



STAINLESS

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

**NICKEL BASE
ALLOY
ALLOY 80A
UNS N07080**

GENERALITIES

The nickel-based NiCr20TiAl alloy has excellent heat resistance, good creep resistance and creep and hot oxidation up to 815°C. The mastery of its VIM production method followed by followed by ESR or VAR remelting gives it a high level of cleanliness and homogeneity in order to properties.

STAINLESS has several qualified European or American sources in stock European or American qualified sources as well as and different diameters to meet your needs in terms of to meet your needs in terms of processing. requirements. This product can also be made to measure or cut into pieces by our by our service centres.

Each material is delivered with its certificate of certificate of origin in order to guarantee you total transparency and complete traceability.

APPLICATIONS

The grade is used for the manufacture of parts subject to high temperatures up to 815°C and high mechanical stresses. Applications include engine valves, aerospace engine parts such as discs and hot mountings.

STANDARDS AND DESIGNATIONS

Numerical designations:

W. Nr 2.4952 & 2.4631 - UNS N07080

Standards :

ASTM B637 NiCr20TiAl – Grade 80A - AFNOR : NC20TA

Brands:

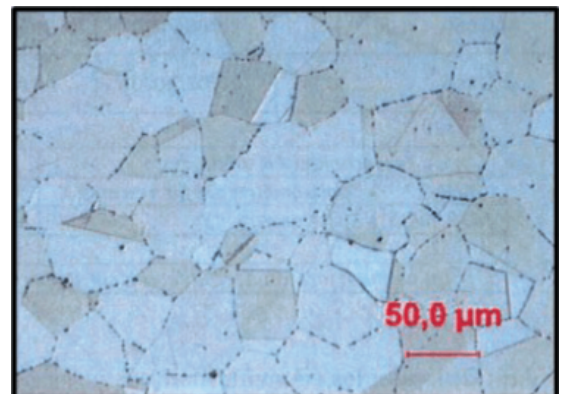
Nimonic®80A, VAT80A,...

TYPICAL CHEMICAL ANALYSIS (mass %)

| | Carbon | Manganese | Silicium | Chrome | Titane | Aluminium | Sulphur | Iron | Nickel |
|-----|--------|-----------|----------|--------|--------|-----------|---------|------|---------|
| MIN | --- | --- | --- | 18.0 | 1.80 | 0.50 | --- | --- | BALANCE |
| MAX | 0.10 | 1.0 | 1.0 | 21.0 | 2.70 | 1.80 | 0.015 | 3.0 | |

METALLURGY

The grade can be put into solution and then work-hardened before ageing. The microstructure is homogeneous and fine grained and hardening occurs by the appearance of gamma prime precipitates. In the solution treated condition, the microstructure is illustrated below with an austenitic matrix and discontinuous carbides at the grain boundaries:



PHYSICAL PROPERTIES AT 20°C

Density.....8.17g.cm⁻³.
Coefficient of thermal expansion (between 20 et 200°C).....12,7 x 10⁻⁶m/m.°C
Young's modulus.....190 - 200 x 10³ MPa
Thermal conductivity.....11.2 W.m/m².°C

MECHANICAL PROPERTIES OF THE BARS

The grade is offered as standard in the solution treated or solution treated and work hardened condition. The grade is always aged at 700°C/16h after machining. The typical mechanical properties are :

| Temper | UTS (Mpa) | YS 0.2% (Mpa) | E5d% |
|----------------|-----------|---------------|------|
| Aged 16h/700°C | > 930 | > 620 | > 20 |

PROCESSIES

Forgeability/Usability

The grade can be hot forged in the temperature range 1050/1200°C. Machining of this grade requires suitable equipment and tools. TIG or MIG welding is possible.

Heat treatments

Ageing is to be carried out at 700°C for 16 hours/air cooling on the solution treated or solution treated and work-hardened.

CORROSION RESISTANCE

The grade is highly resistant to hot oxidation which allows it to be used in engine applications.

STANDARD SHAPE

- 3m bars in solution treated or solution treated and work hardened condition - Work hardened or ground surface
- Other formats: please consult us

The information, data and photos presented in this document are given in good faith and for information purposes only. If you need more precise data, our technical department is at your disposal. Click on the link : t.turpin@stainless.eu