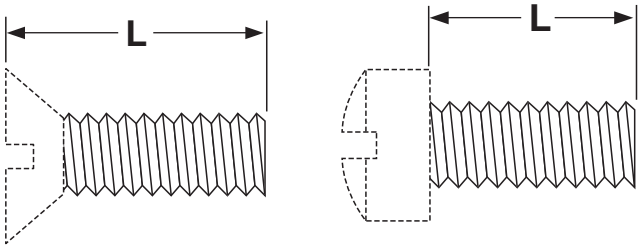
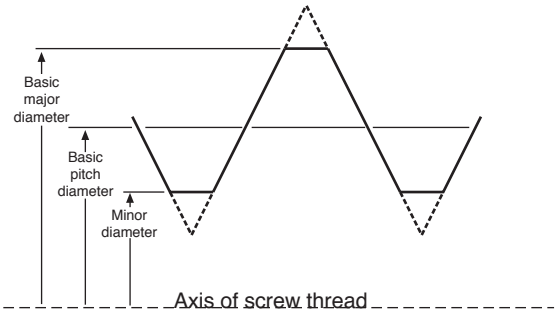
# Machine Screws *METRIC*

**Thread Dimensions**
**Mech. & Perform. Requirements**




## METRIC - External Threads for Machine Screws & Cap Screws, Class 6g

**DIN 13; ISO 898-1 & 965**

| Nominal Size | Major Diameter | | Pitch Diameter | | Minor Diameter | | Stress Area, $mm^2$ | Tensile Strength for STEEL Screws N, min. | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Max | Min | Max | Min | Max | Min | | Class 4.8 | Class 8.8 | Class 10.9 |
| M1.6 | 1.581 | 1.496 | 1.354 | 1.291 | 1.151 | 1.075 | - | - | | |
| M2 | 1.981 | 1.886 | 1.721 | 1.654 | 1.490 | 1.407 | - | - | | |
| M2.5 | 2.480 | 2.380 | 2.188 | 2.117 | 1.928 | 1.840 | - | - | | |
| M3 | 2.980 | 2.874 | 2.655 | 2.580 | 2.367 | 2.273 | 5.03 | 2110 | 4020 | 5230 |
| M4 | 3.978 | 3.838 | 3.523 | 3.433 | 3.119 | 3.002 | 8.78 | 3690 | 7020 | 9130 |
| M5 | 4.976 | 4.826 | 4.456 | 4.361 | 3.995 | 3.869 | 14.2 | 5960 | 11,350 | 14,800 |
| M6 | 5.974 | 5.794 | 5.324 | 5.212 | 4.747 | 4.596 | 20.1 | 8440 | 16,100 | 20,900 |
| M8 | 7.972 | 7.760 | 7.160 | 7.042 | 6.438 | 6.272 | 36.6 | 15,400 | 29,200 | 38,100 |
| M10 | 9.968 | 9.732 | 8.994 | 8.862 | 8.128 | 7.938 | 58 | 24,400 | 46,400 | 60,300 |
| M12 | 11.966 | 11.701 | 10.829 | 10.679 | 9.819 | 9.602 | 84.3 | 35,400 | 67,400 | 87,700 |
| M14 | 13.962 | 13.682 | 12.663 | 12.503 | 11.508 | 11.271 | 115 | 48,300 | 92,000 | 120,000 |
| M16 | 15.962 | 15.682 | 14.663 | 14.503 | 13.508 | 13.271 | 157 | 65,900 | 125,000 | 163,000 |
| M20 | 19.958 | 19.623 | 18.334 | 18.164 | 16.891 | 16.625 | 245 | 103,000 | 203,000 | 255,000 |
| M24 | 23.952 | 23.577 | 22.003 | 21.803 | 20.271 | 19.955 | 353 | 148,000 | 293,000 | 367,000 |
| M30 | 29.947 | 29.522 | 27.674 | 27.462 | 25.653 | 25.306 | 561 | 236,000 | 466,000 | 583,000 |
| M36 | 35.940 | 35.465 | 33.342 | 33.118 | 31.033 | 30.655 | 817 | 343,000 | 678,000 | 850,000 |
| M42 | 41.937 | 41.437 | 39.014 | 38.778 | 36.416 | 36.007 | | | | |
| M48 | 47.929 | 47.399 | 44.681 | 44.431 | 41.795 | 41.352 | | | | |
| M56 | 55.925 | 55.365 | 52.353 | 52.088 | 49.177 | 48.700 | | | | |
| M64 | 63.920 | 63.320 | 60.023 | 59.743 | 56.559 | 56.048 | | | | |

| Tolerance on Length | | | | |
|---|---|---|---|---|
| | 3mm: ±0.2 | 4-6mm: ±0.24 | 8-10mm: ±0.29 | 12-16mm: ±0.35 |
| | 20-30mm: ±0.42 | | 35-50mm: ±0.5 | 55-60mm: ±0.95 |

| | | |
|---|---|---|
| **Description** | A metric machine screw is a straight shank fastener with a metric thread pitch designed to go through a hole or nut that is pre-tapped to form a mating thread for the screw. | |
| **Applications/ Advantages** | Machine screws form a fastening superior in strength to spaced thread screws. Metric screws are the type almost exclusively used in items manufactured in Europe. | |
| **Material** | **Steel** | **Stainless** |
| | Class 4.8 machine screws shall be made from a carbon steel, partially or fully annealed as required, which conforms to the following chemical composition-- ***Carbon***: 0.55% maximum; ***Phosphorus***: 0.05% maximum; ***Sulfur***: 0.06% maximum. | A2 stainless screws shall be made from an austenitic stainless that conforms to the following chemical composition-- ***Carbon***: 0.08% maximum; ***Silicon***: 1.0% maximum; ***Manganese***: 2.0% maximum; ***Phosphorous***: 0.05% maximum; ***Sulfur***: 0.03% maximum; ***Chromium***: 17.0 to 20.0%; ***Carbon***: 0.55% maximum; ***Nickel***: 8.0 to 13.0%. |
| **Hardness** | Rockwell B 71 - 99.5 (Vickers HV 130 - 250) | Rockwell B85 - B95 (approximately) |
| **Tensile Strength** | 420 $N/mm^2$ minimum | - |
| **Plating** | See Appendix-A for plating information | Stainless machine screws are usually provided plain or with a black oxide finish. |

# Machine Screws & SEMS METRIC Conversion Chart

| Thread Pitch Comparison | |
|---|---|
| **Millimeters** | **Threads per Inch** |
| 0.25 | 101.5 |
| 0.3 | 84.75 |
| 0.35 | 72.5 |
| 0.4 | 63.5 |
| 0.45 | 56.5 |
| 0.5 | 50.75 |
| 0.6 | 42.5 |
| 0.7 | 36.5 |
| 0.75 | 33.75 |
| 0.8 | 31.75 |
| 0.9 | 28.5 |
| 1 | 25.5 |
| 1.25 | 20.25 |
| 1.5 | 17 |
| 1.75 | 14.5 |
| 2 | 12.75 |
| 2.5 | 10.25 |
| 3 | 8.5 |
| 3.5 | 7.25 |
| 4 | 6.25 |
| 4.5 | 5.5 |
| 5 | 5.25 |
| 5.5 | 4.5 |
| 6 | 4.25 |