



# STAINLESS GROUP

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

**1.4542**  
**17-4PH**  
**AISI 630**  
**ASTM F899**

## GENERAL INFORMATION

Alloy **1.4542** or **17-4PH** is a structurally hardened martensitic stainless steel that combines a hardness of around 43 HRC with very good corrosion resistance. This grade has a hardening peak at 480°C, making it easy to carry out ageing after machining on a condition initially in solution (condition A). The grade is also available pre-treated and/or as an aerospace-grade remelted version.

STAINLESS has several sources in stock, as well as different product formats and conditions, to meet your processing requirements.

This product can also be made to measure or cut into blanks by our service centers

## APPLICATIONS

Thanks to its good resistance to corrosion, its good hardness in the treated state (43HRC) and its resilience, the grade is used in particular in the manufacture of instruments for the medical sector, general mechanics, 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®...



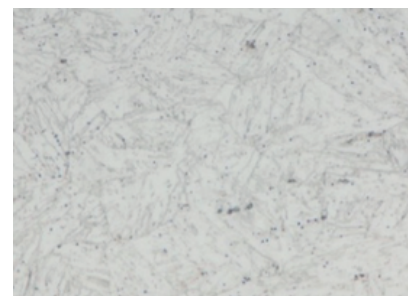
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## TYPICAL CHEMICAL ANALYSIS (mass %)

	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	0.030	1.0	17.50	5.0	5.0	0.45	0.10	

## METALLURGY

The manufacturing processes combined with the transformation processes produce a homogeneous microstructure. In the treated state, the microstructure consists of martensite and nanometric intermetallic precipitates (Ni<sub>3</sub>Cu) that germinate during ageing.



## PHYSICAL PROPERTIES AT 20°C

**Density**.....7,8 g.cm-3.  
**Coefficient of thermal expansion** (between 20 et 200°C).....10,8 x 10<sup>-6</sup>m/m.°C  
**Young's modulus**.....197x 10<sup>3</sup> MPa  
**Thermal conductivity**.....17W.m<sup>-1</sup>K<sup>-1</sup>  
**Ferromagnetic grade that can be magnetized**

## MECHANICAL PROPERTIES OF THE BARS

The grade is available in the quenched or annealed state (cond A or AT according to standards), or pre-treated with the following properties:

Temper	Hardness	Rm (MPa)
Quenched or Annealed (cond A or AT)	< 360 HBW	< 1200
Pre-treated H900	> 40 HRC	> 1310

## PROCESSES

### Forgeability

The grade can be hot forged in the 950/1200°C temperature range. Resolving will be necessary to achieve maximum hardness.

### Weldability

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

### Typical heat treatments

For a target hardness ≥ 40 HRC

- Heating 1030/1050°C
- Oil quench
- Ageing H900 (480°C /4h)

Volume shrinkage of up to approximately 0.07% is to be expected during ageing.

## CORROSION RESISTANCE

The grade is highly resistant to corrosion and is one of the best martensitic stainless steels. The microstructure contains little or no chromium carbides, making it highly insensitive to intergranular corrosion.

## STANDARD SHAPE

- Round or flat bars, annealed (Condition A or AT) or pre-treated – Surface hardened or ground depending on diameter
- Flat bars made to measure in the annealed condition (consult us)
- Other formats: forged blocks, sheet, strip, powder.

The information, data and photos presented in this document are given in good faith and for guidance only. If you need more precise information, our technical department is at your disposal.

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