NiCr20

Brightray®

		EN	UNS (ASTM)	AISI	JGHA
Designation	**NiCr20**	2.4869	N06003	-	**A100**

Chemical composition

Ni	Cr	Mn	Si	Fe	C	Al	S	P
Balance	19.0 - 21.0	1.0 max.	0.75 - 1.75	1.0 max.	0.15 max.	0.30 max.	0.01 max.	0.02 max.

Values (Weight %). In order to achieve maximum homogeneity and consistent quality, the actual manufacturing tolerances are tighter and more precisely than the composition indicated.

Main technical properties and features

NiCr20 Brightray® is a nickel-chromium alloy containing approximately 80% Nickel and 20% Chromium, whose main characteristic is to have excellent high temperature stability. This alloy can be used at service temperatures up to 1200 ºC. This alloy has a low temperature coefficient of resistance (TCR), which makes it suitable for electrical control resistors. This alloy also has good resistance to oxidizing, neutral and reducing atmospheres.

Typical uses

Resistance heating elements in cooking domestic appliances and industrial equipment such as industrial furnaces.

Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
Rolled products	Strip in coils [1]	0.0025 - 0.15	0.3 - 200.0	-
	Strip as sheets [1]	0.15 - 0.600	10.0 - 200.0	100 - 3000

[1] Not all our production possibilities are presented here. Other dimensions or product forms available upon request. Some combinations of thicknesses and widths are not possible.

Mechanical properties of strips

Temper	R_m (N/mm^2)	$Rp_{0.2}$ (N/mm^2)	A_{50mm} (%)	Hardness HV
annealed	550 - 800	180 - 450	25 min.	130 - 230
½ hard	850 - 1100	500 min.	-	240 - 360
hard	1000 min.	800 min.	-	310 min.

Physical properties

Density	g/cm^3	8.44
Melting point / Melting range	ºC	1400 - 1420
Linear dilatation coefficient 20 to 100 ºC	10^{-6}·/ ºC	12.5
Thermal conductivity at 20 ºC	W/m °K	19.2
Specific heat at 20 ºC	J/(kg. K)	419
Electrical resistivity at 20 ºC	μΩcm	109 ± 5%

Tolerances (strip and foil)

Thickness

The table shown is an outline of our typical thickness tolerances available. They are tighter than industry standards.

Our "LMSA Precision" and "LMSA Extreme" tolerances are available upon request.

Thickness (mm)		Lamineries MATTHEY		
≥	<	LMSA Standard	LMSA Precision	LMSA Extreme
-	0.025	-	-	± 0.001
0.025	0.050	± 0.003	± 0.002	± 0.0015
0.050	0.065	± 0.004	± 0.003	± 0.002
0.065	0.100	± 0.006	± 0.004	± 0.003
0.100	0.125	± 0.008	± 0.006	± 0.003
0.125	0.150	± 0.008	± 0.006	± 0.004
0.150	0.250	± 0.010	± 0.008	± 0.004
0.250	0.300	± 0.012	± 0.008	± 0.005
0.300	0.400	± 0.012	± 0.009	± 0.005
0.400	0.500	± 0.015	± 0.010	± 0.006
0.500	0.600	± 0.020	± 0.012	± 0.007
0.600	0.800	± 0.020	± 0.014	± 0.007
0.800	1.000	± 0.025	± 0.015	± 0.009
1.000	1.200	± 0.025	± 0.018	± 0.012
1.200	1.250	± 0.030	± 0.020	± 0.012
1.250	1.500	± 0.035	± 0.025	± 0.014

Width

Our width tolerances "Standard" is +0.2, -0.0 (or ± 0.1 mm upon request). They are available for slit widths < 125 mm and thicknesses < 1.00 mm. Special tolerances upon request.

Camber

Our tolerance "LMSA Standard" respects the EN Standard 1654 (Length of measurement 1000 mm). Other tolerances upon request.

Width (mm)		Camber max. (mm/m)			
		LMSA standard		LMSA extreme	
>	≤	≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm
3	6	12	-	6	-
6	10	8	10	4	5
10	20	4	6	2	3
20	250	2	3	1	1.5

Surface

Special surface qualities upon request

Flatness

Special requirement on the longitudinal or transversal flatness upon request

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