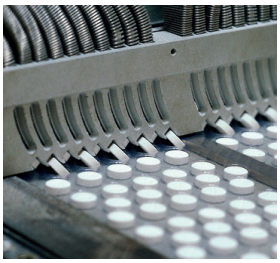
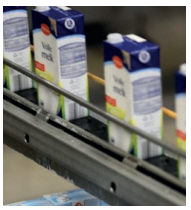
RS Alloys
Steel & Copper

Nicro®100

The quality worth of your experience...




- Mould inserts
- Plastic caps
- Surgery instruments
- Blades
- Filling units
- Pump components
- Precision measurements tools
- Pharmaceutical punches
- Plasticizing screws
- Powder compression

PHARMACEUTICAL
MEDICAL
PACKAGING
FOOD INDUSTRY
PLASTIC
OFF SHORE

TOUGHNESS
CORROSION
WEAR

Nicro®100

Nicro 100 is a new martensitic high Nitrogen alloyed matrix tool steel, born to combine an excellent corrosion resistance, toughness, also with high hardness.

It is produced with the P.E.S.R. process (Pressure Electro-Slag Remelting), That allows to increase the solubility limit of Nitrogen in Iron (Up to 0,5%).

With this high percentage of nitrogen in partial replacement of Carbon, you obtain micro Chrome nitrocarbides that make the structure finer, increasing the corrosion and wear resistance.

The Pressure Electro-Slag Remelting and a sophisticated next technology of forging and lamination provide: High purity, homogeneity and so better machinability and polishing than conventional steels.

Nicro 100 can be heat treated to resist up to 480°C maintaining 58 HRC hardness.

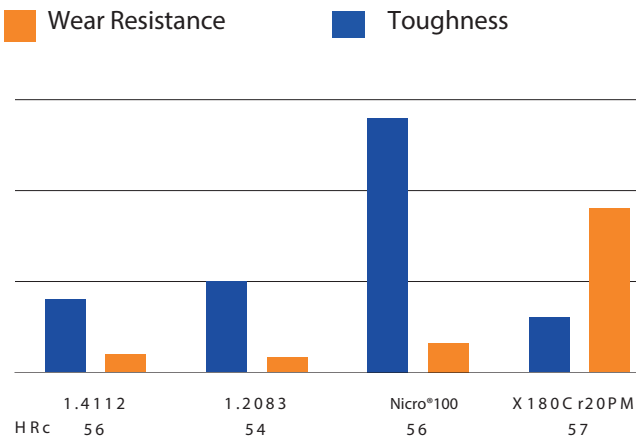
PROPERTIES

High toughness
High hardness
Excellent polishing
Excellent machinability
Very high corrosion resistance
Good substrate for PVD coatings
Excellent wear and compression resistance
Good resistance to static and dynamic stresses
Dimensional stability after heat treatment

APPROXIMATIVE COMPOSITION

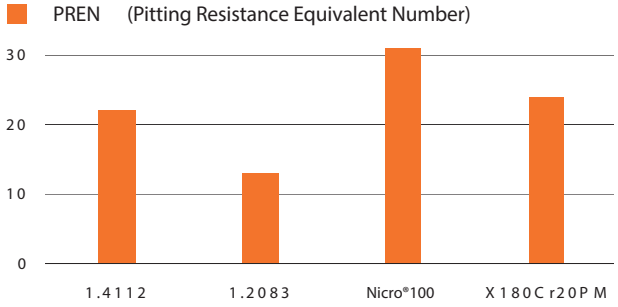
Carbon	0,30	%
Silicon	1,00	%
Manganese	1,00	%
Chrome	15,00	%
Nitrogen	0,50	%
Nikel	0,50	%
Molybdenum	1,00	%

WEAR AND TOUGHNESS

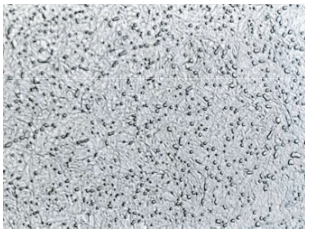


Elastic Module	214	GPa
Density	7,72	g/cm ³
Thermal Conductivity (a 20°C. - x 56÷58 HRc)	14	W/m°K

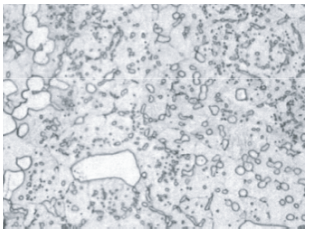
CORROSION



Struttura (1000x)



Nicro 100
P.E.S.R.



1.4112
convenzionale

HEAT TREATMENT

Premise: During heat treatment is important to preserve the surface of the part, vacuum or under controlled atmosphere furnaces allow to protect the piece, otherwise always consider at least 0,2 mm oversize.

ANNEALING

Heat uniformly to 790 ÷ 820°C in furnace.
Maintain the part at temperature for 2 hours and cool slowly in furnace under 500°C .
Continue thereafter cooling freely in air to room temperature.
Hardness after annealing is 250÷310 HB.

STRESS RELIEVING

After the roughing of the machine, uniformly heat the particular up to 600÷650° C and maintain 30 minutes each 25 mm in thickness.
Minimum 2 hours. Slowly cool to below 500°C.
Continue thereafter cooling freely in air to room temperature.

HARDENING

Implement preheat to 600÷650°C and 850÷880°C before ascending to the hardening temperature. Hardening temperature (austenitizing) 980÷1010°C.
Keep hardening, after reaching the temperature to the core.
(40÷20 minutes)
Note: don't fall in temperature at vacuum <$4x10^{-3}$ to prevent nitrogen loss on the surface.

QUENCHING

In oil, gas or salt bath at 550°C.
When using oil quenching, in particular for large pieces, it is good practice to use an interrupted cooling. With the use of inert gas (nitrogen or argon) in quenching use an overpressure of at least 5 bars until reaching 500 °C.
Reach room temperature before proceeding with the tempering.

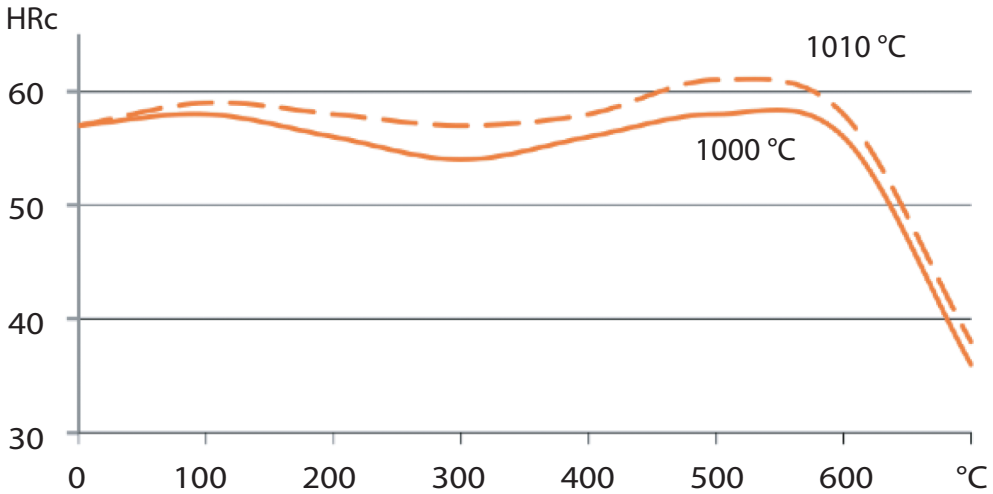
TEMPERING

The tempering must be at least 2 x 2 hours /each at a temperature not less than 180°C and adjusted to achieve the desired hardness.

CRYOGENIC TREATMENT

Serves to transform the residual austenite, it is always advisable, and it becomes necessary after quenching above 1000°C.
To be done after hardening from -80 to -120°C x 2 hours (after reaching the temperature to the core).
On complex parts and at risk of cracks is recommended to have a tempering at 180°C before cryogenic.

Note: The best rust resistance is when hardened and tempered at low temperatures 200 ÷ 450°C.
Nicro 100 is resistant to tempering up to 500°C but surpassing the 450°C there is a reduction of stainless



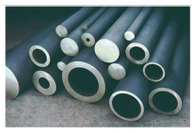
Nicro®100

OUR PROPOSALS...

Copper alloys

FORMAPLAST™
High thermal and electric conductivity alloys, with or without beryllium, to optimize productive cycles in plastic moulds, in packaging and in automatic machines.

Aluminum - Bronze



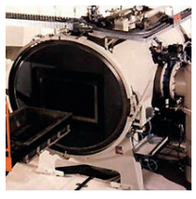
TOUGHMET™
Bronze born to increase the life of mechanical components lowering maintenance costs; excellent mechanical characteristics, low friction coefficient and high resistance to corrosive environments.

FORMAL™
Range of aluminum bronze for cold forming, bearings, rolls, gears and sliding components.

Heat treatments

Kenotherm
VACUUM HEAT TREATMENT

Since 1982 it is solely dedicated to vacuum heat treatment. Ideal partner to solve problems related to heat treatment. Horizontal vacuum furnaces with gas shut off, pressurizable and able to reach high speeds of cooling.
Automatic and repeatable cycles with extreme precision and reliability.



- Hardening on high speed steels
- Hardening on self tempering steels
- Tempering and annealing
- Normalizing and stress relieving
- Solubilization and aging
- Hardening on martensitic inox steels
- Solubilization inox steels
- Treatments on super alloys
- Copper alloys aging
- Magnetic annealing
- Cryogenic treatment
- Localized tempering

Coatings

Dia-Teck® **Cromo - Teck®**

The definitive solution on coating process

Polishing

Our service of mechanical polishing ensures uniformity and flatness, increase the level of rust resistance reducing “pitting” effect.
It makes the ideal surface for coatings

Certificates

S.S.C.®
System Safety Certificate

Our unique and patented system of online certification absolute guarantee on the originality of our products

rev PB 230217

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RS Alloys
Steel & Copper