

## TAPPING SPEED GUIDE

| MATERIALS               |                                |                 | SPEED FEET PER MINUTE | MATERIALS                           |                         |           | SPEED FEET PER MINUTE |
|-------------------------|--------------------------------|-----------------|-----------------------|-------------------------------------|-------------------------|-----------|-----------------------|
| Aluminum Alloys         |                                |                 | 90-100                | (Steel, Cont.) Carbon Steel, Plain  | Annealed                | 40-80     |                       |
| Brass                   |                                |                 | 60-100                |                                     | Tempered                | 15-40     |                       |
| Bronze                  |                                |                 | 40-60                 | Cast, Carbon                        | Annealed                | 40-50     |                       |
| Copper                  |                                |                 | 40-60                 |                                     | Tempered                | 30        |                       |
| High Temperature Alloys |                                |                 | Cobalt Base           | Cast, Corrosion Resistant,          | Annealed                | 20-30     |                       |
|                         |                                |                 |                       |                                     | Iron Base               | as Cast   | 20-25                 |
|                         |                                |                 |                       |                                     | Nickel Base             | Low Alloy | Annealed              |
| Iron                    | Ductile                        | Annealed        | 60                    | Precipitation Hardening, Stainless  | Tempered                | 15-25     |                       |
|                         |                                | as Cast         | 30                    |                                     | Treated                 | 10-15     |                       |
|                         |                                | Tempered        | 15-20                 |                                     | Annealed                | 15-45     |                       |
|                         | Gray,                          | Annealed        | 80                    |                                     | Tempered                | 15-25     |                       |
|                         |                                | As Cast         | 35-60                 |                                     | Annealed                | 45-75     |                       |
|                         | Malleable                      |                 | 60                    |                                     | Tool Steels, High Speed | Annealed  | 15-25                 |
| Magnesium Alloys        |                                | Heat Treated    | 25-50                 | Water Hardening                     | Annealed                | 50        |                       |
|                         |                                | Annealed        | 175                   | Ultra High Strength Steels          | Annealed                | 35        |                       |
| Manganese               |                                |                 | 20                    |                                     | Normalized              | 20        |                       |
| Molybdenum Alloys       |                                | Stress Relieved | 50                    |                                     | Tempered                | 3-7       |                       |
| Monel                   |                                | Annealed        | 20                    | Maraging Steels                     | Annealed                | 20-15     |                       |
| Nickel Alloys           |                                | Annealed        | 25                    |                                     | Maraged                 | 5-10      |                       |
| Plastics,               | Reinforced                     |                 | 25                    | Tantalum Alloys, Stress Relieved    |                         | 3         |                       |
|                         | Thermoplastics                 |                 | 50                    | Titanium Alloys, Commercial Pure,   | Annealed                | 40-60     |                       |
|                         | Thermosetting Plastics         |                 | 50                    | Alpha & Alpha Beta Alloys,          | Annealed                | 10-25     |                       |
| Steels,                 | Alloys, Annealed or Cold Drawn |                 | 40-60                 | Tungsten Alloys, Pressed & Sintered |                         | 50        |                       |
|                         | Quenched & Tempered            |                 | 15-35                 | Zinc Alloys                         | Die Cast                | 150       |                       |
|                         | Armor Plate                    |                 | 10                    |                                     |                         |           |                       |

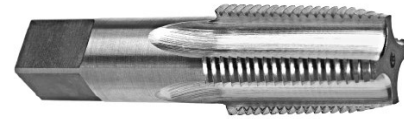
## CONVERSION TABLE, SURFACE FEET PER MINUTE TO REVOLUTIONS PER MINUTE

| SPEED FEET PER MINUTE | 20                     | 25   | 30   | 40   | 50   | 60   | 70   | 80   | 90   | 100  | 110  | 120  | 130  | 140  | 150  |
|-----------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| TAP SIZE              | REVOLUTIONS PER MINUTE |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 0                     | 1273                   | 1592 | 1910 | 2546 | 3183 | 3820 | 4456 | 5093 | 5730 | 6366 | 7003 | 7639 | 8276 | 8913 | 9549 |
| 1                     | 1047                   | 1308 | 1570 | 2093 | 2617 | 3140 | 3663 | 4186 | 4710 | 5233 | 5756 | 6279 | 6808 | 7326 | 7849 |
| 2                     | 888                    | 1110 | 1333 | 1777 | 2221 | 2665 | 3109 | 3554 | 3999 | 4442 | 4886 | 5330 | 5774 | 6218 | 6662 |
| 3                     | 772                    | 964  | 1157 | 1543 | 1929 | 2315 | 2701 | 3086 | 3472 | 3858 | 4244 | 4629 | 5015 | 5401 | 5787 |
| 4                     | 682                    | 853  | 1023 | 1364 | 1705 | 2046 | 2387 | 2728 | 3069 | 3411 | 3751 | 4092 | 4434 | 4775 | 5116 |
| 5                     | 611                    | 764  | 917  | 1222 | 1528 | 1833 | 2139 | 2445 | 2750 | 3056 | 3361 | 3667 | 3973 | 4278 | 4584 |
| 6                     | 553                    | 691  | 829  | 1106 | 1382 | 1658 | 1934 | 2211 | 2487 | 2764 | 3040 | 3316 | 3592 | 3869 | 4145 |
| 8                     | 466                    | 583  | 699  | 932  | 1165 | 1398 | 1631 | 1864 | 2097 | 2330 | 2563 | 2796 | 3029 | 3262 | 3495 |
| 10                    | 401                    | 502  | 603  | 804  | 1005 | 1205 | 1406 | 1607 | 1808 | 2009 | 2210 | 2411 | 2612 | 2813 | 3014 |
| 12                    | 354                    | 442  | 531  | 707  | 884  | 1061 | 1238 | 1415 | 1592 | 1769 | 1945 | 2122 | 2300 | 2476 | 2653 |
| 1/4                   | 306                    | 382  | 458  | 611  | 764  | 917  | 1070 | 1222 | 1375 | 1528 | 1681 | 1833 | 1986 | 2139 | 2292 |
| 5/16                  | 245                    | 306  | 367  | 489  | 611  | 733  | 856  | 978  | 1100 | 1222 | 1345 | 1467 | 1589 | 1711 | 1833 |
| 3/8                   | 204                    | 255  | 306  | 407  | 509  | 611  | 713  | 815  | 917  | 1019 | 1120 | 1222 | 1324 | 1426 | 1528 |
| 7/16                  | 175                    | 219  | 262  | 349  | 437  | 524  | 611  | 698  | 786  | 873  | 960  | 1048 | 1135 | 1222 | 1310 |
| 1/2                   | 153                    | 191  | 229  | 306  | 382  | 458  | 535  | 611  | 688  | 764  | 840  | 917  | 993  | 1070 | 1146 |
| 9/16                  | 137                    | 172  | 206  | 275  | 344  | 412  | 481  | 550  | 619  | 687  | 756  | 825  | 893  | 963  | 1031 |
| 5/8                   | 122                    | 153  | 183  | 244  | 306  | 367  | 428  | 489  | 550  | 611  | 672  | 733  | 794  | 856  | 917  |
| 3/4                   | 102                    | 128  | 153  | 203  | 255  | 306  | 357  | 407  | 458  | 509  | 560  | 611  | 662  | 713  | 764  |
| 7/8                   | 87                     | 109  | 131  | 175  | 218  | 262  | 306  | 350  | 392  | 437  | 480  | 524  | 568  | 611  | 655  |
| 1                     | 76                     | 96   | 115  | 153  | 191  | 230  | 268  | 306  | 344  | 382  | 420  | 458  | 497  | 535  | 573  |

## TAPER PIPE TAPS REGULAR & ECONOMY GROUND THREADS

LIST 120G  
LIST 120DS  
LIST 120C

NPT Ground Thread Regular  
NPTF Ground Thread Regular  
NPT Economy Ground Thread Regular



| TAP SIZE        | NO. OF FLUTES | 120G                   | 120DS                   | 120C                   |
|-----------------|---------------|------------------------|-------------------------|------------------------|
|                 |               | NPT REGULAR EDP NUMBER | NPTF REGULAR EDP NUMBER | NPT ECONOMY EDP NUMBER |
| 1/16 - 27       | 4             | 46102                  | 46202                   | -                      |
| 1/8 - 27        | 4             | 46104                  | 46204                   | 46004                  |
| 1/8 - 27        | 5             | 46106                  | 46206                   | 46006                  |
| 1/8 - 27 sm sh* | 4             | 46107                  | 46207                   | 46007                  |
| 1/8 - 27 sm sh* | 5             | 46108                  | 46208                   | 46008                  |
| 1/4 - 18        | 4             | 46110                  | 46210                   | 46010                  |
| 1/4 - 18        | 5             | 46112                  | 46212                   | 46012                  |
| 3/8 - 18        | 4             | 46116                  | 46216                   | 46016                  |
| 3/8 - 18        | 5             | 46118                  | 46218                   | 46018                  |
|                 |               |                        |                         |                        |
| 1/2 - 14        | 4             | 46122                  | 46222                   | 46022                  |
| 1/2 - 14        | 5             | 46124                  | 46224                   | 46024                  |
| 3/4 - 14        | 5             | 46128                  | 46228                   | 46028                  |
|                 |               |                        |                         |                        |
| 1 - 11 1/2      | 5             | 46132                  | 46232                   | 46032                  |
| 1 1/4 - 11 1/2  | 5             | 46136                  | 46236                   | 46036                  |
| 1 1/2 - 11 1/2  | 7             | 46138                  | 46240                   | 46040                  |
| 2 - 11 1/2      | 7             | 46144                  | 46244                   | 46044                  |
| 2 1/2 - 8       | 7             | 46148                  | 46248                   | 46048                  |
| 3 - 8           | 8             | 46152                  | 46252                   | 46052                  |
| 3 1/2 - 8       | 8             | 46158                  | 46258                   | 46058                  |
| 4 - 8           | 8             | 46160                  | 46260                   | 46060                  |

\*Small Shank .3125

See page 92 for Pipe Tap Dimensions.

**NOTE: ECONOMY GROUND THREAD PIPE TAPS** are economical Production Taps made here to the same general thread specifications as Ground Thread Taps. Economy Thread Pipe Taps are supplied with Oxide Surface Treatment only.

## PIPE TAP DRILL SIZES

| TAP SIZE | *NPT      |                | *NPTF     |                | STRAIGHT  |                |
|----------|-----------|----------------|-----------|----------------|-----------|----------------|
|          | TAP DRILL | DECIMAL EQUIV. | TAP DRILL | DECIMAL EQUIV. | TAP DRILL | DECIMAL EQUIV. |
| 1/16     | D         | .2460          | D         | .2460          | 1/4       | .2500          |
| 1/8      | Q         | .3320          | R         | .3390          | 11/32     | .3438          |
| 1/4      | 7/16      | .4375          | 7/16      | .4375          | 7/16      | .4375          |
| 3/8      | 9/16      | .5625          | 37/64     | .5781          | 37/64     | .5781          |
| 1/2      | 45/64     | .7031          | 45/64     | .7031          | 23/32     | .7188          |
| 3/4      | 29/32     | .9062          | 59/64     | .9219          | 59/64     | .9219          |
| 1        | 1 9/64    | 1.1406         | 1 5/32    | 1.1562         | 1 5/32    | 1.1562         |
| 1 1/4    | 1 31/64   | 1.4844         | 1 1/2     | 1.5000         | 1 1/2     | 1.5000         |
| 1 1/2    | 1 47/64   | 1.7344         | 1 47/64   | 1.7344         | 1 3/4     | 1.7500         |
| 2        | 2 13/64   | 2.2031         | 2 7/32    | 2.2188         | 2 7/32    | 2.2188         |
| 2 1/2    | 2 5/8     | 2.6250         | 2 41/64   | 2.6406         | 2 21/32   | 2.6562         |
| 3        |           |                | 3 17/64   | 3.2656         |           |                |

\*For tapping without reaming.

## STANDARD PIPE TAP DIMENSIONS, STRAIGHT AND TAPER, GROUND THREAD



DIMENSIONS IN INCHES

| NOMINAL SIZE INCHES | DIMENSIONS IN INCHES |                    |                    |                     |                  |
|---------------------|----------------------|--------------------|--------------------|---------------------|------------------|
|                     | LENGTH OVERALL A     | LENGTH OF THREAD B | LENGTH OF SQUARE C | DIAMETER OF SHANK D | SIZE OF SQUARE E |
| 1/16                | 2 1/8                | 11/16              | 3/8                | .3125               | .234             |
| 1/8 Small Shank     | 2 1/8                | 3/4                | 3/8                | .3125               | .234             |
| 1/8 Large Shank     | 2 1/8                | 3/4                | 3/8                | .4375               | .328             |
| 1/4                 | 2 7/16               | 1 1/16             | 7/16               | .5625               | .421             |
| 3/8                 | 2 9/16               | 1 1/16             | 1/2                | .7000               | .531             |
| 1/2                 | 3 1/8                | 1 3/8              | 5/8                | .6875               | .515             |
| 3/4                 | 3 1/4                | 1 3/8              | 11/16              | .9063               | .679             |
| 1                   | 3 3/4                | 1 3/4              | 13/16              | 1.1250              | .843             |
| 1 1/4               | 4                    | 1 3/4              | 15/16              | 1.3125              | .984             |
| 1 1/2               | 4 1/4                | 1 3/4              | 1                  | 1.5000              | 1.125            |
| 2                   | 4 1/2                | 1 3/4              | 1 1/8              | 1.8750              | 1.406            |
| 2 1/2               | 5 1/2                | 2 9/16             | 1 1/4              | 2.2500              | 1.687            |
| 3                   | 6                    | 2 5/8              | 1 3/8              | 2.6250              | 1.968            |
| 3 1/2               | 6 1/2                | 2 11/16            | 1 1/2              | 2.8125              | 2.108            |
| 4                   | 6 3/4                | 2 3/4              | 1 5/8              | 3.0000              | 2.250            |

## TAPER PIPE TAPS THREAD LIMITS

| NOMINAL SIZE INCHES | THREADS PER INCH | STANDARD PROJECTION NPT & NPTF  |                           |               | PTF SAE SHORT PROJECTION        |                           |               |
|---------------------|------------------|---------------------------------|---------------------------|---------------|---------------------------------|---------------------------|---------------|
|                     |                  | PROJECTION THROUGH L1 RING GAGE | THICKNESS OF L1 RING GAGE | RUN OF THREAD | PROJECTION THROUGH L1 RING GAGE | THICKNESS OF L1 RING GAGE | RUN OF THREAD |
| 1/16                | 27               | .312                            | .160                      | .472          | .2405±.019                      | .160                      | .4005         |
| 1/8                 | 27               | .312                            | .1615                     | .4735         | .2405±.019                      | .1615                     | .4020         |
| 1/4                 | 18               | .459                            | .2278                     | .6868         | .3610±.028                      | .2278                     | .5888         |
| 3/8                 | 18               | .454                            | .240                      | .694          | .3610±.028                      | .240                      | .6010         |
| 1/2                 | 14               | .579                            | .320                      | .899          | .4645±.036                      | .320                      | .7845         |
| 3/4                 | 14               | .565                            | .339                      | .904          | .4645±.036                      | .339                      | .8035         |
| 1                   | 11 1/2           | .678                            | .400                      | 1.078         | .5652±.044                      | .400                      | .9652         |
| 1 1/4               | 11 1/2           | .686                            | .420                      | 1.106         | .5652±.044                      | .420                      | .9852         |
| 1 1/2               | 11 1/2           | .699                            | .420                      | 1.119         | .5652±.044                      | .420                      | .9852         |
| 2                   | 11 1/2           | .667                            | .436                      | 1.103         | .5652±.044                      | .436                      | 1.0012        |
| 2 1/2               | 8                | .925                            | .682                      | 1.607         | .8125±.062                      | .682                      | 1.4945        |
| 3                   | 8                | .925                            | .766                      | 1.691         | .8125±.062                      | .766                      | 1.5785        |
| 3 1/2               | 8                | .938                            | .821                      | 1.759         |                                 |                           |               |
| 4                   | 8                | .950                            | .844                      | 1.794         |                                 |                           |               |

Projection & Thickness L1 Ring Gage = Run  
Gage Measurement in Inches