

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/cm²)	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

Diameter mm	Resistance at 20° C Ω/m	Resistance at 20° C Ω/kg	Weight kg/1000 m	Surface area cm ² /m	cm ² /Ω at 20°C
10.4049	0.0006	0.0007	868.4780	326.8804	539327.6143
9.2658	0.0008	0.0011	688.7334	291.0952	380882.5911
8.2515	0.0010	0.0018	546.1896	259.2276	268985.9455
7.3481	0.0012	0.0028	433.1474	230.8486	189962.5778
6.5437	0.0015	0.0045	343.5010	205.5765	134154.8939
5.8273	0.0019	0.0071	272.4083	183.0710	94742.5317
5.1894	0.0024	0.0113	216.0293	163.0293	66908.8324
4.6213	0.0031	0.0179	171.3188	145.1817	47252.1873
4.1154	0.0039	0.0285	135.8618	129.2880	33370.3209
3.6648	0.0049	0.0453	107.7431	115.1342	23566.7041
3.2636	0.0062	0.0721	85.4441	102.5299	16643.2185
2.9063	0.0078	0.1146	67.7601	91.3054	11753.7319
2.5882	0.0098	0.1823	53.7361	81.3098	8300.6910
2.3048	0.0124	0.2899	42.6146	72.4084	5862.0931
2.0525	0.0156	0.4609	33.7949	64.4815	4139.9126
1.8278	0.0196	0.7328	26.8005	57.4224	2923.6787
1.7249	0.0221	0.9241	23.8665	54.1881	2456.9645
1.6277	0.0248	1.1653	21.2538	51.1361	2064.7530
1.5360	0.0278	1.4694	18.9270	48.2559	1735.1513
1.4495	0.0312	1.8528	16.8550	45.5380	1458.1647
1.3679	0.0351	2.3364	15.0098	42.9731	1225.3942

Diameter mm	Resistance at 20° C Ω/m	Resistance at 20° C Ω/kg	Weight kg/1000 m	Surface area cm ² /m	cm ² /Ω at 20°C
1.2908	0.0394	2.9461	13.3666	40.5527	1029.7814
1.2181	0.0442	3.7150	11.9033	38.2686	865.3948
1.1495	0.0497	4.6846	10.6002	36.1132	727.2496
1.0848	0.0558	5.9071	9.4397	34.0792	611.1569
1.0237	0.0626	7.4488	8.4063	32.1597	513.5964
0.9660	0.0703	9.3927	7.4860	30.3483	431.6097
0.9116	0.0790	11.8441	6.6665	28.6390	362.7108
0.8603	0.0887	14.9351	5.9367	27.0260	304.8103
0.8118	0.0996	18.8328	5.2868	25.5038	256.1527
0.7661	0.1118	23.7478	4.7080	24.0673	215.2624
0.7229	0.1255	29.9455	4.1926	22.7117	180.8995
0.6822	0.1410	37.7606	3.7336	21.4325	152.0221
0.6438	0.1583	47.6153	3.3249	20.2254	127.7544
0.6075	0.1778	60.0419	2.9609	19.0862	107.3606
0.5733	0.1996	75.7115	2.6367	18.0112	90.2224
0.5410	0.2242	95.4706	2.3481	16.9967	75.8200
0.5106	0.2517	120.3864	2.0910	16.0394	63.7166
0.4818	0.2827	151.8046	1.8621	15.1360	53.5454
0.4547	0.3174	191.4223	1.6583	14.2835	44.9978
0.4291	0.3564	241.3795	1.4767	13.4790	37.8147
0.4049	0.4003	304.3743	1.3151	12.7198	31.7782
0.3821	0.4495	383.8095	1.1711	12.0034	26.7054
0.3606	0.5047	483.9755	1.0429	11.3273	22.4423
0.3403	0.5668	610.2827	0.9287	10.6893	18.8598
0.3211	0.6365	769.5534	0.8270	10.0873	15.8492
0.2859	0.8026	1223.6414	0.6559	8.9830	11.1930
0.2546	1.0120	1945.6715	0.5201	7.9996	7.9047
0.2268	1.2761	3093.7478	0.4125	7.1238	5.5824
0.2019	1.6092	4919.2657	0.3271	6.3439	3.9424
0.1798	2.0291	7821.9613	0.2594	5.6494	2.7842
0.1601	2.5587	12437.4412	0.2057	5.0310	1.9662
0.1426	3.2264	19776.3628	0.1631	4.4802	1.3886
0.1270	4.0684	31445.7386	0.1294	3.9897	0.9807
0.1131	5.1302	50000.8260	0.1026	3.5529	0.6926
0.1007	6.4691	79504.6552	0.0814	3.1640	0.4891
0.0897	8.1574	126417.7153	0.0645	2.8176	0.3454
0.0799	10.2863	201012.6164	0.0512	2.5092	0.2439
0.0711	12.9708	319623.4946	0.0406	2.2345	0.1723
0.0633	16.3559	508222.7182	0.0322	1.9898	0.1217
0.0564	20.6244	808108.0886	0.0255	1.7720	0.0859
0.0502	26.0070	1284945.8702	0.0202	1.5780	0.0607
0.0447	32.7942	2043149.8119	0.0161	1.4053	0.0429
0.0398	41.3528	3248744.7531	0.0127	1.2514	0.0303
0.0355	52.1450	5165721.2847	0.0101	1.1144	0.0214
0.0316	65.7538	8213842.0894	0.0080	0.9924	0.0151
0.0281	82.9141	13060557.8875	0.0063	0.8838	0.0107
0.0251	104.5529	20767159.9328	0.0050	0.7870	0.0075

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