| **Material** | **Young's Modulus (Modulus of Elasticity) - *E -*** | | **Ultimate Tensile Strength - *Su -* *(106 N/m2, MPa)*** | **Yield Strength - *Sy -* *(106 N/m2, MPa)*** |
| --- | --- | --- | --- | --- |
| ***(106 psi)*** | ***(109 N/m2, GPa)*** |
| ABS plastics |  | 1.4 - 3.1 | 40 |  |
| Acetals |  | 2.8 | 65 |  |
| Acrylic |  | 3.2 | 70 |  |
| Aluminium Bronze |  | 120 |  |  |
| Aluminum | 10.0 | 69 | 110 | 95 |
| Aluminum Alloys | 10.2 |  |  |  |
| Antimony | 11.3 |  |  |  |
| Aramid |  | 70 - 112 |  |  |
| Beryllium (Be) | 42 | 287 |  |  |
| Beryllium Copper | 18.0 |  |  |  |
| Bismuth | 4.6 |  |  |  |
| Bone, compact |  | 18 | 170 (compression) |  |
| Bone, spongy |  | 76 |  |  |
| Boron |  |  |  | 3100 |
| Brass |  | 102 - 125 | 250 |  |
| Brass, Naval |  | 100 |  |  |
| Bronze |  | 96 - 120 |  |  |
| CAB |  | 0.8 |  |  |
| Cadmium | 4.6 |  |  |  |
| Carbon Fiber Reinforced Plastic |  | 150 |  |  |
| Carbon nanotube, single-walled |  | 1000+ |  |  |
| Cast Iron 4.5% C, ASTM A-48 |  |  | 170 |  |
| Cellulose,  cotton, wood pulp and regenerated |  |  | 80 - 240 |  |
| Cellulose acetate, moulded |  |  | 12 - 58 |  |
| Cellulose acetate, sheet |  |  | 30 - 52 |  |
| Cellulose nitrate, celluloid |  |  | 50 |  |
| Chlorinated polyether |  | 1.1 | 39 |  |
| Chlorintated PVC (CPVC) |  | 2.9 |  |  |
| Chromium | 36 |  |  |  |
| Cobalt | 30 |  |  |  |
| Concrete |  | 17 |  |  |
| Concrete, High Strength (compression) |  | 30 | 40 (compression) |  |
| Copper | 17 | 117 | 220 | 70 |
| Diamond (C) |  | 1220 |  |  |
| Douglas fir Wood |  | 13 | 50 (compression) |  |
| Epoxy resins |  | 3-2 | 26 - 85 |  |
| Fiberboard, Medium Density |  | 4 |  |  |
| Flax fiber |  | 58 |  |  |
| Glass |  | 50 - 90 | 50 (compression) |  |
| Glass reinforced polyester matrix |  | 17 |  |  |
| Gold | 10.8 | 74 |  |  |
| Granite |  | 52 |  |  |
| Graphene |  | 1000 |  |  |
| Grey Cast Iron |  | 130 |  |  |
| Hemp fiber |  | 35 |  |  |
| Inconel | 31 |  |  |  |
| Iridium | 75 |  |  |  |
| Iron | 28.5 | 210 |  |  |
| Lead | 2.0 |  |  |  |
| Magnesium metal (Mg) | 6.4 | 45 |  |  |
| Manganese | 23 |  |  |  |
| Marble |  |  | 15 |  |
| MDF - Medium-density fiberboard |  | 4 |  |  |
| Mercury |  |  |  |  |
| Molybdenum (Mo) | 40 | 329 |  |  |
| Monel Metal | 26 |  |  |  |
| Nickel | 31 | 170 |  |  |
| Nickel Silver | 18.5 |  |  |  |
| Nickel Steel | 29 |  |  |  |
| Niobium (Columbium) | 15 |  |  |  |
| Nylon-6 |  | 2 - 4 | 45 - 90 | 45 |
| Nylon-66 |  |  | 60 - 80 |  |
| Oak Wood (along grain) |  | 11 |  |  |
| Osmium (Os) | 80 | 550 |  |  |
| Phenolic cast resins |  |  | 33 - 59 |  |
| Phenol-formaldehyde moulding compounds |  |  | 45 - 52 |  |
| Phosphor Bronze |  | 116 |  |  |
| Pine Wood (along grain) |  | 9 | 40 |  |
| Platinum | 21.3 |  |  |  |
| Plutonium | 14 | 97 |  |  |
| Polyacrylonitrile, fibres |  |  | 200 |  |
| Polybenzoxazole |  | 3.5 |  |  |
| Polycarbonates |  | 2.6 | 52 - 62 |  |
| Polyethylene HDPE (high density) |  | 0.8 | 15 |  |
| Polyethylene Terephthalate, PET |  | 2 - 2.7 | 55 |  |
| Polyimide |  | 2.5 | 85 |  |
| Polyisoprene, hard rubber |  |  | 39 |  |
| Polymethylmethacrylate (PMMA) |  | 2.4 - 3.4 |  |  |
| Polyimide aromatics |  | 3.1 | 68 |  |
| Polypropylene, PP |  | 1.5 - 2 | 28 - 36 |  |
| Polystyrene, PS |  | 3 - 3.5 | 30 - 100 |  |
| Polytehylene, LDPE (low density) |  | 0.11 - 0.45 |  |  |
| Polytetrafluoroethylene (PTFE) |  | 0.4 |  |  |
| Polyurethane cast liquid |  |  | 10 - 20 |  |
| Polyurethane elastomer |  |  | 29  - 55 |  |
| Polyvinylchloride (PVC) |  | 2.4 - 4.1 |  |  |
| Potassium |  |  |  |  |
| Rhodium | 42 |  |  |  |
| Rubber, small strain |  | 0.01 - 0.1 |  |  |
| Sapphire |  | 435 |  |  |
| Selenium | 8.4 |  |  |  |
| Silicon | 16 | 130 - 185 |  |  |
| Silicon Carbide |  | 450 |  | 3440 |
| Silver | 10.5 |  |  |  |
| Sodium |  |  |  |  |
| Steel, High Strength Alloy ASTM A-514 |  |  | 760 | 690 |
| Steel, stainless AISI 302 |  | 180 | 860 | 502 |
| Steel, Structural ASTM-A36 |  | 200 | 400 | 250 |
| Tantalum | 27 |  |  |  |
| Teflon. PTFE |  | 0.5 |  |  |
| Thorium | 8.5 |  |  |  |
| Tin |  | 47 |  |  |
| Titanium | 16 |  |  |  |
| Titanium Alloy |  | 105 - 120 | 900 | 730 |
| Tooth enamel |  | 83 |  |  |
| Tungsten (W) |  | 400 - 410 |  |  |
| Tungsten Carbide (WC) |  | 450 - 650 |  |  |
| Uranium | 24 | 170 |  |  |
| Vanadium | 19 |  |  |  |
| Wrought Iron |  | 190 - 210 |  |  |
| Zinc | 12 |  |  |  |

* *1 N/m2 = 1x10-6 N/mm2 = 1 Pa = 1.4504x10-4 psi*
* *1 psi (lb/in2) = 144 psf (lbf/ft2) = 6,894.8 Pa (N/m2) = 6.895x10-3 N/mm2*

Note! Use the pressure unit converter on this page to switch the values to other units.