



STAINLESS

High performance Alloys - Medical - Aerospace - Microtechnics - Motorsport - Industry

1.4542
17-4PH
AISI 630
ASTM F899

GENERALITIES

Alloy 1.4542 is a structurally hardened martensitic stainless steel that combines a hardness of about 48 HRC with good corrosion resistance. This grade has a hardening peak at 480°C which allows easy ageing after machining on an initially solution treated condition. The grade is remelted to improve the cleanliness and homogeneity of the material. Stainless has a number of sources in stock, as well as different formats or states of the product to suit your processing needs. This product can also be made to measure or cut into slabs by our service centres.

APPLICATIONS

Because of its good corrosion resistance, good hardness in the treated state (48HRC) and its resilience, the grade is used in particular in the the manufacture of medical instruments (drills, etc.), in general mechanics, in the in the food industry and the automotive industry.

STANDARDS AND DESIGNATIONS

Numerical designations:

W. Nr 1.4542 – AISI 630 – UNS S17400

Standards :

NF S 94-090 - ASTM F 899 – NF EN 10088-3 – ISO 7153-1 -ASTM A564 - X5CrNiCuNb16-4 - AFNOR Z6CNU17-04

Brands:

UGI@4542, UGIMA@4542, X17U4@...

TYPICAL CHEMICAL ANALYSIS (mass %)

	Carbon	Manganese	Phosphorus	sulfur	Silicium	Chrom	Nickel	Copper	Niobium + Tantalum	Cobalt	Iron
MIN	---	---	---	---	---	15.0	3.0	3.0	0.15	---	BALANCE
MAX	0.07	1.0	0.040	0.0030	1.0	17.50	5.0	5.0	0.45	0.10	

METALLURGY

The production processes combined with the transformation processes enable a homogeneous microstructure to be obtained. In the processed state the microstructure consists of martensite and nanometric intermetallic precipitates precipitates (Ni3Cu) which grow during the aging process. aging.



PHYSICAL PROPERTIES AT 20°C

Density.....7,8 g.cm-3.
Coefficient of thermal expansion (between 20 et 200°C).....10,8 x 10⁶ m/m.°C
Young's modulus.....197x 10³ MPa
Thermal conductivity.....17W.m⁻¹K⁻¹
Ferromagnetic grade that can be magnetized

MECHANICAL PROPERTIES OF THE BARS

In particular, the grade is offered in the annealed (solution annealed) state with the following properties:

Temper	Hardness
Annealing (cond A or AT)	< 330 HBW

PROCESSIES

Forgeability

The grade can be hot forged in the temperature range 900/1250°C. Resolving will be necessary to achieve to achieve maximum hardness.

Weldability

The grade can be welded using most processes. Welding should preferably be carried out before ageing to avoid embrittlement of the heat affected zone.

Typical heat treatments

For a target hardness ≥ 47HRC (>1620MPa)
<ul style="list-style-type: none"> - Heating 810/850°C - Oil quenching - Ageing H900 (480°C /4h)

A volume contraction of up to about 0.07% is to be expected during to be expected during the ageing process.

CORROSION RESISTANCE

The grade has very good corrosion resistance but must be passivated. The microstructure contains no or very few chromium carbides which makes it less susceptible to intergranular corrosion.

STANDARD SHAPE

- Round or flat bars annealed (Condition A or AT) or pre-treated Hardened or ground surface depending on the diameter
- Flat bars made to measure in the annealed condition (consult us)
- Other formats: sheets

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