

# NICKEL ALLOY

# ALLOY 718



## Alloy 718 (UNS N07718)

Alloy 718 was initially developed for the aerospace industry but its excellent strength and corrosion resistance were recognised by the oil industry and it is now widely used in this field also.

Alloy 718 is a nickel-chromium alloy which can be heat-treated to give high strength, good corrosion resistance, ease of formability and which can be welded with good resistance to strain age cracking. The alloy can be used at temperatures up to 700°C.

In the oil industry, Alloy 718 is heat treated such that the hardness does not exceed 40HRC which is the maximum allowed by NACE MR-01-75 / ISO 15156: 3 to prevent stress corrosion cracking. The major applications in this field are Valves and precision tubing.

In the aerospace and power generation industries, Alloy 718 is heat treated to give maximum strength and high creep resistance with typical hardness values exceeding 42HRC. The major applications are components for gas turbines, aircraft engines, fasteners and other high strength applications.

### AVAILABLE TUBE PRODUCT FORMS

STRAIGHT

SEAMLESS

### TYPICAL MANUFACTURING SPECIFICATIONS

AMS 5589

AMS 5590

Also individual customer specifications

### TYPICAL APPLICATIONS

HEAT EXCHANGERS

WELL HEAD COMPLETION EQUIPMENT

MANDRELS

VALVES

### INDUSTRIES PREDOMINANTLY USING THIS GRADE

AEROSPACE

OIL AND GAS

NUCLEAR AND POWER



## Technical Data

### MECHANICAL PROPERTIES

| Temper                   | Annealed |           |
|--------------------------|----------|-----------|
| Tensile Rm               | 155      | ksi (Max) |
| Tensile Rm               | 1069     | MPa (Max) |
| R.p. 0.2% Yield          | 95       | ksi (Max) |
| R.p. 0.2% Yield          | 655      | MPa (Max) |
| Elongation (2" or 4D gl) | 30       | % (min)   |

### PHYSICAL PROPERTIES (Room Temperature)

|                         |      |                                      |
|-------------------------|------|--------------------------------------|
| Specific Heat (0-100°C) | 435  | J.kg <sup>-1</sup> .°K <sup>-1</sup> |
| Thermal Conductivity    | 11.4 | W.m <sup>-1</sup> .°K <sup>-1</sup>  |
| Thermal Expansion       | 13   | µm/µm/°C                             |
| Modulus Elasticity      | 200  | GPa                                  |
| Electrical Resistivity  | 1.32 | µohm/cm                              |
| Density                 | 8.19 | g/cm <sup>3</sup>                    |

### CHEMICAL COMPOSITION (% by weight)

| Element | Min     | Max   |
|---------|---------|-------|
| C       | -       | 0.08  |
| Si      | -       | 0.35  |
| Mn      | -       | 0.35  |
| P       | -       | 0.015 |
| Al      | 0.2     | 0.8   |
| B       | -       | 0.60  |
| Co      | -       | 1     |
| Cr      | 17      | 21    |
| Cu      | -       | 0.3   |
| Fe      | Balance |       |
| Mo      | 2.8     | 3.3   |
| Nb      | 4.75    | 5.5   |
| Ni      | 50      | 55    |
| Ti      | 0.65    | 1.15  |