HSM Wire International, Inc
Ph: 330-244-8501 Fax: 330-244-8561
www.hsmwire.com

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Alloy 120 - Precision Resistance

Chemical Composition

Nominal Composition	Fe%	Ni%	
	30	70	

Mechanical Properties

Melting Point		1,425°C (2,597°F)	
Max Operating Temp		1099°C (2010°F)	Comments: Operating Temp
Soft Tensile		70 - 100,000 PSI	
Elongation		15 - 30%	
Yield Point		40 - 60,000 PSI	
Tensile Strength at Break		483 MPa (70000 psi)	Comments: Annealed
		1030 MPa (150000 psi)	Comments: Hard

Physical Properties

Ω/cir.mil.ft:	120
Conductivity:	28.9 / W/m-K (201 BTU-in/hr-ft²-°F)
Coeffiecent of Linear Expansion , 10^{-6}:	15.0 µm/m-°C @Temperature 20.0 °C 8.33 µin/in-°F @Temperature 68.0 °F
Temp. coeffiecent of Resistance:	0.0045 ohms/ohm-°C Comments: 0-100°C
Weight/Density:	0.305 lbs/cu.in. (8.44 g/cc)
Specific Heat:	0.523 J/g-°C @Temperature 20.0 °C 0.125 BTU/lb-°F @Temperature 68.0 °F
Specific Gravity:	8.46

Electrical Properties

Electrical Resistivity	0.0000199 ohm-cm Comments: 3% tolerance on sizes below 0.02, 5% tolerance on sizes above 0.02

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Resistance Chart

Diameter			Resistance @ 68°F/20°C Ω/ft	Sq. in/Ω	Weight	Ω/lb.	Ft/Lb	Cross Sectional area (in²)
AWG	Inches	Mm		68°F	lb/1000 ft			
20	**0.032**	**0.812**	0.1171	9.800	2.94	39.78	339.7	0.000804
21	**0.0285**	**0.723**	0.1477	6.930	2.317	63.75	431.6	0.000638
22	**0.0253**	**0.644**	0.1860	4.850	1.825	101.9	547.9	0.000507
23	**0.0226**	**0.573**	0.2350	3.450	1.468	160.1	681.2	0.000401
24	**0.0201**	**0.51**	0.2970	2.430	1.15	258.3	869.6	0.000314
25	**0.0179**	**0.455**	0.3746	1.720	0.9201	396.3	1,087	0.000254
26	**0.0159**	**0.405**	0.4746	1.200	0.7262	653.5	1,377	0.000199
27	**0.0142**	**0.361**	0.5952	0.857	0.5797	1,027	1,725	0.000158
28	**0.0126**	**0.321**	0.7556	0.599	0.4585	1,648	2,181	0.000125
29	**0.0113**	**0.286**	0.9389	0.432	0.3606	2,606	2,773	0.000100
30	**0.01**	**0.255**	1.200	0.299	0.2873	4,177	3,481	0.0000785
31	**0.0089**	**0.227**	1.515	0.211	0.2276	6,657	4,394	0.0000626
32	**0.008**	**0.202**	1.875	0.153	0.1839	10,200	5,438	0.0000496
33	**0.0071**	**0.18**	2.38	0.107	0.1448	16,440	6,906	0.0000394
34	**0.0063**	**0.16**	3.022	0.075	0.114	26,510	8,772	0.0000312
35	**0.0056**	**0.143**	3.826	0.053	0.09011	42,090	11,000	0.0000247
36	**0.005**	**0.127**	4.80	0.0374	0.07184	66,820	13,920	0.0000196
37	**0.0045**	**0.113**	5.926	0.0273	0.02816	101,900	17,190	0.0000152
38	**0.004**	**0.101**	7.5	0.0206	0.04598	163,100	21,750	0.0000126
39	**0.0035**	**0.09**	9.796	0.0138	0.03517	278,500	28,430	0.00000979
40	**0.0031**	**0.08**	12.49	0.0096	0.027580	452,900	36,260	0.00000779
41	**0.0028**	**0.07**	15.86	0.0067	0.021720	730,342	46,029	0.00000616
42	**0.0025**	**0.063**	19.20	0.00503	0.01795	1,069,363	55,696	0.00000487

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R1.06.05.2013