

Special Alloy Wire for High Temp Heating or Thermocouple Applications - PTRH10

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

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

Common Names: Platinum Rhodium; Platinum-10% Rhodium

Uses: Bare Thermocouple wire. Oxidizing or Inert. Do not insert in metal tubes. Beware of contamination. High Temperature.

Composition

Ni	Cr	Fe	Al	Si	Mn	Cu	C	Ti	Pt	Rh
None/Trace	10%	Balance								

Technical Data

Resistivity (Ω/cmft)	114	Resistivity (Ω/sqmf)	89
Resistivity (μΩ/cm)	18.953	Nom. Temp. Coeff. of Resistance (TCR)	
Std. Res. Tol. <.020"		Std. Res. Tol. >.020"	
Thermal EMF vs. Cu	-2.843	Specific Heat (20°C)	
Density (g/cm ³)	20.55	Density (lb/in ³)	0.742
Thermal Conductivity		Coeff. of Linear Expansion (X 10 ⁻⁶)	
Approx. Melting Point	2315°C	Max. Continuous Operating Temp.	1450°C
UTS – Hard (KPSI)		YTS Tensile – Hard (KPSI)	
UTS – Stress Relieved (KPSI)		YTS Tensile – Stress Relieved (KPSI)	
UTS – Annealed (KPSI)		YTS Tensile – Annealed (KPSI)	
Magnetic Attraction	None	Emissivity – fully oxidized	
Designations/Specifications	ANSI/MC96.1 TypeS	Forms Available	Wire, Ribbon, Insul.

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	0.0007	0.0006	1174.1072	15.4432	22732.2313
00	0.3648	0.0009	0.0009	931.1080	13.7525	16053.8992
0	0.3249	0.0011	0.0015	738.4012	12.2470	11337.5443
1	0.2893	0.0014	0.0023	585.5779	10.9062	8006.7720
2	0.2576	0.0017	0.0037	464.3837	9.7123	5654.5224
3	0.2294	0.0022	0.0059	368.2725	8.6490	3993.3226
4	0.2043	0.0027	0.0094	292.0530	7.7022	2820.1542
5	0.1819	0.0034	0.0149	231.6082	6.8590	1991.6422
6	0.1620	0.0043	0.0236	183.6734	6.1081	1406.5326
7	0.1443	0.0055	0.0376	145.6594	5.4394	993.3179
8	0.1285	0.0069	0.0598	115.5130	4.8439	701.4985
9	0.1144	0.0087	0.0951	91.6058	4.3136	495.4105
10	0.1019	0.0110	0.1511	72.6466	3.8414	349.8675
11	0.0907	0.0138	0.2403	57.6113	3.4209	247.0826
12	0.0808	0.0175	0.3821	45.6878	3.0464	174.4940
13	0.0720	0.0220	0.6076	36.2320	2.7129	123.2307
13.5	0.0679	0.0247	0.7662	32.2655	2.5601	103.5591
14	0.0641	0.0278	0.9661	28.7332	2.4159	87.0277
14.5	0.0605	0.0312	1.2183	25.5877	2.2798	73.1352
15	0.0571	0.0350	1.5362	22.7865	2.1514	61.4605
15.5	0.0539	0.0393	1.9371	20.2919	2.0302	51.6494
16	0.0508	0.0441	2.4427	18.0705	1.9159	43.4045
16.5	0.0480	0.0496	3.0801	16.0922	1.8080	36.4757
17	0.0453	0.0557	3.8840	14.3305	1.7061	30.6530
17.5	0.0427	0.0625	4.8976	12.7617	1.6100	25.7598
18	0.0403	0.0702	6.1758	11.3646	1.5194	21.6477
18.5	0.0380	0.0788	7.7876	10.1205	1.4338	18.1920
19	0.0359	0.0885	9.8200	9.0125	1.3530	15.2880
19.5	0.0339	0.0994	12.3828	8.0259	1.2768	12.8475
20	0.0320	0.1116	15.6144	7.1472	1.2049	10.7966
20.5	0.0302	0.1253	19.6894	6.3648	1.1370	9.0731

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
21	0.0285	0.1407	24.8279	5.6680	1.0730	7.6248
21.5	0.0269	0.1580	31.3075	5.0475	1.0126	6.4076
22	0.0253	0.1775	39.4780	4.4949	0.9555	5.3847
22.5	0.0239	0.1993	49.7810	4.0029	0.9017	4.5252
23	0.0226	0.2238	62.7727	3.5646	0.8509	3.8028
23.5	0.0213	0.2513	79.1551	3.1744	0.8030	3.1958
24	0.0201	0.2822	99.8128	2.8269	0.7578	2.6856
24.5	0.0190	0.3168	125.8618	2.5174	0.7151	2.2569
25	0.0179	0.3558	158.7091	2.2418	0.6748	1.8966
25.5	0.0169	0.3995	200.1287	1.9964	0.6368	1.5939
26	0.0159	0.4487	252.3581	1.7778	0.6009	1.3394
26.5	0.0150	0.5038	318.2181	1.5832	0.5671	1.1256
27	0.0142	0.5657	401.2662	1.4099	0.5351	0.9459
27.5	0.0134	0.6353	505.9880	1.2555	0.5050	0.7949
28	0.0126	0.7134	638.0400	1.1181	0.4766	0.6680
29	0.0113	0.8996	1014.5263	0.8867	0.4244	0.4718
30	0.0100	1.1343	1613.1646	0.7032	0.3779	0.3332
31	0.0089	1.4304	2565.0396	0.5576	0.3366	0.2353
32	0.0080	1.8037	4078.5843	0.4422	0.2997	0.1662
33	0.0071	2.2744	6485.2217	0.3507	0.2669	0.1174
34	0.0063	2.8679	10311.9359	0.2781	0.2377	0.0829
35	0.0056	3.6164	16396.6673	0.2206	0.2117	0.0585
36	0.0050	4.5602	26071.7968	0.1749	0.1885	0.0413
37	0.0045	5.7503	41455.8994	0.1387	0.1679	0.0292
38	0.0040	7.2511	65917.6508	0.1100	0.1495	0.0206
39	0.0035	9.1434	104813.4703	0.0872	0.1331	0.0146
40	0.0031	11.5297	166660.4229	0.0692	0.1185	0.0103
41	0.0028	14.5387	265001.2110	0.0549	0.1056	0.0073
42	0.0025	18.3330	421369.6366	0.0435	0.0940	0.0051
43	0.0022	23.1175	670005.8841	0.0345	0.0837	0.0036
44	0.0020	29.1506	1065354.1350	0.0274	0.0746	0.0026
45	0.0018	36.7583	1693984.2767	0.0217	0.0664	0.0018
46	0.0016	46.3515	2693548.2160	0.0172	0.0591	0.0013
47	0.0014	58.4482	4282921.6846	0.0136	0.0526	0.0009
48	0.0012	73.7019	6810131.7240	0.0108	0.0469	0.0006
49	0.0011	92.9365	10828564.5907	0.0086	0.0418	0.0004
50	0.0010	117.1910	17218141.4175	0.0068	0.0372	0.0003

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