

Brand Name	ISA [®] -CHROM 30 ¹⁾		
Material Code	1.4860		
Abbreviation	NiCr3020		
Chemical Composition (mass components) in % Average values of alloy components			
Fe	Ni	Cr	
Rem.	30	20	

Form of Delivery

ISA[®]-CHROM 30 is supplied in the form of round wires in the range 1.0 to 0.05 mm Ø usually in bare condition.

On special request insulated wires and stranded wires can also be manufactured.

Properties and Application Notes

ISA[®]-CHROM 30 is especially characterized by high resistivity and relatively low prices when compared with other nickel-chromium alloys. In spite of its relatively high iron content, this alloy is resistant to oxidation and chemical corrosion. ISA[®]-CHROM 30 is non-magnetic. It is suitable for high-value electrical resistors and for heating wires for any application, also for heating cords and cables. The maximum working temperature in air is 600 °C when used for resistance wires and 1050 °C when used for heating wires.

Electrical Resistance in Annealed Condition

Temperature coefficient of electrical resistance between 20 °C and 105 °C 10 ⁻⁶ /K	Electrical resistivity in: μΩ x cm (first line) and Ω/CMF (second line) Reference Values					
	20 °C tolerance ±5 %	100 °C	200 °C	300 °C	400 °C	500 °C
+300 to +400	104	107	111	114	117	120
	626	644	668	686	704	722

Physical Characteristics (Reference Values)

Density at 20 °C		Melting Point	Specific heat at 20 °C	Thermal conductivity at 20 °C	Average linear thermal expansion coefficient between 20 °C and		Thermal EMF against copper at 20 °C
g/cm ³	lb/cub in	°C	J/g K	W/m K	100 °C 10 ⁻⁶ /K	400 °C 10 ⁻⁶ /K	μV/K
7.9	0.29	1390	0.50	13	14.5	16	-3

Strength Properties at 20 °C in Annealed Condition

Tensile Strength ²⁾		Elongation (L ₀ = 100 mm) % at nominal diameter in mm				
MPa	psi	0.02 to 0.063	>0.063 to 0.125	> 0.125 to 0.5	> 0.5 to 1	> 1
600	87000	≈ 8	≈ 14	≈ 18	≥ 18	≥ 25

1) ISA[®]-CHROM 30 is a registered trademark of Isabellenhütte Heusler GmbH & Co. KG.

2) This value applies to wires of 2.0 mm Ø. For thinner wires the minimum values will substantially increase, depending on the dimension.

Notes on Treatment

ISA[®]-CHROM 30 can easily be spot-welded. Under certain conditions brazing and soldering is possible (see Technical Information).

Nominal Diameter d mm	Cross Section mm ²	Weight per 100 m g	DC Resistance Referred to Length at 20 °C Ω / m			
			Nominal Value	Tolerance	Minimum Value	Maximum Value
0.05	0.001963	1.55	530	± 8 %	487	572
0.056	0.002463	1.95	422		389	456
0.06	0.002827	2.23	368		338	397
0.063	0.003117	2.46	334		307	360
0.07	0.003848	3.04	270		249	292
0.071	0.003959	3.13	263		242	284
0.08	0.005027	3.97	207		190	224
0.09	0.006362	5.03	164		150	177
0.10	0.007854	6.20	132		122	143
0.11	0.009503	7.51	109		± 5 %	104
0.112	0.009852	7.78	106	100		111
0.12	0.01131	8.93	92.0	87.4		96.6
0.125	0.01227	9.69	84.7	80.5		89.0
0.13	0.01327	10.5	78.4	74.4		82.3
0.14	0.01539	12.2	67.6	64.2		70.9
0.15	0.01767	14.0	58.9	55.9		61.8
0.16	0.02011	15.9	51.7	49.1		54.3
0.18	0.02545	20.1	40.9	38.8		42.9
0.20	0.03142	24.8	33.1	31.4		34.8
0.22	0.03801	30.0	27.4	26.0		28.7
0.224	0.03941	31.1	26.4	25.1		27.7
0.25	0.04909	38.8	21.2	20.1		22.2
0.28	0.06158	48.6	16.9	16.1		17.7
0.30	0.07069	55.8	14.7	14.0		15.4
0.315	0.07793	61.6	13.3	12.7		14.0
0.35	0.09621	76.0	10.8	10.3		11.4
0.355	0.09898	78.2	10.5	9.98		11.0
0.40	0.1257	99.3	8.28	7.86		8.69
0.45	0.1590	126	6.54	6.21		6.87
0.50	0.1963	155	5.30	5.03	5.56	
0.55	0.2376	188	4.38	4.16	4.60	
0.56	0.2463	195	4.22	4.01	4.43	
0.60	0.2827	223	3.68	3.49	3.86	
0.63	0.3117	246	3.34	3.17	3.50	
0.65	0.3318	262	3.13	2.98	3.29	
0.70	0.3848	304	2.70	2.57	2.84	
0.71	0.3959	313	2.63	2.50	2.76	
0.80	0.5027	397	2.07	1.97	2.17	
0.90	0.6362	503	1.63	1.55	1.72	
1.00	0.7854	621	1.32	1.26	1.39	