC

ISO CODE  
**M**

ISO CODE  
**N**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
5/8	5/8	1 5/8	3 1/2	0.030	SM3F625R	5251633
5/8	5/8	2 1/4	5	0.030	SM3F625LR	5251631
3/4	3/4	7/8	3	0.030	SM3F750SR	5251643
3/4	3/4	1 5/8	4	0.030	SM3F750R	5251640
3/4	3/4	2 1/4	5	0.030	SM3F750LR	5251638
1	1	2	4	0.030	SM3F1.0R	5251578
1	1	3	6	0.030	SM3F1.0XLR	5251580



## Series SR3F

**High Performance Carbide End Mill with Chipbreakers for Slotting & Heavy Profiling Non-Ferrous and Ferrous Materials <45 HRC**

ISO CODE  
**M**

ISO CODE  
**N**

- 3 Flute
- 50° Helix
- Variable Pitch with Chipbreakers
- Full Eccentric Relief
- Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/4	1/4	3/4	2 1/2	0.015	SR3F250R	5252487
1/4	1/4	1 1/8	3	0.015	SR3F250LR	5252485
5/16	5/16	13/16	2 1/2	0.015	SR3F312R	5252489
3/8	3/8	1	2 1/2	0.015	SR3F375R	5252493
3/8	3/8	1 1/4	3	0.015	SR3F375LR	5252491
7/16	7/16	1	2 3/4	0.015	SR3F437R	5252497
7/16	7/16	2	4	0.015	SR3F437LR	5252495
1/2	1/2	1 1/4	3	0.030	SR3F500R	5252502
1/2	1/2	1 1/2	4	0.030	SR3F500MR	5252501
1/2	1/2	2	4	0.030	SR3F500LR	5252499
5/8	5/8	1 5/8	3 1/2	0.030	SR3F625R	5252506
5/8	5/8	2 1/4	5	0.030	SR3F625LR	5252504
3/4	3/4	1 5/8	4	0.030	SR3F750R	5252510
3/4	3/4	2 1/4	5	0.030	SR3F750LR	5252508
1	1	2	4	0.030	SR3F1.0R	5252483
1	1	3	6	0.030	SR3F1.0LR	5252481

See page 69 for Cutting Parameters

## Series SM3F & SR3F

### Cutting Parameters

#### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Slotting		Facing		Ramping	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.5D Axial		.75D Radial x .25D Axial		Max. Ramp Angle - 10°	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Stainless Steel	M	303,304, 316	450	40.00	450	35.00	450	30.00	450	25.00	400	35.00	400	30.00
		410, 420, 440, 13-8, 15-5, 17-4 Ph	350	35.00	350	30.00	350	25.00	350	20.00	300	30.00	300	25.00
Non-Ferrous	N	Aluminum	1000	100.00	800	80.00	700	70.00	600	60.00	600	60.00	600	50.00
		Copper, Brass, Bronze, Plastics, Fibreglass	500	45.00	450	40.00	400	35.00	400	25.00	400	35.00	450	30.00

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter						
			3/16	1/4	3/8	1/2	5/8	3/4	1
Stainless Steel	M	303,304, 316	0.0012	0.0016	0.0023	0.0032	0.0042	0.0053	0.0065
		410, 420, 440, 13-8, 15-5, 17-4 Ph	0.0012	0.0016	0.0023	0.0032	0.0042	0.0053	0.0065
Non-Ferrous	N	Aluminum, Copper, Brass, Bronze	0.0016	0.0021	0.0032	0.0043	0.0055	0.0065	0.0085
		Plastics, Fibreglass	0.0015	0.0019	0.0029	0.0038	0.0048	0.0058	0.0078

HIGH PERFORMANCE

## Series SM4F

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials <45 HRC

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



- 4 Flute
- 50° Helix
- Equal Flute Spacing
- Full Eccentric Relief
- Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
3/16	3/16	5/16	1 1/2	0.010	SM4F187SR	5251652
3/16	3/16	9/16	2	0.010	SM4F187R	5251650
7/32	1/4	1/2	2	0.015	SM4F218SR	5251656
7/32	1/4	3/4	2 1/2	0.015	SM4F218R	5251654
1/4	1/4	1/2	2	0.015	SM4F250SR	5251662
1/4	1/4	3/4	2 1/2	0.015	SM4F250R	5251660
1/4	1/4	1 1/8	3	0.015	SM4F250LR	5251658
1/4	1/4	1 1/2	4	0.015	SM4F250XLR	5251664
5/16	5/16	1/2	2	0.015	SM4F312SR	5251675
5/16	5/16	13/16	2 1/2	0.015	SM4F312R	5251673
5/16	5/16	1 1/8	3	0.015	SM4F312LR	5251671
3/8	3/8	9/16	2	0.015	SM4F375SR	5251683
3/8	3/8	1	2 1/2	0.015	SM4F375R	5251681
3/8	3/8	1 1/4	3	0.015	SM4F375LR	5251678
7/16	7/16	1	2 3/4	0.015	SM4F437R	5251687
7/16	7/16	2	4	0.015	SM4F437LR	5251685
1/2	1/2	5/8	2 1/2	0.030	SM4F500SR	5251694
1/2	1/2	1 1/4	3	0.030	SM4F500R	5251692
1/2	1/2	1 1/2	4	0.030	SM4F500MR	5251691
1/2	1/2	2	4	0.030	SM4F500LR	5251689
1/2	1/2	3	6	0.030	SM4F500XLR	5251696
5/8	5/8	3/4	3	0.030	SM4F625SR	5251702

See page 74 for Cutting Parameters

## Series **SM4F**

High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials <45 HRC

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
5/8	5/8	1 5/8	3 1/2	0.030	SM4F625R	5251700
5/8	5/8	2 1/4	5	0.030	SM4F625LR	5251698
3/4	3/4	7/8	3	0.030	SM4F750SR	5251708
3/4	3/4	1 5/8	4	0.030	SM4F750R	5251706
3/4	3/4	2 1/4	5	0.030	SM4F750LR	5251704
3/4	3/4	3	6	0.030	SM4F750XLR	5251710
1	1	2	4	0.030	SM4F1.0R	5251645
1	1	3	6	0.030	SM4F1.0XLR	5251647



## Series SR4F

**High Performance Carbide End Mill with Chipbreakers for Medium Profiling Ferrous Materials <45 HRC**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



- 4 Flute
- 50° Helix
- Equal Flute Spacing with Chipbreakers
- Full Eccentric Relief
- Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated	
					Tool Name	EDP #
1/4	1/4	3/4	2 1/2	0.015	SR4F250R	5252518
1/4	1/4	1 1/8	3	0.015	SR4F250LR	5252516
5/16	5/16	13/16	2 1/2	0.015	SR4F312R	5252522
3/8	3/8	1	2 1/2	0.015	SR4F375R	5252526
3/8	3/8	1 1/4	3	0.015	SR4F375LR	5252524
7/16	7/16	1	2 3/4	0.015	SR4F437R	5252530
7/16	7/16	2	4	0.015	SR4F437LR	5252528
1/2	1/2	1 1/4	3	0.030	SR4F500R	5252535
1/2	1/2	1 1/2	4	0.030	SR4F500MR	5252534
1/2	1/2	2	4	0.030	SR4F500LR	5252532
5/8	5/8	1 5/8	3 1/2	0.030	SR4F625R	5252541
5/8	5/8	2 1/4	5	0.030	SR4F625LR	5252539
3/4	3/4	1 5/8	4	0.030	SR4F750R	5252545
3/4	3/4	2 1/4	5	0.030	SR4F750LR	5252543
1	1	2	4	0.030	SR4F1.0R	5252514
1	1	3	6	0.030	SR4F1.0LR	5252512

See page 73 for Cutting Parameters

## Series SR4F

### Cutting Parameters

#### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Slotting		Facing		Ramping	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.5D Axial		.75D Radial x .25D Axial		Max. Ramp Angle - 7°	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	600	60.00	600	50.00	600	45.00	600	40.00	600	50.00	600	45.00
Steel Alloys	P	4140 thru 8820 Steel Alloys <45 HRC, Cobalt Chrome	500	50.00	500	45.00	500	40.00	500	35.00	500	45.00	500	40.00
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	250	30.00	250	25.00	250	20.00	250	15.00	250	25.00	250	20.00
Stainless Steel	M	303,304, 316	450	40.00	450	35.00	450	30.00	450	25.00	450	35.00	450	30.00
		410, 420, 440, 13-8, 15-5, 17-4 Ph	350	35.00	350	30.00	350	25.00	350	20.00	350	30.00	350	25.00
Cast Iron	K	Gray Cast, Malleable, Ductile	600	60.00	600	50.00	600	45.00	600	40.00	600	50.00	600	45.00

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter						
			3/16	1/4	3/8	1/2	5/8	3/4	1
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	0.0010	0.0014	0.0020	0.0027	0.0034	0.0044	0.0055
Steel Alloys	P	4140 thru 8820, Cobalt Chrome Steel Alloys <45 HRC	0.0011	0.0015	0.0022	0.0030	0.0036	0.0048	0.0060
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	0.0012	0.0016	0.0024	0.0032	0.0038	0.0050	0.0062
Stainless Steel	M	303,304, 316	0.0009	0.0012	0.0019	0.0025	0.0031	0.0038	0.0051
		410, 420, 440, 13-8, 15-5, 17-4 Ph	0.0010	0.0014	0.0020	0.0027	0.0034	0.0044	0.0055
Cast Iron	K	Gray Cast, Malleable, Ductile	0.0010	0.0014	0.0020	0.0027	0.0034	0.0044	0.0055

HIGH PERFORMANCE

## Series **SMR4F**

**Fine Pitched Knuckle Style Center Cutting Roughing End Mill. Designed To Have Increased Chip Loads in Steel, Stainless Steel and High Temperature Alloys**

- 4 Flute
- 20° Helix
- nACRo Coating

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**N**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer Size	nACRo Coated	
					Tool Name	EDP #
1/4	1/4	1/2	2	45° x .020	SMR4F250S	5251563
1/4	1/4	3/4	2 1/2	45° x .020	SMR4F250	5251561
1/4	1/4	1 1/8	3	45° x .020	SMR4F250L	5251562
5/16	5/16	1/2	2	45° x .020	SMR4F312S	5251566
5/16	5/16	13/16	2 1/2	45° x .020	SMR4F312	5251564
5/16	5/16	1 1/8	3	45° x .020	SMR4F312L	5251565
3/8	3/8	5/8	2	45° x .020	SMR4F375S	5251569
3/8	3/8	1	2 1/2	45° x .020	SMR4F375	5251567
3/8	3/8	1 1/4	3	45° x .020	SMR4F375L	5251568
1/2	1/2	3/4	2 1/2	45° x .025	SMR4F500XS	5251571
1/2	1/2	5/8	2 1/2	45° x .025	SMR4F500S	5251574
1/2	1/2	3/4	3	45° x .025	SMR4F500MS	5251572
1/2	1/2	1	3	45° x .025	SMR4F500M	5251573
1/2	1/2	1 1/4	3	45° x .025	SMR4F500	5251570
5/8	5/8	3/4	3	45° x .025	SMR4F625S	5251576
5/8	5/8	1 1/4	3 1/2	45° x .025	SMR4F625M	5251575

See page 75 for Cutting Parameters

## Series **SMR4F**

### Cutting Parameters

#### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Cutting Diameter					
			1/4	3/8	7/16	1/2	5/8	3/4
Steel	P	1018 thru 1095, A36, 12L14	SFM - 425 FPT - .0018	SFM - 425 FPT - .0025	SFM - 425 FPT - .0025	SFM - 425 FPT - .0032	SFM - 425 FPT - .0037	SFM - 425 FPT - .004
Steel Alloy	P	4140 - 8820	SFM - 425 FPT - .0018	SFM - 425 FPT - .0025	SFM - 425 FPT - .0025	SFM - 425 FPT - .0032	SFM - 425 FPT - .0037	SFM - 425 FPT - .004
Steel Alloy	P	Cobalt Chrome	SFM - 150 FPT - .0012	SFM - 150 FPT - .0012	SFM - 150 FPT - .0015	SFM - 150 FPT - .0017	SFM - 150 FPT - .002	SFM - 150 FPT - .0025
Tool & Mold Steel	P	01, A2, D2, H13, S7, P20	SFM - 240 FPT - .0005	SFM - 240 FPT - .001	SFM - 240 FPT - .001	SFM - 240 FPT - .0018	SFM - 240 FPT - .0025	SFM - 240 FPT - .0032
Stainless Steel	M	303, 304, 316	SFM - 400 FPT - .0012	SFM - 400 FPT - .0018	SFM - 400 FPT - .0018	SFM - 400 FPT - .0022	SFM - 400 FPT - .0027	SFM - 400 FPT - .0032
Stainless Steel	M	410, 420, 440, 13-8, 15-5, 17-4	SFM - 325 FPT - .0018	SFM - 325 FPT - .0025	SFM - 325 FPT - .0025	SFM - 325 FPT - .0032	SFM - 325 FPT - .0037	SFM - 325 FPT - .004
Titanium	S	6AL-4V	SFM - 150 FPT - .0012	SFM - 150 FPT - .0012	SFM - 150 FPT - .0015	SFM - 150 FPT - .0017	SFM - 150 FPT - .002	SFM - 150 FPT - .0025
High Temp Nickel Based Alloy	S	Inconel 100, 625, 718, Hastelloy, Waspoloy, Ren 41, 77	SFM - 75 FPT - .0009	SFM - 75 FPT - .001	SFM - 75 FPT - .001	SFM - 75 FPT - .0016	SFM - 75 FPT - .0022	SFM - 75 FPT - .0025
Cobalt Based Alloys	S	Stellite, Kovar, L404, Haynes	SFM - 75 FPT - .0009	SFM - 75 FPT - .001	SFM - 75 FPT - .001	SFM - 75 FPT - .0016	SFM - 75 FPT - .0022	SFM - 75 FPT - .0025
Cast Iron	K	Gray Cast	SFM - 450 FPT - .0008	SFM - 450 FPT - .0017	SFM - 450 FPT - .0018	SFM - 450 FPT - .0022	SFM - 450 FPT - .0028	SFM - 450 FPT - .003

HIGH PERFORMANCE

## Series **SM5F** (inch sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials

Series **SM5F**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**



- 5 Flute
- 45° Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/8	1/8	1/4	1 1/2		SM5F125S	5251760	SM5F125SA	5251762
1/8	1/8	1/4	1 1/2	0.010	SM5F125S-010	5251761	SM5F125SA-010	5251763
1/8	1/8	1/2	1 1/2		SM5F125	5251755	SM5F125A	5251758
1/8	1/8	1/2	1 1/2	0.010	SM5F125-010	5251756	SM5F125A-010	5251759
5/32	3/16	5/16	2		SM5F156S	5251769	SM5F156SA	5251771
5/32	3/16	5/16	2	0.010	SM5F156S-010	5251770	SM5F156SA-010	5251772
5/32	3/16	9/16	2		SM5F156	5251764	SM5F156A	5251767
5/32	3/16	9/16	2	0.010	SM5F156-010	5251765	SM5F156A-010	5251768
3/16	3/16	5/16	1 1/2		SM5F187S	5251783	SM5F187SA	5251786
3/16	3/16	5/16	1 1/2	0.010	SM5F187S-010	5251784	SM5F187SA-010	5251787
3/16	3/16	5/16	1 1/2	0.030	SM5F187S-030	5251785	SM5F187SA-030	5251788
3/16	3/16	9/16	2		SM5F187	5251774	SM5F187A	5251779
3/16	3/16	9/16	2	0.010	SM5F187-010	5251775	SM5F187A-010	5251780
3/16	3/16	9/16	2	0.020	SM5F187-020	5251777	SM5F187A-020	5251781
3/16	3/16	9/16	2	0.030	SM5F187-030	5251778	SM5F187A-030	5251782
7/32	1/4	1/2	2		SM5F218S	5251794	SM5F218SA	5251796
7/32	1/4	1/2	2	0.015	SM5F218S-015	5251795	SM5F218SA-015	5251797
7/32	1/4	3/4	2 1/2		SM5F218	5251789	SM5F218A	5251792
7/32	1/4	3/4	2 1/2	0.015	SM5F218-015	5251790	SM5F218A-015	5251793
1/4	1/4	1/2	2		SM5F250S	5251813	SM5F250SA	5251818

See page 84 for Cutting Parameters

## Series **SM5F** (inch sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/4	1/4	1/2	2	0.015	SM5F250S-015	5251815	SM5F250SA-015	5251819
1/4	1/4	1/2	2	0.030	SM5F250S-030	5251816	SM5F250SA-030	5251820
1/4	1/4	3/4	2 1/2		SM5F250	5251798	SM5F250A	5254526
1/4	1/4	3/4	2 1/2	0.015	SM5F250-015	5251799	SM5F250A-015	5251803
1/4	1/4	3/4	2 1/2	0.030	SM5F250-030	5251800	SM5F250A-030	5251805
1/4	1/4	1 1/8	3		SM5F250L	5251806	SM5F250LA	5251809
1/4	1/4	1 1/8	3	0.015	SM5F250L-015	5251807	SM5F250LA-015	5251810
1/4	1/4	1 1/8	3	0.030	SM5F250L-030	5251808	SM5F250LA-030	5251811
1/4	1/4	1 1/2	4		SM5F250XL	5251821	SM5F250XLA	5251824
1/4	1/4	1 1/2	4	0.015	SM5F250XL-015	5251822	SM5F250XLA-015	5251825
1/4	1/4	1 1/2	4	0.030	SM5F250XL-030	5251823	SM5F250XLA-030	5251826
9/32	5/16	1/2	2		SM5F281S	5251831	SM5F281SA	5251833
9/32	5/16	1/2	2	0.015	SM5F281S-015	5251832	SM5F281SA-015	5251834
9/32	5/16	3/4	2 1/2		SM5F281	5251827	SM5F281A	5251829
9/32	5/16	3/4	2 1/2	0.015	SM5F281-015	5251828	SM5F281A-015	5251830
5/16	5/16	1/2	2		SM5F312S	5251849	SM5F312SA	5251852
5/16	5/16	1/2	2	0.015	SM5F312S-015	5251850	SM5F312SA-015	5251853
5/16	5/16	1/2	2	0.030	SM5F312S-030	5251851	SM5F312SA-030	5251854
5/16	5/16	13/16	2 1/2		SM5F312	5251835	SM5F312A	5251838
5/16	5/16	13/16	2 1/2	0.015	SM5F312-015	5251836	SM5F312A-015	5251839
5/16	5/16	13/16	2 1/2	0.030	SM5F312-030	5251837	SM5F312A-030	5251840
5/16	5/16	1 1/8	3		SM5F312L	5251842	SM5F312LA	5251846
5/16	5/16	1 1/8	3	0.015	SM5F312L-015	5251844	SM5F312LA-015	5251847
5/16	5/16	1 1/8	3	0.030	SM5F312L-030	5251845	SM5F312LA-030	5251848
11/32	3/8	9/16	2 1/2		SM5F343S	5251860	SM5F343SA	5251862
11/32	3/8	9/16	2 1/2	0.015	SM5F343S-015	5251861	SM5F343SA-015	5251863
11/32	3/8	7/8	2 1/2		SM5F343	5251856	SM5F343A	5251858
11/32	3/8	7/8	2 1/2	0.015	SM5F343-015	5251857	SM5F343A-015	5251859
3/8	3/8	9/16	2		SM5F375S	5251887	SM5F375SA	5251893
3/8	3/8	9/16	2	0.015	SM5F375S-015	5251889	SM5F375SA-015	5251894
3/8	3/8	9/16	2	0.030	SM5F375S-030	5251890	SM5F375SA-030	5251896
3/8	3/8	9/16	2	0.062	SM5F375S-062	5251892	SM5F375SA-062	5251897



Continued on next page

## Series **SM5F** (inch sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/8	3/8	1	2 1/2		SM5F375	5251864	SM5F375A	5251872
3/8	3/8	1	2 1/2	0.015	SM5F375-015	5251866	SM5F375A-015	5253933
3/8	3/8	1	2 1/2	0.030	SM5F375-030	5251867	SM5F375A-030	5251874
3/8	3/8	1	2 1/2	0.062	SM5F375-062	5251869	SM5F375A-062	5251875
3/8	3/8	1	2 1/2	0.125	SM5F375-125	5251871	SM5F375A-125	5251876
3/8	3/8	1 1/4	3		SM5F375L	5251877	SM5F375LA	5251882
3/8	3/8	1 1/4	3	0.015	SM5F375L-015	5251879	SM5F375LA-015	5251884
3/8	3/8	1 1/4	3	0.030	SM5F375L-030	5251880	SM5F375LA-030	5251885
3/8	3/8	1 1/4	3	0.062	SM5F375L-062	5251881	SM5F375LA-062	5251886
3/8	3/8	1 1/2	4		SM5F375XL	5251898	SM5F375XLA	5251902
3/8	3/8	1 1/2	4	0.015	SM5F375XL-015	5251899	SM5F375XLA-015	5251903
3/8	3/8	1 1/2	4	0.030	SM5F375XL-030	5251900	SM5F375XLA-030	5251904
3/8	3/8	1 1/2	4	0.062	SM5F375XL-062	5251901	SM5F375XLA-062	5251905
3/8	3/8	2	4		SM5F375XXL	5251906	SM5F375XXLA	5251910
3/8	3/8	2	4	0.015	SM5F375XXL-015	5251907	SM5F375XXLA-015	5251911
3/8	3/8	2	4	0.030	SM5F375XXL-030	5251908	SM5F375XXLA-030	5251912
3/8	3/8	2	4	0.062	SM5F375XXL-062	5251909	SM5F375XXLA-062	5251913
7/16	7/16	9/16	2 1/2		SM5F437S	5251930	SM5F437SA	5251933
7/16	7/16	9/16	2 1/2	0.015	SM5F437S-015	5251931	SM5F437SA-015	5251934
7/16	7/16	9/16	2 1/2	0.030	SM5F437S-030	5251932	SM5F437SA-030	5251935
7/16	7/16	1	2 3/4		SM5F437	5251914	SM5F437A	5251919
7/16	7/16	1	2 3/4	0.015	SM5F437-015	5251915	SM5F437A-015	5251920
7/16	7/16	1	2 3/4	0.030	SM5F437-030	5251917	SM5F437A-030	5251921
7/16	7/16	1	2 3/4	0.040	SM5F437-040	5251918	SM5F437A-040	5251922
7/16	7/16	2	4		SM5F437L	5251923	SM5F437LA	5251926
7/16	7/16	2	4	0.015	SM5F437L-015	5251924	SM5F437LA-015	5251927
7/16	7/16	2	4	0.030	SM5F437L-030	5251925	SM5F437LA-030	5251928
1/2	1/2	5/8	2 1/2		SM5F500S	5252014	SM5F500SA	5252025
1/2	1/2	5/8	2 1/2	0.010	SM5F500S-010	5252016	SM5F500SA-010	5252026
1/2	1/2	5/8	2 1/2	0.015	SM5F500S-015	5252017	SM5F500SA-015	5252027
1/2	1/2	5/8	2 1/2	0.030	SM5F500S-030	5252018	SM5F500SA-030	5252028
1/2	1/2	5/8	2 1/2	0.045	SM5F500S-045	5252019	SM5F500SA-045	5252029

Continued on next page

## Series **SM5F** (inch sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/2	1/2	5/8	2 1/2	0.050	SM5F500S-050	5252020	SM5F500SA-050	5252030
1/2	1/2	5/8	2 1/2	0.060	SM5F500S-060	5252021	SM5F500SA-060	5252031
1/2	1/2	5/8	2 1/2	0.062	SM5F500S-062	5252022	SM5F500SA-062	5252032
1/2	1/2	5/8	2 1/2	0.090	SM5F500S-090	5252023	SM5F500SA-090	5252033
1/2	1/2	5/8	2 1/2	0.125	SM5F500S-125	5252024	SM5F500SA-125	5252034
1/2	1/2	1	3		SM5F500MS	5251997	SM5F500MSA	5252006
1/2	1/2	1	3	0.015	SM5F500MS-015	5251999	SM5F500MSA-015	5252007
1/2	1/2	1	3	0.030	SM5F500MS-030	5252000	SM5F500MSA-030	5252008
1/2	1/2	1	3	0.045	SM5F500MS-045	5252001	SM5F500MSA-045	5252009
1/2	1/2	1	3	0.050	SM5F500MS-050	5252002	SM5F500MSA-050	5252010
1/2	1/2	1	3	0.062	SM5F500MS-062	5252003	SM5F500MSA-062	5252011
1/2	1/2	1	3	0.090	SM5F500MS-090	5252004	SM5F500MSA-090	5252012
1/2	1/2	1	3	0.125	SM5F500MS-125	5252005	SM5F500MSA-125	5252013
1/2	1/2	1 1/4	3		SM5F500	5251936	SM5F500A	5251950
1/2	1/2	1 1/4	3	0.010	SM5F500-010	5251939	SM5F500A-010	5251951
1/2	1/2	1 1/4	3	0.015	SM5F500-015	5251940	SM5F500A-015	5251952
1/2	1/2	1 1/4	3	0.030	SM5F500-030	5251941	SM5F500A-030	5251955
1/2	1/2	1 1/4	3	0.045	SM5F500-045	5251943	SM5F500A-045	5251956
1/2	1/2	1 1/4	3	0.047	SM5F500-047	5251944	SM5F500A-047	5251957
1/2	1/2	1 1/4	3	0.050	SM5F500-050	5251945	SM5F500A-050	5251958
1/2	1/2	1 1/4	3	0.060	SM5F500-060	5251946	SM5F500A-060	5251959
1/2	1/2	1 1/4	3	0.062	SM5F500-062	5251947	SM5F500A-062	5251960
1/2	1/2	1 1/4	3	0.090	SM5F500-090	5251948	SM5F500A-090	5251961
1/2	1/2	1 1/4	3	0.125	SM5F500-125	5251949	SM5F500A-125	5251962
1/2	1/2	1 1/2	4		SM5F500M	5251980	SM5F500MA	5251989
1/2	1/2	1 1/2	4	0.015	SM5F500M-015	5251982	SM5F500MA-015	5251990
1/2	1/2	1 1/2	4	0.030	SM5F500M-030	5251983	SM5F500MA-030	5251991
1/2	1/2	1 1/2	4	0.045	SM5F500M-045	5251984	SM5F500MA-045	5251992
1/2	1/2	1 1/2	4	0.050	SM5F500M-050	5251985	SM5F500MA-050	5251993
1/2	1/2	1 1/2	4	0.062	SM5F500M-062	5251986	SM5F500MA-062	5251994
1/2	1/2	1 1/2	4	0.090	SM5F500M-090	5251987	SM5F500MA-090	5251995
1/2	1/2	1 1/2	4	0.125	SM5F500M-125	5251988	SM5F500MA-125	5251996



Continued on next page

## Series **SM5F** (inch sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/2	1/2	2	4		SM5F500L	5251963	SM5F500LA	5251971
1/2	1/2	2	4	0.015	SM5F500L-015	5251964	SM5F500LA-015	5251972
1/2	1/2	2	4	0.030	SM5F500L-030	5251965	SM5F500LA-030	5251973
1/2	1/2	2	4	0.045	SM5F500L-045	5251966	SM5F500LA-045	5251974
1/2	1/2	2	4	0.050	SM5F500L-050	5251967	SM5F500LA-050	5251975
1/2	1/2	2	4	0.062	SM5F500L-062	5251968	SM5F500LA-062	5251976
1/2	1/2	2	4	0.090	SM5F500L-090	5251969	SM5F500LA-090	5251978
1/2	1/2	2	4	0.125	SM5F500L-125	5251970	SM5F500LA-125	5251979
1/2	1/2	3	6		SM5F500XL	5252035	SM5F500XLA	5252043
1/2	1/2	3	6	0.015	SM5F500XL-015	5252036	SM5F500XLA-015	5252044
1/2	1/2	3	6	0.030	SM5F500XL-030	5252037	SM5F500XLA-030	5252045
1/2	1/2	3	6	0.045	SM5F500XL-045	5252038	SM5F500XLA-045	5252046
1/2	1/2	3	6	0.050	SM5F500XL-050	5252039	SM5F500XLA-050	5252047
1/2	1/2	3	6	0.062	SM5F500XL-062	5252040	SM5F500XLA-062	5252048
1/2	1/2	3	6	0.090	SM5F500XL-090	5252041	SM5F500XLA-090	5252049
1/2	1/2	3	6	0.125	SM5F500XL-125	5252042	SM5F500XLA-125	5252050
5/8	5/8	3/4	3		SM5F625S	5252090	SM5F625SA	5252099
5/8	5/8	3/4	3	0.015	SM5F625S-015	5252091	SM5F625SA-015	5252100
5/8	5/8	3/4	3	0.030	SM5F625S-030	5252092	SM5F625SA-030	5252101
5/8	5/8	3/4	3	0.045	SM5F625S-045	5252094	SM5F625SA-045	5252102
5/8	5/8	3/4	3	0.062	SM5F625S-062	5252096	SM5F625SA-062	5252105
5/8	5/8	3/4	3	0.090	SM5F625S-090	5252097	SM5F625SA-090	5252106
5/8	5/8	3/4	3	0.125	SM5F625S-125	5252098	SM5F625SA-125	5252107
5/8	5/8	1 5/8	3 1/2		SM5F625	5252052	SM5F625A	5252062
5/8	5/8	1 5/8	3 1/2	0.015	SM5F625-015	5252053	SM5F625A-015	5252063
5/8	5/8	1 5/8	3 1/2	0.030	SM5F625-030	5252054	SM5F625A-030	5252064
5/8	5/8	1 5/8	3 1/2	0.040	SM5F625-040	5252055	SM5F625A-040	5252065
5/8	5/8	1 5/8	3 1/2	0.045	SM5F625-045	5252056	SM5F625A-045	5252066
5/8	5/8	1 5/8	3 1/2	0.062	SM5F625-062	5252058	SM5F625A-062	5252068
5/8	5/8	1 5/8	3 1/2	0.090	SM5F625-090	5252059	SM5F625A-090	5252069
5/8	5/8	1 5/8	3 1/2	0.125	SM5F625-125	5252060	SM5F625A-125	5252070
5/8	5/8	2 1/4	5		SM5F625L	5252071	SM5F625LA	5252080

Continued on next page

## Series **SM5F** (inch sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
5/8	5/8	2 1/4	5	0.015	SM5F625L-015	5252072	SM5F625LA-015	5252081
5/8	5/8	2 1/4	5	0.030	SM5F625L-030	5252073	SM5F625LA-030	5252082
5/8	5/8	2 1/4	5	0.040	SM5F625L-040	5252074	SM5F625LA-040	5252083
5/8	5/8	2 1/4	5	0.045	SM5F625L-045	5252075	SM5F625LA-045	5252084
5/8	5/8	2 1/4	5	0.062	SM5F625L-062	5252077	SM5F625LA-062	5252086
5/8	5/8	2 1/4	5	0.090	SM5F625L-090	5252078	SM5F625LA-090	5252087
5/8	5/8	2 1/4	5	0.125	SM5F625L-125	5252079	SM5F625LA-125	5252088
3/4	3/4	7/8	3		SM5F750S	5252144	SM5F750SA	5252153
3/4	3/4	7/8	3	0.015	SM5F750S-015	5252145	SM5F750SA-015	5252154
3/4	3/4	7/8	3	0.030	SM5F750S-030	5252146	SM5F750SA-030	5252155
3/4	3/4	7/8	3	0.045	SM5F750S-045	5252147	SM5F750SA-045	5252156
3/4	3/4	7/8	3	0.050	SM5F750S-050	5252148	SM5F750SA-050	5252157
3/4	3/4	7/8	3	0.062	SM5F750S-062	5252149	SM5F750SA-062	5252158
3/4	3/4	7/8	3	0.090	SM5F750S-090	5252150	SM5F750SA-090	5252159
3/4	3/4	7/8	3	0.125	SM5F750S-125	5252151	SM5F750SA-125	5252160
3/4	3/4	1 5/8	4		SM5F750	5252108	SM5F750A	5252117
3/4	3/4	1 5/8	4	0.015	SM5F750-015	5252110	SM5F750A-015	5252118
3/4	3/4	1 5/8	4	0.030	SM5F750-030	5252111	SM5F750A-030	5252119
3/4	3/4	1 5/8	4	0.045	SM5F750-045	5252112	SM5F750A-045	5252121
3/4	3/4	1 5/8	4	0.050	SM5F750-050	5252113	SM5F750A-050	5252122
3/4	3/4	1 5/8	4	0.062	SM5F750-062	5252114	SM5F750A-062	5252123
3/4	3/4	1 5/8	4	0.090	SM5F750-090	5252115	SM5F750A-090	5252124
3/4	3/4	1 5/8	4	0.125	SM5F750-125	5252116	SM5F750A-125	5252125
3/4	3/4	2 1/4	5		SM5F750L	5252126	SM5F750LA	5252134
3/4	3/4	2 1/4	5	0.015	SM5F750L-015	5252127	SM5F750LA-015	5252135
3/4	3/4	2 1/4	5	0.030	SM5F750L-030	5252128	SM5F750LA-030	5252136
3/4	3/4	2 1/4	5	0.045	SM5F750L-045	5252129	SM5F750LA-045	5252137
3/4	3/4	2 1/4	5	0.050	SM5F750L-050	5252130	SM5F750LA-050	5252138
3/4	3/4	2 1/4	5	0.062	SM5F750L-062	5252131	SM5F750LA-062	5252139
3/4	3/4	2 1/4	5	0.090	SM5F750L-090	5252132	SM5F750LA-090	5252140
3/4	3/4	2 1/4	5	0.125	SM5F750L-125	5252133	SM5F750LA-125	5252141
3/4	3/4	3	6		SM5F750XL	5252161	SM5F750XLA	5252169



Continued on next page

## Series **SM5F** (inch sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/4	3/4	3	6	0.015	SM5F750XL-015	5252162	SM5F750XLA-015	5252170
3/4	3/4	3	6	0.030	SM5F750XL-030	5252163	SM5F750XLA-030	5252171
3/4	3/4	3	6	0.045	SM5F750XL-045	5252164	SM5F750XLA-045	5252172
3/4	3/4	3	6	0.050	SM5F750XL-050	5252165	SM5F750XLA-050	5252173
3/4	3/4	3	6	0.062	SM5F750XL-062	5252166	SM5F750XLA-062	5252174
3/4	3/4	3	6	0.090	SM5F750XL-090	5252167	SM5F750XLA-090	5252175
3/4	3/4	3	6	0.125	SM5F750XL-125	5252168	SM5F750XLA-125	5252176
1	1	1 1/4	4		SM5F1.0S	5251732	SM5F1.0SA	5251736
1	1	1 1/4	4	0.030	SM5F1.0S-030	5251733	SM5F1.0SA-030	5251737
1	1	1 1/4	4	0.062	SM5F1.0S-062	5251734	SM5F1.0SA-062	5251738
1	1	1 1/4	4	0.125	SM5F1.0S-125	5251735	SM5F1.0SA-125	5251739
1	1	1 1/2	4		SM5F1.0M	5251724	SM5F1.0MA	5251728
1	1	1 1/2	4	0.030	SM5F1.0M-030	5251725	SM5F1.0MA-030	5251729
1	1	1 1/2	4	0.062	SM5F1.0M-062	5251726	SM5F1.0MA-062	5251730
1	1	1 1/2	4	0.125	SM5F1.0M-125	5251727	SM5F1.0MA-125	5251731
1	1	2	4		SM5F1.0	5251712	SM5F1.0A	5251718
1	1	2	4	0.030	SM5F1.0-030	5251713	SM5F1.0A-030	5251719
1	1	2	4	0.062	SM5F1.0-062	5251714	SM5F1.0A-062	5251720
1	1	2	4	0.090	SM5F1.0-090	5251715	SM5F1.0A-090	5251721
1	1	2	4	0.125	SM5F1.0-125	5251716	SM5F1.0A-125	5251722
1	1	2	4	0.250	SM5F1.0-250	5251717	SM5F1.0A-250	5251723
1	1	3	6		SM5F1.0XL	5251740	SM5F1.0XLA	5251746
1	1	3	6	0.030	SM5F1.0XL-030	5251741	SM5F1.0XLA-030	5251747
1	1	3	6	0.062	SM5F1.0XL-062	5251742	SM5F1.0XLA-062	5251748
1	1	3	6	0.090	SM5F1.0XL-090	5251743	SM5F1.0XLA-090	5251749
1	1	3	6	0.125	SM5F1.0XL-125	5251744	SM5F1.0XLA-125	5251750
1	1	3	6	0.250	SM5F1.0XL-250	5251745	SM5F1.0XLA-250	5251751

## Series **MSM5F** (metric sizes)

### High Performance Carbide End Mill for Medium Profiling & Finishing Ferrous Materials

Series **MSM5F**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**



- 5 Flute
- 45° Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
4mm	6mm	14mm	58mm		MSM5F4	5250701	MSM5F4A	5250702
4mm	6mm	14mm	58mm	.25mm	MSM5F4R	5250703	MSM5F4RA	5250704
5mm	6mm	16mm	58mm		MSM5F5	5250705	MSM5F5A	5250706
5mm	6mm	16mm	58mm	.25mm	MSM5F5R	5250707	MSM5F5RA	5250708
6mm	6mm	19mm	58mm		MSM5F6	5250709	MSM5F6A	5250711
6mm	6mm	19mm	58mm	.38mm	MSM5F6R	5250712	MSM5F6RA	5250713
8mm	8mm	20mm	64mm		MSM5F8	5250714	MSM5F8A	5250715
8mm	8mm	20mm	64mm	.38mm	MSM5F8R	5250716	MSM5F8RA	5250717
10mm	10mm	22mm	67mm		MSM5F10	5250673	MSM5F10A	5250674
10mm	10mm	22mm	67mm	.38mm	MSM5F10R	5250675	MSM5F10RA	5250676
12mm	12mm	25mm	74mm		MSM5F12	5250677	MSM5F12A	5250678
12mm	12mm	25mm	74mm	.64mm	MSM5F12R	5250679	MSM5F12RA	5250608
14mm	14mm	32mm	76mm		MSM5F14	5250681	MSM5F14A	5250682
14mm	14mm	32mm	76mm	.64mm	MSM5F14R	5250683	MSM5F14RA	5250684
16mm	16mm	32mm	93mm		MSM5F16	5250685	MSM5F16A	5250686
16mm	16mm	32mm	93mm	.75mm	MSM5F16R	5250687	MSM5F16RA	5250688
18mm	18mm	38mm	100mm		MSM5F18	5250689	MSM5F18A	5250690
18mm	18mm	38mm	100mm	.75mm	MSM5F18R	5250691	MSM5F18RA	5250692
20mm	20mm	38mm	100mm		MSM5F20	5250693	MSM5F20A	5250694
20mm	20mm	38mm	100mm	.75mm	MSM5F20R	5250695	MSM5F20RA	5250696
25mm	25mm	38mm	101mm		MSM5F25	5250697	MSM5F25A	5250698
25mm	25mm	38mm	101mm	.75mm	MSM5F25R	5250699	MSM5F25RA	5250700

See page 84 for Cutting Parameters

# Series *SM5F & MSM5F*

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Facing	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.75D Radial x .25D Axial	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	600	75.00	600	70.00	600	60.00	600	70.00
Steel Alloys	P	4140 thru 8820	500	60.00	500	55.00	500	50.00	500	55.00
		Steel Alloys <45 HRC, Cobalt Chrome	300	30.00	300	25.00	300	20.00	300	25.00
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	250	40.00	250	35.00	250	30.00	250	35.00
	H*	AR-450, Steels >45 HRC	100	8.00	100	6.00	100	5.00	100	6.00
Stainless Steel	M	303,304, 316	450	45.00	450	40.00	450	35.00	450	35.00
		410, 420, 440, 13-8, 15-5, 17-4 Ph	350	40.00	350	35.00	350	30.00	350	35.00
High Temp - Titanium	S	6Al4V, 5553, 99	200	15.00	200	12.00	200	10.00	200	12.00
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	80	7.00	80	6.00	80	5.00	80	6.00
		Inconel 625, Waspalloy	120	10.00	120	8.00	120	7.00	120	8.00
		Monel 400	250	16.00	250	12.00	250	10.00	250	12.00
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	100	8.00	100	6.00	100	5.00	100	6.00
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF12	70	6.00	70	5.00	70	4.00	70	5.00
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	600	75.00	600	70.00	600	60.00	600	70.00

**HIGH PERFORMANCE**

## Series SM5F & MSM5F

### Cutting Parameters

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter							
			1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	0.0007	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070
Steel Alloys	P	4140 thru 8820	0.0005	0.0007	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
		Cobalt Chrome	0.0008	0.0010	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100
		Steel Alloys <45 HRC	0.0003	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0030
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	0.0005	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0050
	H*	AR-450, Steels >45 HRC	0.0002	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0030
Stainless Steel	M	303,304, 316	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
		410, 420, 440, 13-8, 15-5, 17-4 Ph	0.0005	0.0008	0.0010	0.0015	0.0025	0.0030	0.0040	0.0050
High Temp - Titanium	S	6Al4V, 5553, 99	0.0005	0.0008	0.0010	0.0012	0.0015	0.0020	0.0030	0.0040
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
		Inconel 625, Waspalloy	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
		Monel 400	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040	0.0050
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF12	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	0.0050	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050

HIGH PERFORMANCE

## Series SM6F

### High Performance Carbide End Mill for Light Profiling & Finishing Ferrous Materials

Series SM6F

ISO CODE  
**P**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**



- 6 Flute
- 45° Helix
- Equal Flute Spacing
- Full Eccentric Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/4	1/4	1/2	2		SM6F250S	5252216	SM6F250SA	5252220
1/4	1/4	1/2	2	0.015	SM6F250S-015	5252218	SM6F250SA-015	5252221
1/4	1/4	1/2	2	0.030	SM6F250S-030	5252219	SM6F250SA-030	5252222
1/4	1/4	3/4	2 1/2		SM6F250	5252203	SM6F250A	5252207
1/4	1/4	3/4	2 1/2	0.015	SM6F250-015	5252204	SM6F250A-015	5252208
1/4	1/4	3/4	2 1/2	0.030	SM6F250-030	5252206	SM6F250A-030	5252209
1/4	1/4	1 1/8	3		SM6F250L	5252210	SM6F250LA	5252213
1/4	1/4	1 1/8	3	0.015	SM6F250L-015	5252211	SM6F250LA-015	5252214
1/4	1/4	1 1/8	3	0.030	SM6F250L-030	5252212	SM6F250LA-030	5252215
1/4	1/4	1 1/2	4		SM6F250XL	5252223	SM6F250XLA	5252226
1/4	1/4	1 1/2	4	0.015	SM6F250XL-015	5252224	SM6F250XLA-015	5252227
1/4	1/4	1 1/2	4	0.030	SM6F250XL-030	5252225	SM6F250XLA-030	5252228
5/16	5/16	1/2	2		SM6F312S	5252241	SM6F312SA	5252244
5/16	5/16	1/2	2	0.015	SM6F312S-015	5252242	SM6F312SA-015	5252245
5/16	5/16	1/2	2	0.030	SM6F312S-030	5252243	SM6F312SA-030	5252246
5/16	5/16	13/16	2 1/2		SM6F312	5252229	SM6F312A	5252232
5/16	5/16	13/16	2 1/2	0.015	SM6F312-015	5252230	SM6F312A-015	5252233
5/16	5/16	13/16	2 1/2	0.030	SM6F312-030	5252231	SM6F312A-030	5252234
5/16	5/16	1 1/8	3		SM6F312L	5252235	SM6F312LA	5252238
5/16	5/16	1 1/8	3	0.015	SM6F312L-015	5252236	SM6F312LA-015	5252239

See page 90 for Cutting Parameters

## Series SM6F

### High Performance Carbide End Mill for Light Profiling & Finishing Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
5/16	5/16	1 1/8	3	0.030	SM6F312L-030	5252237	SM6F312LA-030	5252240
3/8	3/8	9/16	2		SM6F375S	5252265	SM6F375SA	5252269
3/8	3/8	9/16	2	0.015	SM6F375S-015	5252266	SM6F375SA-015	5252270
3/8	3/8	9/16	2	0.030	SM6F375S-030	5252267	SM6F375SA-030	5252271
3/8	3/8	1	2 1/2		SM6F375	5252248	SM6F375A	5252251
3/8	3/8	1	2 1/2	0.015	SM6F375-015	5252249	SM6F375A-015	5252253
3/8	3/8	1	2 1/2	0.030	SM6F375-030	5252250	SM6F375A-030	5252254
3/8	3/8	1 1/4	3		SM6F375L	5252256	SM6F375LA	5252261
3/8	3/8	1 1/4	3	0.015	SM6F375L-015	5252259	SM6F375LA-015	5252262
3/8	3/8	1 1/4	3	0.030	SM6F375L-030	5252260	SM6F375LA-030	5252263
3/8	3/8	2	4		SM6F375XL	5252272	SM6F375XLA	5252275
3/8	3/8	2	4	0.015	SM6F375XL-015	5252273	SM6F375XLA-015	5252276
3/8	3/8	2	4	0.030	SM6F375XL-030	5252274	SM6F375XLA-030	5252277
7/16	7/16	1	2 3/4		SM6F437	5252278	SM6F437A	5252281
7/16	7/16	1	2 3/4	0.015	SM6F437-015	5252279	SM6F437A-015	5252282
7/16	7/16	1	2 3/4	0.030	SM6F437-030	5252280	SM6F437A-030	5252283
7/16	7/16	2	4		SM6F437L	5252284	SM6F437LA	5252287
7/16	7/16	2	4	0.015	SM6F437L-015	5252285	SM6F437LA-015	5252288
7/16	7/16	2	4	0.030	SM6F437L-030	5252286	SM6F437LA-030	5252289
1/2	1/2	5/8	2 1/2		SM6F500S	5252324	SM6F500SA	5252331
1/2	1/2	5/8	2 1/2	0.020	SM6F500S-020	5252328	SM6F500SA-020	5252332
1/2	1/2	5/8	2 1/2	0.030	SM6F500S-030	5252329	SM6F500SA-030	5252333
1/2	1/2	5/8	2 1/2	0.060	SM6F500S-060	5252330	SM6F500SA-060	5252334
1/2	1/2	1 1/4	3		SM6F500	5252290	SM6F500A	5252297
1/2	1/2	1 1/4	3	0.020	SM6F500-020	5252293	SM6F500A-020	5252298
1/2	1/2	1 1/4	3	0.030	SM6F500-030	5252294	SM6F500A-030	5252300
1/2	1/2	1 1/4	3	0.060	SM6F500-060	5252295	SM6F500A-060	5252304
1/2	1/2	1 1/2	4		SM6F500ML	5252315	SM6F500MLA	5252319
1/2	1/2	1 1/2	4	0.020	SM6F500ML-020	5252316	SM6F500MLA-020	5252320
1/2	1/2	1 1/2	4	0.030	SM6F500ML-030	5252317	SM6F500MLA-030	5252321
1/2	1/2	1 1/2	4	0.060	SM6F500ML-060	5252318	SM6F500MLA-060	5252322
1/2	1/2	2	4		SM6F500L	5252307	SM6F500LA	5252311



Continued on next page

## Series SM6F

### High Performance Carbide End Mill for Light Profiling & Finishing Ferrous Materials



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/2	1/2	2	4	0.020	SM6F500L-020	5252308	SM6F500LA-020	5252312
1/2	1/2	2	4	0.030	SM6F500L-030	5252309	SM6F500LA-030	5252313
1/2	1/2	2	4	0.060	SM6F500L-060	5253210	SM6F500LA-060	5252314
1/2	1/2	3	6		SM6F500XL	5252335	SM6F500XLA	5252339
1/2	1/2	3	6	0.020	SM6F500XL-020	5252336	SM6F500XLA-020	5252340
1/2	1/2	3	6	0.030	SM6F500XL-030	5252337	SM6F500XLA-030	5252341
1/2	1/2	3	6	0.060	SM6F500XL-060	5252338	SM6F500XLA-060	5252342
5/8	5/8	3/4	3		SM6F625S	5252356	SM6F625SA	5252359
5/8	5/8	3/4	3	0.030	SM6F625S-030	5252357	SM6F625SA-030	5252360
5/8	5/8	3/4	3	0.060	SM6F625S-060	5252358	SM6F625SA-060	5252361
5/8	5/8	1 5/8	3 1/2		SM6F625	5252343	SM6F625A	5252346
5/8	5/8	1 5/8	3 1/2	0.030	SM6F625-030	5252344	SM6F625A-030	5252347
5/8	5/8	1 5/8	3 1/2	0.060	SM6F625-060	5252345	SM6F625A-060	5252348
5/8	5/8	2 1/4	5		SM6F625L	5252349	SM6F625LA	5252352
5/8	5/8	2 1/4	5	0.030	SM6F625L-030	5252350	SM6F625LA-030	5252353
5/8	5/8	2 1/4	5	0.060	SM6F625L-060	5252351	SM6F625LA-060	5252354
3/4	3/4	7/8	3		SM6F750S	5252375	SM6F750SA	5252378
3/4	3/4	7/8	3	0.030	SM6F750S-030	5252376	SM6F750SA-030	5252379
3/4	3/4	7/8	3	0.060	SM6F750S-060	5252377	SM6F750SA-060	5252380
3/4	3/4	1 5/8	4		SM6F750	5252362	SM6F750A	5252365
3/4	3/4	1 5/8	4	0.030	SM6F750-030	5252363	SM6F750A-030	5252366
3/4	3/4	1 5/8	4	0.060	SM6F750-060	5252364	SM6F750A-060	5252368
3/4	3/4	2 1/4	5		SM6F750L	5252369	SM6F750LA	5252372
3/4	3/4	2 1/4	5	0.030	SM6F750L-030	5252370	SM6F750LA-030	5252373
3/4	3/4	2 1/4	5	0.060	SM6F750L-060	5252371	SM6F750LA-060	5252374
3/4	3/4	3	6		SM6F750XL	5252381	SM6F750XLA	5252384
3/4	3/4	3	6	0.030	SM6F750XL-030	5252382	SM6F750XLA-030	5252385
3/4	3/4	3	6	0.060	SM6F750XL-060	5252383	SM6F750XLA-060	5252386
3/4	3/4	4	7		SM6F750XXL	5252387	SM6F750XXLA	5252390
3/4	3/4	4	7	0.030	SM6F750XXL-030	5252388	SM6F750XXLA-030	5252391
3/4	3/4	4	7	0.060	SM6F750XXL-060	5252389	SM6F750XXLA-060	5252392
1	1	1 1/2	4		SM6F1.0	5252177	SM6F1.0A	5252180

Continued on next page

## Series **SM6F**

**High Performance Carbide End Mill for Light Profiling & Finishing Ferrous Materials**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1	1	1 1/2	4	0.030	SM6F1.0-030	5252178	SM6F1.0A-030	5252181
1	1	1 1/2	4	0.060	SM6F1.0-060	5252179	SM6F1.0A-060	5252182
1	1	2	4		SM6F1.0L	5252183	SM6F1.0LA	5252186
1	1	2	4	0.030	SM6F1.0L-030	5252184	SM6F1.0LA-030	5252187
1	1	2	4	0.060	SM6F1.0L-060	5252185	SM6F1.0LA-060	5252188
1	1	2 1/4	5		SM6F1.0XL	5252189	SM6F1.0XLA	5252192
1	1	2 1/4	5	0.030	SM6F1.0XL-030	5252190	SM6F1.0XLA-030	5252193
1	1	2 1/4	5	0.060	SM6F1.0XL-060	5252191	SM6F1.0XLA-060	5252194
1	1	3	6		SM6F1.0XXL	5252195	SM6F1.0XXLA	5252198
1	1	3	6	0.030	SM6F1.0XXL-030	5252196	SM6F1.0XXLA-030	5252199
1	1	3	6	0.060	SM6F1.0XXL-060	5252197	SM6F1.0XXLA-060	5252200
1	1	4	7		SM6F1.0XXXL	5252201	SM6F1.0XXXLA	5252202



# Series SM6F

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		High Feed	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.05D Radial x 2D Axial	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	600	90.00	n/a	n/a	n/a	n/a	n/a	n/a
Steel Alloys	P	4140 thru 8820	500	70.00	n/a	n/a	n/a	n/a	n/a	n/a
		Steel Alloys <45 HRC, Cobalt Chrome	300	35.00	n/a	n/a	n/a	n/a	n/a	n/a
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	250	45.00	n/a	n/a	n/a	n/a	n/a	n/a
	H*	AR-450, Steels >45 HRC	100	12.00	n/a	n/a	n/a	n/a	n/a	n/a
High Temp - Titanium	S	6Al4V, 5553, 99	200	20.00	200	16.00	200	12.00	n/a	n/a
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	80	8.00	80	7.00	80	6.00	250	25
		Inconel 625, Waspalloy	120	12.00	120	10.00	120	8.00	350	35
		Monel 400	250	20.00	250	16.00	250	12.00	500	50
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	100	9.00	100	7.00	100	6.00	300	30
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF12	70	7.00	70	6.00	70	5.00	200	20
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	600	90.00	600	80.00	600	70.00	n/a	n/a

HIGH PERFORMANCE

## Series SM6F

### Cutting Parameters

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter							
			1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	0.0007	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070
Steel Alloys	P	4140 thru 8820	0.0005	0.0007	0.0015	0.0020	0.0030	0.0040	0.0050	0.0060
		Cobalt Chrome	0.0008	0.0010	0.0020	0.0030	0.0050	0.0070	0.0080	0.0100
		Steel Alloys <45 HRC	0.0003	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0030
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	0.0005	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050	0.0050
	H*	AR-450, Steels >45 HRC	0.0002	0.0003	0.0005	0.0008	0.0010	0.0015	0.0020	0.0030
High Temp - Titanium	S	6Al4V, 5553, 99	0.0005	0.0008	0.0010	0.0012	0.0015	0.0020	0.0030	0.0040
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
		Inconel 625, Waspalloy	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
		Monel 400	0.0005	0.0010	0.0015	0.0020	0.0025	0.0030	0.0040	0.0050
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF12	0.0005	0.0007	0.0010	0.0015	0.0020	0.0025	0.0030	0.0030
Iron	K	Gray Cast, Malleable and Ductile Iron	0.0050	0.0007	0.0010	0.0015	0.0020	0.0030	0.0040	0.0050

HIGH PERFORMANCE

## Series AL3F

### High Performance Carbide End Mill for Roughing or Finishing Aluminum Alloys

ISO CODE  
**N**



- 3 Flute
- 45° Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp Corners
- nACRo Coating



Corner radius is available upon request

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	nACRo Coated	
				Tool Name	EDP #
5/32	3/16	5/16	2	AL3F156S	5250007
5/32	3/16	9/16	2	AL3F156	5250006
3/16	3/16	3/8	2	AL3F187S	5250010
3/16	3/16	9/16	2	AL3F187	5250008
7/32	1/4	1/2	2	AL3F218S	5250012
7/32	1/4	3/4	2 1/2	AL3F218	5250011
1/4	1/4	1/2	2	AL3F250S	5250017
1/4	1/4	3/4	2 1/2	AL3F250	5250013
1/4	1/4	1 1/8	3	AL3F250L	5250015
1/4	1/4	1 1/2	4	AL3F250XL	5250020
9/32	5/16	9/16	2	AL3F281S	5250023
9/32	5/16	13/16	2 1/2	AL3F281	5250022
5/16	5/16	1/2	2	AL3F312S	5250026
5/16	5/16	13/16	2 1/2	AL3F312	5250024
5/16	5/16	1 1/8	3	AL3F312L	5250025
3/8	3/8	5/8	2	AL3F375S	5250030
3/8	3/8	1	2 1/2	AL3F375	5250027
3/8	3/8	1 1/4	3	AL3F375L	5250029
3/8	3/8	1 1/2	4	AL3F375XL	5250033
3/8	3/8	2	4	AL3F375XXL	5250034
7/16	7/16	5/8	2 1/2	AL3F437S	5250039
7/16	7/16	1	2 3/4	AL3F437	5250035

See page 94 for Cutting Parameters

## Series **AL3F**

**High Performance Carbide End Mill for  
Roughing or Finishing Aluminum Alloys**

ISO CODE  
**N**

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	nACRo Coating	
				Tool Name	EDP #
7/16	7/16	2	4	AL3F437L	5250037
1/2	1/2	5/8	2 1/2	AL3F500S	5250052
1/2	1/2	1	3	AL3F500	5250041
1/2	1/2	1 1/4	3	AL3F500M	5250047
1/2	1/2	1 1/2	4	AL3F500L	5250043
1/2	1/2	2	4	AL3F500XL	5250056
1/2	1/2	3	6	AL3F500XXL	5250059
5/8	5/8	3/4	3	AL3F625S	5250063
5/8	5/8	1 5/8	3 1/2	AL3F625	5250060
5/8	5/8	2 1/4	5	AL3F625L	5250062
3/4	3/4	1	3	AL3F750S	5250068
3/4	3/4	1 5/8	4	AL3F750	5250064
3/4	3/4	2 1/4	5	AL3F750L	5250066
3/4	3/4	3	6	AL3F750XL	5250069
1	1	1 1/2	4	AL3F1.0	5250003
1	1	2 1/4	5	AL3F1.0L	5250004
1	1	3	6	AL3F1.0XL	5250005



# Series AL3F

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Slotting		Facing		Ramping		High Feed	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.5D Axial		.75D Radial x .25D Axial		Max. Ramp Angle - 10°		.05D Radial x 3D Axial	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Non-Ferrous	N	Aluminum 6061, 6063, 7050, 7075	1500	400.00	1500	350.00	1500	300.00	1200	250.00	1200	350	1200	350.00	2000	500
		Copper, Brass, Bronze, Plastics, Fibreglass	500	70.00	500	50.00	500	40.00	500	30.00	500	50	500	40.00	n/a	n/a

### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter						
			3/16	1/4	3/8	1/2	5/8	3/4	1
Non-Ferrous	N	Aluminium, Copper, Brass, Bronze	0.0040	0.0050	0.0070	0.0090	0.0100	0.0120	0.0150
		Plastics, Fibreglass	0.0020	0.0025	0.0035	0.0045	0.0055	0.0065	0.0080

HIGH PERFORMANCE

**NEW**  
**XTREME XPV**

**SUPERMILL'S**  
Most Advanced Asymmetric  
Design Yet!

New Xtreme XPV Series carbide end mills for Titanium and other difficult materials. Engineered with variable index, variable helix and progressive rake angles.

This new design has been tested and proven to dampen harmonics, eliminate vibration and stop chatter.

They produce a quieter and smoother cut at increased speeds and feeds. With the Xtreme XPV series you can easily double your production with:

- Heavier Cuts (Less Passes)
- Shorter Cycle Times
- Greater tool life

**NEW**  
**XTREME XPVS**

**SUPERMILL'S**  
Most Advanced Asymmetric  
Design Yet!

New Xtreme XPVS Series carbide end mills for Steel, Steel Alloys, Stainless Steels and Hardened Steels. Engineered with variable index, variable helix and progressive rake angles.

This new design has been tested and proven to dampen harmonics, eliminate vibration and stop chatter.

They produce a quieter and smoother cut at increased speeds and feeds. With the Xtreme-XPVS series you can easily double your production with:

- Heavier Cuts (Less Passes)
- Shorter Cycle Times
- Greater tool life

Made in the USA

# HIGH PERFORMANCE

Download .pdf file at [www.supermill.com](http://www.supermill.com)

# Series *CHAMFER MILL*

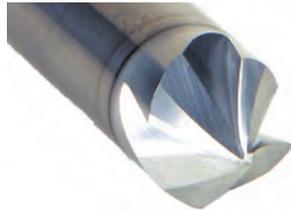
**All Purpose Carbide Chamfer Tool for Ferrous and Non Ferrous Chamfering Operations**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**



- 4 Flute
- 35° Helix
- Full Facet Relief
- S2 (Silver) Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Included Angle	S2 (Silver) Coated	
					Tool Name	EDP #
<b>Chamfer Only</b>						
1/4	1/4		2 1/2	90°	CH4F2500-90	5255384
3/8	3/8		3	90°	CH4F3750-90	5255932
1/2	1/2		3	90°	CH4F5000-90	5255933
1/4	1/4		2 1/2	120°	CH4F2500-120	5255934
3/8	3/8		3	120°	CH4F3750-120	5255935
1/2	1/2		3	120°	CH4F5000-120	5255936
<b>Chamfer Mill</b>						
1/4	1/4	1/2	2 1/2	90°	CM4F2500-90	5255937
3/8	3/8	5/8	3	90°	CM4F3750-90	5255938
1/2	1/2	5/8	2 1/2	90°	CM4F5000S-90	5256113
1/2	1/2	5/8	3	90°	CM4F5000-90	5255939
1/4	1/4	1/2	2 1/2	120°	CM4F2500-120	5255940
3/8	3/8	5/8	3	120°	CM4F3750-120	5255941
1/2	1/2	5/8	3	120°	CM4F5000-120	5255942

## Series *CHAMFER MILL*

All Purpose Carbide Chamfer Tool for Ferrous and Non Ferrous Chamfering Operations

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Included Angle	S2 (Silver) Coated	
					Tool Name	EDP #
<b>Tipped Chamfer Only</b>						
3/16	3/16		2 1/2	90°	T-CH4F1875-90	5256052
1/4	1/4		2 1/2	90°	T-CH4F2500-90	5255943
3/8	3/8		3	90°	T-CH4F3750-90	5255944
1/2	1/2		3	90°	T-CH4F5000-90	5255945
3/16	3/16		2 1/2	120°	T-CH4F1875-120	5256059
1/4	1/4		2 1/2	120°	T-CH4F2500-120	5255946
3/8	3/8		3	120°	T-CH4F3750-120	5255947
1/2	1/2		3	120°	T-CH4F5000-120	5255948
<b>Tipped Chamfer Mill</b>						
1/4	1/4	1/2	2 1/2	90°	T-CM4F2500-90	5255949
3/8	3/8	5/8	3	90°	T-CM4F3750-90	5255950
1/2	1/2	5/8	3	90°	T-CM4F5000-90	5255951
1/4	1/4	1/2	2 1/2	120°	T-CM4F2500-120	5255952
3/8	3/8	5/8	3	120°	T-CM4F3750-120	5255953
1/2	1/2	5/8	3	120°	T-CM4F5000-120	5255954

# Series SAP

## All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials

Series SAP

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**



- 4 Flute
- 35° Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp or Corner Radius
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/8	1/8	1/4	1 1/2		SAP125S	5251066	SAP125SA	5251070
1/8	1/8	1/4	1 1/2	0.010	SAP125S-010	5251067	SAP125SA-010	5251071
1/8	1/8	1/4	1 1/2	0.020	SAP125S-020	5251068	SAP125SA-020	5251072
1/8	1/8	1/4	1 1/2	0.030	SAP125S-030	5251069	SAP125SA-030	5251073
1/8	1/8	1/2	1 1/2		SAP125	5251056	SAP125A	5251060
1/8	1/8	1/2	1 1/2	0.010	SAP125-010	5251057	SAP125A-010	5251061
1/8	1/8	1/2	1 1/2	0.020	SAP125-020	5251058	SAP125A-020	5251062
1/8	1/8	1/2	1 1/2	0.030	SAP125-030	5251059	SAP125A-030	5251063
9/64	3/16	5/16	2		SAP140S	5251077	SAP140SA	5251078
9/64	3/16	9/16	2		SAP140	5251075	SAP140A	5251076
5/32	3/16	5/16	2		SAP156S	5251083	SAP156SA	5251085
5/32	3/16	9/16	2		SAP156	5251079	SAP156A	5251080
11/64	3/16	5/8	2		SAP171	5251088	SAP171A	5251089
3/16	3/16	3/8	2		SAP187S	5251106	SAP187SA	5251111
3/16	3/16	3/8	2	0.010	SAP187S-010	5251107	SAP187SA-010	5251112
3/16	3/16	3/8	2	0.020	SAP187S-020	5251108	SAP187SA-020	5251113
3/16	3/16	3/8	2	0.030	SAP187S-030	5251109	SAP187SA-030	5251114
3/16	3/16	5/8	2		SAP187	5251090	SAP187A	5251094
3/16	3/16	5/8	2	0.010	SAP187-010	5251091	SAP187A-010	5251095
3/16	3/16	5/8	2	0.020	SAP187-020	5251092	SAP187A-020	5251096

See page 110 for Cutting Parameters

## Series **SAP**

### All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/16	3/16	5/8	2	0.030	SAP187-030	5251093	SAP187A-030	5251097
3/16	3/16	3/4	2 1/2		SAP187L	5251098	SAP187LA	5251102
3/16	3/16	3/4	2 1/2	0.010	SAP187L-010	5251099	SAP187LA-010	5251103
3/16	3/16	3/4	2 1/2	0.020	SAP187L-020	5251100	SAP187LA-020	5251104
3/16	3/16	3/4	2 1/2	0.030	SAP187L-030	5251101	SAP187LA-030	5251105
13/64	1/4	5/8	2 1/2		SAP203	5251119	SAP203A	5251121
7/32	1/4	7/16	2		SAP218S	5251129	SAP218SA	5251133
7/32	1/4	5/8	2 1/2		SAP218	5251124	SAP218A	5251126
15/64	1/4	3/4	2 1/2		SAP234	5251137	SAP234A	5251138
1/4	1/4	1/2	2		SAP250S	5251180	SAP250SA	5251186
1/4	1/4	1/2	2	0.010	SAP250S-010	5251181	SAP250SA-010	5251187
1/4	1/4	1/2	2	0.020	SAP250S-020	5251182	SAP250SA-020	5251188
1/4	1/4	1/2	2	0.030	SAP250S-030	5251183	SAP250SA-030	5251190
1/4	1/4	1/2	2	0.045	SAP250S-045	5251184	SAP250SA-045	5251192
1/4	1/4	1/2	2	0.060	SAP250S-060	5251185	SAP250SA-060	5251193
1/4	1/4	3/4	2 1/2		SAP250	5251139	SAP250A	5251147
1/4	1/4	3/4	2 1/2	0.010	SAP250-010	5251140	SAP250A-010	5251148
1/4	1/4	3/4	2 1/2	0.015	SAP250-015	5251141	SAP250A-015	5251149
1/4	1/4	3/4	2 1/2	0.020	SAP250-020	5251142	SAP250A-020	5251150
1/4	1/4	3/4	2 1/2	0.030	SAP250-030	5251144	SAP250A-030	5251151
1/4	1/4	3/4	2 1/2	0.045	SAP250-045	5251145	SAP250A-045	5251152
1/4	1/4	3/4	2 1/2	0.060	SAP250-060	5251146	SAP250A-060	5251153
1/4	1/4	1 1/8	3		SAP250M	5251167	SAP250MA	5251174
1/4	1/4	1 1/8	3	0.010	SAP250M-010	5251168	SAP250MA-010	5251175
1/4	1/4	1 1/8	3	0.020	SAP250M-020	5251169	SAP250MA-020	5251176
1/4	1/4	1 1/8	3	0.030	SAP250M-030	5251170	SAP250MA-030	5251177
1/4	1/4	1 1/8	3	0.045	SAP250M-045	5251171	SAP250MA-045	5251178
1/4	1/4	1 1/8	3	0.060	SAP250M-060	5251173	SAP250MA-060	5251179
1/4	1/4	1 1/2	4		SAP250L	5251154	SAP250LA	5251161
1/4	1/4	1 1/2	4	0.010	SAP250L-010	5251155	SAP250LA-010	5251162
1/4	1/4	1 1/2	4	0.020	SAP250L-020	5251157	SAP250LA-020	5251163
1/4	1/4	1 1/2	4	0.030	SAP250L-030	5251158	SAP250LA-030	5251164



Continued on next page

# Series *SAP*

## All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/4	1/4	1 1/2	4	0.045	SAP250L-045	5251159	SAP250LA-045	5251165
1/4	1/4	1 1/2	4	0.060	SAP250L-060	5251160	SAP250LA-060	5251166
17/64	5/16	3/4	2 1/2		SAP265	5251194	SAP265A	5251195
9/32	5/16	1/2	2		SAP281S	5251201	SAP281SA	5251202
9/32	5/16	3/4	2 1/2		SAP281	5251199	SAP281A	5251200
19/64	5/16	13/16	2 1/2		SAP296	5251205	SAP296A	5251206
5/16	5/16	1/2	2		SAP312S	5251236	SAP312SA	5251243
5/16	5/16	1/2	2	0.010	SAP312S-010	5251237	SAP312SA-010	5251244
5/16	5/16	1/2	2	0.020	SAP312S-020	5251239	SAP312SA-020	5251245
5/16	5/16	1/2	2	0.030	SAP312S-030	5251240	SAP312SA-030	5251246
5/16	5/16	1/2	2	0.045	SAP312S-045	5251241	SAP312SA-045	5251247
5/16	5/16	1/2	2	0.060	SAP312S-060	5251242	SAP312SA-060	5251248
5/16	5/16	13/16	2 1/2		SAP312	5251211	SAP312A	5251217
5/16	5/16	13/16	2 1/2	0.010	SAP312-010	5251212	SAP312A-010	5251218
5/16	5/16	13/16	2 1/2	0.020	SAP312-020	5251213	SAP312A-020	5251219
5/16	5/16	13/16	2 1/2	0.030	SAP312-030	5251214	SAP312A-030	5251220
5/16	5/16	13/16	2 1/2	0.045	SAP312-045	5251215	SAP312A-045	5251221
5/16	5/16	13/16	2 1/2	0.060	SAP312-060	5251216	SAP312A-060	5251222
5/16	5/16	1 1/8	3		SAP312L	5251223	SAP312LA	5251230
5/16	5/16	1 1/8	3	0.010	SAP312L-010	5251224	SAP312LA-010	5251231
5/16	5/16	1 1/8	3	0.020	SAP312L-020	5251225	SAP312LA-020	5251232
5/16	5/16	1 1/8	3	0.030	SAP312L-030	5251226	SAP312LA-030	5251233
5/16	5/16	1 1/8	3	0.045	SAP312L-045	5251227	SAP312LA-045	5251234
5/16	5/16	1 1/8	3	0.060	SAP312L-060	5251228	SAP312LA-060	5251235
21/64	3/8	7/8	2 1/2		SAP328	5251250	SAP328A	5251251
11/32	3/8	7/8	2 1/2		SAP343	5251254	SAP343A	5251255
23/64	3/8	7/8	2 1/2		SAP359	5251256	SAP359A	5251257
3/8	3/8	5/8	2		SAP375S	5251285	SAP375SA	5251291
3/8	3/8	5/8	2	0.010	SAP375S-010	5251286	SAP375SA-010	5251292
3/8	3/8	5/8	2	0.020	SAP375S-020	5251287	SAP375SA-020	5251293
3/8	3/8	5/8	2	0.030	SAP375S-030	5251288	SAP375SA-030	5251294
3/8	3/8	5/8	2	0.045	SAP375S-045	5251289	SAP375SA-045	5251295

*Continued on next page*

## Series **SAP**

### All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/8	3/8	5/8	2	0.060	SAP375S-060	5251290	SAP375SA-060	5251296
3/8	3/8	7/8	2 1/2		SAP375	5251258	SAP375A	5251265
3/8	3/8	7/8	2 1/2	0.010	SAP375-010	5251259	SAP375A-010	5251266
3/8	3/8	7/8	2 1/2	0.020	SAP375-020	5251261	SAP375A-020	5251267
3/8	3/8	7/8	2 1/2	0.030	SAP375-030	5251262	SAP375A-030	5251268
3/8	3/8	7/8	2 1/2	0.045	SAP375-045	5251263	SAP375A-045	5251270
3/8	3/8	7/8	2 1/2	0.060	SAP375-060	5251264	SAP375A-060	5251271
3/8	3/8	1 1/8	3		SAP375L	5251272	SAP375LA	5251279
3/8	3/8	1 1/8	3	0.010	SAP375L-010	5251273	SAP375LA-010	5251280
3/8	3/8	1 1/8	3	0.020	SAP375L-020	5251274	SAP375LA-020	5251281
3/8	3/8	1 1/8	3	0.030	SAP375L-030	5251275	SAP375LA-030	5251282
3/8	3/8	1 1/8	3	0.045	SAP375L-045	5251276	SAP375LA-045	5251283
3/8	3/8	1 1/8	3	0.060	SAP375L-060	5251277	SAP375LA-060	5251284
3/8	3/8	1 3/4	4		SAP375XL	5251298	SAP375XLA	5251304
3/8	3/8	1 3/4	4	0.010	SAP375XL-010	5251299	SAP375XLA-010	5251305
3/8	3/8	1 3/4	4	0.020	SAP375XL-020	5251300	SAP375XLA-020	5251306
3/8	3/8	1 3/4	4	0.030	SAP375XL-030	5251301	SAP375XLA-030	5251307
3/8	3/8	1 3/4	4	0.045	SAP375XL-045	5251302	SAP375XLA-045	5251308
3/8	3/8	1 3/4	4	0.060	SAP375XL-060	5251303	SAP375XLA-060	5251309
3/8	3/8	2	4		SAP375XXL	5251310	SAP375XXLA	5251311
25/64	7/16	7/8	2 1/2		SAP390	5251312	SAP390A	5251313
13/32	7/16	7/8	2 1/2		SAP406	5251314	SAP406A	5251315
27/64	7/16	7/8	2 1/2		SAP421	5251316	SAP421A	5251317
7/16	7/16	5/8	2 1/2		SAP437S	5251335	SAP437SA	5251339
7/16	7/16	5/8	2 1/2	0.020	SAP437S-020	5251336	SAP437SA-020	5251340
7/16	7/16	5/8	2 1/2	0.030	SAP437S-030	5251337	SAP437SA-030	5251341
7/16	7/16	5/8	2 1/2	0.060	SAP437S-060	5251338	SAP437SA-060	5251342
7/16	7/16	7/8	2 3/4		SAP437	5251318	SAP437A	5251323
7/16	7/16	7/8	2 3/4	0.020	SAP437-020	5251319	SAP437A-020	5251324
7/16	7/16	7/8	2 3/4	0.030	SAP437-030	5251320	SAP437A-030	5251325
7/16	7/16	7/8	2 3/4	0.060	SAP437-060	5251321	SAP437A-060	5251326
7/16	7/16	2	4		SAP437L	5251327	SAP437LA	5251331



Continued on next page

# Series *SAP*

## All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
7/16	7/16	2	4	0.020	SAP437L-020	5251328	SAP437LA-020	5251332
7/16	7/16	2	4	0.030	SAP437L-030	5251329	SAP437LA-030	5251333
7/16	7/16	2	4	0.060	SAP437L-060	5251330	SAP437LA-060	5251334
29/64	1/2	1	3		SAP453	5251344	SAP453A	5251345
15/32	1/2	1	3		SAP468	5251347	SAP468A	5251348
31/64	1/2	1	3		SAP484	5251349	SAP484A	5251350
1/2	1/2	5/8	2 1/2		SAP500S	5251420	SAP500SA	5251429
1/2	1/2	5/8	2 1/2	0.010	SAP500S-010	5251421	SAP500SA-010	5251430
1/2	1/2	5/8	2 1/2	0.020	SAP500S-020	5251422	SAP500SA-020	5251431
1/2	1/2	5/8	2 1/2	0.030	SAP500S-030	5251423	SAP500SA-030	5251432
1/2	1/2	5/8	2 1/2	0.045	SAP500S-045	5251424	SAP500SA-045	5251433
1/2	1/2	5/8	2 1/2	0.060	SAP500S-060	5251425	SAP500SA-060	5251434
1/2	1/2	5/8	2 1/2	0.090	SAP500S-090	5251426	SAP500SA-090	5251435
1/2	1/2	5/8	2 1/2	0.125	SAP500S-125	5251428	SAP500SA-125	5251436
1/2	1/2	1	3		SAP500	5251351	SAP500A	5251360
1/2	1/2	1	3	0.010	SAP500-010	5251352	SAP500A-010	5251361
1/2	1/2	1	3	0.020	SAP500-020	5251353	SAP500A-020	5251362
1/2	1/2	1	3	0.030	SAP500-030	5251354	SAP500A-030	5251363
1/2	1/2	1	3	0.045	SAP500-045	5251355	SAP500A-045	5251364
1/2	1/2	1	3	0.060	SAP500-060	5251356	SAP500A-060	5251365
1/2	1/2	1	3	0.090	SAP500-090	5251357	SAP500A-090	5251366
1/2	1/2	1	3	0.125	SAP500-125	5251358	SAP500A-125	5251367
1/2	1/2	1 1/4	3		SAP500M	5251387	SAP500MA	5251396
1/2	1/2	1 1/4	3	0.010	SAP500M-010	5251388	SAP500MA-010	5251397
1/2	1/2	1 1/4	3	0.020	SAP500M-020	5251389	SAP500MA-020	5251398
1/2	1/2	1 1/4	3	0.030	SAP500M-030	5251390	SAP500MA-030	5251399
1/2	1/2	1 1/4	3	0.045	SAP500M-045	5251391	SAP500MA-045	5251400
1/2	1/2	1 1/4	3	0.060	SAP500M-060	5251392	SAP500MA-060	5251401
1/2	1/2	1 1/4	3	0.090	SAP500M-090	5251393	SAP500MA-090	5251402
1/2	1/2	1 1/4	3	0.125	SAP500M-125	5251394	SAP500MA-125	5251403
1/2	1/2	1 1/2	4		SAP500ML	5251404	SAP500MLA	5251412
1/2	1/2	1 1/2	4	0.010	SAP500ML-010	5251405	SAP500MLA-010	5251413

*Continued on next page*

## Series **SAP**

### All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/2	1/2	1 1/2	4	0.020	SAP500ML-020	5251406	SAP500MLA-020	5251414
1/2	1/2	1 1/2	4	0.030	SAP500ML-030	5251407	SAP500MLA-030	5251415
1/2	1/2	1 1/2	4	0.045	SAP500ML-045	5251408	SAP500MLA-045	5251416
1/2	1/2	1 1/2	4	0.060	SAP500ML-060	5251409	SAP500MLA-060	5251417
1/2	1/2	1 1/2	4	0.090	SAP500ML-090	5251410	SAP500MLA-090	5251418
1/2	1/2	1 1/2	4	0.125	SAP500ML-125	5251411	SAP500MLA-125	5251419
1/2	1/2	2	4		SAP500L	5251368	SAP500LA	5251378
1/2	1/2	2	4	0.010	SAP500L-010	5251369	SAP500LA-010	5251379
1/2	1/2	2	4	0.020	SAP500L-020	5251370	SAP500LA-020	5251380
1/2	1/2	2	4	0.030	SAP500L-030	5251371	SAP500LA-030	5251381
1/2	1/2	2	4	0.045	SAP500L-045	5251372	SAP500LA-045	5251382
1/2	1/2	2	4	0.050	SAP500L-050	5251373	SAP500LA-050	5251383
1/2	1/2	2	4	0.060	SAP500L-060	5251374	SAP500LA-060	5251384
1/2	1/2	2	4	0.090	SAP500L-090	5251375	SAP500LA-090	5251385
1/2	1/2	2	4	0.125	SAP500L-125	5251376	SAP500LA-125	5251386
1/2	1/2	3	6		SAP500XL	5251437	SAP500XLA	5251445
1/2	1/2	3	6	0.010	SAP500XL-010	5251438	SAP500XLA-010	5251446
1/2	1/2	3	6	0.020	SAP500XL-020	5251439	SAP500XLA-020	5251447
1/2	1/2	3	6	0.030	SAP500XL-030	5251440	SAP500XLA-030	5251448
1/2	1/2	3	6	0.045	SAP500XL-045	5251441	SAP500XLA-045	5251449
1/2	1/2	3	6	0.060	SAP500XL-060	5251442	SAP500XLA-060	5251450
1/2	1/2	3	6	0.090	SAP500XL-090	5251443	SAP500XLA-090	5251451
1/2	1/2	3	6	0.125	SAP500XL-125	5251444	SAP500XLA-125	5251452
9/16	9/16	1 1/4	3		SAP562	5251455	SAP562A	5251456
5/8	5/8	3/4	3		SAP625S	5251487	SAP625SA	5251494
5/8	5/8	3/4	3	0.020	SAP625S-020	5251488	SAP625SA-020	5251495
5/8	5/8	3/4	3	0.030	SAP625S-030	5251489	SAP625SA-030	5251496
5/8	5/8	3/4	3	0.045	SAP625S-045	5251490	SAP625SA-045	5251497
5/8	5/8	3/4	3	0.060	SAP625S-060	5251491	SAP625SA-060	5251498
5/8	5/8	3/4	3	0.090	SAP625S-090	5251492	SAP625SA-090	5251499
5/8	5/8	3/4	3	0.125	SAP625S-125	5251493	SAP625SA-125	5251500
5/8	5/8	1 1/4	3 1/2		SAP625	5251457	SAP625A	5251465



Continued on next page

# Series SAP

## All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
5/8	5/8	1 1/4	3 1/2	0.020	SAP625-020	5251459	SAP625A-020	5251466
5/8	5/8	1 1/4	3 1/2	0.030	SAP625-030	5251460	SAP625A-030	5251467
5/8	5/8	1 1/4	3 1/2	0.045	SAP625-045	5251461	SAP625A-045	5251468
5/8	5/8	1 1/4	3 1/2	0.060	SAP625-060	5251462	SAP625A-060	5251469
5/8	5/8	1 1/4	3 1/2	0.090	SAP625-090	5251463	SAP625A-090	5251470
5/8	5/8	1 1/4	3 1/2	0.125	SAP625-125	5251464	SAP625A-125	5251471
5/8	5/8	2 1/4	5		SAP625L	5251472	SAP625LA	5251480
5/8	5/8	2 1/4	5	0.020	SAP625L-020	5251474	SAP625LA-020	5251481
5/8	5/8	2 1/4	5	0.030	SAP625L-030	5251475	SAP625LA-030	5251482
5/8	5/8	2 1/4	5	0.045	SAP625L-045	5251476	SAP625LA-045	5251483
5/8	5/8	2 1/4	5	0.060	SAP625L-060	5251477	SAP625LA-060	5251484
5/8	5/8	2 1/4	5	0.090	SAP625L-090	5251478	SAP625LA-090	5251485
5/8	5/8	2 1/4	5	0.125	SAP625L-125	5251479	SAP625LA-125	5251486
3/4	3/4	1	3		SAP750S	5251530	SAP750SA	5251537
3/4	3/4	1	3	0.020	SAP750S-020	5251531	SAP750SA-020	5251538
3/4	3/4	1	3	0.030	SAP750S-030	5251532	SAP750SA-030	5251539
3/4	3/4	1	3	0.045	SAP750S-045	5251533	SAP750SA-045	5251540
3/4	3/4	1	3	0.060	SAP750S-060	5251534	SAP750SA-060	5251541
3/4	3/4	1	3	0.090	SAP750S-090	5251535	SAP750SA-090	5251542
3/4	3/4	1	3	0.125	SAP750S-125	5251536	SAP750SA-125	5251543
3/4	3/4	1 1/2	4		SAP750	5251501	SAP750A	5251508
3/4	3/4	1 1/2	4	0.020	SAP750-020	5251502	SAP750A-020	5251509
3/4	3/4	1 1/2	4	0.030	SAP750-030	5251503	SAP750A-030	5251510
3/4	3/4	1 1/2	4	0.045	SAP750-045	5251504	SAP750A-045	5251511
3/4	3/4	1 1/2	4	0.060	SAP750-060	5251505	SAP750A-060	5251512
3/4	3/4	1 1/2	4	0.090	SAP750-090	5251506	SAP750A-090	5251513
3/4	3/4	1 1/2	4	0.125	SAP750-125	5251507	SAP750A-125	5251514
3/4	3/4	2 1/4	5		SAP750L	5251515	SAP750LA	5251522
3/4	3/4	2 1/4	5	0.020	SAP750L-020	5251516	SAP750LA-020	5251523
3/4	3/4	2 1/4	5	0.030	SAP750L-030	5251517	SAP750LA-030	5251524
3/4	3/4	2 1/4	5	0.045	SAP750L-045	5251518	SAP750LA-045	5251525
3/4	3/4	2 1/4	5	0.060	SAP750L-060	5251519	SAP750LA-060	5251526

Continued on next page

## Series **SAP**

### All Purpose Carbide End Mill for Universal Machining Applications in Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/4	3/4	2 1/4	5	0.090	SAP750L-090	5251520	SAP750LA-090	5251527
3/4	3/4	2 1/4	5	0.125	SAP750L-125	5251521	SAP750LA-125	5251528
3/4	3/4	3	6		SAP750XL	5251544	SAP750XLA	5251548
3/4	3/4	3	6	0.030	SAP750XL-030	5251545	SAP750XLA-030	5251549
3/4	3/4	3	6	0.060	SAP750XL-060	5251546	SAP750XLA-060	5251550
3/4	3/4	3	6	0.125	SAP750XL-125	5251547	SAP750XLA-125	5251551
7/8	7/8	1 1/2	4		SAP875	5251552	SAP875A	5251553
1	1	1 1/2	4		SAP1.0	5251014	SAP1.0A	5251021
1	1	1 1/2	4	0.020	SAP1.0-020	5251015	SAP1.0A-020	5251022
1	1	1 1/2	4	0.030	SAP1.0-030	5251016	SAP1.0A-030	5251023
1	1	1 1/2	4	0.060	SAP1.0-060	5251017	SAP1.0A-060	5251024
1	1	1 1/2	4	0.090	SAP1.0-090	5251018	SAP1.0A-090	5251025
1	1	1 1/2	4	0.125	SAP1.0-125	5251019	SAP1.0A-125	5251026
1	1	1 1/2	4	0.250	SAP1.0-250	5251020	SAP1.0A-250	5251027
1	1	2 1/4	5		SAP1.0L	5251028	SAP1.0LA	5251035
1	1	2 1/4	5	0.020	SAP1.0L-020	5251029	SAP1.0LA-020	5251036
1	1	2 1/4	5	0.030	SAP1.0L-030	5251030	SAP1.0LA-030	5251037
1	1	2 1/4	5	0.060	SAP1.0L-060	5251031	SAP1.0LA-060	5251038
1	1	2 1/4	5	0.090	SAP1.0L-090	5251032	SAP1.0LA-090	5251039
1	1	2 1/4	5	0.125	SAP1.0L-125	5251033	SAP1.0LA-125	5251040
1	1	2 1/4	5	0.250	SAP1.0L-250	5251034	SAP1.0LA-250	5251041
1	1	3	6		SAP1.0XL	5251042	SAP1.0XLA	5251049
1	1	3	6	0.020	SAP1.0XL-020	5251043	SAP1.0XLA-020	5251050
1	1	3	6	0.030	SAP1.0XL-030	5251044	SAP1.0XLA-030	5251051
1	1	3	6	0.060	SAP1.0XL-060	5251045	SAP1.0XLA-060	5251052
1	1	3	6	0.090	SAP1.0XL-090	5251046	SAP1.0XLA-090	5251053
1	1	3	6	0.125	SAP1.0XL-125	5251047	SAP1.0XLA-125	5251054
1	1	3	6	0.250	SAP1.0XL-250	5251048	SAP1.0XLA-250	5251055



# Series *SAPB*

## All Purpose Carbide End Mill for Universal Ball Nose Machining Applications in Ferrous Materials

Series **SAPB**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**



- 4 Flute
- Ball Nose
- 35° Helix
- Variable Pitch
- Primary & Secondary Relief
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
1/8	1/8	1/4	1 1/2	Ball Nose	SAPB125S	5250899	SAPB125SA	5250901
1/8	1/8	1/2	1 1/2	Ball Nose	SAPB125	5250896	SAPB125A	5250897
9/64	3/16	5/16	2	Ball Nose	SAPB140S	5250904	SAPB140SA	5250905
9/64	3/16	9/16	2	Ball Nose	SAPB140	5250902	SAPB140A	5250903
5/32	3/16	5/16	2	Ball Nose	SAPB156S	5250908	SAPB156SA	5250909
5/32	3/16	9/16	2	Ball Nose	SAPB156	5250906	SAPB156A	5250907
11/64	3/16	5/8	2	Ball Nose	SAPB171	5250910	SAPB171A	5250911
3/16	3/16	3/8	2	Ball Nose	SAPB187S	5250916	SAPB187SA	5250917
3/16	3/16	5/8	2	Ball Nose	SAPB187	5250912	SAPB187A	5250913
3/16	3/16	3/4	2 1/2	Ball Nose	SAPB187L	5250914	SAPB187LA	5250915
13/64	1/4	5/8	2 1/2	Ball Nose	SAPB203	5250918	SAPB203A	5250919
7/32	1/4	7/16	2	Ball Nose	SAPB218S	5250922	SAPB218SA	5250923
7/32	1/4	5/8	2 1/2	Ball Nose	SAPB218	5250920	SAPB218A	5250921
15/64	1/4	3/4	2 1/2	Ball Nose	SAPB234	5250924	SAPB234A	5250925
1/4	1/4	1/2	2	Ball Nose	SAPB250S	5250932	SAPB250SA	5250933
1/4	1/4	3/4	2 1/2	Ball Nose	SAPB250	5250926	SAPB250A	5250927
1/4	1/4	1 1/8	3	Ball Nose	SAPB250M	5250930	SAPB250MA	5250931
1/4	1/4	1 1/2	4	Ball Nose	SAPB250L	5250928	SAPB250LA	5250929
17/64	5/16	3/4	2 1/2	Ball Nose	SAPB265	5250934	SAPB265A	5250935
9/32	5/16	3/4	2 1/2	Ball Nose	SAPB281	5250936	SAPB281A	5250937
19/64	5/16	13/16	2 1/2	Ball Nose	SAPB296	5250938	SAPB296A	5250939
5/16	5/16	1/2	2	Ball Nose	SAPB312S	5250944	SAPB312SA	5250945
5/16	5/16	13/16	2 1/2	Ball Nose	SAPB312	5250940	SAPB312A	5250941
5/16	5/16	1 1/8	3	Ball Nose	SAPB312L	5250942	SAPB312LA	5250943

See page 110 for Cutting Parameters

## Series **SAPB**

### All Purpose Carbide End Mill for Universal Ball Nose Machining Applications in Ferrous Materials

Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
21/64	3/8	7/8	2 1/2	Ball Nose	SAPB328	5250946	SAPB328A	5250947
11/32	3/8	7/8	2 1/2	Ball Nose	SAPB343	5250948	SAPB343A	5250949
23/64	3/8	7/8	2 1/2	Ball Nose	SAPB359	5250950	SAPB359A	5250951
3/8	3/8	5/8	2	Ball Nose	SAPB375S	5250958	SAPB375SA	5250959
3/8	3/8	7/8	2 1/2	Ball Nose	SAPB375	5250952	SAPB375A	5250953
3/8	3/8	1 1/8	3	Ball Nose	SAPB375L	5250954	SAPB375LA	5250955
3/8	3/8	1 1/2	4	Ball Nose	SAPB375ML	5250956	SAPB375MLA	5250957
3/8	3/8	1 3/4	4	Ball Nose	SAPB375XL	5250960	SAPB375XLA	5250961
25/64	7/16	7/8	2 1/2	Ball Nose	SAPB390	5250962	SAPB390A	5250963
13/32	7/16	7/8	2 1/2	Ball Nose	SAPB406	5250964	SAPB406A	5250965
27/64	7/16	7/8	2 1/2	Ball Nose	SAPB421	5250966	SAPB421A	5250967
7/16	7/16	5/8	2 1/2	Ball Nose	SAPB437S	5250972	SAPB437SA	5250973
7/16	7/16	7/8	2 3/4	Ball Nose	SAPB437	5250968	SAPB437A	5250969
7/16	7/16	2	4	Ball Nose	SAPB437L	5250970	SAPB437LA	5250971
29/64	1/2	1	3	Ball Nose	SAPB453	5250974	SAPB453A	5250975
15/32	1/2	1	3	Ball Nose	SAPB468	5250976	SAPB468A	5250977
31/64	1/2	1	3	Ball Nose	SAPB484	5250978	SAPB484A	5250979
1/2	1/2	5/8	2 1/2	Ball Nose	SAPB500S	5250990	SAPB500SA	5250991
1/2	1/2	1	3	Ball Nose	SAPB500	5250980	SAPB500A	5250981
1/2	1/2	1	4	Ball Nose	SAPB500E	5250982	SAPB500EA	5250983
1/2	1/2	1 1/4	3	Ball Nose	SAPB500M	5250986	SAPB500MA	5250987
1/2	1/2	1 1/2	4	Ball Nose	SAPB500ML	5250988	SAPB500MLA	5250989
1/2	1/2	2	4	Ball Nose	SAPB500L	5250984	SAPB500LA	5250985
1/2	1/2	3	6	Ball Nose	SAPB500XL	5250992	SAPB500XLA	5250993
9/16	9/16	1 1/4	3	Ball Nose	SAPB562	5250994	SAPB562A	5250995
5/8	5/8	3/4	3	Ball Nose	SAPB625S	5251000	SAPB625SA	5251001
5/8	5/8	1 1/4	3 1/2	Ball Nose	SAPB625	5250996	SAPB625A	5250997
5/8	5/8	2 1/4	5	Ball Nose	SAPB625L	5250998	SAPB625LA	5250999
3/4	3/4	1	3	Ball Nose	SAPB750S	5251007	SAPB750SA	5251008
3/4	3/4	1 1/2	4	Ball Nose	SAPB750	5251003	SAPB750A	5251004
3/4	3/4	2 1/4	5	Ball Nose	SAPB750L	5251005	SAPB750LA	5251006
3/4	3/4	3	6	Ball Nose	SAPB750XL	5251009	SAPB750XLA	5251010
7/8	7/8	1 1/2	4	Ball Nose	SAPB875	5251011	SAPB875A	5251012
1	1	1 1/2	4	Ball Nose	SAPB1.0	5250890	SAPB1.0A	5250891
1	1	2 1/4	5	Ball Nose	SAPB1.0L	5250892	SAPB1.0LA	5250893
1	1	3	6	Ball Nose	SAPB1.0XL	5250894	SAPB1.0XLA	5250895



# Series *SAPBR*

**All Purpose Carbide End Mill with Ball Nose and Chipbreakers for Slotting & Heavy Profiling Ferrous Materials**

**Series SAPBR**

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**S**

ISO CODE  
**K**

ISO CODE  
**H**

- 4 Flute
- Ball Nose
- 35° Helix
- Variable Pitch with Chipbreakers
- Primary & Secondary Relief
- nACRo Coating



Cutting Diameter	Shank Diameter	Length of Cut	Overall Length	Radius Size	nACRo Coated			
					Tool Name	EDP #	Tool Name	EDP #
3/16	3/16	5/8	2	Ball Nose	SAPBR187	5250858	SAPBR187A	5250859
1/4	1/4	3/4	2 1/2	Ball Nose	SAPBR250	5250862	SAPBR250A	5250863
5/16	5/16	13/16	2 1/2	Ball Nose	SAPBR312	5250866	SAPBR312A	5250867
3/8	3/8	7/8	2 1/2	Ball Nose	SAPBR375	5250870	SAPBR375A	5250871
7/16	7/16	7/8	2 3/4	Ball Nose	SAPBR437	5250874	SAPBR437A	5250875
1/2	1/2	1	3	Ball Nose	SAPBR500	5250878	SAPBR500A	5250879
1/2	1/2	1 1/4	3	Ball Nose	SAPBR500M	5250880	SAPBR500MA	5250881
5/8	5/8	1 1/4	3 1/2	Ball Nose	SAPBR625	5250884	SAPBR625A	5250885
3/4	3/4	1 1/2	4	Ball Nose	SAPBR750	5250886	SAPBR750A	5250887
1	1	1 1/2	4	Ball Nose	SAPBR1.0	5250856	SAPBR1.0A	5250857

See page 110 for Cutting Parameters

## Performance Reviews

---

### Series XP-NB (4 Flute) machining Nickel Chrome Molly

A 3/4" tool, [XP750RA] profiling .023" radial depth by 1.220" axial depth at 500 SFM with .004" chipload per tooth

#### CUSTOMER COMMENT

*"The tool ran so well and for so long, we didn't remember when we put the tool in the machining center"*

---

### Series SM5F (5 Flute) machining 422 Stainless

A 3/4" long length end mill [SM5F750L-030] made a 0.030 radial x 2" axial profiling cut at 900 RPM and 16"IPM

#### CUSTOMER COMMENT

*"Great finish and tools lasted forever. No one else performs even close"*

---

### Series SR3F (3 Flute with chipbreakers) machining G-3500 Cast Iron

A 1/2" diameter tool [SR3F500R] made a heavy cut on a double wall slot operation at over 80" IPM & 4200 RPM. Then the same tool made a spring pass that held the tight tolerance so well they were able to avoid a grinding operation.

#### CUSTOMER COMMENT

*"We couldn't make a profit on these parts by using anyone else's tool. Supermill's Super-Ruff [SR3F] was a job-saver and a customer saver"*

---

### Series XP-NB (4 Flute) machining Waspoly

A 1/2" diameter end mill [XP500RA] machined efficiently in a variety of cuts at 1,000 RPM and 4.4" IPM

#### CUSTOMER COMMENT

*"We could have pushed these harder, but we were already 60% faster and twice the tool life of the tool we were using, plus getting a better finish."*

# Series *SAP, SAPB, & SAPBR*

## Cutting Parameters

### Suggested Starting Speeds & Feed Rates

Material Group	ISO Code	Material Examples	Finishing Cuts		Medium Cuts		Heavy Cuts		Slotting		Facing		Ramping	
			.1D Radial x 2D Axial		.25D Radial x 1.5D Axial		.5D Radial x 1.5D Axial		.5D Axial		.75D Radial x .25D Axial		Max. Ramp Angle - 7°	
			SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM	SFM	IPM
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	500	50.00	500	45.00	500	40.00	500	35.00	500	45.00	500	40.00
Steel Alloys	P	4140 thru 8820	400	40.00	400	40.00	400	35.00	400	30.00	400	40.00	400	35.00
		Steel Alloys <45 HRC, Cobalt Chrome	200	30.00	200	25.00	200	20.00	200	15.00	200	25.00	200	15.00
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	250	30.00	250	25.00	250	20.00	250	15.00	250	25.00	250	20.00
	H*	AR-450, Steels >45 HRC	100	6.00	100	5.00	100	4.00	80	3.00	100	5.00	100	4.00
Stainless Steel	M	303,304, 316	400	35.00	400	30.00	400	25.00	400	20.00	400	30.00	400	25.00
		410, 420, 440, 13-8, 15-5, 17-4 Ph	300	30.00	300	25.00	300	20.00	300	15.00	300	25.00	300	20.00
High Temp - Titanium	S	6Al4V, 5553, 99	200	10.00	200	8.00	200	7.00	200	6.00	200	8.00	200	7.00
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	80	8.00	80	7.00	80	6.00	80	4.00	80	5.00	80	4.00
		Inconel 625, Waspalloy	120	10.00	120	9.00	120	8.00	120	6.00	120	7.00	120	6.00
		Monel 400	250	20.00	250	18.00	250	16.00	250	12.00	250	14.00	250	12.00
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	100	8.00	100	7.00	100	6.00	100	5.00	100	7.00	100	6.00
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite SF12	70	7.00	70	6.00	70	5.00	70	4.00	70	6.00	70	5.00
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	500	50.00	500	45.00	500	40.00	500	35.00	500	45.00	500	40.00
Non-Ferrous	N	Aluminum	600	50.00	600	40.00	600	30.00	600	25.00	600	40	600	30.00
		Copper, Brass, Bronze, Plastics, Fibreglass	300	25.00	300	20.00	300	20.00	300	15.00	300	20	300	20.00

ALL PURPOSE

## Series *SAP, SAPB, & SAPBR*

### Cutting Parameters

#### Recommended Chip Loads

Material Group	ISO Code	Material Examples	Cutting Diameter							
			1/8	3/16	1/4	3/8	1/2	5/8	3/4	1
Steel	P	1018 thru 1095, 12L14, A-36, Hot Rolled	0.0006	0.0008	0.0015	0.0025	0.0033	0.0040	0.0050	0.0060
Steel Alloys	P	4140 thru 8820	0.0004	0.0006	0.0010	0.0016	0.0025	0.0033	0.0040	0.0050
		Cobalt Chrome	0.0006	0.0008	0.0016	0.0025	0.0040	0.0060	0.0070	0.0080
		Steel Alloys <45 HRC	0.0002	0.0003	0.0004	0.0006	0.0008	0.0012	0.0020	0.0030
Tool & Mold Steels	P	H-13, O-1, A-2, D-2, S7, P20	0.0040	0.0006	0.0010	0.0016	0.0025	0.0033	0.0040	0.0050
	H*	AR-450, Steels >45 HRC	0.0002	0.0003	0.0004	0.0006	0.0008	0.0012	0.0020	0.0030
Stainless Steel	M	303,304, 316, 410, 420, 440, 13-8, 15-5, 17-4 Ph	0.0006	0.0008	0.0012	0.0016	0.0025	0.0035	0.0040	0.0050
High Temp - Titanium	S	6Al4V, 5553, 99	0.0004	0.0006	0.0008	0.0010	0.0012	0.0020	0.0030	0.0040
High Temp - Nickel Based Alloys	S	Inconel 100, 718, Hastelloy-B, Rene 77, Jethete M252, Haynes 75	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0030	0.0030
		Inconel 625, Waspalloy	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0030	0.0030
		Monel 400	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0030	0.0030
High Temp - Iron Based Alloys	S	Aeromet 100, A286, Jethete M152	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0030	0.0030
High Temp - Cobalt Based Alloys	S	Kovar, L-405, L-605, Stellite, SF12	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0030	0.0030
Cast Iron	K	Gray Cast, Malleable and Ductile Iron	0.0004	0.0006	0.0008	0.0012	0.0016	0.0025	0.0035	0.0045
Non-Ferrous Materials	N	Aluminium	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070	0.0080
		Copper, Brass, Bronze, Plastics, Fibreglass	0.0008	0.0010	0.0020	0.0030	0.0040	0.0050	0.0060	0.0070

ALL PURPOSE

## SFM to RPM Conversion Chart

SFM to RPM Conversion Chart by Cutter Diameter								
Cutting Diameter	1/8	1/4	3/8	1/2	5/8	3/4	7/8	1
Speed (SFM)	Revolutions Per Minute (RPM)							
50	1,527	763	509	382	305	244	218	191
60	1,832	916	611	458	366	305	262	229
70	2,137	1,069	712	534	427	356	305	267
80	2,443	1,221	814	611	489	407	349	305
90	2,748	1,374	916	687	550	458	393	344
100	3,053	1,527	1,018	763	611	509	436	382
150	4,580	2,290	1,527	1,145	916	763	654	573
200	6,107	3,053	2,036	1,527	1,221	1,018	872	763
250	7,634	3,817	2,545	1,908	1,527	1,272	1,091	954
300	9,160	4,580	3,053	2,290	1,832	1,527	1,309	1,145
350	10,687	5,344	3,562	2,672	2,137	1,781	1,527	1,336
400	12,214	6,107	4,071	3,053	2,443	2,036	1,745	1,527
450	13,740	6,870	4,580	3,435	2,748	2,290	1,963	1,718
500	15,267	7,634	5,089	3,817	3,053	2,545	2,181	1,908
600	18,321	9,160	6,107	4,580	3,664	3,053	2,617	2,290
700	21,374	10,687	7,125	5,344	4,275	3,562	3,053	2,672
800	24,427	12,214	8,142	6,107	4,885	4,071	3,490	3,053
900	27,481	13,740	9,160	6,870	5,496	4,580	3,926	3,453
1000	30,534	15,267	10,178	7,634	6,107	5,089	4,362	3,817
1100	33,588	16,794	11,196	8,397	6,718	5,598	4,798	4,198
1200	36,641	18,321	12,214	9,160	7,328	6,107	5,234	4,580

To calculate Surface Footage to RPM's,  $S.F. \times 3.82 \div \text{Tool Diameter} = \text{RPM}$

To calculate RPM's to Surface Footage,  $\text{Tool Diameter} \times 0.2618 \times \text{RPM} = S.F.$

## Test Tool Performance Results

Date \_\_\_\_\_

Customer (end user) \_\_\_\_\_ Contact Name \_\_\_\_\_

Distributor \_\_\_\_\_ Dist. Salesman \_\_\_\_\_

Job Reference # or name \_\_\_\_\_

Workpiece Material \_\_\_\_\_ Hardness \_\_\_\_\_ Machine \_\_\_\_\_ HP \_\_\_\_\_

Spindle Taper \_\_\_\_\_ Holder Type \_\_\_\_\_ Coolant Type \_\_\_\_\_

Coating \_\_\_\_\_ Flat(s) on Shank? \_\_\_ yes \_\_\_ no Length of Tool Extending out from holder \_\_\_\_\_

Supermill Series \_\_\_\_\_ Competitor #1 Series \_\_\_\_\_ Competitor #2 Series \_\_\_\_\_

	Tool or EDP #	Cutting Diameter	LOC	Reach Length (if any)	OAL	Corner Condition	Axial Depth of Cut	Radial Width of Cut
Supermill								
Competitor #1								
Competitor #2								

Results	Supermill	Competitor # 1	Competitor # 2
Number of Parts to be Produced			
Spindle Speed (RPM)			
Cutting Speed (SFM)			
Feed Rate (IPM)			
Chip Load per Tooth			
# of Passes x Length of Cut Per Pass			
Quality of Workpiece Surface Finish			
Minutes "in-the-cut" Per Tool			
Number of Parts Per Tool			

Notes and Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please copy this page, complete the information and send to [info@supermill.com](mailto:info@supermill.com), or fax to 860-828-9573







