

# Engineering Data

## FORMULA FOR TAP/DRILL SIZES (INCH)

### METHOD 1

$$\text{Drilled Hole Size (in.)} = \text{Basic Major Dia. of Thread (in.)} - \frac{.013 \times \% \text{ of Full Thread}^*}{\# \text{ of Threads per Inch (T.P.I.)}$$

\* Use whole number for % of thread...for 65%, use 65 (not .65).

### METHOD 2

$$\text{Nominal O.D.} - (\text{Dbl. Thread Depth} \times \% \text{ of Full Thread}) = \text{Drilled Hole Size}$$

*EXAMPLE: To find the hole size for obtaining 75% of thread in a 1/4-20 tapped hole, follow first column down to 20 threads, then across to 75% of thread. This figure (.0485), when subtracted from the .250 diameter, is .2015, which is the required diameter of hole. See equation:  
.250 - .0485 = .2015*

To figure whether or not pitch is too coarse for diameter:  
(Double thread depth) X 3 = x  
x = the smallest diameter possible for that T.P.I.

| Threads per Inch | Double Thread Depth | 50% Thread | 55% Thread | 60% Thread | 65% Thread | 70% Thread | 75% Thread | 80% Thread | 85% Thread |
|------------------|---------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| 6                | .21651              | .1083      | .1192      | .1300      | .1408      | .1517      | .1625      | .1733      | .1842      |
| 7                | .18558              | .0929      | .1021      | .1114      | .1207      | .1300      | .1393      | .1486      | .1579      |
| 8                | .16238              | .0813      | .0894      | .0975      | .1056      | .1138      | .1219      | .1300      | .1381      |
| 9                | .14434              | .0722      | .0794      | .0866      | .0939      | .1011      | .1083      | .1156      | .1228      |
| 10               | .12990              | .0649      | .0714      | .0779      | .0844      | .0909      | .0974      | .1039      | .1105      |
| 11               | .11809              | .0590      | .0649      | .0708      | .0767      | .0826      | .0885      | .0944      | .1005      |
| 12               | .10825              | .0541      | .0595      | .0649      | .0702      | .0755      | .0808      | .0861      | .0921      |
| 13               | .09992              | .0499      | .0549      | .0599      | .0649      | .0699      | .0749      | .0799      | .0850      |
| 14               | .09278              | .0464      | .0510      | .0556      | .0602      | .0648      | .0694      | .0740      | .0789      |
| 16               | .08119              | .0406      | .0446      | .0486      | .0526      | .0566      | .0606      | .0646      | .0691      |
| 18               | .07217              | .0361      | .0396      | .0431      | .0466      | .0501      | .0536      | .0571      | .0614      |
| 20               | .06495              | .0325      | .0357      | .0389      | .0421      | .0453      | .0485      | .0517      | .0553      |
| 24               | .05412              | .0270      | .0298      | .0326      | .0354      | .0382      | .0410      | .0438      | .0460      |
| 27               | .04811              | .0240      | .0264      | .0288      | .0312      | .0336      | .0360      | .0384      | .0409      |
| 28               | .04639              | .0232      | .0254      | .0276      | .0298      | .0324      | .0347      | .0370      | .0395      |
| 30               | .04330              | .0216      | .0238      | .0260      | .0282      | .0304      | .0326      | .0348      | .0368      |
| 32               | .04059              | .0203      | .0223      | .0243      | .0263      | .0283      | .0303      | .0323      | .0345      |
| 36               | .03608              | .0180      | .0198      | .0216      | .0234      | .0252      | .0270      | .0288      | .0307      |
| 40               | .03247              | .0162      | .0178      | .0194      | .0210      | .0226      | .0242      | .0258      | .0276      |
| 44               | .02952              | .0147      | .0162      | .0177      | .0192      | .0207      | .0222      | .0237      | .0251      |
| 48               | .02706              | .0135      | .0148      | .0161      | .0174      | .0187      | .0200      | .0213      | .0230      |
| 56               | .02319              | .0116      | .0127      | .0138      | .0149      | .0160      | .0171      | .0182      | .0197      |
| 64               | .02029              | .0101      | .0111      | .0121      | .0131      | .0141      | .0151      | .0161      | .0173      |
| 72               | .01804              | .0090      | .0099      | .0107      | .0115      | .0123      | .0131      | .0139      | .0153      |
| 80               | .01623              | .0081      | .0089      | .0097      | .0105      | .0113      | .0121      | .0129      | .0138      |

Figures in table show amount to subtract from O.D. of screw to obtain specific percentages of thread.  
Select nearest size commercial stock drill.

