



Brand Name	ISA-ZIN				
Material Code	2.0881				
Abbreviation	CuNi23Mn				
Chemical Composition (mass components) in %. Average values of alloy components					
Cu Rem.	Ni 23	Mn 1.5			

Features and Application Notes

ISA-ZIN is especially noted for high resistance to oxidation and chemical corrosion, as well as a relatively low resistivity. It is used for resistors of any type and for heating cords, cables and heating mats. Ribbons for instance are used for heating of bimetals. The maximum working temperature in air is +500 °C.

Form of Delivery

ISA-ZIN is supplied in the form of round wires in the range 0.04 to 8.00 mm Ø in bare or enamelled condition flat wires, stranded wires, ribbons and sheets.

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
approx. +180	30	30.4	31	31.5	32.1	32.6
	180	183	186	189	193	196

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	
8.90	0.32	+1,150	0.37	33.00	16.00	17.50	-30.00

Mechanical Properties at +20 °C in Annealed Condition

Tensile Strength ¹⁾		Elongation (L ₀ = 100 mm) % at nominal diameter in mm				
MPa	psi	0.020 to 0.063	> 0.063 to 0.125	> 0.125 to 0.50	> 0.50 to 1.00	> 1.00
350	50,750	≈ 12	≈ 18	≈ 20	≥ 20	≥ 25

Notes on Treatment // ISA-ZIN can be worked easily. This alloy can be soldered and brazed without difficulty. All known welding methods can be used.

1) This value applies to wires of 2.0 mm diameter. For thinner wires the minimum values will substantially increase, depending on the dimensions.

Nominal Diameter	Cross Section	Weight per 1.000 m	DC Resistance Referred to Length at +20 °C			
mm	mm ²	g	Nominal Value	Tolerance	Minimum Value	Maximum Value
0.040	0.001257	11.20	239		220	258
0.045	0.001590	14.20	189		174	204
0.050	0.001963	17.50	153		141	165
0.056	0.002463	21.90	122		112	132
0.060	0.002827	25.20	106		97.6	115
0.063	0.003117	27.70	96.2	±8 %	88.5	104
0.070	0.003848	34.30	78.0		71.7	84.2
0.071	0.003959	35.20	75.8		69.7	81.8
0.080	0.005027	44.70	59.7		54.9	64.5
0.090	0.006362	56.60	47.2		43.4	50.9
0.100	0.007854	69.90	38.2		35.1	41.3
0.110	0.009503	84.60	31.6		29.4	33.8
0.112	0.009852	87.70	30.5		28.3	32.6
0.120	0.01131	100.70	26.5		24.7	28.4
0.125	0.01227	109.00	24.4		22.7	26.2
0.130	0.01327	118.00	22.6	±7 %	21.0	24.2
0.140	0.01539	137.00	19.5		18.1	20.9
0.150	0.01767	157.00	17.0		15.8	18.2
0.160	0.02011	179.00	14.9		13.9	16.0
0.180	0.02545	226.00	11.8		11.0	12.6
0.200	0.03142	280.00	9.55		8.98	10.1
0.220	0.03801	338.00	7.89		7.42	8.37
0.224	0.03941	351.00	7.61		7.16	8.07
0.250	0.04909	437.00	6.11	±6 %	5.74	6.48
0.280	0.06158	548.00	4.87		4.58	5.16
0.300	0.07069	629.00	4.24		3.99	4.50
0.315	0.07793	694.00	3.85		3.66	4.04
0.350	0.09621	856.00	3.12		2.96	3.27
0.355	0.09898	881.00	3.03		2.88	3.18
0.400	0.1257	1,120.00	2.39	±5 %	2.27	2.51
0.450	0.1590	1,420.00	1.89		1.79	1.98
0.500	0.1963	1,750.00	1.53		1.45	1.60

Nominal Diameter	Cross Section	Weight per 1.000 m	DC Resistance Referred to Length at +20 °C			
mm	mm ²	g	Nominal Value	Tolerance	Minimum Value	Maximum Value
0.55	0.2376	2,110.00	1.26	± 4 %	1.21	1.31
0.56	0.2463	2,190.00	1.22		1.17	1.27
0.60	0.2827	2,520.00	1.06		1.02	1.10
0.63	0.3117	2,770.00	0.962		0.924	1.00
0.65	0.3318	2,950.00	0.904		0.868	0.940
0.70	0.3848	3,430.00	0.780		0.748	0.811
0.71	0.3959	3,520.00	0.758		0.727	0.788
0.80	0.5027	4,470.00	0.597		0.573	0.621
0.90	0.6362	5,660.00	0.472		0.453	0.490
1.00	0.7854	6,990.00	0.382		0.367	0.397
1.12	0.9852	8,770.00	0.305		0.292	0.317
1.20	1.131	10,070.00	0.265		0.255	0.276
1.25	1.227	10,920.00	0.244		0.235	0.254
1.40	1.539	13,700.00	0.195		0.187	0.203
1.50	1.767	15,730.00	0.170		0.163	0.177
1.60	2.011	17,900.00	0.149		0.143	0.155
1.80	2.545	22,650.00	0.118		0.113	0.123
2.00	3.142	27,960.00	0.0955		0.0917	0.0993
2.20	3.801	33,830.00	0.0789		0.0758	0.0821
2.24	3.941	35,070.00	0.0761		0.0731	0.0792
2.50	4.909	43,690.00	0.0611		0.0587	0.0636
2.80	6.158	54,800.00	0.0487		0.0468	0.0507
3.00	7.069	62,910.00	0.0424		0.0407	0.0441
3.15	7.793	69,360.00	0.0385		0.0370	0.0400
3.20	8.042	71,580.00	0.0373		0.0358	0.0388
3.50	9.621	85,630.00	0.0312		0.0299	0.0324
3.55	9.898	88,090.00	0.0303		0.0291	0.0315
4.00	12.57	111,840.00	0.0239		0.0229	0.0248
4.50	15.90	141,550.00	0.0189		0.0181	0.0196
5.00	19.63	174,750.00	0.0153		0.0147	0.0159
5.50	23.76	211,450.00	0.0126		0.0121	0.0131
5.60	24.63	219,210.00	0.0122		0.0117	0.0127
6.00	28.27	251,640.00	0.0106	0.0102	0.0110	
6.30	31.17	277,440.00	0.00962	0.00924	0.0100	
8.00	50.27	447,360.00	0.00597	0.00573	0.00621	