

# HM Wire International, Inc.

Ph: 330-244-8501 Fax: 330-244-8561

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## Alloy 90 - Precision Resistance

### Chemical Composition

Nominal Composition	Cu%	Ni%	
	Balance	10	

### Mechanical Properties

Melting Point		1,100°C (2,012°F)	
Max Operating Temp		425°C (800°F)	
Soft Tensile		39 - 51,000 PSI	
Elongation		15 - 30%	
Yield Point		15 - 35,000 PSI	

### Physical Properties

Ω/cir.mil.ft:	90
Conductivity:	60 w / m K
Coeffiecent of Linear Expansion , 10 <sup>-6</sup> :	16.5(200°C), 17.5(400°C), 18.5(600°C)
Temp. coeffiecent of Resistance:	0.0004
Weight/Density:	0.323 lbs/cu.in. (8.9 g/cm <sup>3</sup> )
Specific Heat:	0.092 cal./gm @ 20°C
Specific Gravity:	8.90

\*To be used as a guideline only.

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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 (in <sup>2</sup> )
AWG	Inches	Mm		68°F	lb/1000 ft			
20	0.032	0.812	0.088	13.73	3.12	28.10	320.0	0.000804
21	0.0285	0.723	0.111	9.697	2.47	44.70	403.0	0.000638
22	0.0253	0.644	0.141	6.783	1.97	71.10	512.0	0.000507
23	0.0226	0.573	0.176	4.835	1.55	112.0	641.0	0.000401
24	0.0201	0.51	0.223	3.402	1.22	182.0	819.0	0.000314
25	0.0179	0.455	0.281	2.402	0.985	287.0	1,023	0.000254
26	0.0159	0.405	0.356	1.684	0.771	461.0	1,296	0.000199
27	0.0142	0.361	0.446	1.199	0.612	724.0	1,625	0.000158
28	0.0126	0.321	0.567	0.838	0.485	1,174	2,071	0.000125
29	0.0113	0.286	0.705	0.604	0.388	1,809	2,567	0.000100
30	0.01	0.255	0.900	0.419	0.304	2,950	3,278	0.0000785
31	0.0089	0.227	1.136	0.295	0.243	4,717	4,138	0.0000626
32	0.008	0.202	1.406	0.214	0.192	7,226	5,121	0.0000496
33	0.0071	0.18	1.785	0.150	0.153	11,573	6,502	0.0000394
34	0.0063	0.16	2.268	0.105	0.121	18,747	8,259	0.0000312
35	0.0056	0.143	2.870	0.074	0.0957	29,997	10,452	0.0000247
36	0.005	0.127	3.600	0.0524	0.0760	47,203	13,112	0.0000196
37	0.0045	0.113	4.444	0.0382	0.0589	71,870	16,187	0.0000152
38	0.004	0.101	5.625	0.0268	0.0488	115,136	20,487	0.0000126
39	0.0035	0.09	7.347	0.0180	0.0379	153,824	26,759	0.00000979
40	0.0031	0.08	9.365	0.0125	0.0302	319,269	34,110	0.00000779
41	0.0028	0.07	11.90	0.0087	0.0239	498,440	41,883	0.00000616
42	0.0025	0.063	14.40	0.00654	0.0189	762,869	52,977	0.00000487

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