

Nickel-based Alloy

NY690

NiCr30Fe

SPECIFICATIONS

European Standards:

- NiCr30Fe

UNS : N06690

WL: 2.4642

COMPOSITION

Carbon.....	<0.05
Chromium.....	30.00
Iron.....	10.00
Nickel.....	Base
Very low Co level guaranteed for nuclear applications.	

TYPICAL MECHANICAL PROPERTIES

On metal supplied ready for use:

- Guaranteed level of tensile strength at ambient temperature:
 - UTS: > 586 N/mm²
 - 0.2 % Yield strength: > 240 N/mm²
 - Elongation (5d): > 30 %
- Guaranteed level of tensile strength at 350°C:
 - 0.2 % Yield strength: > 180 N/mm²
- Average tensile strength at high temperature:

APPLICATIONS

- Nuclear industry (RCCM M4102 - M4107) (ASME: SB163 - SB166 - SB167 - SB168 - SB564)
- Chemical industry (HCl/HF acids)
- Furnaces - incinerators
- Petrochemical industry
- Complies with ASTM B163 - B166 - B167 - B168 - B564

CHARACTERISTICS

- NY690 has excellent general and localised corrosion resistance in oxidising acid media, such as hydrochloric or hydrofluoric acid used during nuclear waste reprocessing or in pickling tanks.
- Corrosion resistance in phosphoric acid is excellent up to concentrations of 85 % and a temperature of 80°C.
- In sulphuric acid, this alloy may be used in any concentration but only at ambient temperature.
- NY690 shows very good stress corrosion resistance in aqueous chloride and polythionic acid media and in dilute sodium hydroxide solutions.
- In particular NY690 is used specifically for steam generator tubes and components in pressurised water nuclear power plants.
- At high temperatures NY690 shows good oxidation, sulphurisation and carburisation resistance. It can be used in non-sulphurous oxidising atmospheres up to 1150°C.

Temperature in °C	UTS in (N/mm ²)	0.2 % Yield strength in (N/mm ²)	Elongation (5d) in %
20	680	320	45
200	610	250	42
400	570	225	42
600	500	220	40
800	300	180	-

HEAT TREATMENT

- The treatment consists of a solution treatment above 1000°C followed by rapid water cooling.

PHYSICAL PROPERTIES

- Density:
 - at 20°C: 8.19
- Mean coefficient of expansion in m/m.°C:
 - between 20°C and 100°C: 14.1×10^{-6}
 - between 20°C and 300°C: 14.5×10^{-6}
 - between 20°C and 500°C: 15.5×10^{-6}
 - between 20°C and 700°C: 16.2×10^{-6}
 - between 20°C and 900°C: 17.0×10^{-6}
 - between 20°C and 1000°C: 17.8×10^{-6}
- Modulus of elasticity in N/mm²:
 - at 20°C: 211×10^3
 - at 100°C: 206×10^3
 - at 300°C: 195×10^3
 - at 500°C: 182×10^3
 - at 700°C: 167×10^3
 - at 850°C: 154×10^3
- Thermal conductivity in W.m/m².°C:
 - at 100°C: 13.5
 - at 300°C: 17.3
 - at 500°C: 21.0
 - at 700°C: 24.8
 - at 900°C: 28.5
 - at 1000°C: 30.1
- Specific heat in J/g.°C:
 - at 20°C: 0.45
 - at 100°C: 0.47
 - at 300°C: 0.52
 - at 500°C: 0.58
 - at 700°C: 0.63
 - at 900°C: 0.68
 - at 1000°C: 0.74
- Poisson's ratio: 0.289

FORGING

- 1240/900°C

Contact:

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The data provided in this document represent typical or average values rather than maximum or minimum guaranteed values. The applications indicated for the grades described are given as guidance only in order to help the reader in his personal assessment. Please note that these do not constitute a guarantee whether implicit or explicit as to whether the grade selected is suited to specific requirements. Aubert & Duval's liability shall not under any circumstances extend to product selection or to the consequences of that selection.