

Brand Name	ISA-CHROM® 60 ¹⁾		
Material Code	2.4867		
Abbreviation	NiCr6015		
Chemical Composition (mass components) in % Average values of alloy components			
Ni	Fe	Cr	
Rem.	20	15	

Form of Delivery

ISA®-CHROM 60 is supplied in the form of round wires in the range 1.0 to 0.01 mm Ø in bare, oxide-insulated or enamelled condition, also with rayon or silk covering.

To a limited extent flat wires and stranded wires are also manufactured.

Properties and Application Notes

ISA®-CHROM 60 is especially characterized by high resistivity and high resistance to oxidation and chemical corrosion. The alloy 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 1150 °C when used for heating wires.

Electrical Resistance in Annealed Condition

Temperature coefficient ²⁾ of electrical resistance between 20 °C and 105 °C 10 ⁻⁶ /K	Electrical resistivity ³⁾ 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
+100 to +200	111 668	112 674	114 686	116 698	118 710	122 734

Physical Characteristics (Reference Values)

Density at 20 °C		Melting Point °C	Specific heat at 20 °C J/g K	Thermal conductivity at 20 °C W/m K	Average linear thermal expansion coefficient between 20 °C and		Thermal EMF against copper at 20 °C µV/K
g/cm ³	lb/cub in				100 °C 10 ⁻⁶ /K	400 °C 10 ⁻⁶ /K	
8.2	0.30	1390	0.46	13	13.5	15	+1

Strength Properties at 20 °C in Annealed Condition

Tensile Strength ⁴⁾		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 60 is a registered trademark of Isabellenhütte Heusler GmbH & Co. KG.

2) These values apply to the state after rapid cooling.

3) The resistivity of nickel-chromium Alloys can be modified by special heat treatment (see Technical information).

4) 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 60 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
0.01	0.00007854	0.0644	14133	± 10 %	12720	15546
0.011	0.00009503	0.0779	11680		10512	12848
0.013	0.0001327	0.109	8363		7526	9199
0.014	0.0001539	0.126	7211		6490	7932
0.016	0.0002011	0.165	5521		4969	6073
0.018	0.0002545	0.209	4362		3926	4798
0.02	0.0003142	0.258	3533	± 8 %	3251	3816
0.022	0.0003801	0.312	2920		2686	3154
0.025	0.0004909	0.403	2261		2080	2442
0.028	0.0006158	0.505	1803		1659	1947
0.03	0.0007069	0.580	1570		1445	1696
0.032	0.0008042	0.659	1380		1270	1491
0.036	0.001018	0.835	1091		1003	1178
0.04	0.001257	1.03	883		813	954
0.045	0.001590	1.30	698		642	754
0.05	0.001963	1.61	565		520	611
0.056	0.002463	2.02	451		415	487
0.06	0.002827	2.32	393		361	424
0.063	0.003117	2.56	356		328	385
0.07	0.003848	3.16	288		265	312
0.071	0.003959	3.25	280		258	303
0.08	0.005027	4.12	221		203	239
0.09	0.006362	5.22	175		161	188
0.10	0.007854	6.44	141		130	153
0.11	0.009503	7.79	117	± 5 %	111	123
0.112	0.009852	8.08	113		107	118
0.12	0.01131	9.27	98.1		93.2	103
0.125	0.01227	10.1	90.5		85.9	95.0
0.13	0.01327	10.9	83.6		79.4	87.8
0.14	0.01539	12.6	72.1		68.5	75.7
0.15	0.01767	14.5	62.8		59.7	66.0
0.16	0.02011	16.5	55.2		52.4	58.0
0.18	0.02545	20.9	43.6		41.4	45.8
0.20	0.03142	25.8	35.3		33.6	37.1
0.22	0.03801	31.2	29.2		27.7	30.7
0.224	0.03941	32.3	28.2		26.8	29.6
0.25	0.04909	40.3	22.6		21.5	23.7
0.28	0.06158	50.5	18.0		17.1	18.9
0.30	0.07069	58.0	15.7		14.9	16.5
0.315	0.07793	63.9	14.2		13.5	15.0
0.35	0.09621	78.9	11.5		11.0	12.1
0.355	0.09898	81.2	11.2		10.7	11.8
0.40	0.1257	103	8.83		8.39	9.27
0.45	0.1590	130	6.98		6.63	7.33
0.50	0.1963	161	5.65	5.37	5.94	
0.55	0.2376	195	4.67	4.44	4.91	
0.56	0.2463	202	4.51	4.28	4.73	
0.60	0.2827	232	3.93	3.73	4.12	
0.63	0.3117	256	3.56	3.38	3.74	
0.65	0.3318	272	3.35	3.18	3.51	
0.70	0.3848	316	2.88	2.74	3.03	
0.71	0.3959	325	2.80	2.66	2.94	
0.80	0.5027	412	2.21	2.01	2.32	
0.90	0.6362	522	1.74	1.66	1.83	
1.00	0.7854	644	1.41	1.34	1.48	