

Special Alloy Wire for High Temp Heating or Strength Applications Pure Alloy - MO

$$in^2/\Omega = \frac{I^2 C_t}{p}$$

I = Current
 C_t = Temperature factor
 p = Surface load W/in²

Common Names: Molybdenum, Moly

Uses: Typical uses include High temperature electric furnaces, operating in dry gases including hydrogen, dissociated ammonia, nitrogen, argon, helium, mixtures, or in rich exothermic gas of 78°C dew point or less, or a vacuum, can effectively utilize molybdenum heating elements. Such elements can be formed, by experienced fabricators, and can be expected, under proper conditions, to maintain temperatures up to approximately 1900°C. Molybdenum elements can be welded and spliced, but must be handled with care because such joints may be quite brittle, especially at room temperature. Heat is frequently used to increase ductility during forming especially for thicker sections. Wherever possible, therefore, molybdenum elements should be made of one continuous piece of wire, rod, or ribbon.

Composition

Ni	Cr	Fe	Al	Si	Mn	Cu	C	Ti	Mo	W
None/Trace	None/Trace	None/Trace	None/Trace	None/Trace	None/Trace	None/Trace	None/Trace	None/Trace	99.9%	None/Trace

Technical Data

Resistivity (Ω/cmft)	31	Resistivity (Ω/sqmf)	24
Resistivity (μΩ/cm)	5.15	Nom. Temp. Coeff. of Resistance (TCR)	0.00330
Std. Res. Tol. <.020"	5%	Std. Res. Tol. >.020"	3%
Thermal EMF vs. Cu	+0.007	Specific Heat (20°C)	0.0647 cal/g
Density (g/cm³)	10.20	Density (lb/in³)	0.369
Thermal Conductivity	1.397 W/cm/°C	Coeff. of Linear Expansion (X 10⁻⁶)	5.40 in/in/°C
Approx. Melting Point	2610°C	Max. Continuous Operating Temp.	1900°C
UTS – Hard (KPSI)	320	YTS Tensile – Hard (KPSI)	320
UTS – Stress Relieved (KPSI)		YTS Tensile – Stress Relieved (KPSI)	
UTS – Annealed (KPSI)	100	YTS Tensile – Annealed (KPSI)	100
Magnetic Attraction	None	Emissivity – fully oxidized	
Designations/Specifications		Forms Available	Wire, Ribbon, Square

Alloy Data

Gage AWG	Diameter Inch	Resistance at 68° F Ω/ft	Resistance at 68° F Ω/lb	Weight lb/1000 ft	Surface area in ² /ft	in ² /Ω at 68°F
000	0.4096	0.0002	0.0003	583.5902	15.4432	83595.9474
00	0.3648	0.0002	0.0005	462.8074	13.7525	59036.9197
0	0.3249	0.0003	0.0008	367.0225	12.2470	41692.9049
1	0.2893	0.0004	0.0013	291.0616	10.9062	29444.2584
2	0.2576	0.0005	0.0020	230.8220	9.7123	20794.0501
3	0.2294	0.0006	0.0032	183.0499	8.6490	14685.1218
4	0.2043	0.0007	0.0051	145.1650	7.7022	10370.8898
5	0.1819	0.0009	0.0081	115.1209	6.8590	7324.1037
6	0.1620	0.0012	0.0129	91.2949	6.1081	5172.4101
7	0.1443	0.0015	0.0206	72.4000	5.4394	3652.8464
8	0.1285	0.0019	0.0327	57.4158	4.8439	2579.7040
9	0.1144	0.0024	0.0520	45.5327	4.3136	1821.8321
10	0.1019	0.0030	0.0827	36.1090	3.8414	1286.6097
11	0.0907	0.0038	0.1315	28.6357	3.4209	908.6262
12	0.0808	0.0047	0.2091	22.7091	3.0464	641.6877
13	0.0720	0.0060	0.3324	18.0091	2.7129	453.1711
13.5	0.0679	0.0067	0.4192	16.0376	2.5601	380.8303
14	0.0641	0.0075	0.5286	14.2819	2.4159	320.0374
14.5	0.0605	0.0085	0.6665	12.7184	2.2798	268.9490
15	0.0571	0.0095	0.8404	11.3260	2.1514	226.0160
15.5	0.0539	0.0107	1.0598	10.0861	2.0302	189.9365

Gage AWG	Diameter Inch	Resistance at 68° F Ω/ft	Resistance at 68° F Ω/lb	Weight Lb/1000 ft	Surface area in ² /ft	in ² /Ω at 68°F
16	0.0508	0.0120	1.3363	8.9819	1.9159	159.6164
16.5	0.0480	0.0135	1.6851	7.9986	1.8080	134.1365
17	0.0453	0.0151	2.1249	7.1230	1.7061	112.7239
17.5	0.0427	0.0170	2.6794	6.3432	1.6100	94.7295
18	0.0403	0.0191	3.3787	5.6488	1.5194	79.6076
18.5	0.0380	0.0214	4.2605	5.0304	1.4338	66.8996
19	0.0359	0.0241	5.3724	4.4797	1.3530	56.2203
19.5	0.0339	0.0270	6.7744	3.9893	1.2768	47.2457
20	0.0320	0.0303	8.5424	3.5525	1.2049	39.7037
20.5	0.0302	0.0341	10.7718	3.1636	1.1370	33.3657
21	0.0285	0.0383	13.5830	2.8173	1.0730	28.0395
21.5	0.0269	0.0430	17.1279	2.5089	1.0126	23.5635
22	0.0253	0.0483	21.5979	2.2342	0.9555	19.8020
22.5	0.0239	0.0542	27.2345	1.9896	0.9017	16.6409
23	0.0226	0.0608	34.3422	1.7718	0.8509	13.9845
23.5	0.0213	0.0683	43.3047	1.5778	0.8030	11.7521
24	0.0201	0.0767	54.6063	1.4051	0.7578	9.8761
24.5	0.0190	0.0862	68.8574	1.2513	0.7151	8.2996
25	0.0179	0.0968	86.8277	1.1143	0.6748	6.9747
25.5	0.0169	0.1086	109.4879	0.9923	0.6368	5.8613
26	0.0159	0.1220	138.0619	0.8837	0.6009	4.9256
26.5	0.0150	0.1370	174.0931	0.7869	0.5671	4.1393
27	0.0142	0.1538	219.5276	0.7008	0.5351	3.4786
27.5	0.0134	0.1728	276.8196	0.6241	0.5050	2.9233
28	0.0126	0.1940	349.0636	0.5557	0.4766	2.4566
29	0.0113	0.2446	555.0344	0.4407	0.4244	1.7349
30	0.0100	0.3085	882.5418	0.3495	0.3779	1.2252
31	0.0089	0.3890	1403.3004	0.2772	0.3366	0.8653
32	0.0080	0.4905	2231.3414	0.2198	0.2997	0.6111
33	0.0071	0.6185	3547.9820	0.1743	0.2669	0.4316
34	0.0063	0.7799	5641.5284	0.1382	0.2377	0.3048
35	0.0056	0.9834	8970.4073	0.1096	0.2117	0.2152
36	0.0050	1.2401	14263.5471	0.0869	0.1885	0.1520
37	0.0045	1.5637	22679.9932	0.0689	0.1679	0.1073
38	0.0040	1.9718	36062.7050	0.0547	0.1495	0.0758
39	0.0035	2.4864	57342.1111	0.0434	0.1331	0.0535
40	0.0031	3.1353	91177.7891	0.0344	0.1185	0.0378
41	0.0028	3.9535	144978.7784	0.0273	0.1056	0.0267
42	0.0025	4.9853	230525.9473	0.0216	0.0940	0.0189
43	0.0022	6.2863	366551.6631	0.0171	0.0837	0.0133
44	0.0020	7.9269	582841.6426	0.0136	0.0746	0.0094
45	0.0018	9.9957	926757.1654	0.0108	0.0664	0.0066
46	0.0016	12.6043	1473605.8321	0.0086	0.0591	0.0047
47	0.0014	15.8938	2343131.7603	0.0068	0.0526	0.0033
48	0.0012	20.0417	3725736.1001	0.0054	0.0469	0.0023
49	0.0011	25.2722	5924169.4057	0.0043	0.0418	0.0017
50	0.0010	31.8677	9419825.2921	0.0034	0.0372	0.0012

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