

Resistant Alloys

Iron-Chromium-Aluminium Alloys



1. Chemical composition

	Ni	Cr	Fe	Cu	Others
%	-	22	Bal.	-	Al: 5, Y++, ++

2. Physical properties

- Resistivity (Ω mm ² /m)	: 1.39
- Temperature coefficient (K x 10 ⁻⁶ /°C) from 20 to 1000 °C	: 100
- Thermal conductivity at 120 °C (Wm ⁻¹ C ⁻¹)	: 16
- Coefficient of linear expansion (coeff. 10 ⁻⁶ /°C) from 20 to 1000 °C	: 15
- Density (g/cm ³)	: 7.10
- Creeping point in	
- at 800 °C	: 8
- at 1 000°C	: 1.5
- Melting point (°C)	: 1 490
- Maximal operating temperature (°C)	: 1 300

Standard mechanical properties

- Tensile Strength (daN/mm ²)	: 75
- Yield Strength (daN/mm ²)	: 55
- Elongation (A% on 100 mm)	: ≥ 18
- Hardness (HV)	: 210

3. Typical Applications

It deals with Iron-Chromium-Aluminium alloy with a content of Yttrium.

It can be used in oxidized atmosphere up to 1300 °C inside electric furnaces, and especially when a high resistance to oxidation is required.

We recommend to operate a preoxidation of the spirals at a temperature of 1100 °C during 2 hours when the future operating temperature is below 1 000 °C.

As for the others Iron-Chromium-Aluminium, the layer of Aluminium oxide protects against any chemical attacks. The Yttrium content improves the adhesive power of this oxidation layer and decrease the risk of attacks from other oxides or carbides.

The Yttrium presence prevents from a too rapid grain growth and contributes significantly in the fact that after a long time of utilization, the wire will not become fragile.

Compared to traditional Iron-Chromium-Aluminium alloys, this one has a very good behavior to creeping. In addition, it has a very good life-time, especially, at very high temperature and with important thermal cycles.

April 2012 - The data enclosed in this document are only given as indicative values and correspond to our standard products. Different specific requirements are subject to discussion and formal approval by Aperam Alloys Rescal. For further information or special request, please contact us.