



HSM Wire International, Inc

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Alloy 400 - Nickel Alloy

Description: Alloy 400 is a ductile nickel-copper alloy with resistance to a variety of corrosive conditions. The alloy has a history of use as a corrosion resistant material, dating back to the early 20th century when it was developed as an attempt to use a high copper content nickel ore.

Applications: Nickel Alloy 400 is used for Marine and chemical processing equipment, Valves, pumps, propeller shafts, Marine fixtures and fasteners, Gasoline and fresh water tanks, Heat exchangers and Process vessels and piping.

| | | | | | | | |
|-----------------------------|------------|------------------|-----------|--|------------|------------|------------|
| Nominal Composition: | C% | Mn% | P% | S% | Si% | Al% | Cu% |
| | 0.10 | 0.50 | 0.005 | 0.005 | 0.25 | 0.02 | 32.0 |
| | Fe% | Ni% + Co% | | *By difference - For material furnished to QQ-N-281, lead, tin and zinc are each typically <0.003. | | | |
| | 1.0 | Balance* | | | | | |

Physical Properties

| | |
|--------------------------------------|-------------------|
| Specific Gravity | 8.83 |
| Density | 0.319 lb/cu in |
| Mean Specific Heat | 0.10 Btu/lb/°F |
| Electrical Resistivity - 70°F | 51.0 Mircohm - cm |

Linear Coefficient of Thermal Expansion

| Average From 70°F (21°C) to °F(°C) | | 10 ⁻⁶ / °F | 10 ⁻⁶ / °F |
|---------------------------------------|-------|-----------------------|-----------------------|
| 200 | (93) | 7.7 | 13.9 |
| 400 | (204) | 8.6 | 15.5 |
| 600 | (316) | 8.8 | 15.8 |
| 800 | (427) | 8.9 | 16.0 |
| 1000 | (538) | 9.1 | 16.4 |

Mechanical Properties

| Elastic Modules | | Ultimate Tensile Strength | | Yield Strength | | % Elongation in 2" | Annealed Condition |
|----------------------|-----|---------------------------|-----|----------------|-----|--------------------|----------------------|
| psi | Mpa | psi | Mpa | psi | Mpa | | |
| 26 x 10 ⁶ | 180 | 75,000 | 520 | 35,000 | 240 | 45 | |
| Elastic Modules | | Ultimate Tensile Strength | | Yield Strength | | % Elongation in 2" | Hot Rolled Condition |
| psi | Mpa | psi | Mpa | psi | Mpa | | |
| 26 x 10 ⁶ | 180 | 80,000 | 550 | 45,000 | 310 | 30 | |

*To be used as a guideline only.

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R1.06.13.2013