

# Ultra Performance Carbide End Mills

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



## 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.

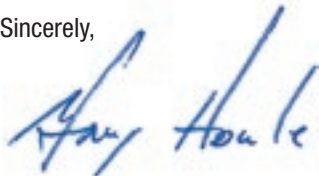
We are pleased to now be a member of the **IMC Group** (International Metalworking Companies) where we have access to additional support and guidance to improve and develop our manufacturing technologies as well as continue to provide top customer service and technical support. We are proud and excited 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*

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### HIGH PERFORMANCE



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## HIGH PERFORMANCE (CONT'D)



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**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**



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



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**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**



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### 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 |

## ALL PURPOSE



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**NICKEL BASED ALLOYS & HARDENED MATERIALS >45 HRC**



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**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**



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**NICKEL BASED ALLOYS & HARDENED MATERIALS > 45 HRC**

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### 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) |
|-------------------------------|----------|-------------------------------------------------------------------------------------------------|-------------------------------------|--------------------|--------------|--------------|-------------------------------------|------------------------|----------------------------------------|
| Steel                         | P        | 1018 thru 1095, 12L14, A-36, Hot Rolled                                                         | SM5F<br>SM4F                        | SM4F               | XPVS         | XPVS         | SAP                                 | XPVS<br>XP             | TC5F                                   |
| Steel Alloys                  | P        | 4140 thru 8820<br><br>Steel Alloys <45 HRC, Cobalt Chrome                                       | SM5F                                |                    |              |              |                                     |                        |                                        |
| Tool & Mold Steels            | P        | H-13, O-1, A-2, D-2, S7, P20                                                                    | SM6F                                |                    |              |              | XP                                  | SM5F<br>SAP            |                                        |
|                               | H        | AR-450, Steels >45 HRC                                                                          | SM6F                                | SM5F<br>XP         | XP           | XP           | SAP                                 | XP                     |                                        |
| Stainless Steel               | M        | 303,304, 316                                                                                    | SM3F                                | SM3F               | XPVS<br>XP   | XPVS<br>XP   | SAP                                 | XPVS                   |                                        |
|                               |          | 410, 420, 440, 13-8, 15-5, 17-4 Ph                                                              | SM5F                                | XPVS               |              |              | SM5F                                | XP                     |                                        |
| High Temp Titanium Alloys     | S        | 6Al4V, 5553, 99                                                                                 | SM7F<br>SM5F<br>SXT7F               | XPV<br>SXT5F       | XPV<br>SXT5F | XPV<br>SXT5F | XPV<br>SXT5F                        | XPV<br>SXT5F           |                                        |
| High Temp Nickel Based Alloys | S        | Inconel 100, 625, 718, 925, Hastelloy-B, Rene 77, Jethete M252, Haynes 75, Waspalloy, Monel 400 | SM6F<br>SM5F<br>SAP<br>SX5F<br>SX6F | SM5F<br>XP<br>SX5F | XP<br>SX4F   | XP<br>SX4F   | SM5F<br>SM6F<br>SAP<br>SX5F<br>SX6F | XP<br>SX4F             | SM6F                                   |
| High Temp Iron Based Alloys   | S        | Aeromet 100, A286, Jethete M152                                                                 | SM5F<br>SM6F                        | SM5F<br>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<br>SAP                         | XPVS<br>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 Radius Corners
- S2 (Silver) Coating

| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | S2 (Silver) Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------------|---------|
|                  |                |               |                |             | Tool Name          | EDP #   |
| 5/32             | 5/32           | 9/16          | 2              | .030        | SX4F156-030        | 5255356 |
| 3/16             | 3/16           | 9/16          | 2              |             | SX4F187            | 5252629 |
| 3/16             | 3/16           | 3/8           | 1 1/2          |             | SX4F187S           | 5252630 |
| 1/4              | 1/4            | 3/4           | 2 1/2          |             | SX4F250            | 5252632 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .015        | SX4F250-015        | 5252633 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .030        | SX4F250-030        | 5252634 |
| 1/4              | 1/4            | 1/2           | 2              |             | SX4F250S           | 5252635 |
| 1/4              | 1/4            | 1/2           | 2              | .015        | SX4F250S-015       | 5252636 |
| 1/4              | 1/4            | 1/2           | 2              | .030        | SX4F250S-030       | 5252637 |
| 5/16             | 5/16           | 13/16         | 2 1/2          |             | SX4F312            | 5252638 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | .015        | SX4F312-015        | 5252639 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | .030        | SX4F312-030        | 5252640 |
| 5/16             | 5/16           | 7/8           | 2 1/2          | .030        | SX4F312M-030       | 5252641 |
| 5/16             | 5/16           | 1/2           | 2              |             | SX4F312S           | 5252642 |
| 5/16             | 5/16           | 1/2           | 3              | .015        | SX4F312S-015       | 5252643 |
| 5/16             | 5/16           | 1/2           | 2              | .030        | SX4F312S-030       | 5252644 |
| 3/8              | 3/8            | 7/8           | 2 1/2          |             | SX4F375            | 5252646 |
| 3/8              | 3/8            | 7/8           | 2 1/2          | .015        | SX4F375-015        | 5252648 |
| 3/8              | 3/8            | 7/8           | 2 1/2          | .030        | SX4F375-030        | 5252649 |
| 3/8              | 3/8            | 7/8           | 2 1/2          | .060        | SX4F375-060        | 5252651 |
| 3/8              | 3/8            | 5/8           | 2              |             | SX4F375MS          | 5252654 |
| 3/8              | 3/8            | 1/2           | 2              |             | SX4F375S           | 5252655 |

See page 22 for Cutting Parameters

## Series **SX4F**

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



| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | S2 (Silver) Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------------|---------|
|                  |                |               |                |             | Tool Name          | EDP #   |
| 3/8              | 3/8            | 1/2           | 2              | .015        | SX4F375S-015       | 5252657 |
| 3/8              | 3/8            | 1/2           | 2              | .030        | SX4F375S-030       | 5252659 |
| 3/8              | 3/8            | 1/2           | 2              | .060        | SX4F375S-060       | 5252661 |
| 7/16             | 7/16           | 7/8           | 2 3/4          | .025        | SX4F437A-025       | 5252663 |
| 7/16             | 7/16           | 1 5/8         | 4              | .015        | SX4F437L-015       | 5255658 |
| 1/2              | 1/2            | 1             | 3              |             | SX4F500            | 5252664 |
| 1/2              | 1/2            | 1             | 3              | .010        | SX4F500-010        | 5252666 |
| 1/2              | 1/2            | 1             | 3              | .015        | SX4F500-015        | 5252667 |
| 1/2              | 1/2            | 1             | 3              | .020        | SX4F500-020        | 5252668 |
| 1/2              | 1/2            | 1             | 3              | .030        | SX4F500-030        | 5252670 |
| 1/2              | 1/2            | 1             | 3              | .060        | SX4F500-060        | 5252672 |
| 1/2              | 1/2            | 1             | 3              | .125        | SX4F500-125        | 5252674 |
| 1/2              | 1/2            | 1 5/8         | 4              |             | SX4F500L           | 5252675 |
| 1/2              | 1/2            | 1 5/8         | 4              | .010        | SX4F500L-010       | 5252676 |
| 1/2              | 1/2            | 1 5/8         | 4              | .015        | SX4F500L-015       | 5252677 |
| 1/2              | 1/2            | 1 5/8         | 4              | .020        | SX4F500L-020       | 5252678 |
| 1/2              | 1/2            | 1 1/2         | 4              | .030        | SX4F500L-030       | 5252679 |
| 1/2              | 1/2            | 1 5/8         | 4              | .060        | SX4F500L-060       | 5252680 |
| 1/2              | 1/2            | 1 5/8         | 4              | .125        | SX4F500L-125       | 5252681 |
| 1/2              | 1/2            | 1 1/4         | 3              |             | SX4F500M           | 5252682 |
| 1/2              | 1/2            | 1 1/4         | 3              | .010        | SX4F500M-010       | 5252684 |
| 1/2              | 1/2            | 1 1/4         | 3              | .015        | SX4F500M-015       | 5252686 |
| 1/2              | 1/2            | 1 1/4         | 3              | .020        | SX4F500M-020       | 5252687 |
| 1/2              | 1/2            | 1 1/4         | 3              | .030        | SX4F500M-030       | 5252688 |
| 1/2              | 1/2            | 1 1/4         | 3              | .060        | SX4F500M-060       | 5252690 |
| 1/2              | 1/2            | 1 1/4         | 3              | .125        | SX4F500M-125       | 5252691 |
| 1/2              | 1/2            | 1 3/4         | 4              | .094        | SX4F500ML-094      | 5255780 |
| 1/2              | 1/2            | 5/8           | 2 1/2          |             | SX4F500S           | 5252692 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .010        | SX4F500S-010       | 5252694 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .015        | SX4F500S-015       | 5252696 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .020        | SX4F500S-020       | 5252698 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .030        | SX4F500S-030       | 5252700 |



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## 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 #   |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .060        | SX4F500S-060       | 5252701 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .125        | SX4F500S-125       | 5252703 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          |             | SX4F625            | 5252705 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .015        | SX4F625-015        | 5252707 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .030        | SX4F625-030        | 5252708 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .060        | SX4F625-060        | 5252710 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .125        | SX4F625-125        | 5252711 |
| 5/8              | 5/8            | 2 1/4         | 5              |             | SX4F625L           | 5252712 |
| 5/8              | 5/8            | 2 1/4         | 5              | .015        | SX4F625L-015       | 5252713 |
| 5/8              | 5/8            | 2 1/4         | 5              | .030        | SX4F625L-030       | 5252714 |
| 5/8              | 5/8            | 2 1/4         | 5              | .060        | SX4F625L-060       | 5252716 |
| 5/8              | 5/8            | 2 1/4         | 5              | .125        | SX4F625L-125       | 5252717 |
| 5/8              | 5/8            | 3/4           | 3              |             | SX4F625S           | 5252718 |
| 5/8              | 5/8            | 3/4           | 3              | .015        | SX4F625S-015       | 5252719 |
| 5/8              | 5/8            | 3/4           | 3              | .030        | SX4F625S-030       | 5252720 |
| 5/8              | 5/8            | 3/4           | 3              | .060        | SX4F625S-060       | 5252722 |
| 5/8              | 5/8            | 3/4           | 3              | .125        | SX4F625S-125       | 5252723 |
| 3/4              | 3/4            | 1 1/2         | 4              |             | SX4F750            | 5252724 |
| 3/4              | 3/4            | 1 1/2         | 4              | .015        | SX4F750-015        | 5252725 |
| 3/4              | 3/4            | 1 1/2         | 4              | .030        | SX4F750-030        | 5252726 |
| 3/4              | 3/4            | 1 1/2         | 4              | .060        | SX4F750-060        | 5252728 |
| 3/4              | 3/4            | 1 1/2         | 4              | .125        | SX4F750-125        | 5252729 |
| 3/4              | 3/4            | 2 1/4         | 5              |             | SX4F750L           | 5252731 |
| 3/4              | 3/4            | 2 1/4         | 5              | .015        | SX4F750L-015       | 5252732 |
| 3/4              | 3/4            | 2 1/4         | 5              | .030        | SX4F750L-030       | 5252733 |
| 3/4              | 3/4            | 2 1/4         | 5              | .060        | SX4F750L-060       | 5252734 |
| 3/4              | 3/4            | 2 1/4         | 5              | .125        | SX4F750L-125       | 5252735 |
| 3/4              | 3/4            | 7/8           | 3              |             | SX4F750S           | 5252736 |
| 3/4              | 3/4            | 1             | 3              | .015        | SX4F750S-015       | 5252737 |
| 3/4              | 3/4            | 7/8           | 3              | .030        | SX4F750S-030       | 5252738 |
| 3/4              | 3/4            | 1             | 3              | .060        | SX4F750S-060       | 5252739 |
| 3/4              | 3/4            | 1             | 3              | .125        | SX4F750S-125       | 5252740 |

## 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 #   |
| 1                | 1              | 1 1/2         | 4              |             | SX4F1.0            | 5252619 |
| 1                | 1              | 1 1/2         | 4              | .015        | SX4F1.0-015        | 5252620 |
| 1                | 1              | 1 1/2         | 4              | .030        | SX4F1.0-030        | 5252621 |
| 1                | 1              | 1 1/2         | 4              | .060        | SX4F1.0-060        | 5252622 |
| 1                | 1              | 1 1/2         | 4              | .125        | SX4F1.0-125        | 5252623 |
| 1                | 1              | 2 1/4         | 5              |             | SX4F1.0L           | 5252624 |
| 1                | 1              | 2 1/4         | 5              | .015        | SX4F1.0L-015       | 5252625 |
| 1                | 1              | 2 1/4         | 5              | .030        | SX4F1.0L-030       | 5252626 |
| 1                | 1              | 2 1/4         | 5              | .060        | SX4F1.0L-060       | 5252627 |
| 1                | 1              | 2 1/4         | 5              | .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 Radius Corners
- S2 (Silver) Coating

| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | S2 (Silver) Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------------|---------|
|                  |                |               |                |             | Tool Name          | EDP #   |
| 1/4              | 1/4            | 3/4           | 2 1/2          |             | SX5F250            | 5252753 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .015        | SX5F250-015        | 5252754 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .030        | SX5F250-030        | 5252756 |
| 1/4              | 1/4            | 1/2           | 2              |             | SX5F250S           | 5252757 |
| 1/4              | 1/4            | 1/2           | 2              | .010        | SX5F250S-010       | 5252758 |
| 1/4              | 1/4            | 1/2           | 2              | .015        | SX5F250S-015       | 5252759 |
| 1/4              | 1/4            | 1/2           | 2              | .030        | SX5F250S-030       | 5252760 |
| 1/4              | 1/4            | 1 1/4         | 3              |             | SX5F250XL          | 5252761 |
| 1/4              | 1/4            | 3/8           | 2              |             | SX5F250XS          | 5252762 |
| 1/4              | 1/4            | 3/8           | 2              | .015        | SX5F250XS-015      | 5252763 |
| 1/4              | 1/4            | 3/8           | 2              | .030        | SX5F250XS-030      | 5252764 |
| 5/16             | 5/16           | 13/16         | 2 1/2          |             | SX5F312            | 5252765 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | .015        | SX5F312-015        | 5252766 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | .030        | SX5F312-030        | 5252767 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | .060        | SX5F312-060        | 5252768 |
| 5/16             | 5/16           | 1/2           | 2              |             | SX5F312S           | 5252769 |
| 5/16             | 5/16           | 1/2           | 2              | .015        | SX5F312S-015       | 5252770 |
| 5/16             | 5/16           | 1/2           | 2              | .030        | SX5F312S-030       | 5252771 |
| 5/16             | 5/16           | 1/2           | 2              | .060        | SX5F312S-060       | 5252772 |
| 3/8              | 3/8            | 1             | 2 1/2          |             | SX5F375            | 5252773 |
| 3/8              | 3/8            | 1             | 2 1/2          | .015        | SX5F375-015        | 5252774 |
| 3/8              | 3/8            | 1             | 2 1/2          | .030        | SX5F375-030        | 5252775 |

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 1/2         | 2 1/2          | .060        | SX5F375-060        | 5252776 |
| 3/8              | 3/8            | 1 1/4         | 2 1/2          | .080        | SX5F375L-080       | 5252777 |
| 3/8              | 3/8            | 5/8           | 2              |             | SX5F375S           | 5252778 |
| 3/8              | 3/8            | 5/8           | 2              | .015        | SX5F375S-015       | 5252779 |
| 3/8              | 3/8            | 5/8           | 2              | .030        | SX5F375S-030       | 5252780 |
| 3/8              | 3/8            | 5/8           | 2              | .060        | SX5F375S-060       | 5252781 |
| 3/8              | 3/8            | 5/8           | 2              | .090        | SX5F375S-090       | 5255267 |
| 3/8              | 3/8            | 1/2           | 2              |             | SX5F375XS          | 5252782 |
| 3/8              | 3/8            | 1/2           | 2              | .015        | SX5F375XS-015      | 5252783 |
| 3/8              | 3/8            | 1/2           | 2              | .030        | SX5F375XS-030      | 5252784 |
| 3/8              | 3/8            | 1/2           | 2              | .060        | SX5F375XS-060      | 5252785 |
| 1/2              | 1/2            | 1             | 3              |             | SX5F500            | 5252787 |
| 1/2              | 1/2            | 1             | 3              | .015        | SX5F500-015        | 5252788 |
| 1/2              | 1/2            | 1             | 3              | .030        | SX5F500-030        | 5252789 |
| 1/2              | 1/2            | 1             | 3              | .060        | SX5F500-060        | 5252790 |
| 1/2              | 1/2            | 1             | 3              | .090        | SX5F500-090        | 5252791 |
| 1/2              | 1/2            | 1             | 3              | .125        | SX5F500-125        | 5252792 |
| 1/2              | 1/2            | 1 3/4         | 4              |             | SX5F500L           | 5252793 |
| 1/2              | 1/2            | 1 3/4         | 4              | .015        | SX5F500L-015       | 5252794 |
| 1/2              | 1/2            | 1 3/4         | 4              | .030        | SX5F500L-030       | 5252795 |
| 1/2              | 1/2            | 1 3/4         | 4              | .060        | SX5F500L-060       | 5252796 |
| 1/2              | 1/2            | 1 3/4         | 4              | .090        | SX5F500L-090       | 5252797 |
| 1/2              | 1/2            | 1 3/4         | 4              | .125        | SX5F500L-125       | 5252798 |
| 1/2              | 1/2            | 1 3/4         | 4              |             | SX5F500M           | 5252799 |
| 1/2              | 1/2            | 1 1/4         | 3              | .015        | SX5F500M-015       | 5252800 |
| 1/2              | 1/2            | 1 1/4         | 3              | .030        | SX5F500M-030       | 5252801 |
| 1/2              | 1/2            | 1 1/4         | 3              | .060        | SX5F500M-060       | 5252802 |
| 1/2              | 1/2            | 1 1/4         | 3              | .090        | SX5F500M-090       | 5252803 |
| 1/2              | 1/2            | 1 1/4         | 3              | .125        | SX5F500M-125       | 5252804 |
| 1/2              | 1/2            | 1 1/4         | 3              | .080        | SX5F500MA-080      | 5252805 |
| 1/1              | 1/2            | 1 1/2         | 4              |             | SX5F500ML          | 5252806 |
| 1/2              | 1/2            | 1 1/2         | 4              | .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              | .030        | SX5F500ML-030      | 5252808 |
| 1/2              | 1/2            | 1 1/2         | 4              | .060        | SX5F500ML-060      | 5252809 |
| 1/2              | 1/2            | 1 1/2         | 4              | .090        | SX5F500ML-090      | 5252810 |
| 1/2              | 1/2            | 1 1/2         | 4              | .125        | SX5F500ML-125      | 5252811 |
| 1/2              | 1/2            | 2             | 4              | .030        | SX5F500MML-030     | 5252812 |
| 1/2              | 1/2            | 5/8           | 2 1/2          |             | SX5F500S           | 5252813 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .015        | SX5F500S-015       | 5252815 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .030        | SX5F500S-030       | 5252816 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .060        | SX5F500S-060       | 5252817 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .090        | SX5F500S-090       | 5252818 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .125        | SX5F500S-125       | 5252819 |
| 1/2              | 1/2            | 5/8           | 2 1/2          |             | SX5F500S           | 5252814 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          |             | SX5F625            | 5252820 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .015        | SX5F625-015        | 5252822 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .030        | SX5F625-030        | 5252823 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .060        | SX5F625-060        | 5252824 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .090        | SX5F625-090        | 5252825 |
| 5/8              | 5/8            | 1 1/4         | 3              | .125        | SX5F625-125        | 5252826 |
| 5/8              | 5/8            | 1 3/4         | 5              |             | SX5F625M           | 5252827 |
| 5/8              | 5/8            | 1 3/4         | 4              | .015        | SX5F625M-015       | 5252828 |
| 5/8              | 5/8            | 1 3/4         | 4              | .030        | SX5F625M-030       | 5252829 |
| 5/8              | 5/8            | 1 3/4         | 4              | .060        | SX5F625M-060       | 5252830 |
| 5/8              | 5/8            | 1 3/4         | 4              | .090        | SX5F625M-090       | 5252831 |
| 5/8              | 5/8            | 1 3/4         | 4              | .125        | SX5F625M-125       | 5252832 |
| 5/8              | 5/8            | 3/4           | 3              |             | SX5F625S           | 5252833 |
| 5/8              | 5/8            | 3/4           | 3              | .015        | SX5F625S-015       | 5252834 |
| 5/8              | 5/8            | 3/4           | 3              | .030        | SX5F625S-030       | 5252836 |
| 5/8              | 5/8            | 3/4           | 3              | .060        | SX5F625S-060       | 5252837 |
| 5/8              | 5/8            | 3/4           | 3              | .090        | SX5F625S-090       | 5252838 |
| 5/8              | 5/8            | 3/4           | 3              | .125        | SX5F625S-125       | 5252839 |
| 3/4              | 3/4            | 1 1/2         | 4              |             | SX5F750            | 5252840 |
| 3/4              | 3/4            | 1 1/2         | 4              | .015        | SX5F750-015        | 5252841 |
| 3/4              | 3/4            | 1 1/2         | 4              | .030        | SX5F750-030        | 5252842 |
| 3/4              | 3/4            | 1 1/2         | 4              | .060        | SX5F750-060        | 5252844 |

## Series **SX5F**

**Extreme Performance Carbide End Mill For Today's  
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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              | .090        | SX5F750-090        | 5252845 |
| 3/4              | 3/4            | 1 1/2         | 4              | .120        | SX5F750-120        | 5252846 |
| 3/4              | 3/4            | 1 1/2         | 4              | .125        | SX5F750-125        | 5252847 |
| 3/4              | 3/4            | 1 1/2         | 4              | .250        | SX5F750-250        | 5252848 |
| 3/4              | 3/4            | 1 1/2         | 4              | .312        | SX5F750-312        | 5252849 |
| 3/4              | 3/4            | 2 1/4         | 5              |             | SX5F750L           | 5252850 |
| 3/4              | 3/4            | 2 1/4         | 5              | .015        | SX5F750L-015       | 5252851 |
| 3/4              | 3/4            | 2 1/4         | 5              | .030        | SX5F750L-030       | 5252852 |
| 3/4              | 3/4            | 2 1/4         | 5              | .060        | SX5F750L-060       | 5252853 |
| 3/4              | 3/4            | 2 1/4         | 5              | .090        | SX5F750L-090       | 5252854 |
| 3/4              | 3/4            | 2 1/4         | 5              | .125        | SX5F750L-125       | 5252855 |
| 3/4              | 3/4            | 1             | 4              | .060        | SX5F750M-060       | 5252856 |
| 3/4              | 3/4            | 1             | 3              | .030        | SX5F750MS-060      | 5252857 |
| 3/4              | 3/4            | 7/8           | 3              |             | SX5F750S           | 5252858 |
| 3/4              | 3/4            | 7/8           | 3              | .015        | SX5F750S-015       | 5252859 |
| 3/4              | 3/4            | 7/8           | 3              | .030        | SX5F750S-030       | 5252860 |
| 3/4              | 3/4            | 7/8           | 3              | .060        | SX5F750S-060       | 5252861 |
| 3/4              | 3/4            | 7/8           | 3              | .090        | SX5F750S-090       | 5252862 |
| 3/4              | 3/4            | 7/8           | 3              | .125        | SX5F750S-125       | 5252863 |
| 1                | 1              | 1 1/2         | 4              |             | SX5F1.0            | 5252741 |
| 1                | 1              | 1 1/2         | 4              | .015        | SX5F1.0-015        | 5252742 |
| 1                | 1              | 1 1/2         | 4              | .030        | SX5F1.0-030        | 5252743 |
| 1                | 1              | 1 1/2         | 4              | .060        | SX5F1.0-060        | 5252744 |
| 1                | 1              | 1 1/2         | 4              | .090        | SX5F1.0-090        | 5252745 |
| 1                | 1              | 1 1/2         | 4              | .125        | SX5F1.0-125        | 5252746 |
| 1                | 1              | 2 1/4         | 5              |             | SX5F1.0L           | 5252747 |
| 1                | 1              | 2 1/4         | 5              | .015        | SX5F1.0L-015       | 5252748 |
| 1                | 1              | 2 1/4         | 4              | .030        | SX5F1.0L-030       | 5252749 |
| 1                | 1              | 2 1/4         | 5              | .060        | SX5F1.0L-060       | 5252750 |
| 1                | 1              | 2 1/4         | 5              | .090        | SX5F1.0L-090       | 5252751 |
| 1                | 1              | 2 1/4         | 5              | .125        | SX5F1.0L-125       | 5252752 |



## Series **SX6F**

**Extreme Performance Carbide End Mill For Today's  
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ISO CODE  
**S**



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

| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | S2 (Silver) Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------------|---------|
|                  |                |               |                |             | Tool Name          | EDP #   |
| 5/32             | 5/32           | 9/16          | 2              |             | SX6F156            | 5252882 |
| 1/4              | 1/4            | 3/4           | 2 1/2          |             | SX6F250            | 5252883 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .015        | SX6F250-015        | 5252884 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .030        | SX6F250-030        | 5252885 |
| 1/4              | 1/4            | 3/4           | 2              | .050        | SX6F250-050        | 5252886 |
| 1/4              | 1/4            | 1/2           | 2              |             | SX6F250S           | 5252888 |
| 1/4              | 1/4            | 1/2           | 2              | .005        | SX6F250S-005       | 5255176 |
| 1/4              | 1/4            | 1/2           | 2              | .015        | SX6F250S-015       | 5252889 |
| 1/4              | 1/4            | 1/2           | 2              | .030        | SX6F250S-030       | 5252890 |
| 3/8              | 3/8            | 1             | 2 1/2          |             | SX6F375            | 5252894 |
| 3/8              | 3/8            | 1             | 2 1/2          | .015        | SX6F375-015        | 5252895 |
| 3/8              | 3/8            | 1             | 2 1/2          | .030        | SX6F375-030        | 5252896 |
| 3/8              | 3/8            | 1             | 2 1/2          | .035        | SX6F375-035        | 5252897 |
| 3/8              | 3/8            | 1             | 2 1/2          | .060        | SX6F375-060        | 5252898 |
| 3/8              | 3/8            | 1             | 2 1/2          | .080        | SX6F375-080        | 5252899 |
| 3/8              | 3/8            | 1             | 2 1/2          | .090        | SX6F375-090        | 5252901 |
| 3/8              | 3/8            | 1             | 2 1/2          | .125        | SX6F375-125        | 5252902 |
| 3/8              | 3/8            | 9/16          | 2              |             | SX6F375S           | 5252903 |
| 3/8              | 3/8            | 9/16          | 2              | .015        | SX6F375S-015       | 5252905 |
| 3/8              | 3/8            | 9/16          | 2              | .030        | SX6F375S-030       | 5252906 |
| 3/8              | 3/8            | 9/16          | 2              | .040        | SX6F375S-040       | 5252907 |
| 3/8              | 3/8            | 9/16          | 2              | .060        | SX6F375S-060       | 5252908 |

See page 22 for Cutting Parameters

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| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | S2 (Silver) Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------------|---------|
|                  |                |               |                |             | Tool Name          | EDP #   |
| 3/8              | 3/8            | 9/16          | 2              | .090        | SX6F375S-090       | 5252909 |
| 1/2              | 1/2            | 1 1/4         | 3              |             | SX6F500            | 5252911 |
| 1/2              | 1/2            | 1 1/4         | 3              | .010        | SX6F500-010        | 5252913 |
| 1/2              | 1/2            | 1 1/4         | 3              | .015        | SX6F500-015        | 5252914 |
| 1/2              | 1/2            | 1 1/4         | 3              | .030        | SX6F500-030        | 5252915 |
| 1/2              | 1/2            | 1 1/4         | 3              | .060        | SX6F500-060        | 5252918 |
| 1/2              | 1/2            | 1 1/4         | 3              | .090        | SX6F500-090        | 5252919 |
| 1/2              | 1/2            | 1 1/4         | 3              | .125        | SX6F500-125        | 5252920 |
| 1/2              | 1/2            | 2             | 4              |             | SX6F500L           | 5252922 |
| 1/2              | 1/2            | 2             | 4              | .015        | SX6F500L-015       | 5252923 |
| 1/2              | 1/2            | 2             | 4              | .030        | SX6F500L-030       | 5252924 |
| 1/2              | 1/2            | 2             | 4              | .060        | SX6F500L-060       | 5252925 |
| 1/2              | 1/2            | 2             | 4              | .090        | SX6F500L-090       | 5252927 |
| 1/2              | 1/2            | 2             | 4              | .125        | SX6F500L-125       | 5252928 |
| 1/2              | 1/2            | 1             | 3              |             | SX6F500MS          | 5252929 |
| 1/2              | 1/2            | 1             | 3              | .015        | SX6F500MS-015      | 5252930 |
| 1/2              | 1/2            | 1             | 3              | .025        | SX6F500MS-025      | 5252931 |
| 1/2              | 1/2            | 1             | 3              | .030        | SX6F500MS-030      | 5252932 |
| 1/2              | 1/2            | 1             | 3              | .045        | SX6F500MS-045      | 5252933 |
| 1/2              | 1/2            | 1             | 3              | .050        | SX6F500MS-050      | 5252934 |
| 1/2              | 1/2            | 1             | 3              | .060        | SX6F500MS-060      | 5252935 |
| 1/2              | 1/2            | 1             | 3              | .090        | SX6F500MS-090      | 5252936 |
| 1/2              | 1/2            | 1             | 3              | .125        | SX6F500MS-125      | 5252938 |
| 1/2              | 1/2            | 1             | 3              | .150        | SX6F500MS-150      | 5252939 |
| 1/2              | 1/2            | 5/8           | 2 1/2          |             | SX6F500S           | 5252940 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .015        | SX6F500S-015       | 5252942 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .030        | SX6F500S-030       | 5252943 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .060        | SX6F500S-060       | 5252945 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .090        | SX6F500S-090       | 5252946 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .125        | SX6F500S-125       | 5252947 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          |             | SX6F625            | 5252948 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .015        | SX6F625-015        | 5252949 |



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## Series **SX6F**

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| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | S2 (Silver) Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------------|---------|
|                  |                |               |                |             | Tool Name          | EDP #   |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .030        | SX6F625-030        | 5252950 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .060        | SX6F625-060        | 5252952 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .090        | SX6F625-090        | 5252953 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | .125        | SX6F625-125        | 5252954 |
| 5/8              | 5/8            | 1 1/3         | 4              |             | SX6F625M           | 5252955 |
| 5/8              | 5/8            | 1 1/3         | 4              | .015        | SX6F625M-015       | 5252956 |
| 5/8              | 5/8            | 1 1/3         | 4              | .030        | SX6F625M-030       | 5252957 |
| 5/8              | 5/8            | 1 1/3         | 4              | .060        | SX6F625M-060       | 5252958 |
| 5/8              | 5/8            | 1 1/3         | 4              | .090        | SX6F625M-090       | 5252959 |
| 5/8              | 5/8            | 1 1/3         | 4              | .125        | SX6F625M-125       | 5252960 |
| 5/8              | 5/8            | 3/4           | 3              |             | SX6F625S           | 5252962 |
| 5/8              | 5/8            | 3/4           | 3              | .015        | SX6F625S-015       | 5252963 |
| 5/8              | 5/8            | 3/4           | 3              | .030        | SX6F625S-030       | 5252964 |
| 5/8              | 5/8            | 3/4           | 3              | .060        | SX6F625S-060       | 5252965 |
| 5/8              | 5/8            | 3/4           | 3              | .090        | SX6F625S-090       | 5252966 |
| 5/8              | 5/8            | 3/4           | 3              | .125        | SX6F625S-125       | 5252967 |
| 3/4              | 3/4            | 1 1/2         | 4              |             | SX6F750            | 5252968 |
| 3/4              | 3/4            | 1 1/2         | 4              | .015        | SX6F750-015        | 5252969 |
| 3/4              | 3/4            | 1 1/2         | 4              | .030        | SX6F750-030        | 5252970 |
| 3/4              | 3/4            | 1 1/2         | 4              | .060        | SX6F750-060        | 5252971 |
| 3/4              | 3/4            | 1 1/2         | 4              | .090        | SX6F750-090        | 5252972 |
| 3/4              | 3/4            | 1 1/2         | 4              | .125        | SX6F750-125        | 5252973 |
| 3/4              | 3/4            | 1 1/3         | 4              |             | SX6F750M           | 5252974 |
| 3/4              | 3/4            | 1 1/3         | 4              | .015        | SX6F750M-015       | 5252975 |
| 3/4              | 3/4            | 1 1/3         | 4              | .030        | SX6F750M-030       | 5252976 |
| 3/4              | 3/4            | 1 1/3         | 4              | .060        | SX6F750M-060       | 5252977 |
| 3/4              | 3/4            | 1 1/3         | 4              | .090        | SX6F750M-090       | 5252978 |
| 3/4              | 3/4            | 1 1/3         | 4              | .125        | SX6F750M-125       | 5252979 |
| 3/4              | 3/4            | 1             | 3              |             | SX6F750S           | 5252980 |
| 3/4              | 3/4            | 1             | 3              | .015        | SX6F750S-015       | 5252981 |
| 3/4              | 3/4            | 1             | 3              | .030        | SX6F750S-030       | 5252982 |
| 3/4              | 3/4            | 1             | 3              | .060        | SX6F750S-060       | 5252983 |
| 3/4              | 3/4            | 1             | 3              | .090        | SX6F750S-090       | 5252984 |
| 3/4              | 3/4            | 1             | 3              | .125        | SX6F750S-125       | 5252985 |

## 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 #   |
| 1                | 1              | 1 1/2         | 4              |             | SX6F1.0            | 5252864 |
| 1                | 1              | 1 1/2         | 4              | .015        | SX6F1.0-015        | 5252865 |
| 1                | 1              | 1 1/2         | 4              | .030        | SX6F1.0-030        | 5252866 |
| 1                | 1              | 1 1/2         | 4              | .060        | SX6F1.0-060        | 5252867 |
| 1                | 1              | 1 1/2         | 4              | .090        | SX6F1.0-090        | 5252868 |
| 1                | 1              | 1 1/2         | 4              | .125        | SX6F1.0-125        | 5252869 |
| 1                | 1              | 2 1/4         | 5              |             | SX6F1.0L           | 5252870 |
| 1                | 1              | 2 1/4         | 5              | .015        | SX6F1.0L-015       | 5252871 |
| 1                | 1              | 2 1/4         | 5              | .030        | SX6F1.0L-030       | 5252872 |
| 1                | 1              | 2 1/4         | 5              | .060        | SX6F1.0L-060       | 5252873 |
| 1                | 1              | 2 1/4         | 5              | .090        | SX6F1.0L-090       | 5252874 |
| 1                | 1              | 2 1/4         | 5              | .125        | SX6F1.0L-125       | 5252875 |
| 1                | 1              | 1 1/4         | 4              |             | SX6F1.0S           | 5252876 |
| 1                | 1              | 1 1/4         | 4              | .015        | SX6F1.0S-015       | 5252877 |
| 1                | 1              | 1 1/4         | 4              | .030        | SX6F1.0S-030       | 5252878 |
| 1                | 1              | 1 1/4         | 4              | .060        | SX6F1.0S-060       | 5252879 |
| 1                | 1              | 1 1/4         | 4              | .090        | SX6F1.0S-090       | 5252880 |
| 1                | 1              | 1 1/4         | 4              | .125        | SX6F1.0S-125       | 5252881 |
| 1                | 1              | 1 1/4         | 4              | .250        | SX6F1.0S-250       | 5255857 |



## Series **SXB**

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

ISO CODE  
**S**

- 4 & 6 Flute design
- 37° Helix Angle
- Variable Index / Variable helix
- Eccentric Relief
- Sharp or Radius Corners
- S2 (Silver) Coating



| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | S2 (Silver) Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------------|---------|
|                  |                |               |                |             | Tool Name          | EDP #   |
| 5/32             | 5/32           | 9/16          | 2              | Ball 4 FL   | SXB4F156           | 5252547 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | Ball 4 FL   | SXB4F250           | 5252548 |
| 1/4              | 1/4            | 1/2           | 2              | Ball 4 FL   | SXB4F250S          | 5252549 |
| 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 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | Ball 6 FL   | SXB6F250           | 5252554 |
| 1/4              | 1/4            | 1/2           | 2              | Ball 6 FL   | SXB6F250S          | 5252555 |
| 3/8              | 3/8            | 7/8           | 2 1/2          | Ball 6 FL   | SXB6F375           | 5252556 |
| 3/8              | 3/8            | 9/16          | 2              | Ball 6 FL   | SXB6F375S          | 5252557 |
| 1/2              | 1/2            | 1 1/4         | 3              | Ball 6 FL   | SXB6F500           | 5252558 |
| 1/2              | 1/2            | 1             | 3              | Ball 6 FL   | SXB6F500MS         | 5252559 |
| 1/2              | 1/2            | 5/8           | 2              | Ball 6 FL   | SXB6F500S          | 5252560 |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | Ball 6 FL   | SXB6F625           | 5252561 |
| 5/8              | 5/8            | 2 1/4         | 5              | Ball 6 FL   | SXB6F625L          | 5252562 |
| 5/8              | 5/8            | 1 3/4         | 5              | Ball 6 FL   | SXB6F625M          | 5252563 |
| 5/8              | 5/8            | 3/4           | 3              | Ball 6 FL   | SXB6F625S          | 5252564 |
| 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 Radius Corners
- 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              | .050        | SX7F375-050        | 5252986 |
| 1/2              | 1/2            | 1 1/4         | 3              | .015        | SX7F500-015        | 5252988 |
| 1/2              | 1/2            | 1 1/4         | 3              | .030        | SX7F500-030        | 5252989 |
| 1/2              | 1/2            | 1 1/4         | 3              | .060        | SX7F500-060        | 5252990 |
| 1/2              | 1/2            | 1 1/2         | 4              | .015        | SX7F500L-015       | 5252991 |
| 1/2              | 1/2            | 1 1/2         | 4              | .030        | SX7F500L-030       | 5252992 |
| 1/2              | 1/2            | 1             | 3              |             | SX7F500MS          | 5252993 |
| 1/2              | 1/2            | 1             | 3              | .015        | SX7F500MS-015      | 5252995 |
| 1/2              | 1/2            | 1             | 3              | .060        | SX7F500MS-060      | 5252996 |
| 1/2              | 1/2            | 5/8           | 2 1/2          |             | SX7F500S           | 5252997 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .015        | SX7F500S-015       | 5252998 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .030        | SX7F500S-030       | 5252999 |
| 1/2              | 1/2            | 2             | 4              | .015        | SX7F500XL-015      | 5253000 |
| 1/2              | 1/2            | 2             | 4              | .060        | SX7F500XL-060      | 5253001 |
| 5/8              | 5/8            | 1 5/8         | 4              |             | SX7F625            | 5253002 |

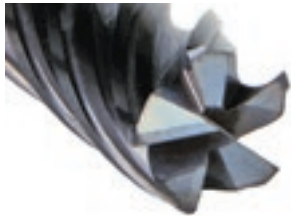


See page 22 for Cutting Parameters

## 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 Radius Corners
- nACRo Coating

| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | nACRo Coated     |         |
|------------------|----------------|---------------|----------------|-------------|------------------|---------|
|                  |                |               |                |             | Tool Name        | EDP #   |
| 5 Flute          |                |               |                |             |                  |         |
| 1/4              | 1/4            | 5/8           | 2 1/2          | .010        | SXT5F250M-010    | 5255435 |
| 1/4              | 1/4            | 1/2           | 2              | .010        | SXT5F250S-010    | 5255434 |
| 1/4              | 1/4            | 1 1/4         | 3              |             | SXT5F250XL       | 5252568 |
| 1/4              | 1/4            | 3/8           | 2              | .010        | SXT5F250XS-010   | 5255433 |
| 1/2              | 1/2            | 1             | 3              | .030        | SXT5F500-030     | 5252569 |
| 1/2              | 1/2            | 1             | 3              | .090        | SXT5F500-090     | 5252570 |
| 1/2              | 1/2            | 1 1/4         | 3 1/2          | .030        | SXT5F500M-030    | 5255432 |
| 3/4              | 3/4            | 1 5/8         | 4              |             | SXT5F750         | 5252571 |
| 3/4              | 3/4            | 1 5/8         | 4              | .030        | SXT5F750-030     | 5252572 |
| 3/4              | 3/4            | 1 5/8         | 4              | .060        | SXT5F750-060     | 5252573 |
| 3/4              | 3/4            | 1 1/2         | 4              | .190        | SXT5F750-190     | 5252574 |
| 3/4              | 3/4            | 2 1/4         | 5              | .060        | SXT5F750L-060    | 5252575 |
| 3/4              | 3/4            | 2             | 5              | .250        | SXT5F750XL-250   | 5252576 |
| 3/4              | 3/4            | 4             | 7              | .030        | SXT5F750XXXL-030 | 5255792 |
| 7 Flute          |                |               |                |             |                  |         |
| 3/8              | 3/8            | 1 5/8         | 3              |             | SXT7F375XL       | 5252577 |
| 1/2              | 1/2            | 1 1/4         | 3              |             | SXT7F500         | 5252578 |
| 1/2              | 1/2            | 1 1/4         | 3              | .010        | SXT7F500-010     | 5252579 |
| 1/2              | 1/2            | 1 1/4         | 3              | .015        | SXT7F500-015     | 5252580 |
| 1/2              | 1/2            | 1 1/4         | 3              | .020        | SXT7F500-020     | 5252581 |
| 1/2              | 1/2            | 1 1/4         | 3              | .030        | SXT7F500-030     | 5252582 |

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            | 1 1/4         | 3              | .060        | SXT7F500-060   | 5252584 |
| 1/2              | 1/2            | 2             | 4              |             | SXT7F500L      | 5252585 |
| 1/2              | 1/2            | 2             | 4              | .010        | SXT7F500L-010  | 5252586 |
| 1/2              | 1/2            | 2             | 4              | .015        | SXT7F500L-015  | 5252587 |
| 1/2              | 1/2            | 2             | 4              | .020        | SXT7F500L-020  | 5252588 |
| 1/2              | 1/2            | 2             | 4              | .030        | SXT7F500L-030  | 5252589 |
| 1/2              | 1/2            | 2             | 4              | .060        | SXT7F500L-060  | 5252590 |
| 1/2              | 1/2            | 1 1/2         | 4              |             | SXT7F500M      | 5252591 |
| 1/2              | 1/2            | 1 1/2         | 4              | .010        | SXT7F500M-010  | 5252592 |
| 1/2              | 1/2            | 1 1/2         | 4              | .015        | SXT7F500M-015  | 5252593 |
| 1/2              | 1/2            | 1 1/2         | 4              | .020        | SXT7F500M-020  | 5252594 |
| 1/2              | 1/2            | 1 1/2         | 4              | .030        | SXT7F500M-030  | 5252595 |
| 1/2              | 1/2            | 1 1/2         | 4              | .060        | SXT7F500M-060  | 5252596 |
| 1/2              | 1/2            | 1             | 3              |             | SXT7F500MS     | 5252597 |
| 1/2              | 1/2            | 1             | 3              | .010        | SXT7F500MS-010 | 5252599 |
| 1/2              | 1/2            | 1             | 3              | .015        | SXT7F500MS-015 | 5252600 |
| 1/2              | 1/2            | 1             | 3              | .020        | SXT7F500MS-020 | 5252601 |
| 1/2              | 1/2            | 1             | 3              | .030        | SXT7F500MS-030 | 5252602 |
| 1/2              | 1/2            | 1             | 3              | .060        | SXT7F500MS-060 | 5252603 |
| 1/2              | 1/2            | 5/8           | 2 1/2          |             | SXT7F500S      | 5252604 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .010        | SXT7F500S-010  | 5252605 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .015        | SXT7F500S-015  | 5252606 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .020        | SXT7F500S-020  | 5252607 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .030        | SXT7F500S-030  | 5252608 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | .060        | SXT7F500S-060  | 5252609 |
| 1/2              | 1/2            | 2 1/4         | 5              | .030        | SXT7F500XL-030 | 5252610 |
| 3/4              | 3/4            | 1 1/2         | 4              |             | SXT7F750-060   | 5252612 |
| 3/4              | 3/4            | 2 1/4         | 5              | .060        | SXT7F750L-060  | 5252613 |



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

### Cutting Parameters

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

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



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## Series *HM*

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

ISO CODE  
**H**



- 4 Flute
- Variable Helix
- Variable Pitch
- Full Eccentric Relief
- Sharp or Radius Corners
- Tixco Coating

| Cutting Diameter | Shank Diameter | Length of Cut | Overall Length | Radius Size | Tixco Coated |         |
|------------------|----------------|---------------|----------------|-------------|--------------|---------|
|                  |                |               |                |             | Tool Name    | EDP #   |
| 1/4              | 1/4            | 3/4           | 2 1/2          |             | HM6F250      | 5250635 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .015        | HM6F250-015  | 5250636 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | .030        | HM6F250-030  | 5250637 |
| 1/4              | 1/4            | 1/2           | 2 1/2          |             | HM6F250S     | 5250638 |
| 1/4              | 1/4            | 1/2           | 2 1/2          | .015        | HM6F250S-015 | 5250639 |
| 1/4              | 1/4            | 1/2           | 2              | .030        | HM6F250S-030 | 5250640 |
| 3/8              | 3/8            | 1             | 2 1/2          |             | HM6F375      | 5250641 |
| 3/8              | 3/8            | 1             | 2 1/2          | .015        | HM6F375-015  | 5250642 |
| 3/8              | 3/8            | 1             | 2 1/2          | .030        | HM6F375-030  | 5250643 |
| 3/8              | 3/8            | 1/2           | 2 1/2          |             | HM6F375S     | 5250644 |
| 3/8              | 3/8            | 1/2           | 2 1/2          | .015        | HM6F375S-015 | 5250645 |
| 3/8              | 3/8            | 1/2           | 2 1/2          | .030        | HM6F375S-030 | 5250646 |
| 1/2              | 1/2            | 1             | 3              |             | HM6F500      | 5250647 |
| 1/2              | 1/2            | 1             | 3              | .015        | HM6F500-015  | 5250648 |
| 1/2              | 1/2            | 1             | 3              | .030        | HM6F500-030  | 5250649 |
| 1/2              | 1/2            | 1 1/4         | 3              |             | HM6F500M     | 5250650 |
| 1/2              | 1/2            | 1 1/4         | 3              | .015        | HM6F500M-015 | 5250651 |
| 1/2              | 1/2            | 1 1/4         | 3              | .030        | HM6F500M-030 | 5250652 |
| 1/2              | 1/2            | 1 1/8         | 3              |             | HM6F500MS    | 5250653 |
| 1/2              | 1/2            | 5/8           | 3              |             | HM6F500S     | 5250654 |
| 1/2              | 1/2            | 5/8           | 3              | .015        | HM6F500S-015 | 5250655 |
| 1/2              | 1/2            | 5/8           | 3              | .030        | HM6F500S-030 | 5250656 |

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 #   |
| 3/4              | 3/4            | 1 1/2         | 4              |             | HM6F750       | 5250657 |
| 3/4              | 3/4            | 1 1/2         | 4              | .015        | HM6F750-015   | 5250658 |
| 3/4              | 3/4            | 1 1/2         | 4              | .030        | HM6F750-030   | 5250659 |
| 3/4              | 3/4            | 1 3/4         | 4              |             | HM6F750L      | 5250660 |
| 3/4              | 3/4            | 1 3/4         | 4              | .015        | HM6F750L-015  | 5250661 |
| 3/4              | 3/4            | 1 3/4         | 4              | .030        | HM6F750L-030  | 5250662 |
| 3/4              | 3/4            | 1 1/4         | 4              |             | HM6F750MS     | 5250663 |
| 3/4              | 3/4            | 1 1/4         | 4              | .015        | HM6F750MS-015 | 5250664 |
| 3/4              | 3/4            | 1 1/4         | 4              | .030        | HM6F750MS-030 | 5250665 |
| 1/4              | 1/4            | 1/2           | 2              | .030        | HM6F250S-030  | 5250640 |
| 3/8              | 3/8            | 1/2           | 2 1/2          | .030        | HM6F375S-030  | 5250646 |



## Series *HM*

### Cutting Parameters

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

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



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## Series *TC5F* — *The Tomcat*

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



- 5 Flute
- Variable Helix
- Variable Pitch
- Sharp or Radius Corners
- Full Eccentric Relief
- nACRo Coating

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 #   |
| 1/4              | 1/4            | 3/8           | 2              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | TC5F625VM      | 5253090 |
| 5/8              | 5/8            | 1 3/4         | 4              | 0.015       | TC5F625VM-015  | 5253091 |

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 |

## 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 Radius Corners
- 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          | 0.000       | 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          | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 |

## 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | XPV1.0XL     | 5253460 |

### 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          | Ball Nose   | XPVB125S     | 5253200 |
| 1/8              | 1/8            | 1/2           | 1 1/2          | Ball Nose   | XPVB125      | 5253199 |
| 3/16             | 3/16           | 3/8           | 1 1/2          | Ball Nose   | XPVB187S     | 5253202 |
| 3/16             | 3/16           | 9/16          | 2              | Ball Nose   | XPVB187      | 5253201 |
| 1/4              | 1/4            | 1/2           | 2              | Ball Nose   | XPVB250S     | 5253206 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | Ball Nose   | XPVB250      | 5253203 |
| 1/4              | 1/4            | 1 1/8         | 3              | Ball Nose   | XPVB250L     | 5253205 |
| 5/16             | 5/16           | 1/2           | 2              | Ball Nose   | XPVB312S     | 5253210 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | Ball Nose   | XPVB312      | 5253208 |
| 5/16             | 5/16           | 1 1/8         | 3              | Ball Nose   | XPVB312L     | 5253209 |
| 3/8              | 3/8            | 1/2           | 2              | Ball Nose   | XPVB375S     | 5253214 |
| 3/8              | 3/8            | 7/8           | 2 1/2          | Ball Nose   | XPVB375      | 5253211 |
| 3/8              | 3/8            | 1 1/8         | 3              | Ball Nose   | XPVB375L     | 5253213 |
| 3/8              | 3/8            | 1 1/2         | 4              | Ball Nose   | XPVB375XL    | 5253216 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | Ball Nose   | XPVB500S     | 5253221 |
| 1/2              | 1/2            | 1             | 3              | Ball Nose   | XPVB500      | 5253217 |
| 1/2              | 1/2            | 1 1/4         | 3              | Ball Nose   | XPVB500M     | 5253219 |
| 1/2              | 1/2            | 1 1/2         | 4              | Ball Nose   | XPVB500L     | 5253218 |
| 1/2              | 1/2            | 2             | 4              | Ball Nose   | XPVB500XL    | 5253222 |
| 1/2              | 1/2            | 3             | 6              | Ball Nose   | 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              | Ball Nose   | XPVB625S     | 5253226  |
| 5/8              | 5/8            | 1 1/4         | 3 1/2          | Ball Nose   | XPVB625      | 5253224  |
| 5/8              | 5/8            | 2 1/4         | 5              | Ball Nose   | XPVB625L     | 5253225  |
| 3/4              | 3/4            | 1             | 3              | Ball Nose   | XPVB750S     | 5253229  |
| 3/4              | 3/4            | 1 1/2         | 4              | Ball Nose   | XPVB750      | 5253227  |
| 3/4              | 3/4            | 2 1/4         | 5              | Ball Nose   | XPVB750L     | 5253228  |
| 3/4              | 3/4            | 3             | 6              | Ball Nose   | XPVB750XL    | 5253230  |
| 1                | 1              | 1 1/2         | 4              | Ball Nose   | XPVB1.0      | 525 3196 |
| 1                | 1              | 2 1/4         | 5              | Ball Nose   | XPVB1.0L     | 5253197  |
| 1                | 1              | 3             | 6              | Ball Nose   | 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<br>x 2D Axial |       | .25D Radial<br>x 1.5D Axial |       | .5D Radial<br>x 1.5D Axial |       | .5D Axial |       | .75D Radial<br>x .25D Axial |       | Max. Ramp<br>Angle -7° |       |
|                                   |          |                    | SFM                      | IPM   | SFM                         | IPM   | SFM                        | IPM   | SFM       | IPM   | SFM                         | IPM   | SFM                    | IPM   |
| High Temp<br>- Titanium<br>Alloys | <b>S</b> | 6Al4V,<br>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<br>- Titanium<br>Alloys | <b>S</b> | 6Al4V, 5553, 99   | 0.0004           | 0.0005 | 0.0010 | 0.0015 | 0.0020 | 0.0025 | 0.0030 | 0.0040 |

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## 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 Radius Corners
- 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          | 0.000       | SM7F187S     | 5252407 |
| 3/16             | 3/16           | 3/8           | 1 1/2          | 0.010       | SM7F187S-010 | 5252408 |
| 3/16             | 3/16           | 9/16          | 2              | 0.000       | SM7F187      | 5252403 |
| 3/16             | 3/16           | 9/16          | 2              | 0.010       | SM7F187-010  | 5252404 |
| 3/16             | 3/16           | 3/4           | 2 1/2          | 0.000       | SM7F187L     | 5252405 |
| 3/16             | 3/16           | 3/4           | 2 1/2          | 0.010       | SM7F187L-010 | 5252406 |
| 1/4              | 1/4            | 1/2           | 2              | 0.000       | SM7F250S     | 5252415 |
| 1/4              | 1/4            | 1/2           | 2              | 0.015       | SM7F250S-015 | 5252416 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | 0.000       | SM7F250      | 5252409 |
| 1/4              | 1/4            | 3/4           | 2 1/2          | 0.015       | SM7F250-015  | 5252411 |
| 1/4              | 1/4            | 1 1/8         | 3              | 0.000       | SM7F250L     | 5252413 |
| 1/4              | 1/4            | 1 1/8         | 3              | 0.015       | SM7F250L-015 | 5252414 |
| 5/16             | 5/16           | 1/2           | 2              | 0.000       | SM7F312S     | 5252421 |
| 5/16             | 5/16           | 1/2           | 2              | 0.015       | SM7F312S-015 | 5252422 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | 0.000       | SM7F312      | 5252417 |
| 5/16             | 5/16           | 13/16         | 2 1/2          | 0.015       | SM7F312-015  | 5252418 |
| 5/16             | 5/16           | 1 1/8         | 3              | 0.000       | SM7F312L     | 5252419 |
| 5/16             | 5/16           | 1 1/8         | 3              | 0.015       | SM7F312L-015 | 5252420 |
| 3/8              | 3/8            | 9/16          | 2              | 0.000       | SM7F375S     | 5252428 |
| 3/8              | 3/8            | 9/16          | 2              | 0.015       | SM7F375S-015 | 5252429 |
| 3/8              | 3/8            | 1             | 2 1/2          | 0.000       | 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              | 0.000       | SM7F375L      | 5252426 |
| 3/8              | 3/8            | 1 1/4         | 3              | 0.015       | SM7F375L-015  | 5252427 |
| 7/16             | 7/16           | 1             | 2 3/4          | 0.000       | SM7F437       | 5252430 |
| 7/16             | 7/16           | 1             | 2 3/4          | 0.015       | SM7F437-015   | 5252431 |
| 7/16             | 7/16           | 2             | 4              | 0.000       | SM7F437L      | 5252432 |
| 7/16             | 7/16           | 2             | 4              | 0.015       | SM7F437L-015  | 5252433 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 Radius Corners
- 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          | 0.000       | 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          | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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 |

ISO CODE  
**P**

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**M**

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*Continued on next page*

## Series *XPVS*

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

ISO CODE  
**P**

ISO CODE  
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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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 |

## 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 |

ISO CODE  
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**M**

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## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | XPVS1.0XL     | 5253276 |
| 1                | 1              | 3             | 6              | 0.015       | XPVS1.0XL-015 | 5253277 |
| 1                | 1              | 3             | 6              | 0.030       | XPVS1.0XL-030 | 5253278 |

## 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              | 0.045       | 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 |

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



## 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<br>x 2D Axial |       | .25D Radial<br>x 1.5D Axial |       | .5D Radial<br>x 1.5D Axial |       | .5D Axial |       | .75D Radial<br>x .25D Axial |       | Max. Ramp<br>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 |

## 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 Radius Corners
- 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          | 0.000                  | 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          | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | 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          | 0.000                  | 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              | 0.000                  | XP625L       | 5253803 | XP625LA    | 5253804 |
| 3/4              | 3/4            | 1             | 3              | .020" x 45°            | XP750SC      | 5253828 | XP750SCA   | 5253829 |
| 3/4              | 3/4            | 1             | 3              | 0.000                  | 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 |

## 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 1/2         | 4              | 0.000                  | 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              | 0.000                  | XP750L       | 5253820 | XP750LA   | 5253821 |
| 3/4              | 3/4            | 3             | 6              | .020" x 45°            | XP750XLC     | 5253834 | XP750XLCA | 5253835 |
| 3/4              | 3/4            | 3             | 6              | 0.000                  | 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              | 0.000                  | 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              | 0.000                  | XP1.0L       | 5253628 | XP1.0LA   | 5253629 |
| 1                | 1              | 3             | 6              | .020" x 45°            | XP1.0XLC     | 5253636 | XP1.0XLCA | 5253637 |
| 1                | 1              | 3             | 6              | 0.000                  | 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 Radius Corners
- 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           | 0.000                  | MXP3         | 5250758 | MXP3A     | 5250759 |
| 3mm              | 6mm            | 8mm           | 58mm           | .25mm                  | MXP3R        | 5250760 | MXP3RA    | 5250761 |
| 4mm              | 6mm            | 11mm          | 58mm           | 0.000                  | MXP4         | 5250762 | MXP4A     | 5250763 |
| 4mm              | 6mm            | 11mm          | 58mm           | .25mm                  | MXP4R        | 5250764 | MXP4RA    | 5250765 |
| 5mm              | 6mm            | 13mm          | 58mm           | 0.000                  | MXP5         | 5250766 | MXP5A     | 5250767 |
| 5mm              | 6mm            | 13mm          | 58mm           | .25mm                  | MXP5R        | 5250768 | MXP5RA    | 5250769 |
| 6mm              | 6mm            | 13mm          | 58mm           | 0.000                  | MXP6         | 5250770 | MXP6A     | 5250771 |
| 6mm              | 6mm            | 13mm          | 58mm           | .38mm                  | MXP6R        | 5250772 | MXP6RA    | 5250773 |
| 7mm              | 8mm            | 19mm          | 64mm           | 0.000                  | MXP7         | 5250774 | MXP7A     | 5250775 |
| 7mm              | 8mm            | 19mm          | 64mm           | .38mm                  | MXP7R        | 5250776 | MXP7RA    | 5250777 |
| 8mm              | 8mm            | 19mm          | 64mm           | 0.000                  | MXP8         | 5250778 | MXP8A     | 5250779 |
| 8mm              | 8mm            | 19mm          | 64mm           | .38mm                  | MXP8R        | 5250780 | MXP8RA    | 5250781 |
| 9mm              | 10mm           | 22mm          | 67mm           | 0.000                  | MXP9         | 5250782 | MXP9A     | 5250783 |
| 9mm              | 10mm           | 22mm          | 67mm           | .38mm                  | MXP9R        | 5250784 | MXP9RA    | 5250785 |
| 10mm             | 10mm           | 22mm          | 67mm           | 0.000                  | MXP10        | 5250718 | MXP10A    | 5250719 |
| 10mm             | 10mm           | 22mm          | 67mm           | .38mm                  | MXP10R       | 5250720 | MXP10RA   | 5250721 |
| 11mm             | 12mm           | 26mm          | 74mm           | 0.000                  | MXP11        | 5250722 | MXP11A    | 5250723 |
| 11mm             | 12mm           | 26mm          | 74mm           | .64mm                  | MXP11R       | 5250724 | MXP11RA   | 5250725 |
| 12mm             | 12mm           | 26mm          | 74mm           | 0.000                  | MXP12        | 5250726 | MXP12A    | 5250727 |
| 12mm             | 12mm           | 26mm          | 74mm           | .64mm                  | MXP12R       | 5250728 | MXP12RA   | 5250729 |
| 13mm             | 14mm           | 26mm          | 76mm           | 0.000                  | MXP13        | 5250730 | MXP13A    | 5250731 |
| 13mm             | 14mm           | 26mm          | 76mm           | .64mm                  | MXP13R       | 5250732 | MXP13RA   | 5250733 |

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 #   |
| 14mm             | 14mm           | 26mm          | 76mm           | 0.000                  | MXP14        | 5250734 | MXP14A    | 5250735 |
| 14mm             | 14mm           | 26mm          | 76mm           | .64mm                  | MXP14R       | 5250736 | MXP14RA   | 5250737 |
| 15mm             | 16mm           | 32mm          | 93mm           | 0.000                  | MXP15        | 5250738 | MXP15A    | 5250739 |
| 15mm             | 16mm           | 32mm          | 93mm           | .75mm                  | MXP15R       | 5250740 | MXP15RA   | 5250741 |
| 16mm             | 16mm           | 32mm          | 93mm           | 0.000                  | MXP16        | 5250742 | MXP16A    | 5250743 |
| 16mm             | 16mm           | 32mm          | 93mm           | .75mm                  | MXP16R       | 5250744 | MXP16RA   | 5250745 |
| 18mm             | 18mm           | 32mm          | 93mm           | 0.000                  | MXP18        | 5250746 | MXP18A    | 5250747 |
| 18mm             | 18mm           | 32mm          | 93mm           | .75mm                  | MXP18R       | 5250748 | MXP18RA   | 5250749 |
| 20mm             | 20mm           | 38mm          | 100mm          | 0.000                  | MXP20        | 5250750 | MXP20A    | 5250751 |
| 20mm             | 20mm           | 38mm          | 100mm          | .75mm                  | MXP20R       | 5250752 | MXP20RA   | 5250753 |
| 25mm             | 25mm           | 38mm          | 101mm          | 0.000                  | 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 |

## 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**

| 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 |

ISO CODE  
**P**

ISO CODE  
**M**

ISO CODE  
**K**



## 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 74 for Cutting Parameters



**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



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## Series *SM4F & 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 |

## Series SM4F & SR4F

### Cutting Parameters

#### 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 **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 Radius Corners
- 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          | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | 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 |

## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 |

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## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | SM5F625L      | 5252071 | SM5F625LA      | 5252080 |

## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | SM5F750XL    | 5252161 | SM5F750XLA    | 5252169 |

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## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 Radius Corners
- 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           | 0.000       | MSM5F4       | 5250701 | MSM5F4A   | 5250702 |
| 4mm              | 6mm            | 14mm          | 58mm           | .25mm       | MSM5F4R      | 5250703 | MSM5F4RA  | 5250704 |
| 5mm              | 6mm            | 16mm          | 58mm           | 0.000       | MSM5F5       | 5250705 | MSM5F5A   | 5250706 |
| 5mm              | 6mm            | 16mm          | 58mm           | .25mm       | MSM5F5R      | 5250707 | MSM5F5RA  | 5250708 |
| 6mm              | 6mm            | 19mm          | 58mm           | 0.000       | MSM5F6       | 5250709 | MSM5F6A   | 5250711 |
| 6mm              | 6mm            | 19mm          | 58mm           | .38mm       | MSM5F6R      | 5250712 | MSM5F6RA  | 5250713 |
| 8mm              | 8mm            | 20mm          | 64mm           | 0.000       | MSM5F8       | 5250714 | MSM5F8A   | 5250715 |
| 8mm              | 8mm            | 20mm          | 64mm           | .38mm       | MSM5F8R      | 5250716 | MSM5F8RA  | 5250717 |
| 10mm             | 10mm           | 22mm          | 67mm           | 0.000       | MSM5F10      | 5250673 | MSM5F10A  | 5250674 |
| 10mm             | 10mm           | 22mm          | 67mm           | .38mm       | MSM5F10R     | 5250675 | MSM5F10RA | 5250676 |
| 12mm             | 12mm           | 25mm          | 74mm           | 0.000       | MSM5F12      | 5250677 | MSM5F12A  | 5250678 |
| 12mm             | 12mm           | 25mm          | 74mm           | .64mm       | MSM5F12R     | 5250679 | MSM5F12RA | 5250608 |
| 14mm             | 14mm           | 32mm          | 76mm           | 0.000       | MSM5F14      | 5250681 | MSM5F14A  | 5250682 |
| 14mm             | 14mm           | 32mm          | 76mm           | .64mm       | MSM5F14R     | 5250683 | MSM5F14RA | 5250684 |
| 16mm             | 16mm           | 32mm          | 93mm           | 0.000       | MSM5F16      | 5250685 | MSM5F16A  | 5250686 |
| 16mm             | 16mm           | 32mm          | 93mm           | .75mm       | MSM5F16R     | 5250687 | MSM5F16RA | 5250688 |
| 18mm             | 18mm           | 38mm          | 100mm          | 0.000       | MSM5F18      | 5250689 | MSM5F18A  | 5250690 |
| 18mm             | 18mm           | 38mm          | 100mm          | .75mm       | MSM5F18R     | 5250691 | MSM5F18RA | 5250692 |
| 20mm             | 20mm           | 38mm          | 100mm          | 0.000       | MSM5F20      | 5250693 | MSM5F20A  | 5250694 |
| 20mm             | 20mm           | 38mm          | 100mm          | .75mm       | MSM5F20R     | 5250695 | MSM5F20RA | 5250696 |
| 25mm             | 25mm           | 38mm          | 101mm          | 0.000       | 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<br>2D Axial |       | .25D Radial x<br>1.5D Axial |       | .5D Radial x<br>1.5D Axial |       | .75D Radial x<br>.25D Axial |       |
|                                       |          |                                                                             | SFM                      | IPM   | SFM                         | IPM   | SFM                        | IPM   | SFM                         | IPM   |
| Steel                                 | P        | 1018 thru 1095,<br>12L14, A-36,<br>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<br><45 HRC,<br>Cobalt Chrome                                   | 300                      | 30.00 | 300                         | 25.00 | 300                        | 20.00 | 300                         | 25.00 |
| Tool & Mold<br>Steels                 | P        | H-13, O-1, A-2,<br>D-2, S7, P20                                             | 250                      | 40.00 | 250                         | 35.00 | 250                        | 30.00 | 250                         | 35.00 |
|                                       | H*       | AR-450,<br>Steels >45 HRC                                                   | 100                      | 8.00  | 100                         | 6.00  | 100                        | 5.00  | 100                         | 6.00  |
| Stainless<br>Steel                    | M        | 303,304, 316                                                                | 450                      | 45.00 | 450                         | 40.00 | 450                        | 35.00 | 450                         | 35.00 |
|                                       |          | 410, 420, 440,<br>13-8, 15-5,<br>17-4 Ph                                    | 350                      | 40.00 | 350                         | 35.00 | 350                        | 30.00 | 350                         | 35.00 |
| High Temp -<br>Titanium               | S        | 6Al4V, 5553, 99                                                             | 200                      | 15.00 | 200                         | 12.00 | 200                        | 10.00 | 200                         | 12.00 |
| High Temp -<br>Nickel Based<br>Alloys | S        | Inconel 100, 718,<br>Hastelloy-B,<br>Rene 77,<br>Jethete M252,<br>Haynes 75 | 80                       | 7.00  | 80                          | 6.00  | 80                         | 5.00  | 80                          | 6.00  |
|                                       |          | Inconel 625,<br>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 -<br>Iron Based<br>Alloys   | S        | Aeromet 100,<br>A286,<br>Jethete M152                                       | 100                      | 8.00  | 100                         | 6.00  | 100                        | 5.00  | 100                         | 6.00  |
| High Temp -<br>Cobalt Based<br>Alloys | S        | Kovar, L-405,<br>L-605,<br>Stellite SF12                                    | 70                       | 6.00  | 70                          | 5.00  | 70                         | 4.00  | 70                          | 5.00  |
| Cast Iron                             | K        | Gray Cast,<br>Malleable and<br>Ductile Iron                                 | 600                      | 75.00 | 600                         | 70.00 | 600                        | 60.00 | 600                         | 70.00 |

## 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 Radius Corners
- 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | SM6F1.0        | 5252177 | SM6F1.0A        | 5252180 |

## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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  |
|                                 | S        | Inconel 625, Waspalloy                                          | 120                   | 12.00 | 120                      | 10.00 | 120                     | 8.00  | 350                    | 35  |
|                                 | S        | 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 |

## 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 Coating |         |
|------------------|----------------|---------------|----------------|---------------|---------|
|                  |                |               |                | 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 |

## Customers *On-The-Record*

*“We have been purchasing an assortment of Supermills since the spring of 2008 and are very pleased with the performance of these end mills. We used the XPR series end mills in place of cobalt roughing end mills and went from 6 IPM to 36 IPM, not to mention tool life increased 10-fold. We have tested the Supermill against other manufacture’s high performance end mills and Supermill has outperformed all the competitors. All of the different style end mills that we have bought from them have met and exceeded our expectations. We look forward to doing more business with Supermill in the future.”*

Wayne LaBreck  
**Arundel Machine Tool Co.**  
Arundel, ME

*“We at Barnes Aerospace have been doing business with Supermill for the past 20 years. Their commitment to quality, on-time delivery and pricing is second to none. They have continuously met our needs year after year and with the Supermill line of high performance tooling, they have enabled us to keep up with the ever changing environment of the aerospace industry.”*

Eric Whitney  
**Barnes Aerospace**  
Windsor, CT

*“These Supermills are the go-to end mills for our manufacturing department. Every job that we use these little monsters on, the run-times are dramatically reduced. They have amazingly long lives, they hold tight tolerances consistently and they will not break your wallet. Definitely give them a try.”*

Barry Space  
**PMC Industries**  
Wickliffe, OH

# HIGH PERFORMANCE

## 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
- 30° Helix
- Full Eccentric Relief
- nACRo Coating



| Cutting Diameter | Shank Diameter | Overall Length | Included Angle | nACRo Coating |         |
|------------------|----------------|----------------|----------------|---------------|---------|
|                  |                |                |                | Tool Name     | EDP #   |
| Chamfer Only     |                |                |                |               |         |
| 1/4              | 1/4            | 2 1/2          | 120°           | CH4F2500-120  | 5255934 |
| 1/4              | 1/4            | 2 1/2          | 90°            | CH4F2500-90   | 5255384 |
| 3/8              | 3/8            | 3              | 120°           | CH4F3750-120  | 5255935 |
| 3/8              | 3/8            | 3              | 90°            | CH4F3750-90   | 5255932 |
| 1/2              | 1/2            | 3              | 120°           | CH4F5000-120  | 5255936 |
| 1/2              | 1/2            | 3              | 90°            | CH4F5000-90   | 5255933 |
| Chamfer Mill     |                |                |                |               |         |
| 1/4              | 1/4            | 2 1/2          | 120°           | CM4F2500-120  | 5255940 |
| 1/4              | 1/4            | 2 1/2          | 90°            | CM4F2500-90   | 5255937 |
| 3/8              | 3/8            | 3              | 120°           | CM4F3750-120  | 5255941 |
| 3/8              | 3/8            | 3              | 90°            | CM4F3750-90   | 5255938 |
| 1/2              | 1/2            | 3              | 120°           | CM4F5000-120  | 5255942 |
| 1/2              | 1/2            | 2 1/2          | 90°            | CM4F5000S-90  | 5256113 |
| 1/2              | 1/2            | 3              | 90°            | CM4F5000-90   | 5255939 |

## Series *CHAMFER MILL*

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

| Cutting Diameter    | Shank Diameter | Overall Length | Included Angle | nACRo Coating  |         |
|---------------------|----------------|----------------|----------------|----------------|---------|
|                     |                |                |                | Tool Name      | EDP #   |
| Tipped Chamfer Only |                |                |                |                |         |
| 3/16                | 3/16           | 2 1/2          | 120°           | T-CH4F1875-120 | 5256059 |
| 3/16                | 3/16           | 2 1/2          | 90°            | T-CH4F1875-90  | 5256052 |
| 1/4                 | 1/4            | 2 1/2          | 120°           | T-CH4F2500-120 | 5255946 |
| 1/4                 | 1/4            | 2 1/2          | 90°            | T-CH4F2500-90  | 5255943 |
| 3/8                 | 3/8            | 3              | 120°           | T-CH4F3750-120 | 5255947 |
| 3/8                 | 3/8            | 3              | 90°            | T-CH4F3750-90  | 5255944 |
| 1/2                 | 1/2            | 3              | 120°           | T-CH4F5000-120 | 5255948 |
| 1/2                 | 1/2            | 3              | 90°            | T-CH4F5000-90  | 5255945 |
| Tipped Chamfer Mill |                |                |                |                |         |
| 1/4                 | 1/4            | 2 1/2          | 120°           | T-CM4F2500-120 | 5255952 |
| 1/4                 | 1/4            | 2 1/2          | 90°            | T-CM4F2500-90  | 5255949 |
| 3/8                 | 3/8            | 3              | 120°           | T-CM4F3750-120 | 5255953 |
| 3/8                 | 3/8            | 3              | 90°            | T-CM4F3750-90  | 5255950 |
| 1/2                 | 1/2            | 3              | 120°           | T-CM4F5000-120 | 5255954 |
| 1/2                 | 1/2            | 3              | 90°            | T-CM4F5000-90  | 5255951 |



## 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 Radius Corners
- 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          | 0.000       | 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          | 0.000       | 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              | 0.000       | SAP140S      | 5251077 | SAP140SA     | 5251078 |
| 9/64             | 3/16           | 9/16          | 2              | 0.000       | SAP140       | 5251075 | SAP140A      | 5251076 |
| 5/32             | 3/16           | 5/16          | 2              | 0.000       | SAP156S      | 5251083 | SAP156SA     | 5251085 |
| 5/32             | 3/16           | 9/16          | 2              | 0.000       | SAP156       | 5251079 | SAP156A      | 5251080 |
| 11/64            | 3/16           | 5/8           | 2              | 0.000       | SAP171       | 5251088 | SAP171A      | 5251089 |
| 3/16             | 3/16           | 3/8           | 2              | 0.000       | 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              | 0.000       | 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          | 0.000       | 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          | 0.000       | SAP203       | 5251119 | SAP203A      | 5251121 |
| 7/32             | 1/4            | 7/16          | 2              | 0.000       | SAP218S      | 5251129 | SAP218SA     | 5251133 |
| 7/32             | 1/4            | 5/8           | 2 1/2          | 0.000       | SAP218       | 5251124 | SAP218A      | 5251126 |
| 15/64            | 1/4            | 3/4           | 2 1/2          | 0.000       | SAP234       | 5251137 | SAP234A      | 5251138 |
| 1/4              | 1/4            | 1/2           | 2              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 |



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## 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          | 0.000       | SAP265       | 5251194 | SAP265A      | 5251195 |
| 9/32             | 5/16           | 1/2           | 2              | 0.000       | SAP281S      | 5251201 | SAP281SA     | 5251202 |
| 9/32             | 5/16           | 3/4           | 2 1/2          | 0.000       | SAP281       | 5251199 | SAP281A      | 5251200 |
| 19/64            | 5/16           | 13/16         | 2 1/2          | 0.000       | SAP296       | 5251205 | SAP296A      | 5251206 |
| 5/16             | 5/16           | 1/2           | 2              | 0.000       | 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          | 0.000       | 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              | 0.000       | 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          | 0.000       | SAP328       | 5251250 | SAP328A      | 5251251 |
| 11/32            | 3/8            | 7/8           | 2 1/2          | 0.000       | SAP343       | 5251254 | SAP343A      | 5251255 |
| 23/64            | 3/8            | 7/8           | 2 1/2          | 0.000       | SAP359       | 5251256 | SAP359A      | 5251257 |
| 3/8              | 3/8            | 5/8           | 2              | 0.000       | 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 |

## 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          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | SAP375XXL    | 5251310 | SAP375XXLA    | 5251311 |
| 25/64            | 7/16           | 7/8           | 2 1/2          | 0.000       | SAP390       | 5251312 | SAP390A       | 5251313 |
| 13/32            | 7/16           | 7/8           | 2 1/2          | 0.000       | SAP406       | 5251314 | SAP406A       | 5251315 |
| 27/64            | 7/16           | 7/8           | 2 1/2          | 0.000       | SAP421       | 5251316 | SAP421A       | 5251317 |
| 7/16             | 7/16           | 5/8           | 2 1/2          | 0.000       | 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          | 0.000       | 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              | 0.000       | SAP437L      | 5251327 | SAP437LA      | 5251331 |



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## 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              | 0.000       | SAP453       | 5251344 | SAP453A       | 5251345 |
| 15/32            | 1/2            | 1             | 3              | 0.000       | SAP468       | 5251347 | SAP468A       | 5251348 |
| 31/64            | 1/2            | 1             | 3              | 0.000       | SAP484       | 5251349 | SAP484A       | 5251350 |
| 1/2              | 1/2            | 5/8           | 2 1/2          | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | SAP500ML     | 5251404 | SAP500MLA     | 5251412 |
| 1/2              | 1/2            | 1 1/2         | 4              | 0.010       | SAP500ML-010 | 5251405 | SAP500MLA-010 | 5251413 |

## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | SAP562       | 5251455 | SAP562A       | 5251456 |
| 5/8              | 5/8            | 3/4           | 3              | 0.000       | 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          | 0.000       | SAP625       | 5251457 | SAP625A       | 5251465 |



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## 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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 |

## 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              | 0.000       | 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              | 0.000       | SAP875       | 5251552 | SAP875A       | 5251553 |
| 1                | 1              | 1 1/2         | 4              | 0.000       | 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              | 0.000       | 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              | 0.000       | 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

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

A ¾" 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"*

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

A ¾" 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"*

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

A ½" 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"*

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### **Series XP-NB (4 Flute) machining Waspoloy**

A ½" 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<br>x 2D Axial |       | .25D Radial<br>x 1.5D Axial |       | .5D Radial<br>x 1.5D Axial |       | .5D Axial |       | .75D Radial<br>x .25D Axial |       | Max. Ramp<br>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 |
|                                 |          |                                                                 | 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        | Aluminum                                                        | 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<br>EDP # | Cutting<br>Diameter | LOC | Reach<br>Length<br>(if any) | OAL | Corner<br>Condition | Axial<br>Depth of<br>Cut | Radial<br>Width of<br>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



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## This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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