

**YG V7 PLUS A END MILLS**

**UGMF68** SQUARE

**UGMF76** CHAMFER

**UGMF70** CORNER RADIUS

**UGMG53** BALL NOSE

**CARBIDE, 4 FLUTE STANDARD LENGTH**

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR TYPE END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER END MILLS

JET-POWER END MILLS

TitaNox -POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER CFRP END MILLS

ROUTERS CFRP

STANDARD CARBIDE END MILLS

ONLY ONE COATED PM60 END MILLS

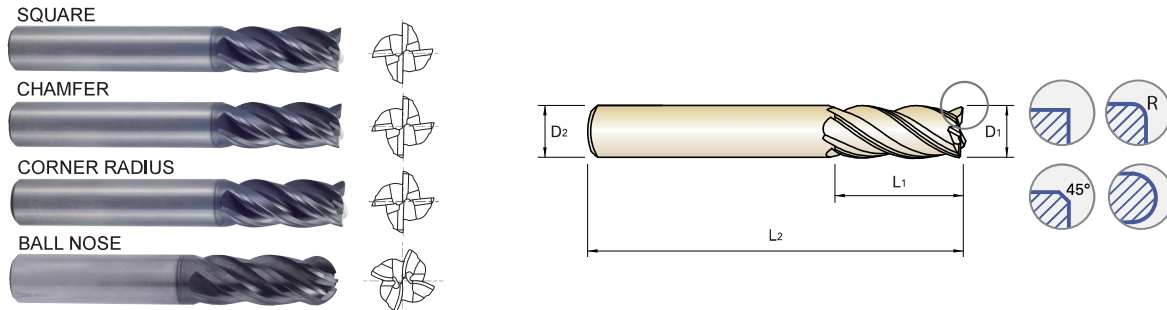
SINE -POWER END MILLS

TANK-POWER END MILLS

STANDARD COBALT & HSS END MILLS

TECHNICAL DATA

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life



MG HM 4 35°/37° PLAIN ±.0008 C x 45° P.1006~1010

Unit : Inch

| OD    | SD   | LOC   | OAL   | Square End  | Chamfer   | Corner Radius |             |             |             |             |         |         |         | Ball Nose   |
|-------|------|-------|-------|-------------|-----------|---------------|-------------|-------------|-------------|-------------|---------|---------|---------|-------------|
|       |      |       |       |             |           | .010          | .015        | .030        | .060        | .090        | .125    | .190    | .250    |             |
| D1    | D2   | L1    | L2    | EDP No.     | EDP No.   | EDP No.       | EDP No.     | EDP No.     | EDP No.     | EDP No.     | EDP No. | EDP No. | EDP No. | EDP No.     |
| 1/8   | 1/8  | 1/8   | 1-1/2 | UGMF68008   | -         | UGMF70008     | -           | UGMF70955   | -           | -           | -       | -       | -       | UGMG53901   |
|       |      | 3/8   | 1-1/2 | UGMF68901   | -         | UGMF70901     | -           | UGMF70902   | -           | -           | -       | -       | -       | UGMG53008   |
|       |      | 1/2   | 2-1/2 | *UGMF68S915 | -         | *UGMF70S956   | -           | *UGMF70S957 | -           | -           | -       | -       | -       | *UGMG53S902 |
| 5/32  | 3/16 | 3/16  | 2     | UGMF68010   | -         | UGMF70010     | -           | -           | -           | -           | -       | -       | -       | UGMG53903   |
|       |      | 7/16  | 2     | UGMF68902   | -         | UGMF70958     | -           | -           | -           | -           | -       | -       | -       | UGMG53010   |
|       |      | 3/16  | 2     | UGMF68012   | -         | UGMF70012     | -           | -           | -           | -           | -       | -       | -       | UGMG53904   |
| 3/16  | 3/16 | 5/16  | 2     | UGMF68916   | -         | UGMF70959     | -           | UGMF70960   | -           | -           | -       | -       | -       | UGMG53905   |
|       |      | 7/16  | 2     | UGMF68903   | -         | UGMF70903     | -           | UGMF70904   | -           | -           | -       | -       | -       | UGMG53012   |
|       |      | 5/8   | 2-1/2 | *UGMF68S917 | -         | *UGMF70S961   | -           | *UGMF70S962 | -           | -           | -       | -       | -       | *UGMG53S906 |
| 7/32  | 1/4  | 1/4   | 2     | UGMF68014   | -         | UGMF70014     | -           | -           | -           | -           | -       | -       | -       | UGMG53907   |
|       |      | 7/16  | 2-1/2 | UGMF68904   | -         | UGMF70963     | -           | -           | -           | -           | -       | -       | -       | UGMG53014   |
|       |      | 3/8   | 2     | UGMF68016   | UGMF76016 | UGMF70016     | -           | UGMF70905   | UGMF70906   | -           | -       | -       | -       | UGMG53908   |
| 1/4   | 1/4  | 1/2   | 2-1/2 | UGMF68918   | -         | -             | UGMF70964   | UGMF70965   | UGMF70966   | -           | -       | -       | -       | UGMG53016   |
|       |      | 3/4   | 2-1/2 | UGMF68905   | UGMF76902 | UGMF70907     | UGMF70908   | UGMF70909   | UGMF70967   | -           | -       | -       | -       | UGMG53909   |
|       |      | 1     | 3     | *UGMF68S919 | -         | -             | *UGMF70S968 | *UGMF70S969 | *UGMF70S970 | -           | -       | -       | -       | *UGMG53S910 |
| 9/32  | 5/16 | 5/8   | 2-1/2 | UGMF68018   | -         | -             | UGMF70018   | UGMF70971   | UGMF70972   | -           | -       | -       | -       | UGMG53018   |
|       |      | 1     | 3     | UGMF68S920  | -         | -             | *UGMF70S973 | *UGMF70S974 | -           | -           | -       | -       | -       | *UGMG53S911 |
|       |      | 7/16  | 2     | UGMF68020   | -         | -             | -           | UGMF70020   | -           | -           | -       | -       | -       | UGMG53912   |
| 5/16  | 5/16 | 13/16 | 2-1/2 | UGMF68906   | UGMF76020 | UGMF70910     | -           | UGMF70911   | UGMF70912   | -           | -       | -       | -       | UGMG53020   |
|       |      | 1-1/4 | 3     | *UGMF68S921 | -         | -             | *UGMF70S975 | *UGMF70S976 | *UGMF70S977 | -           | -       | -       | -       | *UGMG53S913 |
|       |      | 1/2   | 2-1/2 | UGMF68022   | -         | -             | -           | UGMF70022   | -           | -           | -       | -       | -       | UGMG53914   |
| 11/32 | 3/8  | 13/16 | 2-1/2 | UGMF68922   | -         | -             | -           | UGMF70978   | -           | -           | -       | -       | -       | UGMG53022   |
|       |      | 1/2   | 2-1/2 | UGMF68024   | UGMF76903 | UGMF70024     | -           | UGMF70913   | UGMF70914   | UGMF70979   | -       | -       | -       | UGMG53915   |
|       |      | 7/8   | 2-1/2 | UGMF68907   | UGMF76024 | UGMF70915     | -           | UGMF70916   | UGMF70917   | UGMF70980   | -       | -       | -       | UGMG53024   |
| 3/8   | 3/8  | 1     | 3     | UGMF68923   | -         | UGMF70981     | -           | UGMF70982   | UGMF70983   | UGMF70984   | -       | -       | -       | UGMG53916   |
|       |      | 1-1/4 | 3     | *UGMF68S924 | -         | *UGMF70S985   | -           | *UGMF70S986 | *UGMF70S987 | *UGMF70S988 | -       | -       | -       | *UGMG53S917 |

**NOTE:** \* Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P             |              |                    |                 | H        |                      | M                | K         | N      |          |          |         | S    |          |                        |
|---------------|--------------|--------------------|-----------------|----------|----------------------|------------------|-----------|--------|----------|----------|---------|------|----------|------------------------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels |          | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225        | HB225~325    | HRc30~40           | HRc40~45        | HRc45~55 | HRc55~70             |                  |           |        |          |          |         |      |          |                        |
| ◎             | ◎            | ◎                  | ○               |          |                      | ◎                | ◎         |        |          |          |         |      | ○        | ○                      |

# YG V7 PLUS A END MILLS

**UGMF68** SQUARE

**UGMF76** CHAMFER

**UGMF70** CORNER RADIUS

**UGMG53** BALL NOSE

**CARBIDE**

**HSS**

## CARBIDE, 4 FLUTE STANDARD LENGTH

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

SQUARE



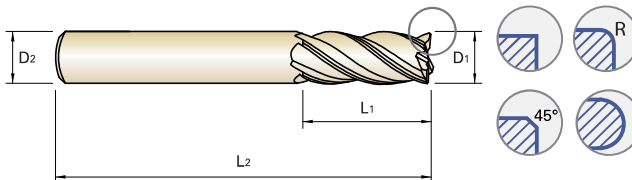
CHAMFER



CORNER RADIUS



BALL NOSE



MG HM
4
35°/37°
PLAIN
R ±.0008
C x 45°
P.1006~1010

Unit : Inch

| OD    | SD   | LOC   | OAL   | Square End | Chamfer    | Corner Radius |            |            |            |            |            |            |            | Ball Nose  |            |
|-------|------|-------|-------|------------|------------|---------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
|       |      |       |       |            |            | .010          | .015       | .030       | .060       | .090       | .125       | .190       | .250       |            |            |
| D1    | D2   | L1    | L2    | EDP No.    | EDP No.    | EDP No.       | EDP No.    | EDP No.    | EDP No.    | EDP No.    | EDP No.    | EDP No.    | EDP No.    | EDP No.    |            |
| 13/32 | 7/16 | 1/2   | 23/4  | UGMF68026  | -          | -             | -          | UGMF70026  | -          | -          | -          | -          | -          | UGMG53026  |            |
|       |      | 15/16 | 23/4  | UGMF68925  | -          | -             | -          | UGMF70989  | -          | -          | -          | -          | -          | UGMG53918  |            |
| 7/16  | 7/16 | 5/8   | 2-1/2 | UGMF68028  | -          | -             | UGMF70028  | UGMF70918  | UGMF70990  | UGMF70991  | -          | -          | -          | UGMG53919  |            |
|       |      | 7/8   | 23/4  | UGMF68926  | UGMF76028  | -             | UGMF70992  | UGMF70993  | UGMF70994  | UGMF70995  | -          | -          | -          | UGMG53920  |            |
|       |      | 1     | 23/4  | UGMF68908  | -          | UGMF70919     | -          | UGMF70920  | UGMF70921  | -          | -          | -          | -          | UGMG53028  |            |
| 15/32 | 1/2  | 5/8   | 2-1/2 | UGMF68030  | -          | -             | -          | UGMF70030  | -          | -          | -          | -          | -          | UGMG53030  |            |
|       |      | 1     | 3     | UGMF68927  | -          | -             | -          | UGMF70996  | -          | -          | -          | -          | -          | UGMG53921  |            |
|       |      | 1-1/4 | 3-1/2 | UGMF68928  | -          | -             | -          | UGMF70997  | -          | -          | -          | -          | -          | UGMG53922  |            |
| 1/2   | 1/2  | 5/8   | 2-1/2 | UGMF68032  | UGMF76032  | UGMF70032     | UGMF70922  | UGMF70923  | UGMF70924  | UGMF70998  | UGMF70999  | -          | -          | UGMG53923  |            |
|       |      | 1     | 3     | UGMF68909  | UGMF76904  | UGMF70925     | UGMF70801  | UGMF70926  | UGMF70927  | UGMF70802  | UGMF70928  | -          | -          | UGMG53032  |            |
|       |      | 1-1/4 | 3-1/2 | UGMF68910  | UGMF76901  | UGMF70929     | UGMF70930  | UGMF70931  | UGMF70932  | UGMF70803  | UGMF70933  | -          | -          | UGMG53924  |            |
|       |      | 1-5/8 | 4     | *UGMF68929 | *UGMF76905 | -             | *UGMF70934 | *UGMF70935 | *UGMF70936 | *UGMF70804 | *UGMF70937 | *UGMF70938 | -          | -          | *UGMG53925 |
|       |      | 2     | 4     | *UGMF68939 | -          | -             | *UGMF70939 | *UGMF70940 | *UGMF70941 | *UGMF70805 | *UGMF70942 | *UGMF70943 | -          | -          | *UGMG53939 |
|       |      | 2-1/2 | 4-1/2 | *UGMF68940 | *UGMF76906 | -             | *UGMF70944 | *UGMF70945 | *UGMF70946 | *UGMF70806 | *UGMF70947 | *UGMF70948 | -          | -          | *UGMG53940 |
| 5/8   | 5/8  | 3/4   | 3     | UGMF68040  | -          | UGMF70040     | UGMF70809  | UGMF70934  | UGMF70935  | UGMF70810  | UGMF70811  | -          | -          | UGMG53926  |            |
|       |      | 1-1/4 | 3-1/2 | UGMF68911  | UGMF76040  | UGMF70936     | UGMF70937  | UGMF70938  | UGMF70939  | UGMF70812  | UGMF70940  | -          | -          | UGMG53040  |            |
|       |      | 1-5/8 | 4     | UGMF68930  | UGMF76907  | -             | UGMF70813  | UGMF70814  | UGMF70815  | UGMF70816  | UGMF70817  | -          | -          | UGMG53927  |            |
|       |      | 2     | 4     | *UGMF68931 | -          | -             | *UGMF70818 | *UGMF70819 | *UGMF70820 | *UGMF70821 | *UGMF70822 | -          | -          | *UGMG53928 |            |
|       |      | 3-1/4 | 6     | *UGMF68932 | -          | -             | *UGMF70823 | *UGMF70824 | *UGMF70825 | *UGMF70826 | *UGMF70827 | -          | -          | *UGMG53929 |            |
| 3/4   | 3/4  | 3/4   | 3     | UGMF68048  | UGMF76908  | -             | UGMF70828  | UGMF70048  | UGMF70941  | UGMF70829  | UGMF70830  | UGMF70831  | UGMF70832  | UGMG53930  |            |
|       |      | 1-1/2 | 4     | UGMF68912  | UGMF76048  | -             | UGMF70942  | UGMF70943  | UGMF70944  | UGMF70833  | UGMF70945  | UGMF70834  | UGMF70835  | UGMG53048  |            |
|       |      | 1-7/8 | 4     | UGMF68933  | -          | -             | UGMF70836  | UGMF70837  | UGMF70838  | UGMF70839  | UGMF70840  | UGMF70841  | UGMF70842  | UGMG53931  |            |
|       |      | 2-1/4 | 5     | UGMF68934  | UGMF76909  | -             | UGMF70843  | UGMF70844  | UGMF70845  | UGMF70846  | UGMF70847  | UGMF70848  | UGMF70849  | UGMG53932  |            |
|       |      | 3-1/4 | 6     | *UGMF68935 | -          | -             | *UGMF70850 | *UGMF70851 | *UGMF70852 | *UGMF70853 | *UGMF70854 | *UGMF70855 | *UGMF70856 | *UGMG53933 |            |

**NOTE:** \* Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P             |              |                    |                 | H        |                      | M                | K         | N      |          |          |         | S    |          |                        |
|---------------|--------------|--------------------|-----------------|----------|----------------------|------------------|-----------|--------|----------|----------|---------|------|----------|------------------------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels |          | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225        | HB225~325    | HRC30~40           | HRC40~45        | HRC45~55 | HRC55~70             |                  |           |        |          |          |         |      |          |                        |
| ◎             | ◎            | ◎                  | ○               |          |                      | ◎                | ◎         |        |          |          |         |      | ○        | ○                      |

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR TYPE END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER END MILLS

JET-POWER END MILLS

TitaNox -POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER CFRP END MILLS

ROUTERS CFRP

STANDARD CARBIDE END MILLS

ONLY ONE COATED PM60 END MILLS

SINE -POWER END MILLS

TANK-POWER END MILLS

STANDARD COBALT & HSS END MILLS

TECHNICAL DATA



**V7 PLUS A  
END MILLS**

**UGMF68**

SQUARE

**UGMF76**

CHAMFER

**UGMF70**

CORNER RADIUS

**UGMG53**

BALL NOSE

**CARBIDE, 4 FLUTE STANDARD LENGTH**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
- ▶ Advanced coating for superior performance and tool life

SQUARE



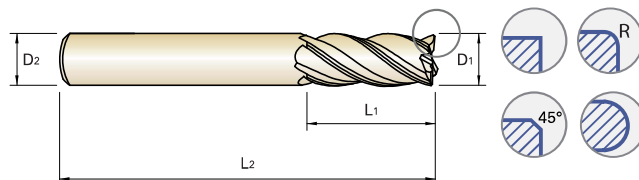
CHAMFER



CORNER RADIUS



BALL NOSE



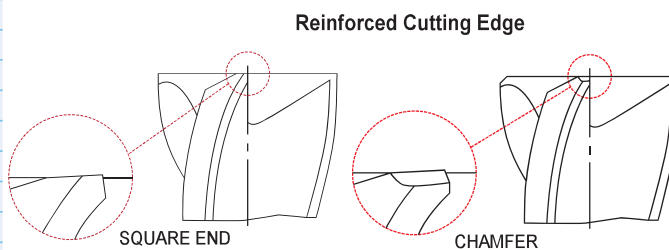
MG HM 4 35°/37° PLAIN ±.0008 C x 45° P.1006~1010

Unit : Inch

| OD | SD | LOC   | OAL | Square End | Chamfer   | Corner Radius |           |           |           |           |           |           |           | Ball Nose |
|----|----|-------|-----|------------|-----------|---------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|    |    |       |     |            |           | .010          | .015      | .030      | .060      | .090      | .125      | .190      | .250      |           |
| D1 | D2 | L1    | L2  | EDP No.    | EDP No.   | EDP No.       | EDP No.   | EDP No.   | EDP No.   | EDP No.   | EDP No.   | EDP No.   | EDP No.   | EDP No.   |
| 1  | 1  | 1     | 4   | UGMF68064  | UGMF76910 | -             | UGMF70064 | UGMF70946 | UGMF70947 | UGMF70857 | UGMF70858 | UGMF70859 | UGMF70860 | UGMG53934 |
|    |    | 1-1/2 | 4   | UGMF68913  | UGMF76064 | -             | UGMF70948 | UGMF70949 | UGMF70950 | UGMF70861 | UGMF70951 | UGMF70862 | UGMF70863 | UGMG53064 |
|    |    | 2     | 5   | UGMF68914  | UGMF76911 | -             | UGMF70952 | UGMF70953 | UGMF70954 | UGMF70864 | UGMF70865 | UGMF70866 | UGMF70867 | UGMG53935 |
|    |    | 2-5/8 | 5   | UGMF68936  | UGMF76912 | -             | UGMF70868 | UGMF70869 | UGMF70870 | UGMF70871 | UGMF70872 | UGMF70873 | UGMF70874 | UGMG53936 |
|    |    | 3     | 6   | UGMF68937  | -         | -             | UGMF70875 | UGMF70876 | UGMF70877 | UGMF70878 | UGMF70879 | UGMF70880 | UGMF70881 | UGMG53937 |
|    |    | 4-1/4 | 7   | UGMF68938  | -         | -             | UGMF70882 | UGMF70883 | UGMF70884 | UGMF70885 | UGMF70886 | UGMF70887 | UGMF70888 | UGMG53938 |
|    |    | 4-1/4 | 7   | UGMF68938  | -         | -             | UGMF70882 | UGMF70883 | UGMF70884 | UGMF70885 | UGMF70886 | UGMF70887 | UGMF70888 | UGMG53938 |

| CHAMFER KEY   |              | BALL NOSE KEY |                |
|---------------|--------------|---------------|----------------|
| Mill Diameter | Chamfer Size | Mill Diameter | Radius of Ball |
| 1/4           | .007         | 1/8           | 1/16           |
| 5/16          | .007         | 5/32          | 5/64           |
| 3/8           | .011         | 3/16          | 3/32           |
| 7/16          | .013         | 7/32          | 7/64           |
| 1/2           | .013         | 1/4           | 1/8            |
| 5/8           | .015         | 9/32          | 9/64           |
| 3/4           | .019         | 5/16          | 5/32           |
| 1             | .019         | 11/32         | 11/64          |
|               |              | 3/8           | 3/16           |
|               |              | 7/16          | 7/32           |
|               |              | 1/2           | 1/4            |
|               |              | 5/8           | 5/16           |
|               |              | 3/4           | 3/8            |
|               |              | 1             | 1/2            |

**NOTE:** \* Length of cut in excess of 3xD on 37° single-helix requires feed reduction of approximately 50%



| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|----------------------------|----------------------|
| 0~-.0012                   | h6                   |

◎ : Excellent ○ : Good

| P             |              |                    |                 | H        |                      | M                | K         | N      |          |          |         | S    |          |                        |
|---------------|--------------|--------------------|-----------------|----------|----------------------|------------------|-----------|--------|----------|----------|---------|------|----------|------------------------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels |          | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225        | HB225~325    | HRc30~40           | HRc40~45        | HRc45~55 | HRc55~70             |                  |           |        |          |          |         |      |          |                        |
| ◎             | ◎            | ◎                  | ○               |          |                      | ◎                | ◎         |        |          |          |         |      | ○        | ○                      |

**CARBIDE**

**HSS**

CBN  
END MILLS

i-Xmill  
END MILLS

i-SMART  
MODULAR  
TYPE END MILLS

X5070  
END MILLS

4G MILL  
END MILLS

X-POWER  
END MILLS

JET-POWER  
END MILLS

TitaNox  
-POWER  
END MILLS

V7 MILL INOX  
END MILLS

ALU-POWER  
HPC  
END MILLS

ALU-POWER  
END MILLS

D-POWER  
GRAPHITE  
END MILLS

D-POWER  
CFRP  
END MILLS

ROUTERS  
CFRP

STANDARD  
CARBIDE  
END MILLS

ONLY ONE  
COATED PM60  
END MILLS

SINE-POWER  
END MILLS

TANK-POWER  
END MILLS

STANDARD  
COBALT & HSS  
END MILLS

TECHNICAL  
DATA

**YG V7 PLUS A END MILLS**

**GMF52 / GMF56 SERIES**

CHAMFER

**GMF54 / GMF58 SERIES**

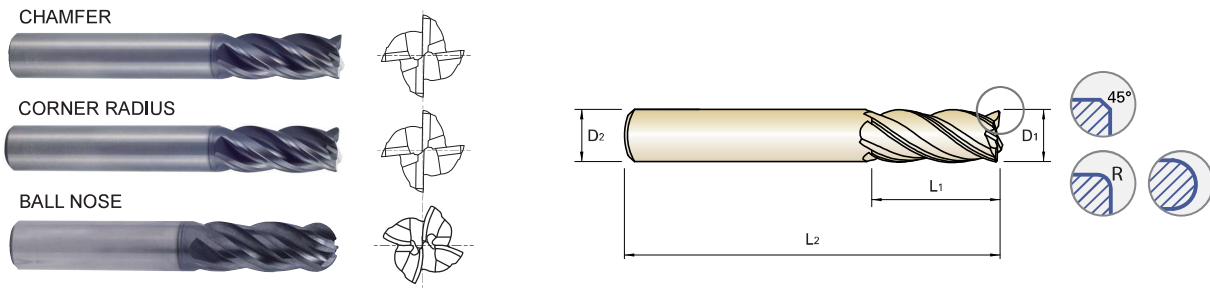
CORNER RADIUS

**GMG55 SERIES**

BALL NOSE

**CARBIDE, 4 FLUTE STANDARD LENGTH**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRC40
- ▶ Advanced coating for superior performance and tool life



MG HM
4
35°/37°
PLAIN
C x 45°
±0.02mm
R
P.1012~1014

Unit : mm

| OD   | SD    | LOC | OAL | Chamfer | Corner Radius |          |          |          |          | Ball Nose |          |
|------|-------|-----|-----|---------|---------------|----------|----------|----------|----------|-----------|----------|
|      |       |     |     |         | 0.30          | 0.50     | 1.00     | 2.00     | 3.00     |           |          |
| D1   | D2    | L1  | L2  | EDP No. | EDP No.       | EDP No.  | EDP No.  | EDP No.  | EDP No.  | EDP No.   |          |
| 3.0  | .1181 | 6   | 7   | 54      | GMF52030      | GMF54030 | GMF54901 | -        | -        | -         | -        |
|      |       | 6   | 8   | 57      | GMF56030      | GMF58030 | GMF58901 | -        | -        | -         | GMG55030 |
| 4.0  | .1575 | 6   | 8   | 54      | GMF52040      | GMF54040 | GMF54902 | -        | -        | -         | -        |
|      |       | 6   | 11  | 57      | GMF56040      | GMF58040 | GMF58902 | -        | -        | -         | GMG55040 |
| 5.0  | .1969 | 6   | 10  | 54      | GMF52050      | GMF54050 | GMF54903 | -        | -        | -         | -        |
|      |       | 6   | 13  | 57      | GMF56050      | GMF58050 | GMF58903 | -        | -        | -         | GMG55050 |
| 6.0  | .2362 | 6   | 10  | 54      | GMF52060      | GMF54060 | GMF54904 | GMF54905 | -        | -         | -        |
|      |       | 6   | 13  | 57      | GMF56060      | GMF58060 | GMF58904 | GMF58905 | -        | -         | GMG55060 |
| 8.0  | .3150 | 8   | 12  | 58      | GMF52080      | -        | GMF54080 | GMF54906 | -        | -         | -        |
|      |       | 8   | 19  | 63      | GMF56080      | -        | GMF58080 | GMF58906 | -        | -         | GMG55080 |
| 10.0 | .3937 | 10  | 14  | 66      | GMF52100      | -        | GMF54100 | GMF54907 | -        | -         | -        |
|      |       | 10  | 22  | 72      | GMF56100      | -        | GMF58100 | GMF58907 | -        | -         | GMG55100 |
| 12.0 | .4724 | 12  | 16  | 73      | GMF52120      | -        | GMF54120 | GMF54908 | GMF54909 | -         | -        |
|      |       | 12  | 26  | 83      | GMF56120      | -        | GMF58120 | GMF58908 | GMF58909 | -         | GMG55120 |
| 14.0 | .5512 | 14  | 18  | 75      | GMF52140      | -        | GMF54140 | -        | -        | -         | -        |
|      |       | 14  | 26  | 83      | GMF56140      | -        | GMF58140 | -        | -        | -         | -        |
| 16.0 | .6299 | 16  | 22  | 82      | GMF52160      | -        | -        | GMF54160 | GMF54912 | GMF54913  | -        |
|      |       | 16  | 32  | 92      | GMF56160      | -        | -        | GMF58160 | GMF58912 | GMF58913  | GMG55160 |

▶ NEXT PAGE

◎ : Excellent ○ : Good

| P             |              |                    |                   | H                    | M                | K         | N      |          |          |         | S    |          |                        |
|---------------|--------------|--------------------|-------------------|----------------------|------------------|-----------|--------|----------|----------|---------|------|----------|------------------------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels   | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225        | HB225~325    | HRc30~40           | HRc40~45 HRc45~55 | HRc55~70             |                  |           |        |          |          |         |      |          |                        |
| ◎             | ◎            | ◎                  | ○                 |                      | ◎                | ◎         |        |          |          |         |      | ○        | ○                      |

# YG V7 PLUS A END MILLS

**GMF52 / GMF56** SERIES

CHAMFER

**GMF54 / GMF58** SERIES

CORNER RADIUS

**GMG55** SERIES

BALL NOSE

**CARBIDE**

**HSS**

## CARBIDE, 4 FLUTE STANDARD LENGTH

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for stainless steels, mild steels, cast iron, low/medium hardness materials and all exotic materials up to HRc40
- ▶ Advanced coating for superior performance and tool life

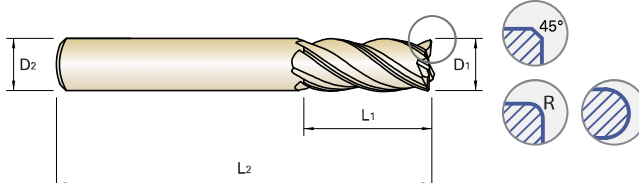
CHAMFER



CORNER RADIUS



BALL NOSE



P.1012~1014

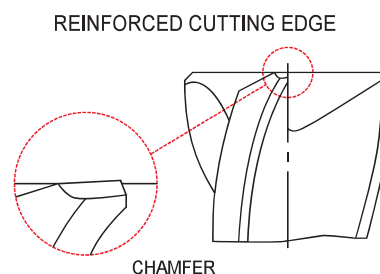
Unit : mm

| OD     |       | SD | LOC | OAL | Chamfer  | Corner Radius |         |          |          |          | Ball Nose |
|--------|-------|----|-----|-----|----------|---------------|---------|----------|----------|----------|-----------|
| D1     |       |    |     |     |          | 0.30          | 0.50    | 1.00     | 2.00     | 3.00     |           |
| Metric | Inch  | D2 | L1  | L2  | EDP No.  | EDP No.       | EDP No. | EDP No.  | EDP No.  | EDP No.  | EDP No.   |
| 18.0   | .7087 | 18 | 24  | 84  | GMF52180 | -             | -       | GMF54180 | -        | -        | -         |
|        |       | 18 | 32  | 92  | GMF56180 | -             | -       | GMF58180 | -        | -        | -         |
| 20.0   | .7874 | 20 | 26  | 92  | GMF52200 | -             | -       | GMF54200 | GMF54916 | GMF54917 | -         |
|        |       | 20 | 38  | 104 | GMF56200 | -             | -       | GMF58200 | GMF58916 | GMF58917 | GMG55200  |
| 25.0   | .9843 | 25 | 38  | 104 | GMF56250 | -             | -       | GMF58250 | -        | -        | GMG55250  |

| CHAMFER KEY   |       |                   |
|---------------|-------|-------------------|
| Mill Diameter |       | Chamfer Size (mm) |
| Metric        | Inch  |                   |
| 3.0           | .1181 | 0.10              |
| 4.0           | .1575 | 0.15              |
| 5.0           | .1969 | 0.15              |
| 6.0           | .2362 | 0.20              |
| 8.0           | .3150 | 0.20              |
| 10.0          | .3937 | 0.30              |
| 12.0          | .4724 | 0.35              |
| 14.0          | .5512 | 0.40              |
| 16.0          | .6299 | 0.40              |
| 18.0          | .7087 | 0.50              |
| 20.0          | .7874 | 0.50              |
| 25.0          | .9843 | 0.50              |

| BALL NOSE KEY |       |                |
|---------------|-------|----------------|
| Mill Diameter |       | Radius of Ball |
| Metric        | Inch  |                |
| 3.0           | .1181 | 1.5            |
| 4.0           | .1575 | 2.0            |
| 5.0           | .1969 | 2.5            |
| 6.0           | .2362 | 3.0            |
| 8.0           | .3150 | 4.0            |
| 10.0          | .3937 | 5.0            |
| 12.0          | .4724 | 6.0            |
| 16.0          | .6299 | 8.0            |
| 20.0          | .7874 | 10.0           |
| 25.0          | .9843 | 12.5           |

| Mill Dia. Tolerance (inch) | Shank Dia. Tolerance |
|----------------------------|----------------------|
| 0~.0012                    | h6                   |



◎ : Excellent ○ : Good

| P             |              |                    |                 |          | H                    | M                | K         | N      |          |          |         | S    |          |                        |
|---------------|--------------|--------------------|-----------------|----------|----------------------|------------------|-----------|--------|----------|----------|---------|------|----------|------------------------|
| Carbon Steels | Alloy Steels | Prehardened Steels | Hardened Steels |          | High Hardened Steels | Stainless Steels | Cast Iron | Copper | Graphite | Aluminum | Acrylic | CFRP | Titanium | High Temperature Alloy |
| ~HB225        | HB225~325    | HRc30~40           | HRc40~45        | HRc45~55 | HRc55~70             |                  |           |        |          |          |         |      |          |                        |
| ◎             | ◎            | ◎                  | ○               |          |                      | ◎                | ◎         |        |          |          |         |      | ○        | ○                      |

CBN END MILLS

i-Xmill END MILLS

i-SMART MODULAR TYPE END MILLS

X5070 END MILLS

4G MILL END MILLS

X-POWER END MILLS

JET-POWER END MILLS

TitaNox -POWER END MILLS

V7 PLUS A END MILLS

V7 MILL INOX END MILLS

ALU-POWER HPC END MILLS

ALU-POWER END MILLS

D-POWER GRAPHITE END MILLS

D-POWER CFRP END MILLS

ROUTERS CFRP

STANDARD CARBIDE END MILLS

ONLY ONE COATED PM60 END MILLS

SINE -POWER END MILLS

TANK-POWER END MILLS

STANDARD COBALT & HSS END MILLS

TECHNICAL DATA



**CARBIDE, 4 FLUTE - INCH**

**UGMF68, UGMF69, UGMF70, UGMF71, UGMF72, UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES**

CBN  
END MILLS

i-Xmill  
END MILLS

i-SMART  
MODULAR  
TYPE END MILLS

X5070  
END MILLS

4G MILL  
END MILLS

X-POWER  
END MILLS

JET-POWER  
END MILLS

TitaNox  
-POWER  
END MILLS

**V7 PLUS A  
END MILLS**

V7 MILL INOX  
END MILLS

ALU-POWER  
HPC  
END MILLS

ALU-POWER  
END MILLS

D-POWER  
GRAPHITE  
END MILLS

D-POWER  
CFRP  
END MILLS

ROUTERS  
CFRP

STANDARD  
CARBIDE  
END MILLS

ONLY ONE  
COATED PM60  
END MILLS

SINE-POWER  
END MILLS

TANK-POWER  
END MILLS

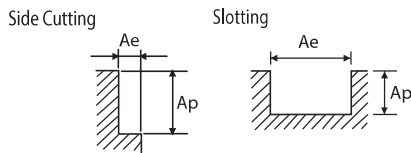
STANDARD  
COBALT & HSS  
END MILLS

TECHNICAL  
DATA

| ISO Hardness (BHN) | Work Materials                                | Speed and Feed Recommendations |           |         |            | Diameter (in.) |       |       |               |
|--------------------|---|--------------------------------|-----------|---------|------------|----------------|-------|-------|---------------|
|                    |   | Type of Cut                    | Ap x D1   | Ae x D1 | Parameters | 1/8            | 5/32  | 3/16  | 7/32          |
| P <300             | CARBON STEEL<br>10**, 11**, 12**, 12L**, 15** | Side Cutting<br>               | 1.5 (1.2) | 0.5     | SFM (VC)   | 499 (400-599)  |       |       | 499 (400-598) |
|                    |   |                                |           |         | RPM        | 15249          | 12200 | 10166 | 8714          |
|                    |   |                                |           |         | FZ         | .0002          | .0003 | .0004 | .0005         |
|                    |   | Slotting<br>                   | 1 (0.8)   | 1       | SFM (VC)   | 499 (400-599)  |       |       | 499 (400-598) |
|                    |   |                                |           |         | RPM        | 15249          | 12200 | 10166 | 8714          |
|                    |   |                                |           |         | FZ         | .0002          | .0003 | .0004 | .0005         |
| P >300<br>P <380   | ALLOY STEEL<br>41**, 43**, 51**, 86**         | Side Cutting<br>               | 1.5 (1.2) | 0.5     | SFM (VC)   | 351 (281-422)  |       |       | 351 (281-421) |
|                    |   |                                |           |         | RPM        | 10727          | 8581  | 7151  | 6129          |
|                    |   |                                |           |         | FZ         | .0002          | .0003 | .0004 | .0005         |
|                    |   | Slotting<br>                   | 1 (0.8)   | 1       | SFM (VC)   | 351 (281-422)  |       |       | 351 (281-421) |
|                    |   |                                |           |         | RPM        | 10727          | 8581  | 7151  | 6129          |
|                    |   |                                |           |         | FZ         | .0002          | .0003 | .0004 | .0005         |
| P <380             | TOOL STEEL<br>A2, D2, H13, P20, T15           | Side Cutting<br>               | 1.5 (1.2) | 0.5     | SFM (VC)   | 210 (168-252)  |       |       |               |
|                    |   |                                |           |         | RPM        | 6418           | 5134  | 4278  | 3667          |
|                    |   |                                |           |         | FZ         | .0001          | .0002 | .0003 | .0004         |
|                    |   | Slotting<br>                   | 1 (0.8)   | 1       | SFM (VC)   | 210 (168-252)  |       |       |               |
|                    |   |                                |           |         | RPM        | 6418           | 5134  | 4278  | 3667          |
|                    |   |                                |           |         | FZ         | .0001          | .0002 | .0003 | .0004         |
| K <260             | CAST IRON<br>GRAY, MALLEABLE, DUCTILE         | Side Cutting<br>               | 1.5 (1.2) | 0.5     | SFM (VC)   | 367 (294-440)  |       |       |               |
|                    |   |                                |           |         | RPM        | 11216          | 8972  | 7477  | 6409          |
|                    |   |                                |           |         | FZ         | .0002          | .0004 | .0006 | .0007         |
|                    |   | Slotting<br>                   | 1 (0.8)   | 1       | SFM (VC)   | 367 (294-440)  |       |       |               |
|                    |   |                                |           |         | RPM        | 11216          | 8972  | 7477  | 6409          |
|                    |   |                                |           |         | FZ         | .0002          | .0004 | .0006 | .0007         |

RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth

- NOTES:**
- ▶ Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
  - ▶ The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
  - ▶ In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%
  - ▶ Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2% x D1



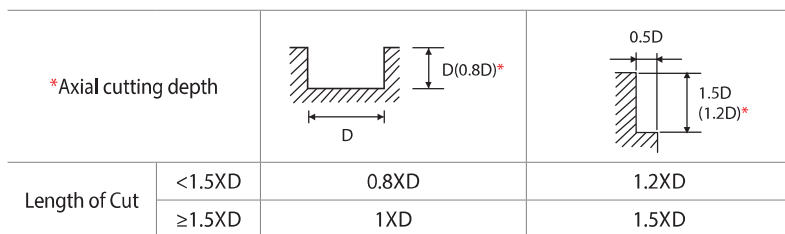
**CARBIDE, 4 FLUTE - INCH**

**UGMF68, UGMF69, UGMF70, UGMF71, UGMF72, UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES**

| Diameter (in.) |               |               |               |               |               |               |       |       |       |
|----------------|---------------|---------------|---------------|---------------|---------------|---------------|-------|-------|-------|
| 1/4            | 9/32          | 5/16          | 11/32         | 3/8           | 7/16          | 1/2           | 5/8   | 3/4   | 1     |
| 499 (400-599)  | 499 (400-598) | 499 (400-599) | 525 (420-630) | 551 (441-662) | 551 (441-661) | 551 (441-662) |       |       |       |
| 7625           | 6778          | 6100          | 5834          | 5613          | 4811          | 4210          | 3368  | 2806  | 2105  |
| .0006          | .0008         | .0011         | .0013         | .0015         | .0017         | .0019         | .0021 | .0026 | .0025 |
| 19.21          | 22.95         | 25.94         | 29.86         | 33.59         | 32.20         | 31.16         | 28.11 | 28.73 | 21.21 |
| 499 (400-599)  | 499 (400-598) | 499 (400-599) | 525 (420-630) | 551 (441-662) | 551 (441-661) | 551 (441-662) |       |       |       |
| 7625           | 6778          | 6100          | 5834          | 5613          | 4811          | 4210          | 3368  | 2806  | 2105  |
| .0006          | .0008         | .0011         | .0013         | .0015         | .0017         | .0019         | .0021 | .0026 | .0025 |
| 19.21          | 22.95         | 25.94         | 29.86         | 33.59         | 32.20         | 31.16         | 28.11 | 28.73 | 21.21 |
| 351 (281-422)  | 351 (281-421) | 351 (281-422) | 368 (295-441) | 384 (308-461) | 384 (308-460) | 384 (308-461) |       |       |       |
| 5363           | 4767          | 4291          | 4089          | 3912          | 3353          | 2934          | 2347  | 1956  | 1467  |
| .0006          | .0008         | .0011         | .0013         | .0015         | .0017         | .0019         | .0021 | .0026 | .0025 |
| 13.51          | 16.14         | 18.24         | 20.93         | 23.41         | 22.44         | 21.71         | 19.59 | 20.02 | 14.78 |
| 351 (281-422)  | 351 (281-421) | 351 (281-422) | 368 (295-441) | 384 (308-461) | 384 (308-460) | 384 (308-461) |       |       |       |
| 5363           | 4767          | 4291          | 4089          | 3912          | 3353          | 2934          | 2347  | 1956  | 1467  |
| .0006          | .0008         | .0011         | .0013         | .0015         | .0017         | .0019         | .0021 | .0023 | .0025 |
| 13.51          | 16.14         | 18.24         | 20.93         | 23.41         | 22.44         | 21.71         | 19.59 | 18.17 | 14.78 |
| 210 (168-252)  |               |               | 220 (176-264) |               | 230 (184-276) |               |       |       |       |
| 3209           | 2852          | 2567          | 2445          | 2343          | 2008          | 1757          | 1406  | 1171  | 879   |
| .0004          | .0006         | .0007         | .0009         | .0011         | .0012         | .0013         | .0015 | .0018 | .0018 |
| 5.56           | 6.74          | 7.68          | 8.86          | 9.96          | 9.33          | 8.86          | 8.19  | 8.30  | 6.23  |
| 210 (168-252)  |               |               | 220 (176-264) |               | 230 (184-276) |               |       |       |       |
| 3209           | 2852          | 2567          | 2445          | 2343          | 2008          | 1757          | 1406  | 1171  | 879   |
| .0004          | .0006         | .0007         | .0009         | .0011         | .0012         | .0013         | .0015 | .0018 | .0018 |
| 5.56           | 6.74          | 7.68          | 8.86          | 9.96          | 9.33          | 8.86          | 8.19  | 8.30  | 6.23  |
| 367 (294-440)  |               |               | 386 (309-463) |               | 404 (324-484) |               |       |       |       |
| 5608           | 4985          | 4486          | 4290          | 4115          | 3527          | 3087          | 2469  | 2058  | 1543  |
| .0008          | .0011         | .0013         | .0016         | .0019         | .0021         | .0023         | .0026 | .0032 | .0031 |
| 17.66          | 21.19         | 24.02         | 27.70         | 31.11         | 29.44         | 28.19         | 25.28 | 26.25 | 19.20 |
| 367 (294-440)  |               |               | 386 (309-463) |               | 404 (324-484) |               |       |       |       |
| 5608           | 4985          | 4486          | 4290          | 4115          | 3527          | 3087          | 2469  | 2058  | 1543  |
| .0008          | .0011         | .0013         | .0016         | .0019         | .0021         | .0023         | .0026 | .0032 | .0031 |
| 17.66          | 21.19         | 24.02         | 27.70         | 31.11         | 29.44         | 28.19         | 25.28 | 26.25 | 19.20 |

RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth

NEXT PAGE ►





**CARBIDE, 4 FLUTE - INCH**

**UGMF68, UGMF69, UGMF70, UGMF71, UGMF72, UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES**

CBN  
END MILLS

i-Xmill  
END MILLS

i-SMART  
MODULAR  
TYPE END MILLS

X5070  
END MILLS

4G MILL  
END MILLS

X-POWER  
END MILLS

JET-POWER  
END MILLS

TitaNox  
-POWER  
END MILLS

**V7 PLUS A  
END MILLS**

V7 MILL INOX  
END MILLS

ALU-POWER  
HPC  
END MILLS

ALU-POWER  
END MILLS

D-POWER  
GRAPHITE  
END MILLS

D-POWER  
CFRP  
END MILLS

ROUTERS  
CFRP

STANDARD  
CARBIDE  
END MILLS

ONLY ONE  
COATED PM60  
END MILLS

SINE -POWER  
END MILLS

TANK-POWER  
END MILLS

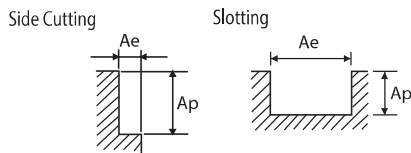
STANDARD  
COBALT & HSS  
END MILLS

TECHNICAL  
DATA

| ISO Hardness (BHN) | Work Materials  | Speed And Feed Recommendations |              |         |            | Diameter (in.) |       |       |       |
|--------------------|---|--------------------------------|--------------|---------|------------|----------------|-------|-------|-------|
|                    |   | Type Of Cut                    | Ap x D1      | Ae x D1 | Parameters | 1/8            | 5/32  | 3/16  | 7/32  |
| M                  | STAINLESS STEELS 300<br>304, 316, 304L,<br>316LSUS316       | Side Cutting<br>               | 1.5<br>(1.2) | 0.5     | SFM (VC)   | 348 [279-417]  |       |       |       |
|                    |   |                                |              |         | RPM        | 10635          | 8508  | 7090  | 6077  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0005 | .0006 |
|                    |   | Slotting<br>                   | 1<br>(0.8)   | 1       | SFM (VC)   | 348 [279-417]  |       |       |       |
|                    |   |                                |              |         | RPM        | 10635          | 8508  | 7090  | 6077  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0005 | .0006 |
| M                  | STAINLESS STEELS 400<br>416, 420F, 430F, 440F               | Side Cutting<br>               | 1.5<br>(1.2) | 0.5     | SFM (VC)   | 486 [389-583]  |       |       |       |
|                    |   |                                |              |         | RPM        | 14852          | 11882 | 9901  | 8487  |
|                    |   |                                |              |         | FZ         | .0002          | .0002 | .0004 | .0004 |
|                    |   | Slotting<br>                   | 1<br>(0.8)   | 1       | SFM (VC)   | 486 [389-583]  |       |       |       |
|                    |   |                                |              |         | RPM        | 14852          | 11882 | 9901  | 8487  |
|                    |   |                                |              |         | FZ         | .0002          | .0002 | .0004 | .0004 |
| M                  | STAINLESS STEELS (PH)<br>17-4PH, 15-5PH, 13-8PH             | Side Cutting<br>               | 1.5<br>(1.2) | 0.5     | SFM (VC)   | 312 [250-374]  |       |       |       |
|                    |   |                                |              |         | RPM        | 9535           | 7628  | 6356  | 5448  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0005 | .0006 |
|                    |   | Slotting<br>                   | 1<br>(0.8)   | 1       | SFM (VC)   | 312 [250-374]  |       |       |       |
|                    |   |                                |              |         | RPM        | 9535           | 7628  | 6356  | 5448  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0005 | .0006 |
| S                  | TITANIUM<br>Ti6AL4V,<br>Ti5AL5V5MO,<br>Ti7AL4MO             | Side Cutting<br>               | 1            | 0.35    | SFM (VC)   | 190 [152-228]  |       |       |       |
|                    |   |                                |              |         | RPM        | 5806           | 4645  | 3871  | 3318  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0004 | .0005 |
|                    |   | Slotting<br>                   | 0.5          | 1       | SFM (VC)   | 190 [152-228]  |       |       |       |
|                    |   |                                |              |         | RPM        | 5806           | 4645  | 3871  | 3318  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0004 | .0005 |
| S                  | HIGH-TEMPERATURE<br>ALLOY<br>INCONEL,<br>HASTALLOY,<br>RENE | Side Cutting<br>               | 1            | 0.25    | SFM (VC)   | 85 [68-102]    |       |       |       |
|                    |   |                                |              |         | RPM        | 2598           | 2078  | 1732  | 1484  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0003 | .0004 |
|                    |   | Slotting<br>                   | 0.5          | 1       | SFM (VC)   | 85 [68-102]    |       |       |       |
|                    |   |                                |              |         | RPM        | 2598           | 2078  | 1732  | 1484  |
|                    |   |                                |              |         | FZ         | .0002          | .0003 | .0003 | .0004 |

RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth

- NOTES:**
- ▶ Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
  - ▶ The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
  - ▶ In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%
  - ▶ Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2% x D1



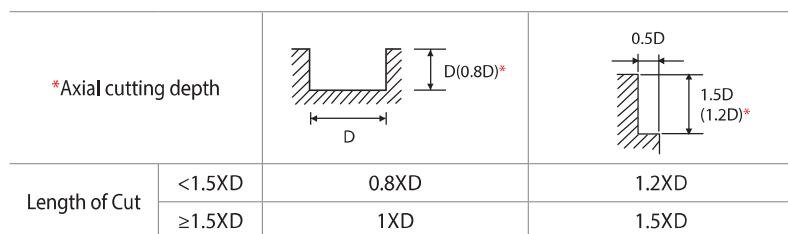


## CARBIDE, 4 FLUTE - INCH

### UGMF68, UGMF69, UGMF70, UGMF71, UGMF72, UGMF73, UGMF74, UGMF75, UGMF76, UGMF77 SERIES

| Diameter (in.) |       |       |       |       |       |       |       |       |       |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1/4            | 9/32  | 5/16  | 11/32 | 3/8   | 7/16  | 1/2   | 5/8   | 3/4   | 1     |
| 348 (279-417)  |       |       |       |       |       |       |       |       |       |
| 5317           | 4727  | 4254  | 3867  | 3545  | 3039  | 2659  | 2127  | 1772  | 1329  |
| .0007          | .0009 | .0011 | .0015 | .0019 | .0020 | .0022 | .0024 | .0030 | .0030 |
| 15.07          | 17.12 | 18.76 | 23.14 | 26.80 | 24.64 | 23.03 | 20.77 | 21.49 | 16.12 |
| 348 (279-417)  |       |       |       |       |       |       |       |       |       |
| 5317           | 4727  | 4254  | 3867  | 3545  | 3039  | 2659  | 2127  | 1772  | 1329  |
| .0007          | .0009 | .0011 | .0015 | .0019 | .0020 | .0022 | .0024 | .0030 | .0030 |
| 15.07          | 17.12 | 18.76 | 23.14 | 26.80 | 24.64 | 23.03 | 20.77 | 21.49 | 16.12 |
| 486 (389-583)  |       |       |       |       |       |       |       |       |       |
| 7426           | 6601  | 5941  | 5401  | 4951  | 4243  | 3713  | 2970  | 2475  | 1857  |
| .0005          | .0007 | .0009 | .0011 | .0013 | .0014 | .0015 | .0018 | .0022 | .0022 |
| 15.20          | 18.48 | 20.58 | 23.81 | 26.51 | 24.39 | 22.80 | 21.05 | 21.44 | 16.08 |
| 486 (389-583)  |       |       |       |       |       |       |       |       |       |
| 7426           | 6601  | 5941  | 5401  | 4951  | 4243  | 3713  | 2970  | 2475  | 1857  |
| .0005          | .0007 | .0009 | .0011 | .0013 | .0014 | .0015 | .0018 | .0022 | .0022 |
| 15.20          | 18.19 | 20.58 | 23.81 | 26.51 | 24.39 | 22.80 | 21.05 | 21.44 | 16.08 |
| 312 (250-374)  |       |       |       |       |       |       |       |       |       |
| 4767           | 4238  | 3814  | 3467  | 3178  | 2724  | 2384  | 1907  | 1589  | 1192  |
| .0007          | .0009 | .0011 | .0015 | .0019 | .0020 | .0022 | .0024 | .0030 | .0030 |
| 13.51          | 15.35 | 16.82 | 20.75 | 24.02 | 22.09 | 20.65 | 18.62 | 19.02 | 14.26 |
| 312 (250-374)  |       |       |       |       |       |       |       |       |       |
| 4767           | 4238  | 3814  | 3467  | 3178  | 2724  | 2384  | 1907  | 1589  | 1192  |
| .0007          | .0009 | .0011 | .0015 | .0019 | .0020 | .0022 | .0024 | .0030 | .0030 |
| 13.51          | 15.35 | 16.82 | 20.75 | 24.02 | 22.09 | 20.65 | 18.62 | 19.02 | 14.26 |
| 190 (152-228)  |       |       |       |       |       |       |       |       |       |
| 2903           | 2581  | 2323  | 2111  | 1935  | 1659  | 1452  | 1161  | 968   | 726   |
| .0006          | .0008 | .0010 | .0013 | .0017 | .0018 | .0020 | .0022 | .0027 | .0027 |
| 7.32           | 8.33  | 9.14  | 11.14 | 12.80 | 12.02 | 11.43 | 10.06 | 10.36 | 7.89  |
| 190 (152-228)  |       |       |       |       |       |       |       |       |       |
| 2903           | 2581  | 2323  | 2111  | 1935  | 1659  | 1452  | 1161  | 968   | 726   |
| .0006          | .0008 | .0010 | .0013 | .0017 | .0018 | .0020 | .0022 | .0027 | .0027 |
| 7.32           | 8.33  | 9.14  | 11.14 | 12.80 | 12.02 | 11.43 | 10.06 | 10.36 | 7.89  |
| 85 (68-102)    |       |       |       |       |       |       |       |       |       |
| 1299           | 1154  | 1039  | 945   | 866   | 742   | 649   | 520   | 433   | 325   |
| .0005          | .0006 | .0007 | .0010 | .0013 | .0014 | .0015 | .0017 | .0021 | .0020 |
| 2.45           | 2.82  | 3.11  | 3.87  | 4.50  | 4.15  | 3.89  | 3.52  | 3.68  | 2.66  |
| 85 (68-102)    |       |       |       |       |       |       |       |       |       |
| 1299           | 1154  | 1039  | 945   | 866   | 742   | 649   | 520   | 433   | 325   |
| .0005          | .0006 | .0007 | .0010 | .0013 | .0014 | .0015 | .0017 | .0021 | .0020 |
| 2.45           | 2.82  | 3.11  | 3.87  | 4.50  | 4.15  | 3.89  | 3.52  | 3.68  | 2.66  |

RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth





**CARBIDE, 4 FLUTE - METRIC**

**GMF52, GMF53, GMF54, GMF55, GMF56, GMF57, GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES**

CBN  
END MILLS

i-Xmill  
END MILLS

i-SMART  
MODULAR  
TYPE END MILLS

X5070  
END MILLS

4G MILL  
END MILLS

X-POWER  
END MILLS

JET-POWER  
END MILLS

TitaNox  
-POWER  
END MILLS

**V7 PLUS A  
END MILLS**

V7 MILL INOX  
END MILLS

ALU-POWER  
HPC  
END MILLS

ALU-POWER  
END MILLS

D-POWER  
GRAPHITE  
END MILLS

D-POWER  
CFRP  
END MILLS

ROUTERS  
CFRP

STANDARD  
CARBIDE  
END MILLS

ONLY ONE  
COATED PM60  
END MILLS

SINE -POWER  
END MILLS

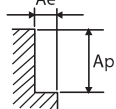
TANK-POWER  
END MILLS

STANDARD  
COBALT & HSS  
END MILLS

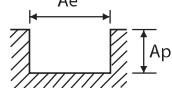
TECHNICAL  
DATA

| ISO Hardness (BHN) | Work Materials   | Type of Cut      | Ap x D1   | Ae x D1 | Parameters | Diameter (mm) |       |       |       |       |               |       |       |       |       |       |       |
|--------------------|--|------------------|-----------|---------|------------|---------------|-------|-------|-------|-------|---------------|-------|-------|-------|-------|-------|-------|
|                    |  |                  |           |         |            | 3             | 4     | 5     | 6     | 8     | 10            | 12    | 14    | 16    | 18    | 20    | 25    |
| P <300             | CARBON STEEL<br>1.1191 (C45)<br>1.0726 (35 S 20)<br>1.0715 (9 SMN 28)<br>1.0718 (9 SMNPB 28)   | Side Cutting<br> | 1.5 (1.2) | 0.5     | SFM (VC)   | 499 (399-598) |       |       |       |       | 551 (441-661) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 16128         | 12096 | 9677  | 8064  | 6048  | 5348          | 4456  | 3820  | 3342  | 2971  | 2674  | 2139  |
|                    |  |                  |           |         | Fz         | .0002         | .0003 | .0004 | .0006 | .0011 | .0015         | .0019 | .0019 | .0021 | .0023 | .0026 | .0025 |
|                    |  | Slotting<br>     | 1 (0.8)   | 1       | SFM (VC)   | 499 (399-598) |       |       |       |       | 551 (441-661) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 16128         | 12096 | 9677  | 8064  | 6048  | 5348          | 4456  | 3820  | 3342  | 2971  | 2674  | 2139  |
|                    |  |                  |           |         | FEED       | 12.70         | 15.24 | 16.76 | 20.32 | 25.72 | 32.00         | 32.98 | 29.47 | 27.90 | 27.60 | 27.37 | 21.56 |
| P >300<br>P <380   | ALLOY STEEL<br>1.2330 (35 CRMO 4)<br>1.6565 (40NICRMO6)<br>1.7033 (34CR4)<br>1.6523 (21 NICRMO2)                                     | Side Cutting<br> | 1.5 (1.2) | 0.5     | SFM (VC)   | 351 (281-421) |       |       |       |       | 384 (307-461) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 11353         | 8515  | 6812  | 5677  | 4257  | 3724          | 3104  | 2660  | 2328  | 2069  | 1862  | 1490  |
|                    |  |                  |           |         | FZ         | .0002         | .0003 | .0004 | .0006 | .0011 | .0015         | .0019 | .0019 | .0021 | .0023 | .0026 | .0025 |
|                    |  | Slotting<br>     | 1 (0.8)   | 1       | SFM (VC)   | 351 (281-421) |       |       |       |       | 384 (307-461) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 11353         | 8515  | 6812  | 5677  | 4257  | 3724          | 3104  | 2660  | 2328  | 2069  | 1862  | 1490  |
|                    |  |                  |           |         | FEED       | 8.94          | 10.73 | 11.80 | 14.30 | 18.10 | 22.29         | 22.97 | 20.53 | 19.43 | 19.22 | 19.06 | 15.01 |
| P <380             | TOOL STEEL<br>1.2363 (X100 CRMOV 5 1)<br>1.2379 (X155 CRVMO 12 1)<br>1.2344 (X40 CRMOV 5 1)<br>1.3243 (S 6-5-2-5)                    | Side Cutting<br> | 1.5 (1.2) | 0.5     | SFM (VC)   | 210 (168-252) |       |       |       |       | 230 (184-276) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 6791          | 5093  | 4074  | 3395  | 2546  | 2228          | 1857  | 1592  | 1393  | 1238  | 1114  | 891   |
|                    |  |                  |           |         | FZ         | .0001         | .0002 | .0003 | .0004 | .0007 | .0011         | .0013 | .0013 | .0015 | .0016 | .0018 | .0018 |
|                    |  | Slotting<br>     | 1 (0.8)   | 1       | SFM (VC)   | 210 (168-252) |       |       |       |       | 230 (184-276) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 6791          | 5093  | 4074  | 3395  | 2546  | 2228          | 1857  | 1592  | 1393  | 1238  | 1114  | 891   |
|                    |  |                  |           |         | FEED       | 3.21          | 4.81  | 5.13  | 5.88  | 7.62  | 9.47          | 9.36  | 8.52  | 8.11  | 7.99  | 7.90  | 6.32  |
| K < 260            | CAST IRON<br>0.6020 (GG20)<br>0.8145 (GTS-45-06)<br>0.7060 (GGG-60)  | Side Cutting<br> | 1.5 (1.2) | 0.5     | SFM (VC)   | 367 (294-441) |       |       |       |       | 404 (323-484) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 11884         | 8913  | 7130  | 5942  | 4456  | 3915          | 3263  | 2797  | 2447  | 2175  | 1958  | 1566  |
|                    |  |                  |           |         | FZ         | .0002         | .0004 | .0006 | .0008 | .0013 | .0019         | .0023 | .0024 | .0026 | .0029 | .0032 | .0031 |
|                    |  | Slotting<br>     | 1 (0.8)   | 1       | SFM (VC)   | 367 (294-441) |       |       |       |       | 404 (323-484) |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 11884         | 8913  | 7130  | 5942  | 4456  | 3915          | 3263  | 2797  | 2447  | 2175  | 1958  | 1566  |
|                    |  |                  |           |         | FEED       | 11.23         | 14.04 | 15.72 | 18.71 | 23.86 | 29.60         | 29.80 | 26.86 | 25.05 | 25.01 | 24.97 | 19.48 |
| M                  | STAINLESS STEELS 300<br>1.4301 (X5 CRNI 18 10)<br>1.4436 (X3 CRNIMO 17 13 3)<br>1.4306 (X2 CRNI 19 11)<br>1.4435 (X2 CRNIMO 18 14 3) | Side Cutting<br> | 1.5 (1.2) | 0.5     | SFM (VC)   | 348 (278-417) |       |       |       |       |               |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 11247         | 8435  | 6748  | 5623  | 4218  | 3374          | 2812  | 2410  | 2109  | 1874  | 1687  | 1350  |
|                    |  |                  |           |         | FZ         | .0002         | .0003 | .0005 | .0007 | .0011 | .0019         | .0022 | .0023 | .0024 | .0028 | .0030 | .0030 |
|                    |  | Slotting<br>     | 1 (0.8)   | 1       | SFM (VC)   | 348 (278-417) |       |       |       |       |               |       |       |       |       |       |       |
|                    |  |                  |           |         | RPM        | 11247         | 8435  | 6748  | 5623  | 4218  | 3374          | 2812  | 2410  | 2109  | 1874  | 1687  | 1350  |
|                    |  |                  |           |         | FEED       | 8.86          | 10.63 | 13.82 | 15.94 | 18.60 | 25.50         | 24.35 | 22.39 | 20.59 | 20.66 | 20.46 | 16.37 |

Side Cutting



Slotting



RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth

CHART CONTINUES ON NEXT PAGE ▶

**CARBIDE, 4 FLUTE - METRIC**

**GMF52, GMF53, GMF54, GMF55, GMF56, GMF57, GMF58, GMF59, GMF60, GMF61, GMF62, GMF63 SERIES**

| ISO Hardness (BHN) | Work Materials   | Speed and Feed Recommendations |           |         |            | Diameter (mm) |       |       |       |       |       |       |       |       |       |       |       |
|--------------------|--|--------------------------------|-----------|---------|------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                    |  | Type of Cut                    | Ap x D1   | Ae x D1 | Parameters | 3             | 4     | 5     | 6     | 8     | 10    | 12    | 14    | 16    | 18    | 20    | 25    |
| M                  | STAINLESS STEELS 400<br>1.4005 (X12 CRS 13)<br>1.4104 (X12 CRMOS 17) | Side Cutting<br>               | 1.5 (1.2) | 0.5     | SFM (VC)   | 486 (388-583) |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 15703         | 11777 | 9422  | 7852  | 5889  | 4711  | 3926  | 3365  | 2944  | 2617  | 2355  | 1884  |
|                    |  |                                |           |         | FZ         | .0002         | .0002 | .0004 | .0005 | .0009 | .0013 | .0015 | .0017 | .0018 | .0020 | .0022 | .0022 |
|                    |  | FEED                           | 9.89      | 11.13   | 13.35      | 16.07         | 20.40 | 25.22 | 24.11 | 22.26 | 20.87 | 20.61 | 20.40 | 16.32 |       |       |       |
|                    |  | Slotting<br>                   | 1 (0.8)   | 1       | SFM (VC)   | 486 (388-583) |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 15703         | 11777 | 9422  | 7852  | 5889  | 4711  | 3926  | 3365  | 2944  | 2617  | 2355  | 1884  |
| FZ                 | .0002  |                                |           |         | .0002      | .0004         | .0005 | .0009 | .0013 | .0015 | .0017 | .0018 | .0020 | .0022 | .0022 |       |       |
| FEED               | 9.89   | 11.13                          | 13.35     | 16.07   | 20.40      | 25.22         | 24.11 | 22.26 | 20.87 | 20.61 | 20.40 | 16.32 |       |       |       |       |       |
| M                  | STAINLESS STEELS (PH)<br>1.4594 (Z7 CNU 15.05)                       | Side Cutting<br>               | 1.5 (1.2) | 0.5     | SFM (VC)   | 312 (249-374) |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 10080         | 7560  | 6048  | 5040  | 3780  | 3024  | 2520  | 2160  | 1890  | 1680  | 1512  | 1210  |
|                    |  |                                |           |         | FZ         | .0002         | .0003 | .0005 | .0007 | .0011 | .0019 | .0022 | .0023 | .0024 | .0027 | .0030 | .0030 |
|                    |  | FEED                           | 7.94      | 9.52    | 12.38      | 14.29         | 16.67 | 22.86 | 21.83 | 20.07 | 18.45 | 18.25 | 18.10 | 14.48 |       |       |       |
|                    |  | Slotting<br>                   | 1 (0.8)   | 1       | SFM (VC)   | 312 (249-374) |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 10080         | 7560  | 6048  | 5040  | 3780  | 3024  | 2520  | 2160  | 1890  | 1680  | 1512  | 1210  |
| FZ                 | .0002  |                                |           |         | .0003      | .0005         | .0007 | .0011 | .0019 | .0022 | .0023 | .0024 | .0027 | .0030 | .0030 |       |       |
| FEED               | 7.94   | 9.52                           | 12.38     | 14.29   | 16.67      | 22.86         | 21.83 | 20.07 | 18.45 | 18.25 | 18.10 | 14.48 |       |       |       |       |       |
| S                  | TITANIUM<br>Ti6AL4V<br>Ti5AL5V5MO<br>Ti7AL4MO                        | Side Cutting<br>               | 1         | 0.35    | SFM (VC)   | 190 (152-228) |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 6154          | 4615  | 3692  | 3077  | 2308  | 1846  | 1538  | 1319  | 1154  | 1026  | 923   | 738   |
|                    |  |                                |           |         | FZ         | .0002         | .0003 | .0004 | .0006 | .0010 | .0017 | .0020 | .0021 | .0022 | .0024 | .0027 | .0027 |
|                    |  | FEED                           | 3.88      | 5.09    | 6.40       | 7.75          | 9.09  | 12.21 | 12.11 | 11.01 | 9.99  | 10.01 | 9.89  | 8.02  |       |       |       |
|                    |  | Slotting<br>                   | 0.5       | 1       | SFM (VC)   | 190 (152-228) |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 6154          | 4615  | 3692  | 3077  | 2308  | 1846  | 1538  | 1319  | 1154  | 1026  | 923   | 738   |
| FZ                 | .0002  |                                |           |         | .0003      | .0004         | .0006 | .0010 | .0017 | .0020 | .0021 | .0022 | .0024 | .0027 | .0027 |       |       |
| FEED               | 3.88   | 5.09                           | 6.40      | 7.75    | 9.09       | 12.21         | 12.11 | 11.01 | 9.99  | 10.01 | 9.89  | 8.02  |       |       |       |       |       |
| S                  | HIGH-TEMPERATURE ALLOY<br>INCONEL<br>HASTALLOY<br>RENE               | Side Cutting<br>               | 1         | 0.25    | SFM (VC)   | 85 (68-102)   |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 2759          | 2069  | 1655  | 1379  | 1035  | 828   | 690   | 591   | 517   | 460   | 414   | 331   |
|                    |  |                                |           |         | FZ         | .0002         | .0003 | .0003 | .0005 | .0007 | .0013 | .0015 | .0016 | .0017 | .0019 | .0021 | .0020 |
|                    |  | FEED                           | 2.17      | 2.28    | 2.09       | 2.61          | 3.10  | 4.30  | 4.13  | 3.72  | 3.50  | 3.48  | 3.52  | 2.71  |       |       |       |
|                    |  | Slotting<br>                   | 0.5       | 1       | SFM (VC)   | 85 (68-102)   |       |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |           |         | RPM        | 2759          | 2069  | 1655  | 1379  | 1035  | 828   | 690   | 591   | 517   | 460   | 414   | 331   |
| FZ                 | .0002  |                                |           |         | .0003      | .0003         | .0005 | .0007 | .0013 | .0015 | .0016 | .0017 | .0019 | .0021 | .0020 |       |       |
| FEED               | 2.17   | 2.28                           | 2.09      | 2.61    | 3.10       | 4.30          | 4.13  | 3.72  | 3.50  | 3.48  | 3.52  | 2.71  |       |       |       |       |       |

RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth

|                      |        |             |        |
|----------------------|--------|-------------|--------|
| *Axial cutting depth |        | $D(0.8D)^*$ | $0.5D$ |
| Length of Cut        | <1.5XD | 0.8XD       | 1.2XD  |
|                      | ≥1.5XD | 1XD         | 1.5XD  |

**NOTES:**

- \* Feed to be reduced by approximately 50% if L.O.C. (Length Of Cut) is over 3xD
- \* The above recommendations are based on ideal conditions; for smaller taper machining centers or less rigid conditions please adjust parameters accordingly on diameters greater than 1/2"
- \* In profile operations, engaging more than 2xD, reduce the radial depth of cut by 50%-60%
- \* Finish cuts typically require reduced cutting feeds and speeds; also, it is recommended the radial width of cut (AE) should not exceed 2% x D1



**CARBIDE, 4 FLUTE - INCH**

**UGMG53, UGMG54, UGMH10 SERIES**

CBN  
END MILLS

i-Xmill  
END MILLS

i-SMART  
MODULAR  
TYPE END MILLS

X5070  
END MILLS

4G MILL  
END MILLS

X-POWER  
END MILLS

JET-POWER  
END MILLS

TitaNox  
-POWER  
END MILLS

V7 PLUS A  
END MILLS

V7 MILL INOX  
END MILLS

ALU-POWER  
HPC  
END MILLS

ALU-POWER  
END MILLS

D-POWER  
GRAPHITE  
END MILLS

D-POWER  
CFRP  
END MILLS

ROUTERS  
CFRP

STANDARD  
CARBIDE  
END MILLS

ONLY ONE  
COATED PM60  
END MILLS

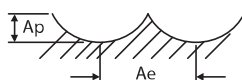
SINE -POWER  
END MILLS

TANK-POWER  
END MILLS

STANDARD  
COBALT & HSS  
END MILLS

TECHNICAL  
DATA

| ISO Hardness (BHN) | Work Materials                                     | Type of Cut | Speed and Feed Recommendations |         |            |               | Diameter (in.) |       |       |       |       |       |       |       |       |       |
|--------------------|--|-------------|--------------------------------|---------|------------|---------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                    |  |             | Ap x D1                        | Ae x D1 | Parameters | 1/8           | 3/16           | 13/64 | 1/4   | 5/16  | 3/8   | 1/2   | 5/8   | 11/16 | 3/4   | 1     |
| P <300             | CARBON STEEL<br>10**, 11**, 12**, 12L**, 15**      |             | 1                              | 0.5     | SFM (VC)   | 531 (425-637) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 16227         | 10818          | 9986  | 8114  | 6491  | 5409  | 4057  | 3245  | 2950  | 2705  | 2028  |
|                    |  |             |                                |         | Fz         | .0010         | .0011          | .0012 | .0016 | .0024 | .0026 | .0028 | .0030 | .0031 | .0035 | .0039 |
|                    |  |             |                                |         | FEED       | 63.89         | 46.00          | 47.18 | 51.11 | 61.33 | 55.37 | 44.72 | 38.33 | 37.17 | 38.33 | 31.62 |
| P >300<br>P <380   | ALLOY STEEL<br>41**, 43**, 51**, 86**              |             | 1                              | 0.5     | SFM (VC)   | 371 (297-445) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 11338         | 7559           | 6977  | 5669  | 4535  | 3779  | 2834  | 2268  | 2061  | 1890  | 1417  |
|                    |  |             |                                |         | Fz         | .0010         | .0011          | .0012 | .0016 | .0024 | .0026 | .0028 | .0029 | .0031 | .0035 | .0039 |
|                    |  |             |                                |         | FEED       | 44.64         | 32.14          | 32.96 | 35.71 | 42.85 | 38.69 | 31.25 | 26.43 | 25.65 | 26.78 | 22.10 |
| P <380             | TOOL STEEL<br>A2, D2, H13, P20, T15                |             | 1                              | 0.5     | SFM (VC)   | 223 (178-268) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 6815          | 4543           | 4194  | 3407  | 2726  | 2272  | 1704  | 1363  | 1239  | 1136  | 852   |
|                    |  |             |                                |         | Fz         | .0007         | .0007          | .0008 | .0011 | .0017 | .0018 | .0019 | .0020 | .0022 | .0025 | .0028 |
|                    |  |             |                                |         | FEED       | 18.24         | 13.59          | 13.87 | 15.02 | 18.03 | 16.10 | 13.15 | 11.16 | 10.93 | 11.27 | 9.39  |
| K <260             | CAST IRON<br>GRAY, MALLEABLE, DUCTILE              |             | 1                              | 0.5     | SFM (VC)   | 390 (312-468) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 11918         | 7946           | 7334  | 5959  | 4767  | 3973  | 2980  | 2384  | 2167  | 1986  | 1490  |
|                    |  |             |                                |         | Fz         | .0012         | .0013          | .0015 | .0020 | .0029 | .0032 | .0034 | .0037 | .0039 | .0044 | .0049 |
|                    |  |             |                                |         | FEED       | 58.18         | 41.29          | 42.74 | 46.92 | 55.56 | 50.68 | 40.82 | 34.91 | 33.78 | 35.04 | 29.09 |
| M                  | STAINLESS STEELS 300<br>304, 316, 304L, 316LSUS316 |             | 1                              | 0.5     | SFM (VC)   | 279 (223-335) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 8526          | 5684           | 5247  | 4263  | 3410  | 2842  | 2132  | 1705  | 1550  | 1421  | 1066  |
|                    |  |             |                                |         | Fz         | .0008         | .0008          | .0010 | .0016 | .0018 | .0020 | .0022 | .0024 | .0025 | .0026 | .0027 |
|                    |  |             |                                |         | FEED       | 26.85         | 17.90          | 20.66 | 27.53 | 24.17 | 22.38 | 18.46 | 16.11 | 15.62 | 14.55 | 11.41 |
| M                  | STAINLESS STEELS 400<br>416, 420F, 430F, 440F      |             | 1                              | 0.5     | SFM (VC)   | 253 (202-304) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 7732          | 5154           | 4758  | 3866  | 3093  | 2577  | 1933  | 1546  | 1406  | 1289  | 966   |
|                    |  |             |                                |         | Fz         | .0006         | .0006          | .0010 | .0012 | .0016 | .0018 | .0020 | .0021 | .0023 | .0023 | .0023 |
|                    |  |             |                                |         | FEED       | 18.26         | 12.18          | 18.73 | 18.26 | 19.48 | 18.26 | 15.22 | 13.15 | 13.06 | 11.77 | 8.98  |
| M                  | STAINLESS STEELS (PH)<br>17-4PH, 15-5PH, 13-8PH    |             | 1                              | 0.5     | SFM (VC)   | 253 (202-304) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 7732          | 5154           | 4758  | 3866  | 3093  | 2577  | 1933  | 1546  | 1406  | 1289  | 966   |
|                    |  |             |                                |         | Fz         | .0008         | .0008          | .0010 | .0016 | .0018 | .0020 | .0022 | .0024 | .0025 | .0026 | .0027 |
|                    |  |             |                                |         | FEED       | 24.35         | 16.23          | 18.73 | 24.96 | 21.92 | 20.29 | 16.74 | 14.61 | 14.17 | 13.19 | 10.35 |
| S                  | TITANIUM<br>TI6AL4V, TI5AL5V5MO, TI7AL4MO          |             | 0.3                            | 0.5     | SFM (VC)   | 154 (123-185) |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 4706          | 3137           | 2896  | 2353  | 1882  | 1569  | 1177  | 941   | 856   | 784   | 588   |
|                    |  |             |                                |         | Fz         | .0007         | .0007          | .0009 | .0015 | .0016 | .0018 | .0019 | .0021 | .0023 | .0023 | .0024 |
|                    |  |             |                                |         | FEED       | 13.34         | 8.89           | 10.03 | 13.71 | 11.86 | 11.12 | 9.08  | 8.00  | 7.82  | 7.16  | 5.65  |
| S                  | HIGH-TEMPERATURE ALLOY<br>INCONEL, HASTALLOY, RENE |             | 0.3                            | 0.2     | SFM (VC)   | 69 (55-83)    |                |       |       |       |       |       |       |       |       |       |
|                    |  |             |                                |         | RPM        | 2109          | 1406           | 1298  | 1054  | 843   | 703   | 527   | 422   | 383   | 351   | 264   |
|                    |  |             |                                |         | Fz         | .0006         | .0006          | .0007 | .0011 | .0012 | .0014 | .0015 | .0017 | .0018 | .0018 | .0019 |
|                    |  |             |                                |         | FEED       | 4.65          | 3.10           | 3.47  | 4.65  | 4.12  | 3.87  | 3.15  | 2.79  | 2.72  | 2.49  | 1.99  |



RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth

**SEE NOTES ON NEXT PAGE**



**CARBIDE, 4 FLUTE - METRIC**

**UGMG55, UGMG56 SERIES**

CBN  
END MILLS

i-Xmill  
END MILLS

i-SMART  
MODULAR  
TYPE END MILLS

X5070  
END MILLS

4G MILL  
END MILLS

X-POWER  
END MILLS

JET-POWER  
END MILLS

TitaNox  
-POWER  
END MILLS

**V7 PLUS A  
END MILLS**

V7 MILL INOX  
END MILLS

ALU-POWER  
HPC  
END MILLS

ALU-POWER  
END MILLS

D-POWER  
GRAPHITE  
END MILLS

D-POWER  
CFRP  
END MILLS

ROUTERS  
CFRP

STANDARD  
CARBIDE  
END MILLS

ONLY ONE  
COATED PM60  
END MILLS

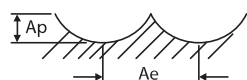
SINE -POWER  
END MILLS

TANK-POWER  
END MILLS

STANDARD  
COBALT & HSS  
END MILLS

TECHNICAL  
DATA

| ISO Hardness (BHN) | Work Materials   | Speed and Feed Recommendations |         |         |            | Diameter (mm) |       |       |       |       |       |       |       |       |       |       |
|--------------------|--|--------------------------------|---------|---------|------------|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                    |  | Type of Cut                    | Ap x D1 | Ae x D1 | Parameters | 3             | 4     | 5     | 6     | 8     | 10    | 12    | 16    | 18    | 20    | 25    |
| P < 300            | CARBON STEEL<br>10**, 11**<br>12**, 12L**, 15**          |                                | 1       | 0.5     | SFM (VC)   | 531 (425-638) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 17189         | 12892 | 10313 | 8594  | 6446  | 5157  | 4297  | 3223  | 2865  | 2578  | 2063  |
|                    |  |                                |         |         | Fz         | .0010         | .0011 | .0012 | .0016 | .0024 | .0026 | .0028 | .0030 | .0031 | .0035 | .0039 |
|                    |  |                                |         |         | FEED       | 67.67         | 54.81 | 48.72 | 54.14 | 60.90 | 52.78 | 47.37 | 38.07 | 36.09 | 36.54 | 32.16 |
| P > 300<br>P < 380 | ALLOY STEEL<br>41**, 43**,<br>51**, 86**                 |                                | 1       | 0.5     | SFM (VC)   | 371 (297-445) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 11990         | 8992  | 7194  | 5995  | 4496  | 3597  | 2997  | 2248  | 1998  | 1798  | 1439  |
|                    |  |                                |         |         | FZ         | .0010         | .0011 | .0012 | .0016 | .0024 | .0026 | .0028 | .0029 | .0031 | .0035 | .0039 |
|                    |  |                                |         |         | FEED       | 47.20         | 38.23 | 33.99 | 37.76 | 42.48 | 36.82 | 33.04 | 26.20 | 24.86 | 25.49 | 22.43 |
| P < 380            | TOOL STEEL<br>A2, D2, H13,<br>P20, T15                   |                                | 1       | 0.5     | SFM (VC)   | 223 (178-268) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 7215          | 5411  | 4329  | 3608  | 2706  | 2165  | 1804  | 1353  | 1203  | 1082  | 866   |
|                    |  |                                |         |         | FZ         | .0007         | .0007 | .0008 | .0011 | .0017 | .0018 | .0019 | .0020 | .0022 | .0025 | .0028 |
|                    |  |                                |         |         | FEED       | 19.32         | 16.19 | 14.32 | 15.91 | 17.90 | 15.34 | 13.92 | 11.08 | 10.60 | 10.74 | 9.54  |
| K < 260            | CAST IRON<br>GRAY, MALLEABLE,<br>DUCTILE                 |                                | 1       | 0.5     | SFM (VC)   | 390 (312-469) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 12626         | 9470  | 7576  | 6313  | 4735  | 3788  | 3157  | 2367  | 2104  | 1894  | 1515  |
|                    |  |                                |         |         | FZ         | .0012         | .0013 | .0015 | .0020 | .0029 | .0032 | .0034 | .0037 | .0039 | .0044 | .0049 |
|                    |  |                                |         |         | FEED       | 61.64         | 49.21 | 44.14 | 49.71 | 55.18 | 48.32 | 43.25 | 34.67 | 32.81 | 33.40 | 29.59 |
| M                  | STAINLESS STEELS<br>300<br>304, 316, 304L,<br>316LSUS316 |                                | 1       | 0.5     | SFM (VC)   | 279 (223-335) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 9019          | 6764  | 5411  | 4509  | 3382  | 2706  | 2255  | 1691  | 1503  | 1353  | 1082  |
|                    |  |                                |         |         | FZ         | .0008         | .0008 | .0010 | .0016 | .0018 | .0020 | .0022 | .0024 | .0025 | .0026 | .0027 |
|                    |  |                                |         |         | FEED       | 28.41         | 21.30 | 21.30 | 29.12 | 23.97 | 21.30 | 19.53 | 15.98 | 15.15 | 13.85 | 11.59 |
| M                  | STAINLESS STEELS<br>400<br>416, 420F,<br>430F, 440F      |                                | 1       | 0.5     | SFM (VC)   | 253 (202-303) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 8170          | 6127  | 4902  | 4085  | 3064  | 2451  | 2042  | 1532  | 1362  | 1225  | 980   |
|                    |  |                                |         |         | FZ         | .0006         | .0006 | .0010 | .0012 | .0016 | .0018 | .0020 | .0021 | .0023 | .0023 | .0023 |
|                    |  |                                |         |         | FEED       | 19.30         | 14.47 | 19.30 | 19.30 | 19.30 | 17.37 | 16.08 | 13.03 | 12.65 | 11.19 | 9.11  |
| M                  | STAINLESS STEELS<br>(PH)<br>17-4PH,<br>15-5PH, 13-8PH    |                                | 1       | 0.5     | SFM (VC)   | 253 (202-303) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 8170          | 6127  | 4902  | 4085  | 3064  | 2451  | 2042  | 1532  | 1362  | 1225  | 980   |
|                    |  |                                |         |         | FZ         | .0008         | .0008 | .0010 | .0016 | .0018 | .0020 | .0022 | .0024 | .0025 | .0026 | .0027 |
|                    |  |                                |         |         | FEED       | 25.73         | 19.30 | 19.30 | 26.38 | 21.71 | 19.30 | 17.69 | 14.47 | 13.72 | 12.54 | 10.50 |
| S                  | TITANIUM<br>Ti6AL4V<br>Ti5AL5V5MO<br>Ti7AL4MO            |                                | 0.3     | 0.5     | SFM (VC)   | 154 (123-185) |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 4987          | 3740  | 2992  | 2493  | 1870  | 1496  | 1247  | 935   | 831   | 748   | 598   |
|                    |  |                                |         |         | FZ         | .0007         | .0007 | .0009 | .0015 | .0016 | .0018 | .0019 | .0021 | .0023 | .0023 | .0024 |
|                    |  |                                |         |         | FEED       | 14.14         | 10.60 | 10.37 | 14.53 | 11.78 | 10.60 | 9.62  | 7.95  | 7.59  | 6.83  | 5.75  |
| S                  | HIGH-TEMPERATURE<br>ALLOY<br>INCONEL<br>HASTALLOY, RENE  |                                | 0.3     | 0.2     | SFM (VC)   | 69 (55-83)    |       |       |       |       |       |       |       |       |       |       |
|                    |  |                                |         |         | RPM        | 2228          | 1671  | 1337  | 1114  | 836   | 668   | 557   | 418   | 371   | 334   | 267   |
|                    |  |                                |         |         | FZ         | .0006         | .0006 | .0007 | .0011 | .0012 | .0014 | .0015 | .0017 | .0018 | .0018 | .0019 |
|                    |  |                                |         |         | FEED       | 4.91          | 3.68  | 3.58  | 4.91  | 4.08  | 3.68  | 3.33  | 2.76  | 2.63  | 2.37  | 2.02  |



RPM = rev./min. FEED = in./min.  
SFM = ft./min. FZ = in./tooth

**See notes on next page**