

# KSPT Reference Information

| ISO h6 SPECIFICATIONS |         |          |           |       |       |
|-----------------------|---------|----------|-----------|-------|-------|
| DIAMETER              | +       | -        | DIAMETER  | +     | -     |
| ≥ 1/8 - 3/16          | 0.00000 | -0.00032 | ≤ 3       | 0,000 | 0,006 |
| > 3/16 - 7/16         | 0.00000 | -0.00035 | > 3 - 6   | 0,000 | 0,008 |
| > 7/16 - 5/8          | 0.00000 | -0.00043 | > 6 - 10  | 0,000 | 0,009 |
| > 5/8 - 1             | 0.00000 | -0.00051 | > 10 - 18 | 0,000 | 0,011 |
| > 1 - 1-1/4           | 0.00000 | -0.00063 | > 18 - 25 | 0,000 | 0,013 |

| MACHINING FORMULAS   |  |
|--|--|
| INCH FORMULAS  | METRIC FORMULAS  |
| sfm = rpm x .262 x cutting diameter  | m/min = (3.14 x cutting diameter x rpm) / 1000   |
| rpm = sfm x 3.82 / cutting diameter  | rpm = (1000 x m / min) / (3.14 x cutting diameter)   |
| feed (inches per tooth) = ipm / ( number of teeth x rpm)   | feed (mm per tooth) = millimeters per minute / (number of teeth x rpm)   |
| feed (inches / minute) = inches per tooth x number of teeth x rpm  | feed (mm/minute) = feed per tooth x number of teeth x rpm  |
| feed (inches / minute) = ipr x rpm   | feed (mm/minute) = mmr x rpm   |
| feed (inches / revolution) = ipm / rpm   | feed (mm per revolution) = mmr / rpm   |
| cuspl height = (tool diameter / 2) - $\sqrt{(\text{tool diameter}^2 - \text{pitch}^2) / 4}$                    | cuspl height = (tool diameter / 2) - $\sqrt{(\text{tool diameter}^2 - \text{pitch}^2) / 4}$                    |
| pitch = $\sqrt{4 \times (\text{cuspl height} \times \text{tool diameter}) - 4 \times (\text{cuspl height}^2)}$ | pitch = $\sqrt{4 \times (\text{cuspl height} \times \text{tool diameter}) - 4 \times (\text{cuspl height}^2)}$ |
| mrr – milling – (in <sup>3</sup> /min) = width of cut x depth of cut x ipm                                     | mrr – milling – (cm <sup>3</sup> /min) = (width of cut x depth of cut x mm/min) / 1000                         |
| cutting time – drilling – (minutes) = length / ipm   | cutting time – drilling – (minutes) = length / mm/min  |

|        |  |
|--------|--|
| sfm    | surface feet per minute                  |
| rpm    | revolutions per minute                   |
| ipm    | feed rate in inches per minutes          |
| ipr    | inches per revolution                    |
| mmr    | millimeters per revolution               |
| mm/min | feed rate in millimeters per minute      |
| mrr    | material removal rate<br>on flat surface |

| GENERAL FORMULAS  |                           |
|---|---------------------------|
| coolant pressure: 1 Bar = 14.5 Pounds per Square Inch (PSI)   |                           |
| calculation of coolant pressure: Pounds Per Square Inch (PSI) = (Horsepower of Pump x 1.460) / Gallons per Minute (GPM) |                           |
| 1 Liter = 0.254 Gallons   |                           |
| inch = millimeters / 25.4   | millimeters = inch x 25.4 |
| inch tap drill sizes = major diameter – ((1.299 x % of thread) / threads per inch)                                      |                           |
| metric tap drill sizes = major diameter – (1.082 x pitch x % of thread)   |                           |
| inch thread forming drill size: maximum diameter = basic major diameter – (3/8 x number of threads per inch)            |                           |
| inch thread forming drill size: minimum diameter = basic major diameter – (1/2 x number of threads per inch)            |                           |
| metric thread forming drill size: maximum diameter = basic major diameter – (.375 x pitch)                              |                           |
| metric thread forming drill size: minimum diameter = basic major diameter – (.500 x pitch)                              |                           |

# Decimal Equivalents

Fraction • Number • Letter • Metric Sizes

| INCH | METRIC | DECIMAL EQUIVALENT | INCH | METRIC | DECIMAL EQUIVALENT | INCH  | METRIC | DECIMAL EQUIVALENT | INCH  | METRIC | DECIMAL EQUIVALENT | INCH  | METRIC | DECIMAL EQUIVALENT | INCH  | METRIC | DECIMAL EQUIVALENT |
|------|--------|--------------------|------|--------|--------------------|-------|--------|--------------------|-------|--------|--------------------|-------|--------|--------------------|-------|--------|--------------------|
| -    | 0,10   | 0.0039             | -    | 1,60   | 0.0630             | 9/64  | 3,57   | 0.1406             | #1    | 5,79   | 0.2280             | R     | 8,61   | 0.3390             | -     | 13,00  | 0.5118             |
| -    | 0,20   | 0.0079             | #52  | 1,61   | 0.0635             | -     | 3,60   | 0.1417             | -     | 5,80   | 0.2283             | -     | 8,70   | 0.3425             | 33/64 | 13,10  | 0.5156             |
| -    | 0,25   | 0.0098             | -    | 1,65   | 0.0650             | #27   | 3,66   | 0.1440             | -     | 5,90   | 0.2323             | 11/32 | 8,73   | 0.3438             | 17/32 | 13,49  | 0.5312             |
| -    | 0,30   | 0.0118             | #51  | 1,70   | 0.0669             | -     | 3,70   | 0.1457             | A     | 5,94   | 0.2340             | -     | 8,75   | 0.3445             | -     | 13,50  | 0.5315             |
| #80  | 0,34   | 0.0135             | -    | 1,75   | 0.0689             | #26   | 3,73   | 0.1470             | 15/64 | 5,95   | 0.2344             | -     | 8,80   | 0.3465             | 35/64 | 13,89  | 0.5469             |
| -    | 0,35   | 0.0138             | #50  | 1,78   | 0.0700             | -     | 3,75   | 0.1476             | -     | 6,00   | 0.2362             | S     | 8,84   | 0.3480             | -     | 14,00  | 0.5512             |
| #79  | 0,37   | 0.0145             | -    | 1,80   | 0.0709             | #25   | 3,80   | 0.1495             | B     | 6,05   | 0.2380             | -     | 8,90   | 0.3504             | 9/16  | 14,29  | 0.5625             |
| 1/64 | 0,40   | 0.0156             | #49  | 1,85   | 0.0728             | -     | 3,80   | 0.1496             | -     | 6,10   | 0.2402             | -     | 9,00   | 0.3543             | -     | 14,50  | 0.5709             |
| #78  | 0,41   | 0.0160             | -    | 1,90   | 0.0748             | #24   | 3,86   | 0.1520             | C     | 6,15   | 0.2420             | T     | 9,09   | 0.3580             | 37/64 | 14,68  | 0.5781             |
| -    | 0,45   | 0.0177             | #48  | 1,93   | 0.0760             | -     | 3,90   | 0.1535             | -     | 6,20   | 0.2441             | -     | 9,10   | 0.3583             | -     | 15,00  | 0.5906             |
| #77  | 0,46   | 0.0180             | -    | 1,95   | 0.0768             | #23   | 3,91   | 0.1540             | D     | 6,25   | 0.2461             | 23/64 | 9,13   | 0.3594             | 19/32 | 15,08  | 0.5938             |
| -    | 0,50   | 0.0197             | 5/64 | 1,98   | 0.0781             | 5/32  | 3,97   | 0.1562             | -     | 6,30   | 0.2480             | -     | 9,20   | 0.3622             | 39/64 | 15,48  | 0.6094             |
| #76  | 0,51   | 0.0200             | #47  | 1,99   | 0.0785             | #22   | 3,99   | 0.1570             | E     | 6,35   | 0.2500             | -     | 9,25   | 0.3642             | -     | 15,50  | 0.6102             |
| #75  | 0,53   | 0.0210             | -    | 2,00   | 0.0787             | -     | 4,00   | 0.1575             | 1/4   | 6,35   | 0.2500             | -     | 9,30   | 0.3661             | 5/8   | 15,88  | 0.6250             |
| -    | 0,55   | 0.0217             | -    | 2,05   | 0.0807             | #21   | 4,04   | 0.1590             | -     | 6,40   | 0.2520             | U     | 9,35   | 0.3680             | -     | 16,00  | 0.6299             |
| #74  | 0,57   | 0.0225             | #46  | 2,06   | 0.0810             | #20   | 4,09   | 0.1610             | -     | 6,50   | 0.2559             | -     | 9,40   | 0.3701             | 41/64 | 16,27  | 0.6406             |
| -    | 0,60   | 0.0236             | #45  | 2,08   | 0.0820             | -     | 4,10   | 0.1614             | F     | 6,53   | 0.2570             | -     | 9,50   | 0.3740             | -     | 16,50  | 0.6496             |
| #73  | 0,61   | 0.0240             | -    | 2,10   | 0.0827             | -     | 4,20   | 0.1654             | -     | 6,60   | 0.2598             | 3/8   | 9,53   | 0.3750             | 21/32 | 16,67  | 0.6562             |
| #72  | 0,64   | 0.0250             | -    | 2,15   | 0.0846             | #19   | 4,22   | 0.1660             | G     | 6,63   | 0.2610             | V     | 9,56   | 0.3770             | -     | 17,00  | 0.6693             |
| -    | 0,65   | 0.0256             | #44  | 2,18   | 0.0860             | -     | 4,25   | 0.1673             | -     | 6,70   | 0.2638             | -     | 9,60   | 0.3780             | 43/64 | 17,07  | 0.6719             |
| #71  | 0,66   | 0.0260             | -    | 2,20   | 0.0866             | -     | 4,30   | 0.1693             | 17/64 | 6,75   | 0.2656             | -     | 9,70   | 0.3819             | 11/16 | 17,46  | 0.6875             |
| -    | 0,70   | 0.0276             | -    | 2,25   | 0.0886             | #18   | 4,31   | 0.1695             | H     | 6,76   | 0.2660             | -     | 9,75   | 0.3839             | -     | 17,50  | 0.6890             |
| #70  | 0,71   | 0.0280             | #43  | 2,26   | 0.0890             | 11/64 | 4,37   | 0.1719             | -     | 6,80   | 0.2677             | W     | 9,80   | 0.3858             | 45/64 | 17,86  | 0.7031             |
| #69  | 0,74   | 0.0292             | -    | 2,30   | 0.0906             | #17   | 4,39   | 0.1730             | -     | 6,90   | 0.2717             | -     | 9,90   | 0.3898             | -     | 18,00  | 0.7087             |
| -    | 0,75   | 0.0295             | -    | 2,35   | 0.0925             | -     | 4,40   | 0.1732             | I     | 6,91   | 0.2720             | 25/64 | 9,92   | 0.3906             | 23/32 | 18,26  | 0.7188             |
| #68  | 0,79   | 0.0310             | #42  | 2,37   | 0.0935             | #16   | 4,50   | 0.1770             | -     | 7,00   | 0.2756             | -     | 10,00  | 0.3937             | -     | 18,50  | 0.7283             |
| 1/32 | 0,79   | 0.0313             | 3/32 | 2,38   | 0.0938             | -     | 4,50   | 0.1772             | J     | 7,04   | 0.2770             | X     | 10,08  | 0.3970             | 47/64 | 18,65  | 0.7344             |
| -    | 0,80   | 0.0315             | -    | 2,40   | 0.0945             | #15   | 4,57   | 0.1800             | -     | 7,10   | 0.2795             | -     | 10,10  | 0.3976             | -     | 19,00  | 0.7480             |
| #67  | 0,81   | 0.0320             | #41  | 2,44   | 0.0960             | -     | 4,60   | 0.1811             | K     | 7,14   | 0.2810             | -     | 10,20  | 0.4016             | 3/4   | 19,05  | 0.7500             |
| #66  | 0,84   | 0.0330             | -    | 2,45   | 0.0965             | #14   | 4,62   | 0.1820             | 9/32  | 7,14   | 0.2812             | Y     | 10,26  | 0.4040             | 49/64 | 19,45  | 0.7656             |
| -    | 0,85   | 0.0335             | #40  | 2,50   | 0.0984             | #13   | 4,70   | 0.1850             | -     | 7,20   | 0.2835             | -     | 10,30  | 0.4055             | -     | 19,50  | 0.7677             |
| #65  | 0,89   | 0.0350             | #39  | 2,53   | 0.0995             | -     | 4,75   | 0.1870             | -     | 7,25   | 0.2854             | 13/32 | 10,32  | 0.4062             | 25/32 | 19,84  | 0.7812             |
| -    | 0,90   | 0.0354             | #38  | 2,58   | 0.1015             | 3/16  | 4,76   | 0.1875             | -     | 7,30   | 0.2874             | -     | 10,40  | 0.4094             | -     | 20,00  | 0.7874             |
| #64  | 0,91   | 0.0360             | -    | 2,60   | 0.1024             | #12   | 4,80   | 0.1890             | L     | 7,37   | 0.2900             | Z     | 10,49  | 0.4130             | 51/64 | 20,24  | 0.7969             |
| #63  | 0,94   | 0.0370             | #37  | 2,64   | 0.1040             | #11   | 4,85   | 0.1910             | -     | 7,40   | 0.2913             | -     | 10,50  | 0.4134             | -     | 20,50  | 0.8071             |
| -    | 0,95   | 0.0374             | -    | 2,70   | 0.1063             | #10   | 4,90   | 0.1929             | M     | 7,49   | 0.2950             | -     | 10,60  | 0.4173             | 13/16 | 20,64  | 0.8125             |
| #62  | 0,97   | 0.0380             | #36  | 2,71   | 0.1065             | #9    | 4,91   | 0.1935             | -     | 7,50   | 0.2953             | -     | 10,70  | 0.4213             | -     | 21,00  | 0.8268             |
| #61  | 0,99   | 0.0390             | -    | 2,75   | 0.1083             | #8    | 4,98   | 0.1960             | 19/64 | 7,54   | 0.2969             | 27/64 | 10,72  | 0.4219             | 53/64 | 21,03  | 0.8281             |
| -    | 1,00   | 0.0394             | 7/64 | 2,78   | 0.1094             | -     | 5,00   | 0.1969             | -     | 7,60   | 0.2992             | -     | 10,80  | 0.4252             | 27/32 | 21,43  | 0.8438             |
| #60  | 1,02   | 0.0400             | #35  | 2,79   | 0.1100             | #7    | 5,05   | 0.1990             | N     | 7,67   | 0.3020             | -     | 10,90  | 0.4291             | -     | 21,50  | 0.8465             |
| #59  | 1,04   | 0.0410             | -    | 2,80   | 0.1102             | -     | 5,10   | 0.2008             | -     | 7,70   | 0.3031             | -     | 11,00  | 0.4331             | 55/64 | 21,84  | 0.8594             |
| -    | 1,05   | 0.0413             | #34  | 2,82   | 0.1110             | #6    | 5,11   | 0.2010             | -     | 7,75   | 0.3051             | -     | 11,10  | 0.4370             | -     | 22,00  | 0.8661             |
| #58  | 1,07   | 0.0420             | #33  | 2,87   | 0.1130             | 13/64 | 5,16   | 0.2031             | -     | 7,80   | 0.3071             | 7/16  | 11,11  | 0.4375             | 7/8   | 22,23  | 0.8750             |
| #57  | 1,09   | 0.0430             | -    | 2,90   | 0.1142             | #5    | 5,18   | 0.2040             | -     | 7,90   | 0.3110             | -     | 11,20  | 0.4409             | -     | 22,50  | 0.8858             |
| -    | 1,10   | 0.0433             | #32  | 2,95   | 0.1160             | -     | 5,20   | 0.2047             | 5/16  | 7,94   | 0.3125             | -     | 11,30  | 0.4449             | 57/64 | 22,62  | 0.8906             |
| -    | 1,15   | 0.0453             | -    | 3,00   | 0.1181             | #4    | 5,22   | 0.2055             | -     | 8,00   | 0.3150             | -     | 11,40  | 0.4488             | -     | 23,00  | 0.9055             |
| #56  | 1,18   | 0.0465             | #31  | 3,05   | 0.1200             | -     | 5,25   | 0.2067             | O     | 8,03   | 0.3160             | -     | 11,50  | 0.4528             | 29/32 | 23,02  | 0.9062             |
| 3/64 | 1,19   | 0.0469             | -    | 3,10   | 0.1220             | -     | 5,3    | 0.2087             | -     | 8,10   | 0.3189             | 29/64 | 11,51  | 0.4531             | 59/64 | 23,42  | 0.9219             |
| -    | 1,20   | 0.0472             | 1/8  | 3,18   | 0.1250             | #3    | 5,31   | 0.2090             | -     | 8,20   | 0.3228             | -     | 11,60  | 0.4567             | -     | 23,50  | 0.9252             |
| -    | 1,25   | 0.0492             | -    | 3,20   | 0.1260             | #2    | 5,40   | 0.2126             | P     | 8,20   | 0.3230             | -     | 11,70  | 0.4606             | 15/16 | 23,81  | 0.9375             |
| -    | 1,30   | 0.0512             | -    | 3,25   | 0.1280             | -     | 5,41   | 0.2130             | -     | 8,25   | 0.3248             | -     | 11,80  | 0.4646             | -     | 24,00  | 0.9449             |
| #55  | 1,32   | 0.0520             | #30  | 3,26   | 0.1285             | -     | 5,50   | 0.2165             | -     | 8,30   | 0.3268             | -     | 11,90  | 0.4685             | 61/64 | 24,21  | 0.9531             |
| -    | 1,35   | 0.0531             | -    | 3,30   | 0.1299             | 7/32  | 5,56   | 0.2188             | 21/64 | 8,33   | 0.3281             | 15/32 | 11,91  | 0.4688             | -     | 24,50  | 0.9646             |
| #54  | 1,40   | 0.0550             | -    | 3,40   | 0.1339             | -     | 5,60   | 0.2205             | -     | 8,40   | 0.3307             | -     | 12,00  | 0.4724             | 31/32 | 24,61  | 0.9688             |
| #53  | 1,51   | 0.0595             | #29  | 3,45   | 0.1360             | #1    | 5,61   | 0.2210             | Q     | 8,43   | 0.3320             | 31/64 | 12,30  | 0.4844             | -     | 25,00  | 0.9843             |
| -    | 1,55   | 0.0610             | -    | 3,50   | 0.1378             | -     | 5,70   | 0.2244             | -     | 8,50   | 0.3346             | -     | 12,50  | 0.4921             | 63/64 | 25,00  | 0.9844             |
| 1/16 | 1,59   | 0.0625             | #28  | 3,57   | 0.1405             | -     | 5,75   | 0.2264             | -     | 8,60   | 0.3386             | 1/2   | 12,70  | 0.5000             | 1     | 25,40  | 1.0000             |

# Hardness Conversion Chart

| ROCKWELL HARDNESS (HRb) | ROCKWELL HARDNESS (HRc) | BRINELL HARDNESS (HB) | VICKERS HARDNESS (HV) | TENSILE STRENGTH (N/mm <sup>2</sup> ) | PSI (1000lb/in <sup>2</sup> ) |
|-------------------------|-------------------------|-----------------------|-----------------------|---------------------------------------|-------------------------------|
| 67                      | –                       | 121                   | 122                   | 401                                   | 58                            |
| 70                      | –                       | 126                   | 127                   | 432                                   | 63                            |
| 73                      | –                       | 132                   | 132                   | 448                                   | 65                            |
| 75                      | –                       | 136                   | 137                   | 455                                   | 66                            |
| 77                      | –                       | 140                   | 143                   | 463                                   | 67                            |
| 80                      | –                       | 147                   | 150                   | 479                                   | 69                            |
| 82                      | –                       | 153                   | 156                   | 494                                   | 72                            |
| 84                      | –                       | 159                   | 163                   | 525                                   | 76                            |
| 86                      | –                       | 165                   | 171                   | 540                                   | 78                            |
| 89                      | –                       | 177                   | 178                   | 556                                   | 81                            |
| 91                      | –                       | 186                   | 188                   | 602                                   | 88                            |
| 93                      | –                       | 197                   | 196                   | 632                                   | 92                            |
| 96                      | –                       | 216                   | 212                   | 664                                   | 97                            |
| 97                      | –                       | 223                   | 218                   | 695                                   | 101                           |
| 98                      | 21                      | 230                   | 234                   | 756                                   | 110                           |
| –                       | 22                      | 236                   | 241                   | 772                                   | 112                           |
| –                       | 23                      | 242                   | 247                   | 787                                   | 114                           |
| –                       | 24                      | 248                   | 255                   | 818                                   | 118                           |
| –                       | 25                      | 254                   | 261                   | 849                                   | 123                           |
| –                       | 27                      | 266                   | 269                   | 865                                   | 125                           |
| –                       | 28                      | 272                   | 275                   | 895                                   | 130                           |
| –                       | 29                      | 278                   | 284                   | 911                                   | 132                           |
| –                       | 30                      | 284                   | 292                   | 942                                   | 136                           |
| –                       | 31                      | 293                   | 300                   | 973                                   | 141                           |
| –                       | 32                      | 302                   | 308                   | 988                                   | 143                           |
| –                       | 33                      | 310                   | 318                   | 1019                                  | 147                           |
| –                       | 34                      | 319                   | 327                   | 1050                                  | 152                           |
| –                       | 35                      | 328                   | 337                   | 1096                                  | 159                           |
| –                       | 37                      | 345                   | 349                   | 1127                                  | 163                           |
| –                       | 38                      | 353                   | 359                   | 1158                                  | 168                           |
| –                       | 39                      | 362                   | 370                   | 1189                                  | 172                           |
| –                       | 40                      | 370                   | 381                   | 1235                                  | 179                           |
| –                       | 41                      | 381                   | 395                   | 1266                                  | 183                           |
| –                       | 42                      | 391                   | 408                   | 1312                                  | 190                           |
| –                       | 44                      | 411                   | 422                   | 1359                                  | 197                           |
| –                       | 45                      | 422                   | 437                   | 1420                                  | 206                           |
| –                       | 46                      | 433                   | 452                   | 1467                                  | 212                           |
| –                       | 48                      | 455                   | 470                   | 1513                                  | 219                           |
| –                       | 50                      | 479                   | 497                   | 1559                                  | 226                           |
| –                       | 51                      | 485                   | 517                   | 1621                                  | 235                           |
| –                       | 52                      | 497                   | 532                   | 1668                                  | 241                           |
| –                       | 54                      | –                     | 573                   | 1729                                  | 250                           |
| –                       | 56                      | –                     | 609                   | 1807                                  | 262                           |
| –                       | 57                      | –                     | 630                   | 1884                                  | 273                           |
| –                       | 59                      | –                     | 670                   | 1961                                  | 284                           |
| –                       | 60                      | –                     | 698                   | 2039                                  | 295                           |
| –                       | 61                      | –                     | 725                   | –                                     | –                             |
| –                       | 62                      | –                     | 740                   | –                                     | –                             |
| –                       | 63                      | –                     | 780                   | –                                     | –                             |
| –                       | 64                      | –                     | 812                   | –                                     | –                             |
| –                       | 65                      | –                     | 847                   | –                                     | –                             |
| –                       | 66                      | –                     | 885                   | –                                     | –                             |
| –                       | 67                      | –                     | 926                   | –                                     | –                             |
| –                       | 68                      | –                     | 971                   | –                                     | –                             |

Conversions from each scale are approximate