# 410 Stainless Steel

**Categories:** Metal; Ferrous Metal; Heat Resisting; Stainless Steel; T 400 Series Stainless Steel

**Material Notes:** 16 mm diameter bar, heated to 980°C for 30 min., oil quenched, 49°C temper for 2 hours

**Key Words:** AFNOR Z 12 C 13, UNI X 12 Cr 13, JIS SUS 410, SS14 2302 (Sweden), B.S. 410 S 21, UNS S41000, AMS 5504, AMS 5505, AMS 5591, AMS 5613, AMS 5776, AMS 5821, ASME SA194 (6), ASME SA240, ASME SA268, ASME SA479, ASTM A176, ASTM A193, ASTM A194, ASTM A240, ASTM A276, ASTM A314, ASTM A473, ASTM A479, ASTM A493, ASTM A511, martensitic, ASTM A580, FED QQ-S-763, FED QQ-W-423, MIL SPEC MIL-S-862, SAE J405 (51410), B.S. En. 56 A, B.S. ANC 1 Grade A (U.K), SAE J412 (51410), DIN 1.4006, AFNOR Z 10 C 13, AFNOR Z 10 C 14 (France), , ISO 683/13 3

**Vendors:** Click here to view all available suppliers for this material.

Please click here if you are a supplier and would like information on how to add your listing to this material.



| Physical Properties | Metric | English | Comments |
|---|---|---|---|
| Density | 7.80 g/cc | 0.282 lb/in³ | |

| Mechanical Properties | Metric | English | Comments |
|---|---|---|---|
| Hardness, Brinell | 422 | 422 | Converted from Rockwell C hardness |
| Hardness, Knoop | 464 | 464 | Converted from Rockwell C hardness |
| Hardness, Rockwell C | 45 | 45 | |
| Hardness, Vickers | 446 | 446 | Converted from Rockwell C hardness. |
| Tensile Strength, Ultimate | 1525 MPa | 221200 psi | |
| Tensile Strength, Yield | 1225 MPa @Strain 0.200 % | 177700 psi @Strain 0.200 % | |
| Elongation at Break | 14.5 % | 14.5 % | in 50 mm |
| Reduction of Area | 45 % | 45 % | |
| Modulus of Elasticity | 200 GPa | 29000 ksi | |

| Electrical Properties | Metric | English | Comments |
|---|---|---|---|
| Electrical Resistivity | 0.0000570 ohm-cm @Temperature 20.0 °C | 0.0000570 ohm-cm @Temperature 68.0 °F | |
| | 0.000108 ohm-cm @Temperature 650 °C | 0.000108 ohm-cm @Temperature 1200 °F | |
| Magnetic Permeability | 700 - 1000 | 700 - 1000 | annealed condition at RT |

| Thermal Properties | Metric | English | Comments |
|---|---|---|---|
| CTE, linear | 9.90 µm/m-°C @Temperature 0.000 - 100 °C | 5.50 µin/in-°F @Temperature 32.0 - 212 °F | |
| | 11.0 µm/m-°C @Temperature 0.000 - 315 °C | 6.11 µin/in-°F @Temperature 32.0 - 599 °F | |
| | 11.5 µm/m-°C @Temperature 0.000 - 540 °C | 6.39 µin/in-°F @Temperature 32.0 - 1000 °F | |
| | 11.7 µm/m-°C @Temperature 0.000 - 650 °C | 6.50 µin/in-°F @Temperature 32.0 - 1200 °F | |
| Specific Heat Capacity | 0.460 J/g-°C @Temperature 0.000 - 100 °C | 0.110 BTU/lb-°F @Temperature 32.0 - 212 °F | |
| Thermal Conductivity | 24.9 W/m-K @Temperature 100 °C | 173 BTU-in/hr-ft²-°F @Temperature 212 °F | |
| | 28.7 W/m-K @Temperature 500 °C | 199 BTU-in/hr-ft²-°F @Temperature 932 °F | |
| Melting Point | 1480 - 1530 °C | 2700 - 2790 °F | |
| Solidus | 1480 °C | 2700 °F | |
| Liquidus | 1530 °C | 2790 °F | |
| Maximum Service Temperature, Air | 705 °C | 1300 °F | Continuous Service |
| | 815 °C | 1500 °F | Intermittent Service |

| Component Elements Properties | Metric | English | Comments |
|---|---|---|---|
| Carbon, C | <= 0.15 % | <= 0.15 % | |
| Chromium, Cr | 11.5 - 13.5 % | 11.5 - 13.5 % | |
| Iron, Fe | 84.3 - 88.5 % | 84.3 - 88.5 % | as balance |
| Manganese, Mn | <= 1.0 % | <= 1.0 % | |
| Phosphorous, P | <= 0.040 % | <= 0.040 % | |
| Silicon, Si | <= 1.0 % | <= 1.0 % | |

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