Alloy 601

Smiths Advanced Metals

Oxidation Resistance

Nickel-chromium high temperature alloy.

Alloy 601 (UNS N06601) is a nickel-chromium alloy used in high temperature service, combining excellent oxidation resistance with good creep and rupture strength.

An aluminium addition forms a tightly adherent oxide scale which resists spalling under thermal cycling, and gives good hot corrosion resistance in oxidising conditions. The alloy retains good ductility after long service exposure.

It is readily weldable, with no preheat or post-weld heat treatment required. The work hardened layer makes machining fairly difficult.

We stock Alloy 601 in a broad range of sizes, including round bar, plate, sheet and round tube.



Grades / Specifications

- UNS N06601 / W.Nr 2.4851
- ASTM B166 / B167 / B168
- AMS 5715 / AMS 5870

Benefits

- Excellent high temperature oxidation resistance
- Good creep & rupture strength
- Readily weldable

* Chemical Composition (weight %)

	Ni	Cr	Al	C	Mn	Si	Cu	S	Fe
min.	58.0	21.0	1.0						Bal
max.	63.0	25.0	1.7	0.10	1.0	0.50	1.0	0.015	

* As per ASTM B166

* Mechanical Properties (short-time tensile, typical)

Test Temperature	21 °C	538 °C	649 °C	760 °C	871 °C
Tensile Strength, MPa	690	621	414	234	124
0.2% Yield Strength, MPa	372	331	283	179	103
Elongation, %	45	44	45	70	120

* Typical values, converted from imperial

Thermal Cycling

Because its oxide scale stays tightly attached through repeated heating and cooling, Alloy 601 suits equipment that cycles in and out of service temperature, such as radiant tubes, retorts and annealing tubes.

Physical Properties

Alloy 601 has a density of 8.11 g/cm^3, a melting range of 1360–1411 °C and an elastic modulus of 206.5 GPa at room temperature. Its thermal conductivity is 13.75 W/m·K at 100 °C.

Unit 5 Percy Road,
Huntingdon,
Cambridgeshire PE29 6SZ
Tel: +44 (0) 1767 604710

bsi ISO 9001 Quality Management Systems CERTIFIED
AS/EN 9100 Aviation Space and Defence CERTIFIED
EN 9120 Aviation Space and Defence CERTIFIED
UKAS TESTING 1930

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