



Fasteners 101 - Threads

Threads: Metric bolts are specified by thread pitch. Pitch refers to the distance between teeth. A bolt described as 16mm-1.5 refers to a bolt with 16mm diameter shaft and 1.5mm between threads. There are up to 3 different pitch variants for a given metric bolt diameter. SAE bolts are specified by threads per inch so a bolt described as ½”-20 means a ½” diameter bolt with 20 threads per inch. SAE bolts are specified as either UNF or UNC referring to fine and course thread respectively. Tables 1 and 2 show common diameter-thread combinations.

Table 1 - Standard Thread Pitch for Metric Bolts

| Bolt Diameter (mm) | Thread Pitch (distance between threads, mm) | | |
|-----------------------|--|------|------------|
| | Standard | Fine | Super Fine |
| 2 | 0.4 | - | - |
| 2.5 | 0.45 | - | - |
| 3 | 0.5 | - | - |
| 4 | 0.7 | - | - |
| 5 | 0.8 | - | - |
| 6 | 1 | - | - |
| 7 | 1 | - | - |
| 8 | 1.25 | 1 | - |
| 10 | 1.5 | 1.25 | 1 |
| 12 | 1.75 | 1.5 | 1.25 |
| 14 | 2 | 1.5 | - |
| 16 | 2 | 1.5 | - |
| 18 | 2.5 | 1.5 | - |
| 20 | 2.5 | - | - |



Table 2 - Threads Per Inch (TPI) for SAE Bolts and Machine Screws

| Bolt Size or Diameter | Threads Per Inch (TPI) | |
|-----------------------|------------------------|-------------------|
| | Coarse Thread (UNC) | Fine Thread (UNF) |
| #2 | 56 | - |
| #3 | 48 | - |
| #4 | 40 | - |
| #5 | 40 | - |
| #6 | 32 | - |
| #8 | 32 | - |
| #10 | 24 | 32 |
| #12 | 24 | - |
| 1/4 | 20 | 28 |
| 5/16 | 18 | 24 |
| 3/8 | 16 | 24 |
| 7/16 | 14 | 20 |
| 1/2 | 13 | 20 |
| 9/16 | 12 | 18 |
| 5/8 | 11 | 18 |
| 3/4 | 10 | 16 |
| 7/8 | 9 | 14 |
| 1 | 8 | 12,14 |

* 12tpi is the UNF standard however 14tpi is far more common in actual use.