

# SGS<sup>®</sup>

*Solid Carbide Tools*

An ISO 9001 Certified Company



## **CARB**

*Solid Carbide End Mills  
for Aluminum*

*2-Flute and 3-Flute End Mills  
for Aluminum, Non-Ferrous  
and Non-Metallic Materials  
Including Aluminum Alloys,  
Plastics, Copper, Brass  
and Bronze*



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

 **Let the Chips Fly.™**



### S-Carb Series 43 3-Flute Features and Benefits

#### Engineered Flute Design

- Effective chip removal at high feed rates
- Lower cutting forces than comparable products

#### Unique Symmetrical End Gashing

- Improved balance at high spindle speeds
- Improved workpiece finish through better balance
- More effective plunging vs. conventional designs

#### Selection of Popular Lengths and Corner Radii

- Available from stock
- CNC ground corner radii
- Resharpener service available

**Ti-NAMITE-B®**

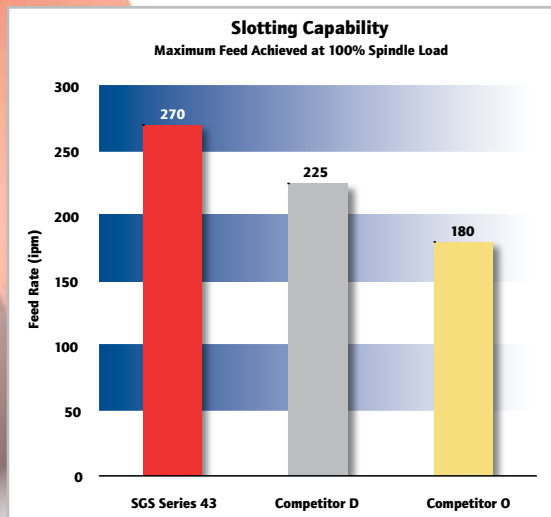
Available with  $\text{TiB}_2$  coating (Titanium Diboride) for exceptional performance in a variety of aluminum and magnesium alloys.

**Hardness:** 4000HV

**Oxidation Temperature:** 850°C - 1562°F

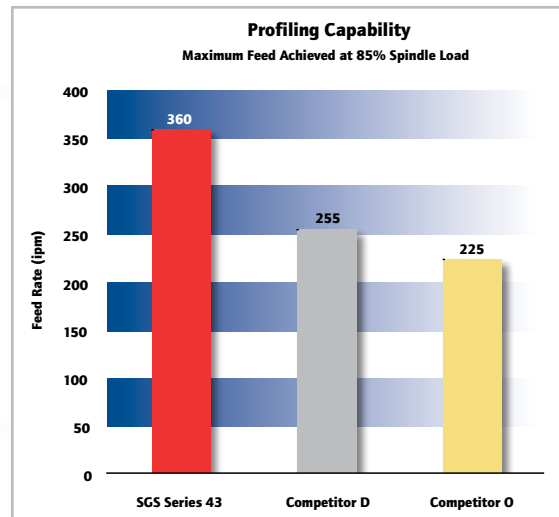
**Coefficient Of Friction:** .45

**Thickness:** 1 - 2 Microns (based on tool diameter)



6061T6 Aluminum  
10,000 rpm  
Haas VM3 30 HP  
Tool Diameter = 1/2"  
Slot Depth = 1/2"  
Water Soluble Oil

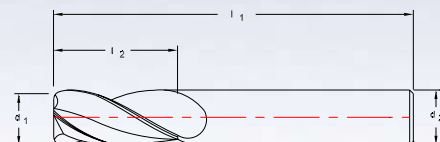
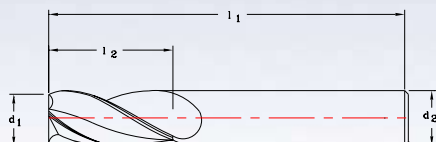
The SGS Series 43 was 20% more productive than Competitor D and 50% more than Competitor O.



6061T6 Aluminum  
10,000 rpm  
Haas VM3 30 HP  
Tool Diameter = 1/2"  
Radial Width = 1/4"  
Axial Depth = 3/4"  
Water Soluble Oil

The SGS Series 43 was 41% more productive than competitor D and 60% more productive than Competitor O.

# Fractional



## Series 43 3-Flute Fractional Square End

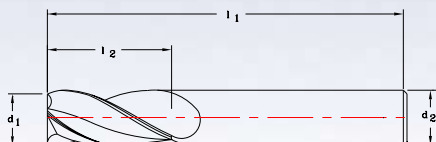
| Cutting Diameter<br>d1 | Length of Cut<br>l2 | Overall Length<br>l1 | Shank Diameter<br>d2 | Uncoated<br>EDP Number | Ti-NAMITE-B<br>(TiB <sub>2</sub> )<br>EDP Number |
|------------------------|---------------------|----------------------|----------------------|------------------------|--------------------------------------------------|
| 1/8                    | 3/8                 | 1-1/2                | 1/8                  | 34701                  | 34728                                            |
| 3/16                   | 9/16                | 2                    | 3/16                 | 34702                  | 34729                                            |
| 1/4                    | 3/8                 | 2                    | 1/4                  | 34703                  | 34730                                            |
| 1/4                    | 3/4                 | 2-1/2                | 1/4                  | 34704                  | 34731                                            |
| 1/4                    | 1-1/4               | 3-1/2                | 1/4                  | 34705                  | 34732                                            |
| 5/16                   | 7/16                | 2                    | 5/16                 | 34706                  | 34733                                            |
| 5/16                   | 5/8                 | 2-1/2                | 5/16                 | 34707                  | 34734                                            |
| 5/16                   | 1-1/4               | 4                    | 5/16                 | 34708                  | 34735                                            |
| 3/8                    | 1/2                 | 2                    | 3/8                  | 34709                  | 34736                                            |
| 3/8                    | 1                   | 2-1/2                | 3/8                  | 34710                  | 34737                                            |
| 3/8                    | 1-1/2               | 3-1/2                | 3/8                  | 34711                  | 34738                                            |
| 1/2                    | 5/8                 | 2-1/2                | 1/2                  | 34712                  | 34739                                            |
| 1/2                    | 1-1/4               | 3-1/4                | 1/2                  | 34713                  | 34740                                            |
| 1/2                    | 2                   | 4                    | 1/2                  | 34714                  | 34741                                            |
| 1/2                    | 3-1/8               | 6                    | 1/2                  | 34715                  | 34742                                            |
| 5/8                    | 3/4                 | 3                    | 5/8                  | 34716                  | 34743                                            |
| 5/8                    | 1-5/8               | 3-3/4                | 5/8                  | 34717                  | 34744                                            |
| 5/8                    | 2-1/2               | 5                    | 5/8                  | 34718                  | 34745                                            |
| 5/8                    | 3-3/4               | 6                    | 5/8                  | 34719                  | 34746                                            |
| 3/4                    | 1                   | 3                    | 3/4                  | 34720                  | 34747                                            |
| 3/4                    | 1-5/8               | 4                    | 3/4                  | 34721                  | 34748                                            |
| 3/4                    | 2-1/4               | 5                    | 3/4                  | 34722                  | 34749                                            |
| 3/4                    | 3-1/4               | 6                    | 3/4                  | 34723                  | 34750                                            |
| 1                      | 1-1/4               | 4                    | 1                    | 34724                  | 34751                                            |
| 1                      | 2                   | 4-1/2                | 1                    | 34725                  | 34752                                            |
| 1                      | 2-5/8               | 6                    | 1                    | 34726                  | 34753                                            |
| 1                      | 3-1/4               | 6                    | 1                    | 34727                  | 34754                                            |

## Series 43C 3-Flute Fractional Corner Radius

| Cutting Diameter<br>d1 | Length of Cut<br>l2 | Overall Length<br>l1 | Shank Diameter<br>d2 | Corner Radius | Uncoated<br>EDP Number | Ti-NAMITE-B<br>(TiB <sub>2</sub> )<br>EDP Number |
|------------------------|---------------------|----------------------|----------------------|---------------|------------------------|--------------------------------------------------|
| 1/8                    | 3/8                 | 1-1/2                | 1/8                  | .010          | 34771                  | 34793                                            |
| 3/16                   | 9/16                | 2                    | 3/16                 | .010          | 34772                  | 34794                                            |
| 1/4                    | 3/4                 | 2-1/2                | 1/4                  | .010          | 34773                  | 34795                                            |
| 1/4                    | 3/4                 | 2-1/2                | 1/4                  | .030          | 34774                  | 34796                                            |
| 5/16                   | 5/8                 | 2-1/2                | 5/16                 | .030          | 34775                  | 34797                                            |
| 3/8                    | 1                   | 2-1/2                | 3/8                  | .010          | 34776                  | 34798                                            |
| 3/8                    | 1                   | 2-1/2                | 3/8                  | .030          | 34777                  | 34799                                            |
| 1/2                    | 1-1/4               | 3-1/4                | 1/2                  | .010          | 34778                  | 34800                                            |
| 1/2                    | 1-1/4               | 3-1/4                | 1/2                  | .030          | 34779                  | 34801                                            |
| 1/2                    | 1-1/4               | 3-1/4                | 1/2                  | .060          | 34780                  | 34802                                            |
| 1/2                    | 1-1/4               | 3-1/4                | 1/2                  | .090          | 34781                  | 34803                                            |
| 5/8                    | 1-5/8               | 3-3/4                | 5/8                  | .030          | 34782                  | 34804                                            |
| 5/8                    | 1-5/8               | 3-3/4                | 5/8                  | .060          | 34783                  | 34805                                            |
| 5/8                    | 1-5/8               | 3-3/4                | 5/8                  | .090          | 34784                  | 34806                                            |
| 3/4                    | 1-5/8               | 4                    | 3/4                  | .030          | 34785                  | 34807                                            |
| 3/4                    | 1-5/8               | 4                    | 3/4                  | .060          | 34786                  | 34808                                            |
| 3/4                    | 1-5/8               | 4                    | 3/4                  | .090          | 34787                  | 34809                                            |
| 3/4                    | 1-5/8               | 4                    | 3/4                  | .125          | 34788                  | 34810                                            |
| 1                      | 2                   | 4-1/2                | 1                    | .030          | 34789                  | 34811                                            |
| 1                      | 2                   | 4-1/2                | 1                    | .060          | 34790                  | 34812                                            |
| 1                      | 2                   | 4-1/2                | 1                    | .090          | 34791                  | 34813                                            |
| 1                      | 2                   | 4-1/2                | 1                    | .125          | 34792                  | 34814                                            |

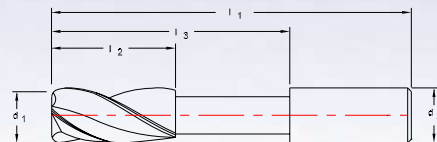
| Tolerances (inch) |                |                |
|-------------------|----------------|----------------|
| Diameter          | d1             | d2             |
| 1/8-1             | -.0001/-0.0004 | -.0001/-0.0004 |
| Tolerances (mm)   |                |                |
| Diameter          | d1             | d2             |
| 3-25              | -0,0025/-0,010 | -0,0025/-0,010 |

# Metric



**Series 43M 3-Flute  
Metric Square End**

| Cutting Diameter<br>d1 mm | Length of Cut<br>l2 mm | Overall Length<br>l1 mm | Shank Diameter<br>d2 mm | Uncoated EDP Number | Ti-NAMITE-B (TiB <sub>2</sub> ) EDP Number |
|---------------------------|------------------------|-------------------------|-------------------------|---------------------|--------------------------------------------|
| 6                         | 13                     | 57                      | 6                       | 44701               | 44715                                      |
| 6                         | 13                     | 72                      | 6                       | 44702               | 44716                                      |
| 8                         | 19                     | 63                      | 8                       | 44703               | 44717                                      |
| 10                        | 22                     | 72                      | 10                      | 44705               | 44719                                      |
| 12                        | 26                     | 83                      | 12                      | 44708               | 44722                                      |
| 16                        | 32                     | 92                      | 16                      | 44711               | 44725                                      |
| 20                        | 38                     | 104                     | 20                      | 44714               | 44728                                      |



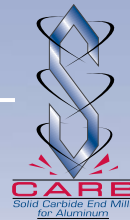
**Series 43MCR 3-Flute  
Metric Corner Radius**

| Cutting Diameter<br>d1 mm | Length of Cut<br>l2 mm | Overall Length<br>l1 mm | Shank Diameter<br>d2 mm | Reach<br>l3 mm | Corner Radius | Uncoated EDP Number | Ti-NAMITE-B (TiB <sub>2</sub> ) EDP Number |
|---------------------------|------------------------|-------------------------|-------------------------|----------------|---------------|---------------------|--------------------------------------------|
| 6                         | 10                     | 63                      | 6                       | 20             | .5            | 44769               | 44789                                      |
| 6                         | 10                     | 63                      | 6                       | 20             | 1             | 44770               | 44790                                      |
| 6                         | 13                     | 72                      | 6                       | 30             | .5            | 44771               | 44791                                      |
| 6                         | 13                     | 72                      | 6                       | 30             | 1             | 44772               | 44792                                      |
| 8                         | 12                     | 75                      | 8                       | 25             | .3            | 44773               | 44793                                      |
| 8                         | 12                     | 75                      | 8                       | 25             | .5            | 44774               | 44794                                      |
| 8                         | 12                     | 75                      | 8                       | 25             | 1             | 44775               | 44795                                      |
| 8                         | 12                     | 75                      | 8                       | 25             | 1.5           | 44776               | 44796                                      |
| 10                        | 14                     | 100                     | 10                      | 35             | .3            | 44777               | 44797                                      |
| 10                        | 14                     | 100                     | 10                      | 35             | .5            | 44778               | 44798                                      |
| 10                        | 14                     | 100                     | 10                      | 35             | 1             | 44779               | 44799                                      |
| 10                        | 14                     | 100                     | 10                      | 35             | 1.5           | 44780               | 44800                                      |
| 12                        | 16                     | 100                     | 12                      | 40             | .5            | 44781               | 44801                                      |
| 12                        | 16                     | 100                     | 12                      | 40             | 1             | 44782               | 44802                                      |
| 12                        | 16                     | 100                     | 12                      | 40             | 1.5           | 44783               | 44803                                      |
| 12                        | 16                     | 100                     | 12                      | 40             | 2             | 44784               | 44804                                      |
| 16                        | 20                     | 125                     | 16                      | 50             | 2             | 44785               | 44805                                      |
| 16                        | 20                     | 125                     | 16                      | 50             | 4             | 44786               | 44806                                      |
| 20                        | 25                     | 150                     | 20                      | 65             | 2             | 44787               | 44807                                      |
| 20                        | 25                     | 150                     | 20                      | 65             | 4             | 44788               | 44808                                      |

| Tolerances (inch) |                 |                 |
|-------------------|-----------------|-----------------|
| Diameter          | d1              | d2              |
| 1/8-1             | -0.0001/-0.0004 | -0.0001/-0.0004 |
| Tolerances (mm)   |                 |                 |
| Diameter          | d1              | d2              |
| 3-25              | -0.0025/-0.010  | -0.0025/-0.010  |



## S-CARB SERIES 47 2-Flute End Mills for Aluminum



### S-Carb Series 47 2-Flute Features & Benefits

#### Chatter Free Operation

- Improves Material Removal Rates
- Improves Surface Finishes

#### Low Cutting Force

- Permits Higher Feed Rates
- Increases Tool Life

#### Selection of Styles

- Regular Length, Square and Ball End
- Extended Reach, Square and Ball End
- Fractional and Metric Sizes

#### Suitable for Non-Ferrous / Non-Metallic Materials

- Aluminum Alloys
- Plastics
- Copper
- Brass / Bronze

**Ti-NAMITE-B®**

Available with  $\text{TiB}_2$  coating (Titanium Diboride) for exceptional performance in a variety of aluminum and magnesium alloys.

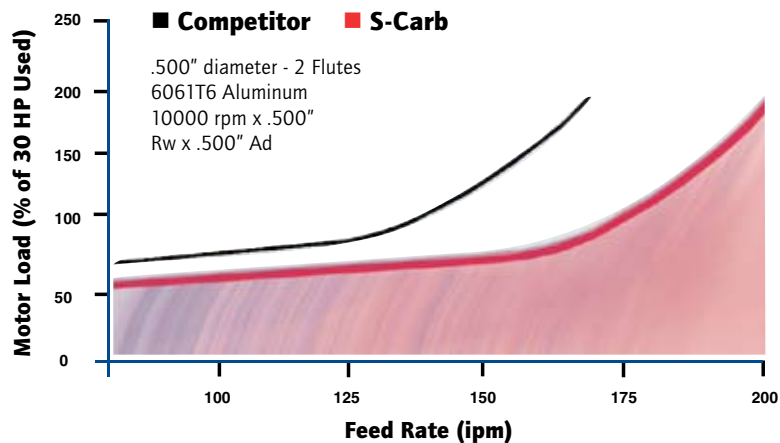
**Hardness:** 4000HV

**Oxidation Temperature:** 850°C - 1562°F

**Coefficient Of Friction:** .45

**Thickness:** 1 - 2 Microns (based on tool diameter)

### Performance Comparison S-Carb vs. Competitor



## Metric



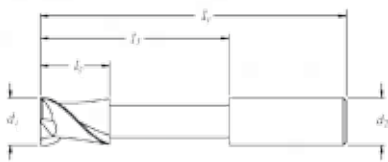
**Series 47M 2-Flute**  
**Metric Regular Length Square End**

| Cutting Diameter<br>d1 mm | Length of Cut<br>l2 mm | Overall Length<br>l1 mm | Shank Diameter<br>d2 mm | Uncoated EDP Number | Ti-NAMITE-B (TiB <sub>2</sub> ) EDP Number |
|---------------------------|------------------------|-------------------------|-------------------------|---------------------|--------------------------------------------|
| 3                         | 8                      | 38                      | 3                       | 44550               | 44587                                      |
| 4                         | 11                     | 50                      | 4                       | 44551               | 44588                                      |
| 5                         | 13                     | 50                      | 5                       | 44552               | 44589                                      |
| 6                         | 13                     | 57                      | 6                       | 44553               | 44590                                      |
| 8                         | 19                     | 63                      | 8                       | 44554               | 44591                                      |
| 10                        | 22                     | 72                      | 10                      | 44555               | 44592                                      |
| 12                        | 26                     | 83                      | 12                      | 44556               | 44593                                      |
| 14                        | 26                     | 83                      | 14                      | 44557               | 44594                                      |
| 16                        | 32                     | 92                      | 16                      | 44558               | 44595                                      |
| 20                        | 38                     | 104                     | 20                      | 44559               | 44596                                      |
| 25                        | 44                     | 104                     | 25                      | 44560               | 44597                                      |



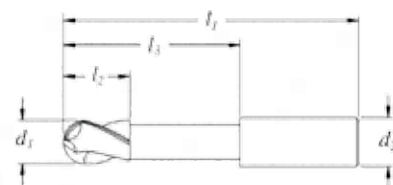
**Series 47MB 2-Flute**  
**Metric Regular Length Ball End**

| Cutting Diameter<br>d1 mm | Length of Cut<br>l2 mm | Overall Length<br>l1 mm | Shank Diameter<br>d2 mm | Uncoated EDP Number | Ti-NAMITE-B (TiB <sub>2</sub> ) EDP Number |
|---------------------------|------------------------|-------------------------|-------------------------|---------------------|--------------------------------------------|
| 3                         | 8                      | 38                      | 3                       | 44570               | 44598                                      |
| 4                         | 11                     | 50                      | 4                       | 44571               | 44599                                      |
| 5                         | 13                     | 50                      | 5                       | 44572               | 44600                                      |
| 6                         | 13                     | 57                      | 6                       | 44573               | 44601                                      |
| 8                         | 19                     | 63                      | 8                       | 44574               | 44602                                      |
| 10                        | 22                     | 72                      | 10                      | 44575               | 44603                                      |
| 12                        | 26                     | 83                      | 12                      | 44576               | 44604                                      |
| 14                        | 26                     | 83                      | 14                      | 44577               | 44605                                      |
| 16                        | 32                     | 92                      | 16                      | 44578               | 44606                                      |
| 20                        | 38                     | 104                     | 20                      | 44579               | 44607                                      |
| 25                        | 44                     | 104                     | 25                      | 44580               | 44608                                      |



**Series 47MES 2-Flute**  
**Metric Extended Reach Square End**

| Cutting Diameter<br>d1 mm | Length of Cut<br>l2 mm | Overall Length<br>l1 mm | Shank Diameter<br>d2 mm | Reach<br>l3 mm | Uncoated EDP Number | Ti-NAMITE-B (TiB <sub>2</sub> ) EDP Number |
|---------------------------|------------------------|-------------------------|-------------------------|----------------|---------------------|--------------------------------------------|
| 6                         | 10                     | 100                     | 6                       | 54             | 44561               | 44609                                      |
| 8                         | 12                     | 100                     | 8                       | 54             | 44562               | 44610                                      |
| 10                        | 12                     | 100                     | 10                      | 54             | 44563               | 44611                                      |
| 12                        | 16                     | 150                     | 12                      | 80             | 44564               | 44612                                      |
| 16                        | 20                     | 150                     | 16                      | 80             | 44565               | 44613                                      |
| 20                        | 25                     | 150                     | 20                      | 80             | 44566               | 44614                                      |



**Series 47MEB 2-Flute**  
**Metric Extended Reach Ball End**

| Cutting Diameter<br>d1 mm | Length of Cut<br>l2 mm | Overall Length<br>l1 mm | Shank Diameter<br>d2 mm | Reach<br>l3 mm | Uncoated EDP Number | Ti-NAMITE-B (TiB <sub>2</sub> ) EDP Number |
|---------------------------|------------------------|-------------------------|-------------------------|----------------|---------------------|--------------------------------------------|
| 6                         | 10                     | 100                     | 6                       | 54             | 44581               | 44615                                      |
| 8                         | 12                     | 100                     | 8                       | 54             | 44582               | 44616                                      |
| 10                        | 12                     | 100                     | 10                      | 54             | 44583               | 44617                                      |
| 12                        | 16                     | 150                     | 12                      | 80             | 44584               | 44618                                      |
| 16                        | 20                     | 150                     | 16                      | 80             | 44585               | 44619                                      |
| 20                        | 25                     | 150                     | 20                      | 80             | 44586               | 44620                                      |

| Tolerances (inch) |                |                |
|-------------------|----------------|----------------|
| Diameter          | d1             | d2             |
| 1/8-1             | -.0001/-.0004  | -.0001/-.0004  |
| Tolerances (mm)   |                |                |
| Diameter          | d1             | d2             |
| 3-25              | -0,0025/-0,010 | -0,0025/-0,010 |

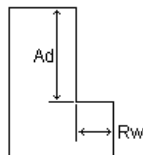
# Fractional / Metric

## Series 43 Speed and Feed Recommendations – Stub and Regular Length

|              |    | Aluminum Alloys<br>1600-2000 sfm<br>490-610 m/min |      | Plastics<br>1200-1600 sfm<br>365-490 m/min |      | Copper Alloys<br>800-1200 sfm<br>245-365 m/min |      | Brass / Bronze<br>800-1500 sfm<br>245-455 m/min |      |
|--------------|----|---------------------------------------------------|------|--------------------------------------------|------|------------------------------------------------|------|-------------------------------------------------|------|
| Diameter (D) |    | Feed Rate Per Tooth                               |      |                                            |      |                                                |      |                                                 |      |
| in           | mm | in                                                | mm   | in                                         | mm   | in                                             | mm   | in                                              | mm   |
| 1/8          | 3  | 0.0015                                            | 0.04 | 0.0030                                     | 0.08 | 0.0015                                         | 0.04 | 0.0015                                          | 0.04 |
|              | 4  |                                                   | 0.05 |                                            | 0.10 |                                                | 0.05 |                                                 | 0.05 |
| 3/16         | 5  | 0.0025                                            | 0.06 | 0.0050                                     | 0.12 | 0.0025                                         | 0.06 | 0.0025                                          | 0.06 |
| 1/4          | 6  | 0.0030                                            | 0.07 | 0.0060                                     | 0.14 | 0.0030                                         | 0.07 | 0.0030                                          | 0.07 |
| 5/16         | 8  | 0.0040                                            | 0.10 | 0.0080                                     | 0.20 | 0.0040                                         | 0.10 | 0.0040                                          | 0.10 |
| 3/8          | 10 | 0.0050                                            | 0.12 | 0.0100                                     | 0.24 | 0.0050                                         | 0.12 | 0.0050                                          | 0.12 |
| 1/2          | 12 | 0.0060                                            | 0.15 | 0.0120                                     | 0.30 | 0.0060                                         | 0.15 | 0.0060                                          | 0.15 |
|              | 14 |                                                   | 0.17 |                                            | 0.34 |                                                | 0.17 |                                                 | 0.17 |
| 5/8          | 16 | 0.0070                                            | 0.18 | 0.0140                                     | 0.36 | 0.0070                                         | 0.18 | 0.0070                                          | 0.18 |
| 3/4          | 20 | 0.0080                                            | 0.22 | 0.0160                                     | 0.44 | 0.0080                                         | 0.22 | 0.0080                                          | 0.22 |
| 1            | 25 | 0.0100                                            | 0.25 | 0.0180                                     | 0.46 | 0.0100                                         | 0.25 | 0.0100                                          | 0.25 |

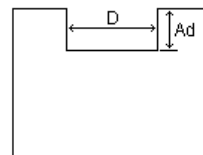
Feed rates shown are for slotting  
Rates shown can be increased 40% when profile milling  
When finish milling, reduce feed to obtain desired finish

$rpm = sfm \times 3.82 / \text{tool diameter}$   
 $rpm = (m/min \times 1000) / (3.14 \times \text{tool diameter})$   
feed per minute = feed per tooth x no. of teeth x rpm



Axial Depth  
(Ad)  $\leq 1.5 \times D$

Radial Width  
(Rw)  $\leq .5 \times D$



Axial Depth  
(Ad)  $\leq 1 \times D$

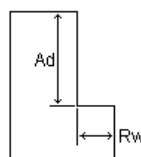
# Fractional / Metric

## Series 47 Speed and Feed Recommendations – Stub and Regular Length

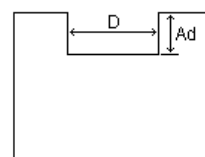
|              |    | Aluminum Alloys<br>1600-2000 sfm<br>490-610 m/min |      | Plastics<br>1200-1600 sfm<br>365-490 m/min |      | Copper Alloys<br>800-1200 sfm<br>245-365 m/min |      | Brass / Bronze<br>800-1500 sfm<br>245-455 m/min |      |
|--------------|----|---------------------------------------------------|------|--------------------------------------------|------|------------------------------------------------|------|-------------------------------------------------|------|
| Diameter (D) |    | Feed Rate Per Tooth                               |      |                                            |      |                                                |      |                                                 |      |
| in           | mm | in                                                | mm   | in                                         | mm   | in                                             | mm   | in                                              | mm   |
| 1/8          | 3  | 0.0015                                            | 0.04 | 0.0030                                     | 0.08 | 0.0015                                         | 0.04 | 0.0015                                          | 0.04 |
|              | 4  |                                                   | 0.05 |                                            | 0.10 |                                                | 0.05 |                                                 | 0.05 |
| 3/16         | 5  | 0.0025                                            | 0.06 | 0.0050                                     | 0.12 | 0.0025                                         | 0.06 | 0.0025                                          | 0.06 |
| 1/4          | 6  | 0.0030                                            | 0.07 | 0.0060                                     | 0.14 | 0.0030                                         | 0.07 | 0.0030                                          | 0.07 |
| 5/16         | 8  | 0.0040                                            | 0.10 | 0.0080                                     | 0.20 | 0.0040                                         | 0.10 | 0.0040                                          | 0.10 |
| 3/8          | 10 | 0.0050                                            | 0.12 | 0.0100                                     | 0.24 | 0.0050                                         | 0.12 | 0.0050                                          | 0.12 |
| 1/2          | 12 | 0.0060                                            | 0.15 | 0.0120                                     | 0.30 | 0.0060                                         | 0.15 | 0.0060                                          | 0.15 |
|              | 14 |                                                   | 0.17 |                                            | 0.34 |                                                | 0.17 |                                                 | 0.17 |
| 5/8          | 16 | 0.0070                                            | 0.18 | 0.0140                                     | 0.36 | 0.0070                                         | 0.18 | 0.0070                                          | 0.18 |
| 3/4          | 20 | 0.0080                                            | 0.22 | 0.0160                                     | 0.44 | 0.0080                                         | 0.22 | 0.0080                                          | 0.22 |
| 1            | 25 | 0.0100                                            | 0.25 | 0.0180                                     | 0.46 | 0.0100                                         | 0.25 | 0.0100                                          | 0.25 |

Feed rates shown are for slotting  
Rates shown can be increased 40% when profile milling  
When finish milling, reduce feed to obtain desired finish

rpm = sfm x 3.82 / tool diameter  
rpm = (m/min x 1000) / (3.14 x tool diameter)  
feed per minute = feed per tooth x no. of teeth x rpm



Axial Depth  
(Ad) ≤ 1.5 x D  
Radial Width  
(Rw) ≤ .5 x D



Axial Depth  
(Ad) ≤ 1 x D



# Metric

## Speed and Feed Recommendations - Long Reach

|            | Aluminum                      |           |          |           |            |           |            |           |
|------------|-------------------------------|-----------|----------|-----------|------------|-----------|------------|-----------|
|            | Slotting                      |           |          |           | Peripheral |           | Contouring |           |
|            |                               |           | Roughing | Finishing | Roughing   | Finishing | Roughing   | Finishing |
|            | Radial Width (Rw)             |           | 1xD      | 1xD       | .25xD      | .05xD     | .3xD       | .04xD     |
|            | Axial Depth (Ad)              |           | .5xD     | .05xD     | 1xD        | .8xD      | .3xD       | .05xD     |
|            | Speed (m/min)                 |           | 610      | 610       | 610        | 610       | 610        | 610       |
|            | Feed / Tooth by Diameter (mm) |           |          |           |            |           |            |           |
|            | 6                             |           | 8-10     |           | 12-16      |           | 20         |           |
| Operation  | Roughing                      | Finishing | Roughing | Finishing | Roughing   | Finishing | Roughing   | Finishing |
| Slotting   | 0.040                         | 0.050     | 0.090    | 0.100     | 0.110      | 0.140     | 0.180      | 0.215     |
| Peripheral | 0.050                         | 0.070     | 0.100    | 0.110     | 0.140      | 0.180     | 0.215      | 0.250     |
| Contouring | 0.060                         | 0.100     | 0.110    | 0.150     | 0.180      | 0.200     | 0.250      | 0.300     |

|            | Copper Alloys                 |           |          |           |            |           |            |           |
|------------|-------------------------------|-----------|----------|-----------|------------|-----------|------------|-----------|
|            | Slotting                      |           |          |           | Peripheral |           | Contouring |           |
|            |                               |           | Roughing | Finishing | Roughing   | Finishing | Roughing   | Finishing |
|            | Radial Width (Rw)             |           | 1xD      | 1xD       | .25xD      | .05xD     | .1xD       | .04xD     |
|            | Axial Depth (Ad)              |           | .1xD     | .05xD     | 1xD        | .8xD      | .2xD       | .05xD     |
|            | Speed (m/min)                 |           | 125      | 125       | 125        | 125       | 185        | 185       |
|            | Feed / Tooth by Diameter (mm) |           |          |           |            |           |            |           |
|            | 6                             |           | 8-10     |           | 12-16      |           | 20         |           |
| Operation  | Roughing                      | Finishing | Roughing | Finishing | Roughing   | Finishing | Roughing   | Finishing |
| Slotting   | 0.025                         | 0.035     | 0.040    | 0.050     | 0.090      | 0.100     | 0.110      | 0.140     |
| Peripheral | 0.035                         | 0.050     | 0.050    | 0.070     | 0.100      | 0.110     | 0.140      | 0.170     |
| Contouring | 0.050                         | 0.065     | 0.060    | 0.100     | 0.110      | 0.150     | 0.170      | 0.200     |

|            | Plastics                      |           |          |           |            |           |            |           |
|------------|-------------------------------|-----------|----------|-----------|------------|-----------|------------|-----------|
|            | Slotting                      |           |          |           | Peripheral |           | Contouring |           |
|            |                               |           | Roughing | Finishing | Roughing   | Finishing | Roughing   | Finishing |
|            | Radial Width (Rw)             |           | 1xD      | 1xD       | .25xD      | .05xD     | .3xD       | .04xD     |
|            | Axial Depth (Ad)              |           | .5xD     | .05xD     | 1xD        | .8xD      | .3xD       | .05xD     |
|            | Speed (m/min)                 |           | 85       | 100       | 110        | 125       | 125        | 135       |
|            | Feed / Tooth by Diameter (mm) |           |          |           |            |           |            |           |
|            | 6                             |           | 8-10     |           | 12-16      |           | 20         |           |
| Operation  | Roughing                      | Finishing | Roughing | Finishing | Roughing   | Finishing | Roughing   | Finishing |
| Slotting   | 0.025                         | 0.035     | 0.040    | 0.050     | 0.090      | 0.100     | 0.110      | 0.140     |
| Peripheral | 0.035                         | 0.050     | 0.050    | 0.070     | 0.100      | 0.110     | 0.140      | 0.170     |
| Contouring | 0.050                         | 0.065     | 0.060    | 0.100     | 0.110      | 0.150     | 0.170      | 0.200     |

$\text{rpm} = \text{sfm} \times 3.82 / \text{tool diameter}$   
 $\text{rpm} = (\text{m/min} \times 1000) / (3.14 \times \text{tool diameter})$   
 $\text{feed per minute} = \text{feed per tooth} \times \text{no. of teeth} \times \text{rpm}$