

# General Information

## SI Units & Conversions for Characteristics of Mechanical Fasteners

| PROPERTY    | UNIT                    | SYMBOL            | CONVERSION                  |                   |             | APPROXIMATE EQUIVALENT                    |
|-------------|-------------------------|-------------------|-----------------------------|-------------------|-------------|---|
|             |                         |                   | FROM                        | TO                | MULTIPLY BY |   |
| Length      | metre                   | m                 | inch                        | mm                | 25.4        | 25mm = 1 in                               |
|             | centimeter              | cm                | inch                        | cm                | 2.54        | 300mm=1 ft                                |
|             | millimeter              | mm                | foot                        | mm                | 304.8       | 1m = 39.37                                |
| Mass        | kilogram                | kg                | ounce                       | g                 | 28.35       | 28g = 1oz                                 |
|             | gram                    | g                 | pound                       | kg                | .4536       | 1kg = 2.2lb = 35oz                        |
|             | tonne (megagram)        | t                 | ton (224lb)                 | kg                | 984.2       | 1t = 2206lbs                              |
| Density     | kilogram per cub. metre | kg/m <sup>3</sup> | pounds per cu. ft           | kg/m <sup>3</sup> | 16.02       | 16kg/m <sup>3</sup> = 1lb/ft <sup>3</sup> |
| Temperature | deg. Celsius            | °C                | deg. Fahr                   | °C                | (°F-32)x5/9 | 0°C = 32 °F                               |
| Area        | square metre            | m <sup>2</sup>    | sq. inch                    | mm <sup>2</sup>   | 645.2       | 645mm <sup>2</sup> = 1 in <sup>2</sup>    |
|             | squaremillimetre        | mm <sup>2</sup>   | sq. ft                      | m <sup>2</sup>    | .0929       | 1m <sup>2</sup> = 11 ft <sup>2</sup>      |
| Volume      | cubic metre             | m <sup>3</sup>    | cu. in                      | mm <sup>3</sup>   | 16387       | 16400mm <sup>3</sup> = 1 in <sup>3</sup>  |
|             | cubic centimeter        | cm <sup>3</sup>   | cu. ft                      | m <sup>3</sup>    | .02832      | 1m <sup>3</sup> = 35ft <sup>3</sup>       |
|             | cubic millimeter        | mm <sup>3</sup>   | cu. yd                      | m <sup>3</sup>    | .7645       | 1m <sup>3</sup> = 1.3yd                   |
| Force       | newton                  | N                 | ounce(Force)                | N                 | .278        | 1N = 3.6 oz'                              |
|             | kilonewton              | kN                | pound(Force)                | kN                | .00445      | 4.4N = 1 lbf                              |
|             | meganewton              | MN                | kip                         | MN                | .00445      | 1kN = 225 lbf                             |
| Pressure    | bar                     | bar               | MPa                         | bar               | .1          | 1MPa = 1bar                               |
|             | megapascal              | MPa               | pound/in <sup>2</sup> (psi) | MPa               | .0069       | 1MPa = 145 psi                            |
|             | newton/sqmm             | N/m <sup>2</sup>  | Kip/in <sup>2</sup> (ksi)   | MPa               | 6.895       | 7MPa = 1ksi                               |
| Torque      | newton-meters           | N-m               | inch-ounce                  | N-m               | .00706      | 1N-m = 140 in.oz                          |
|             |                         |                   | inch-pound                  | N-m               | .113        | 1N-m = 9 in. ib                           |
|             |                         |                   | foot-pound                  | N-m               | 1.356       | 1N-m.75 ft lb<br>1.4N-m = 1 ft.lb         |

# General Information

**Hardness Comparison Table**

| Brinell 10m/m Ball<br>3000kg load. | Firth or<br>Vickers 120kg | Rockwell                          |                                   | Brinell 10m/m Ball<br>3000kg load. | Firth or<br>Vickers 120kg | Rockwell                          |                               |
|------------------------------------|---------------------------|-----------------------------------|-----------------------------------|------------------------------------|---------------------------|-----------------------------------|-------------------------------|
|                                    |                           | C. Scale 120°<br>Cone 150kg load. | B. Scale 1/16"<br>Ball 100kg load |                                    |                           | C. Scale 120°<br>Cone 150kg load. | B. Scale 1/16"<br>100kg load. |
| 800                                | -                         | 72                                | -                                 | 276                                | 278                       | 30                                | 105                           |
| 780                                | 1220                      | 71                                | -                                 | 269                                | 272                       | 29                                | 104                           |
| 760                                | 1170                      | 70                                | -                                 | 261                                | 261                       | 28                                | 103                           |
| 745                                | 1114                      | 68                                | -                                 | 258                                | 258                       | 27                                | 102                           |
| 725                                | 1060                      | 67                                | -                                 | 255                                | 255                       | 26                                | 102                           |
| 712                                | 1021                      | 66                                | -                                 | 249                                | 250                       | 25                                | 101                           |
| 682                                | 940                       | 65                                | -                                 | 245                                | 246                       | 24                                | 100                           |
| 688                                | 905                       | 64                                | -                                 | 240                                | 240                       | 23                                | 99                            |
| 652                                | 867                       | 63                                | -                                 | 237                                | 235                       | 22                                | 99                            |
| 262                                | 803                       | 62                                | -                                 | 229                                | 226                       | 21                                | 98                            |
| 614                                | 775                       | 61                                | -                                 | 224                                | 221                       | 20                                | 97                            |
| 601                                | 746                       | 60                                | -                                 | 217                                | 127                       | 19                                | 96                            |
| 590                                | 727                       | 59                                | -                                 | 211                                | 213                       | 18                                | 95                            |
| 576                                | 694                       | 57                                | -                                 | 206                                | 209                       | 17                                | 94                            |
| 552                                | 649                       | 56                                | -                                 | 203                                | 201                       | 16                                | 94                            |
| 545                                | 639                       | 55                                | -                                 | 200                                | 199                       | 15                                | 93                            |
| 529                                | 606                       | 54                                | -                                 | 196                                | 197                       | 14                                | 92                            |
| 514                                | 587                       | 53                                | 120                               | 191                                | 190                       | 13                                | 92                            |
| 502                                | 565                       | 52                                | 119                               | 187                                | 186                       | 12                                | 91                            |
| 495                                | 551                       | 51                                | 119                               | 185                                | 184                       | 11                                | 91                            |
| 477                                | 534                       | 49                                | 118                               | 183                                | 183                       | 10                                | 90                            |
| 461                                | 489                       | 47                                | 117                               | 175                                | 174                       | 7                                 | 88                            |
| 444                                | 474                       | 46                                | 116                               | 170                                | 171                       | 6                                 | 87                            |
| 427                                | 460                       | 45                                | 115                               | 167                                | 168                       | 5                                 | 87                            |
| 415                                | 435                       | 44                                | 115                               | 165                                | 165                       | 4                                 | 86                            |
| 401                                | 413                       | 43                                | 114                               | 163                                | 162                       | 3                                 | 85                            |
| 388                                | 401                       | 42                                | 114                               | 160                                | 159                       | 2                                 | 84                            |
| 374                                | 390                       | 41                                | 113                               | 156                                | 154                       | 1                                 | 83                            |
| 370                                | 385                       | 40                                | 112                               | 154                                | 152                       | -                                 | 82                            |
| 362                                | 280                       | 39                                | 111                               | 152                                | 150                       | -                                 | 82                            |
| 351                                | 361                       | 38                                | 111                               | 147                                | 147                       | -                                 | 80                            |
| 346                                | 352                       | 37                                | 110                               | 147                                | 147                       | -                                 | 79                            |
| 331                                | 335                       | 36                                | 109                               | 143                                | 144                       | -                                 | 79                            |
| 323                                | 320                       | 35                                | 109                               | 141                                | 142                       | -                                 | 77                            |
| 311                                | 312                       | 34                                | 108                               | 140                                | 135                       | -                                 | 75                            |
| 301                                | 305                       | 33                                | 107                               | 135                                | 135                       | -                                 | 75                            |
| 293                                | 291                       | 32                                | 106                               | 130                                | 130                       | -                                 | 72                            |
| 285                                | 285                       | 31                                | 105                               | -                                  | -                         | -                                 | -                             |