



Designation: E 1751 – 00

Standard Guide for Temperature Electromotive Force (emf) Tables for Non- Letter Designated Thermocouple Combinations¹

This standard is issued under the fixed designation E 1751; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide consists of reference tables that give temperature-electromotive force (emf) relationships for special purpose, limited use, thermocouple combinations that do not have a letter designation.

1.2 Extension wire or compensating extension wires are not covered by this guide. ASTM MNL 12² or thermocouple alloy suppliers should be consulted.

2. Terminology

2.1 Definitions:

2.1.1 For definitions of terms used in this guide see Terminology E 344.

2.2 Definitions of Terms Specific to This Standard:

2.2.1 *matched pairs, n*—a set of positive and negative thermoelements chosen so that a thermocouple fabricated from these thermoelements will match a specified temperature-electromotive force relationship to within a specified tolerance, at the time of first use.

3. Source of Data

3.1 The data in these tables are based on the SI Volt and the International Temperature Scale of 1990.

3.2 All temperature–electromotive force data in Tables 1-18 have been developed from NIST, NRC, and wire manufacturers' data.

3.3 Tables 1-14 give emf values in millivolts to three decimal places (1 μV) at 1 °C or 1 °F intervals. Tables 15-18 give emf values in microvolts to one decimal place (0.1 μV) at 1 °C or 1 °F intervals. If greater precision is required, refer to the equation and coefficients listed for each thermocouple alloy.

4. Significance and Use

4.1 These thermocouple combinations have been developed for specific applications by the wire manufacturer(s). If addi-

tional information is required, consult ASTM MNL 12 or one of the following thermocouple manufacturers: Carpenter Technology, Engelhard Corp. Specialty Metals Div., Hoskins Mfg. Co., Johnson Matthey, Sigmund Cohn Corp.

5. Thermocouple Types

5.1 Letter symbols have not been assigned. Identification is made by alloy composition with the thermoelectrically positive material listed first.

5.1.1 Tungsten versus tungsten–26 % rhenium.

5.1.2 Platinel II.³

5.1.3 KP versus gold–0.07 % iron.⁴

5.1.4 Platinum–5 % molybdenum versus platinum–0.1 % molybdenum.

5.1.5 Platinum–40 % rhodium versus platinum–20 % rhodium.

5.1.6 Nickel–18 % molybdenum versus nickel–0.8 % cobalt.⁵

5.1.7 Iridium–40 % rhodium versus iridium.

5.1.8 Gold versus platinum.

5.1.9 Platinum versus palladium.

6. Tolerances on Initial Values of emf versus Temperature

6.1 Tolerances on initial values of emf versus temperature have not been established for the thermocouples in this guide. When required, tolerances on initial values of emf versus temperature should be established by agreement between the consumer and the producer. These thermocouple combinations are supplied typically as matched pairs.

7. Table Information

7.1 The following is a list of emf versus temperature tables included in this guide.

Table Number	Thermocouple Type	Temperature Range
Table 1	Tungsten versus Tungsten–26 % Rhenium	0 °C to 2315 °C
Table 2	Tungsten versus Tungsten–26 % Rhenium	32 °F to 4200 °F

¹ This guide is under the jurisdiction of ASTM Committee E20 on Temperature Measurement and is the direct responsibility of Subcommittee E20.04 on Thermocouples.

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² *Manual on the Use of Thermocouples in Temperature Measurement*, ASTM Manual 12, ASTM, 1993.

³ Trademark of Engelhard Corp., Specialty Metals Division.

⁴ Alloy compositions are expressed in percentages by mass, except for the gold–0.07 % iron alloy, which is given in atomic percent.

⁵ Nickel–18 % molybdenum versus nickel 0.8 % cobalt is supplied by Carpenter Technology as 20 alloy and 19 alloy.

Table 3	Platinel II	0 °C to 1395 °C
Table 4	Platinel II	32 °F to 2543 °F
Table 5	KP versus Gold–0.07 % Iron	–273 °C to 7 °C
Table 6	KP versus Gold–0.07 % Iron	–459 °F to 44 °F
Table 7	Platinum–5 % Molybdenum versus Platinum–0.1 % Molybdenum	0 °C to 1600 °C
Table 8	Platinum–5 % Molybdenum versus Platinum–0.1 % Molybdenum	32 °F to 2912 °F
Table 9	Platinum–40 % Rhodium versus Platinum–20 % Rhodium	0 °C to 1888 °C
Table 10	Platinum–40 % Rhodium versus Platinum–20 % Rhodium	32 °F to 3430 °F
Table 11	Nickel–18 % Molybdenum versus Nickel–0.8 % Cobalt	–50 °C to 1410 °C
Table 12	Nickel–18 % Molybdenum versus Nickel–0.8 % Cobalt	–58 °F to 2570 °F
Table 13	Iridium 40 % Rhodium versus Iridium	0 °C to 2110 °C
Table 14	Iridium 40 % Rhodium versus Iridium	32 °F to 3830 °F
Table 15	Gold versus Platinum	0 °C to 1000 °C
Table 16	Gold versus Platinum	32 °F to 1832 °F
Table 17	Platinum versus Palladium	0 °C to 1500 °C
Table 18	Platinum versus Palladium	32 °F to 2732 °F
Table 19	Polynomial Coefficients for the Computation of Temperatures in °C or °F as a Function of Thermocouple emf	

7.2 Tables 1-18 were derived from equations of the form:

$$E = c_0 + c_1 T + c_2 T^2 + \dots c_n T^n \quad (1)$$

where:

E = the emf in millivolts (except for Tables 15-18 where E is in microvolts), and

T = the temperature in °C or °F. The coefficients used to calculate each table are given at the end of the table.

7.3 Table 19 gives coefficients of inverse equations that may be used to compute approximate values of temperature (T) in either °C or °F for each thermocouple combination. The inverse equations are of the form:

$$T = b_0 + b_1 E + b_2 E^2 + \dots b_n E^n \quad (2)$$

except for the gold versus platinum thermocouple in the ranges 209 °C to 1000 °C (408.2 °F to 1832 °F), where the inverse equation is of the form:

$$T = b_0 + \sum_{i=1}^{11} b_i \left(\frac{E - 9645}{7620} \right)^i \quad (3)$$

For these equations, the thermocouple emf (E) is in units of millivolts, except for gold versus platinum and platinum versus palladium thermocouples, for which the emf is in units of microvolts.

7.3.1 Table 19 also gives the temperature range, emf range, and error range of each inverse equation.

TABLE 1 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
0	0.000	0.001	0.003	0.004	0.005	0.007	0.008	0.010	0.012	0.013	0.015	0
10	0.015	0.017	0.018	0.020	0.022	0.024	0.026	0.028	0.030	0.032	0.034	10
20	0.034	0.036	0.038	0.041	0.043	0.045	0.048	0.050	0.053	0.055	0.058	20
30	0.058	0.060	0.063	0.065	0.068	0.071	0.074	0.076	0.079	0.082	0.085	30
40	0.085	0.088	0.091	0.094	0.097	0.100	0.104	0.107	0.110	0.113	0.117	40
50	0.117	0.120	0.123	0.127	0.130	0.134	0.138	0.141	0.145	0.148	0.152	50
60	0.152	0.156	0.160	0.164	0.168	0.172	0.175	0.179	0.184	0.188	0.192	60
70	0.192	0.196	0.200	0.204	0.209	0.213	0.217	0.222	0.226	0.231	0.235	70
80	0.235	0.240	0.244	0.249	0.254	0.258	0.263	0.268	0.273	0.277	0.282	80
90	0.282	0.287	0.292	0.297	0.302	0.307	0.312	0.318	0.323	0.328	0.333	90
100	0.333	0.339	0.344	0.349	0.355	0.360	0.366	0.371	0.377	0.382	0.388	100
110	0.388	0.394	0.399	0.405	0.411	0.417	0.422	0.428	0.434	0.440	0.446	110
120	0.446	0.452	0.458	0.464	0.471	0.477	0.483	0.489	0.495	0.502	0.508	120
130	0.508	0.514	0.521	0.527	0.534	0.540	0.547	0.553	0.560	0.567	0.573	130
140	0.573	0.580	0.587	0.594	0.601	0.607	0.614	0.621	0.628	0.635	0.642	140
150	0.642	0.649	0.656	0.664	0.671	0.678	0.685	0.693	0.700	0.707	0.715	150
160	0.715	0.722	0.729	0.737	0.744	0.752	0.760	0.767	0.775	0.782	0.790	160
170	0.790	0.798	0.806	0.813	0.821	0.829	0.837	0.845	0.853	0.861	0.869	170
180	0.869	0.877	0.885	0.893	0.902	0.910	0.918	0.926	0.935	0.943	0.951	180
190	0.951	0.960	0.968	0.976	0.985	0.993	1.002	1.011	1.019	1.028	1.037	190
200	1.037	1.045	1.054	1.063	1.072	1.080	1.089	1.098	1.107	1.116	1.125	200
210	1.125	1.134	1.143	1.152	1.161	1.170	1.180	1.189	1.198	1.207	1.217	210
220	1.217	1.226	1.235	1.245	1.254	1.264	1.273	1.283	1.292	1.302	1.311	220
230	1.311	1.321	1.331	1.340	1.350	1.360	1.369	1.379	1.389	1.399	1.409	230
240	1.409	1.419	1.429	1.439	1.449	1.459	1.469	1.479	1.489	1.499	1.509	240
250	1.509	1.520	1.530	1.540	1.550	1.561	1.571	1.582	1.592	1.602	1.613	250
260	1.613	1.623	1.634	1.644	1.655	1.666	1.676	1.687	1.698	1.708	1.719	260
270	1.719	1.730	1.741	1.752	1.762	1.773	1.784	1.795	1.806	1.817	1.828	270
280	1.828	1.839	1.850	1.862	1.873	1.884	1.895	1.906	1.918	1.929	1.940	280
290	1.940	1.951	1.963	1.974	1.986	1.997	2.009	2.020	2.032	2.043	2.055	290
300	2.055	2.066	2.078	2.090	2.101	2.113	2.125	2.136	2.148	2.160	2.172	300
310	2.172	2.184	2.196	2.208	2.219	2.231	2.243	2.255	2.267	2.280	2.292	310
320	2.292	2.304	2.316	2.328	2.340	2.353	2.365	2.377	2.389	2.402	2.414	320
330	2.414	2.426	2.439	2.451	2.464	2.476	2.489	2.501	2.514	2.526	2.539	330
340	2.539	2.552	2.564	2.577	2.590	2.602	2.615	2.628	2.641	2.653	2.666	340
350	2.666	2.679	2.692	2.705	2.718	2.731	2.744	2.757	2.770	2.783	2.796	350
360	2.796	2.809	2.822	2.836	2.849	2.862	2.875	2.888	2.902	2.915	2.928	360
370	2.928	2.942	2.955	2.968	2.982	2.995	3.009	3.022	3.036	3.049	3.063	370
380	3.063	3.076	3.090	3.104	3.117	3.131	3.145	3.158	3.172	3.186	3.200	380
390	3.200	3.214	3.227	3.241	3.255	3.269	3.283	3.297	3.311	3.325	3.339	390
400	3.339	3.353	3.367	3.381	3.395	3.409	3.423	3.438	3.452	3.466	3.480	400
410	3.480	3.494	3.509	3.523	3.537	3.552	3.566	3.580	3.595	3.609	3.624	410
420	3.624	3.638	3.653	3.667	3.682	3.696	3.711	3.725	3.740	3.755	3.769	420
430	3.769	3.784	3.799	3.813	3.828	3.843	3.858	3.872	3.887	3.902	3.917	430
440	3.917	3.932	3.947	3.962	3.977	3.992	4.007	4.022	4.037	4.052	4.067	440
450	4.067	4.082	4.097	4.112	4.127	4.142	4.158	4.173	4.188	4.203	4.219	450
460	4.219	4.234	4.249	4.264	4.280	4.295	4.311	4.326	4.341	4.357	4.372	460
470	4.372	4.388	4.403	4.419	4.434	4.450	4.465	4.481	4.497	4.512	4.528	470
480	4.528	4.544	4.559	4.575	4.591	4.606	4.622	4.638	4.654	4.670	4.685	480
490	4.685	4.701	4.717	4.733	4.749	4.765	4.781	4.797	4.813	4.829	4.845	490
500	4.845	4.861	4.877	4.893	4.909	4.925	4.941	4.957	4.974	4.990	5.006	500
°C	0	1	2	3	4	5	6	7	8	9	10	°C

TABLE 1 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C *Continued*

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
500	4.845	4.861	4.877	4.893	4.909	4.925	4.941	4.957	4.974	4.990	5.006	500
510	5.006	5.022	5.038	5.055	5.071	5.087	5.104	5.120	5.136	5.153	5.169	510
520	5.169	5.185	5.202	5.218	5.235	5.251	5.267	5.284	5.300	5.317	5.334	520
530	5.334	5.350	5.367	5.383	5.400	5.416	5.433	5.450	5.466	5.483	5.500	530
540	5.500	5.517	5.533	5.550	5.567	5.584	5.600	5.617	5.634	5.651	5.668	540
550	5.668	5.685	5.702	5.718	5.735	5.752	5.769	5.786	5.803	5.820	5.837	550
560	5.837	5.854	5.871	5.888	5.906	5.923	5.940	5.957	5.974	5.991	6.008	560
570	6.008	6.026	6.043	6.060	6.077	6.095	6.112	6.129	6.146	6.164	6.181	570
580	6.181	6.198	6.216	6.233	6.250	6.268	6.285	6.303	6.320	6.338	6.355	580
590	6.355	6.373	6.390	6.408	6.425	6.443	6.460	6.478	6.495	6.513	6.531	590
600	6.531	6.548	6.566	6.583	6.601	6.619	6.636	6.654	6.672	6.690	6.707	600
610	6.707	6.725	6.743	6.761	6.778	6.796	6.814	6.832	6.850	6.868	6.886	610
620	6.886	6.903	6.921	6.939	6.957	6.975	6.993	7.011	7.029	7.047	7.065	620
630	7.065	7.083	7.101	7.119	7.137	7.155	7.173	7.191	7.210	7.228	7.246	630
640	7.246	7.264	7.282	7.300	7.319	7.337	7.355	7.373	7.391	7.410	7.428	640
650	7.428	7.446	7.465	7.483	7.501	7.519	7.538	7.556	7.575	7.593	7.611	650
660	7.611	7.630	7.648	7.667	7.685	7.703	7.722	7.740	7.759	7.777	7.796	660
670	7.796	7.814	7.833	7.852	7.870	7.889	7.907	7.926	7.944	7.963	7.982	670
680	7.982	8.000	8.019	8.038	8.056	8.075	8.094	8.113	8.131	8.150	8.169	680
690	8.169	8.187	8.206	8.225	8.244	8.263	8.281	8.300	8.319	8.338	8.357	690
700	8.357	8.376	8.395	8.414	8.432	8.451	8.470	8.489	8.508	8.527	8.546	700
710	8.546	8.565	8.584	8.603	8.622	8.641	8.660	8.679	8.698	8.717	8.737	710
720	8.737	8.756	8.775	8.794	8.813	8.832	8.851	8.870	8.890	8.909	8.928	720
730	8.928	8.947	8.966	8.986	9.005	9.024	9.043	9.063	9.082	9.101	9.120	730
740	9.120	9.140	9.159	9.178	9.198	9.217	9.236	9.256	9.275	9.295	9.314	740
750	9.314	9.333	9.353	9.372	9.392	9.411	9.430	9.450	9.469	9.489	9.508	750
760	9.508	9.528	9.547	9.567	9.586	9.606	9.625	9.645	9.665	9.684	9.704	760
770	9.704	9.723	9.743	9.763	9.782	9.802	9.821	9.841	9.861	9.880	9.900	770
780	9.900	9.920	9.939	9.959	9.979	9.998	10.018	10.038	10.058	10.077	10.097	780
790	10.097	10.117	10.137	10.156	10.176	10.196	10.216	10.236	10.256	10.275	10.295	790
800	10.295	10.315	10.335	10.355	10.375	10.395	10.414	10.434	10.454	10.474	10.494	800
810	10.494	10.514	10.534	10.554	10.574	10.594	10.614	10.634	10.654	10.674	10.694	810
820	10.694	10.714	10.734	10.754	10.774	10.794	10.814	10.834	10.854	10.874	10.894	820
830	10.894	10.914	10.934	10.954	10.974	10.995	11.015	11.035	11.055	11.075	11.095	830
840	11.095	11.115	11.136	11.156	11.176	11.196	11.216	11.236	11.257	11.277	11.297	840
850	11.297	11.317	11.338	11.358	11.378	11.398	11.419	11.439	11.459	11.479	11.500	850
860	11.500	11.520	11.540	11.561	11.581	11.601	11.622	11.642	11.662	11.683	11.703	860
870	11.703	11.723	11.744	11.764	11.784	11.805	11.825	11.845	11.866	11.886	11.907	870
880	11.907	11.927	11.948	11.968	11.988	12.009	12.029	12.050	12.070	12.091	12.111	880
890	12.111	12.132	12.152	12.173	12.193	12.214	12.234	12.255	12.275	12.296	12.316	890
900	12.316	12.337	12.357	12.378	12.398	12.419	12.439	12.460	12.481	12.501	12.522	900
910	12.522	12.542	12.563	12.583	12.604	12.625	12.645	12.666	12.686	12.707	12.728	910
920	12.728	12.748	12.769	12.790	12.810	12.831	12.852	12.872	12.893	12.914	12.934	920
930	12.934	12.955	12.976	12.996	13.017	13.038	13.058	13.079	13.100	13.121	13.141	930
940	13.141	13.162	13.183	13.204	13.224	13.245	13.266	13.287	13.307	13.328	13.349	940
950	13.349	13.370	13.390	13.411	13.432	13.453	13.474	13.494	13.515	13.536	13.557	950
960	13.557	13.578	13.598	13.619	13.640	13.661	13.682	13.702	13.723	13.744	13.765	960
970	13.765	13.786	13.807	13.828	13.848	13.869	13.890	13.911	13.932	13.953	13.974	970
980	13.974	13.995	14.015	14.036	14.057	14.078	14.099	14.120	14.141	14.162	14.183	980
990	14.183	14.204	14.225	14.245	14.266	14.287	14.308	14.329	14.350	14.371	14.392	990
1000	14.392	14.413	14.434	14.455	14.476	14.497	14.518	14.539	14.560	14.581	14.602	1000
°C	0	1	2	3	4	5	6	7	8	9	10	°C

TABLE 1 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C *Continued*

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
1000	14.392	14.413	14.434	14.455	14.476	14.497	14.518	14.539	14.560	14.581	14.602	1000
1010	14.602	14.623	14.644	14.665	14.686	14.707	14.728	14.749	14.770	14.791	14.812	1010
1020	14.812	14.833	14.854	14.875	14.896	14.917	14.938	14.959	14.980	15.001	15.022	1020
1030	15.022	15.043	15.064	15.085	15.106	15.127	15.148	15.169	15.190	15.211	15.232	1030
1040	15.232	15.253	15.274	15.295	15.316	15.337	15.359	15.380	15.401	15.422	15.443	1040
1050	15.443	15.464	15.485	15.506	15.527	15.548	15.569	15.590	15.611	15.633	15.654	1050
1060	15.654	15.675	15.696	15.717	15.738	15.759	15.780	15.801	15.822	15.844	15.865	1060
1070	15.865	15.886	15.907	15.928	15.949	15.970	15.991	16.012	16.034	16.055	16.076	1070
1080	16.076	16.097	16.118	16.139	16.160	16.181	16.202	16.224	16.245	16.266	16.287	1080
1090	16.287	16.308	16.329	16.350	16.372	16.393	16.414	16.435	16.456	16.477	16.498	1090
1100	16.498	16.520	16.541	16.562	16.583	16.604	16.625	16.646	16.668	16.689	16.710	1100
1110	16.710	16.731	16.752	16.773	16.794	16.816	16.837	16.858	16.879	16.900	16.921	1110
1120	16.921	16.943	16.964	16.985	17.006	17.027	17.048	17.069	17.091	17.112	17.133	1120
1130	17.133	17.154	17.175	17.196	17.218	17.239	17.260	17.281	17.302	17.323	17.345	1130
1140	17.345	17.366	17.387	17.408	17.429	17.450	17.471	17.493	17.514	17.535	17.556	1140
1150	17.556	17.577	17.598	17.620	17.641	17.662	17.683	17.704	17.725	17.747	17.768	1150
1160	17.768	17.789	17.810	17.831	17.852	17.874	17.895	17.916	17.937	17.958	17.979	1160
1170	17.979	18.000	18.022	18.043	18.064	18.085	18.106	18.127	18.149	18.170	18.191	1170
1180	18.191	18.212	18.233	18.254	18.275	18.297	18.318	18.339	18.360	18.381	18.402	1180
1190	18.402	18.423	18.445	18.466	18.487	18.508	18.529	18.550	18.571	18.593	18.614	1190
1200	18.614	18.635	18.656	18.677	18.698	18.719	18.741	18.762	18.783	18.804	18.825	1200
1210	18.825	18.846	18.867	18.888	18.910	18.931	18.952	18.973	18.994	19.015	19.036	1210
1220	19.036	19.057	19.078	19.100	19.121	19.142	19.163	19.184	19.205	19.226	19.247	1220
1230	19.247	19.268	19.289	19.311	19.332	19.353	19.374	19.395	19.416	19.437	19.458	1230
1240	19.458	19.479	19.500	19.521	19.543	19.564	19.585	19.606	19.627	19.648	19.669	1240
1250	19.669	19.690	19.711	19.732	19.753	19.774	19.795	19.816	19.837	19.858	19.880	1250
1260	19.880	19.901	19.922	19.943	19.964	19.985	20.006	20.027	20.048	20.069	20.090	1260
1270	20.090	20.111	20.132	20.153	20.174	20.195	20.216	20.237	20.258	20.279	20.300	1270
1280	20.300	20.321	20.342	20.363	20.384	20.405	20.426	20.447	20.468	20.489	20.510	1280
1290	20.510	20.531	20.552	20.573	20.594	20.615	20.636	20.657	20.678	20.699	20.720	1290
1300	20.720	20.741	20.762	20.783	20.804	20.824	20.845	20.866	20.887	20.908	20.929	1300
1310	20.929	20.950	20.971	20.992	21.013	21.034	21.055	21.076	21.097	21.117	21.138	1310
1320	21.138	21.159	21.180	21.201	21.222	21.243	21.264	21.285	21.305	21.326	21.347	1320
1330	21.347	21.368	21.389	21.410	21.431	21.452	21.472	21.493	21.514	21.535	21.556	1330
1340	21.556	21.577	21.597	21.618	21.639	21.660	21.681	21.702	21.722	21.743	21.764	1340
1350	21.764	21.785	21.806	21.826	21.847	21.868	21.889	21.910	21.930	21.951	21.972	1350
1360	21.972	21.993	22.014	22.034	22.055	22.076	22.097	22.117	22.138	22.159	22.180	1360
1370	22.180	22.200	22.221	22.242	22.263	22.283	22.304	22.325	22.345	22.366	22.387	1370
1380	22.387	22.408	22.428	22.449	22.470	22.490	22.511	22.532	22.552	22.573	22.594	1380
1390	22.594	22.614	22.635	22.656	22.676	22.697	22.718	22.738	22.759	22.780	22.800	1390
1400	22.800	22.821	22.841	22.862	22.883	22.903	22.924	22.945	22.965	22.986	23.006	1400
1410	23.006	23.027	23.047	23.068	23.089	23.109	23.130	23.150	23.171	23.191	23.212	1410
1420	23.212	23.233	23.253	23.274	23.294	23.315	23.335	23.356	23.376	23.397	23.417	1420
1430	23.417	23.438	23.458	23.479	23.499	23.520	23.540	23.561	23.581	23.602	23.622	1430
1440	23.622	23.643	23.663	23.683	23.704	23.724	23.745	23.765	23.786	23.806	23.826	1440
1450	23.826	23.847	23.867	23.888	23.908	23.928	23.949	23.969	23.990	24.010	24.030	1450
1460	24.030	24.051	24.071	24.091	24.112	24.132	24.152	24.173	24.193	24.213	24.234	1460
1470	24.234	24.254	24.274	24.295	24.315	24.335	24.356	24.376	24.396	24.416	24.437	1470
1480	24.437	24.457	24.477	24.498	24.518	24.538	24.558	24.578	24.599	24.619	24.639	1480
1490	24.639	24.659	24.680	24.700	24.720	24.740	24.760	24.781	24.801	24.821	24.841	1490
1500	24.841	24.861	24.881	24.902	24.922	24.942	24.962	24.982	25.002	25.022	25.042	1500
°C	0	1	2	3	4	5	6	7	8	9	10	°C

TABLE 1 Tungsten versus Tungsten–26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C *Continued*

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
1500	24.841	24.861	24.881	24.902	24.922	24.942	24.962	24.982	25.002	25.022	25.042	1500
1510	25.042	25.063	25.083	25.103	25.123	25.143	25.163	25.183	25.203	25.223	25.243	1510
1520	25.243	25.263	25.283	25.303	25.324	25.344	25.364	25.384	25.404	25.424	25.444	1520
1530	25.444	25.464	25.484	25.504	25.524	25.544	25.564	25.584	25.603	25.623	25.643	1530
1540	25.643	25.663	25.683	25.703	25.723	25.743	25.763	25.783	25.803	25.823	25.843	1540
1550	25.843	25.862	25.882	25.902	25.922	25.942	25.962	25.982	26.001	26.021	26.041	1550
1560	26.041	26.061	26.081	26.101	26.120	26.140	26.160	26.180	26.200	26.219	26.239	1560
1570	26.239	26.259	26.279	26.298	26.318	26.338	26.358	26.377	26.397	26.417	26.437	1570
1580	26.437	26.456	26.476	26.496	26.515	26.535	26.555	26.574	26.594	26.614	26.633	1580
1590	26.633	26.653	26.673	26.692	26.712	26.731	26.751	26.771	26.790	26.810	26.829	1590
1600	26.829	26.849	26.869	26.888	26.908	26.927	26.947	26.966	26.986	27.005	27.025	1600
1610	27.025	27.044	27.064	27.083	27.103	27.122	27.142	27.161	27.181	27.200	27.220	1610
1620	27.220	27.239	27.259	27.278	27.297	27.317	27.336	27.356	27.375	27.394	27.414	1620
1630	27.414	27.433	27.453	27.472	27.491	27.511	27.530	27.549	27.569	27.588	27.607	1630
1640	27.607	27.627	27.646	27.665	27.685	27.704	27.723	27.742	27.762	27.781	27.800	1640
1650	27.800	27.819	27.839	27.858	27.877	27.896	27.915	27.935	27.954	27.973	27.992	1650
1660	27.992	28.011	28.031	28.050	28.069	28.088	28.107	28.126	28.145	28.164	28.184	1660
1670	28.184	28.203	28.222	28.241	28.260	28.279	28.298	28.317	28.336	28.355	28.374	1670
1680	28.374	28.393	28.412	28.431	28.450	28.469	28.488	28.507	28.526	28.545	28.564	1680
1690	28.564	28.583	28.602	28.621	28.640	28.659	28.678	28.697	28.716	28.734	28.753	1690
1700	28.753	28.772	28.791	28.810	28.829	28.848	28.866	28.885	28.904	28.923	28.942	1700
1710	28.942	28.961	28.979	28.998	29.017	29.036	29.054	29.073	29.092	29.111	29.129	1710
1720	29.129	29.148	29.167	29.186	29.204	29.223	29.242	29.260	29.279	29.298	29.316	1720
1730	29.316	29.335	29.354	29.372	29.391	29.409	29.428	29.447	29.465	29.484	29.502	1730
1740	29.502	29.521	29.539	29.558	29.577	29.595	29.614	29.632	29.651	29.669	29.688	1740
1750	29.688	29.706	29.725	29.743	29.762	29.780	29.798	29.817	29.835	29.854	29.872	1750
1760	29.872	29.891	29.909	29.927	29.946	29.964	29.982	30.001	30.019	30.038	30.056	1760
1770	30.056	30.074	30.092	30.111	30.129	30.147	30.166	30.184	30.202	30.220	30.239	1770
1780	30.239	30.257	30.275	30.293	30.312	30.330	30.348	30.366	30.384	30.403	30.421	1780
1790	30.421	30.439	30.457	30.475	30.493	30.511	30.530	30.548	30.566	30.584	30.602	1790
1800	30.602	30.620	30.638	30.656	30.674	30.692	30.710	30.728	30.746	30.764	30.782	1800
1810	30.782	30.800	30.818	30.836	30.854	30.872	30.890	30.908	30.926	30.944	30.962	1810
1820	30.962	30.980	30.997	31.015	31.033	31.051	31.069	31.087	31.105	31.122	31.140	1820
1830	31.140	31.158	31.176	31.194	31.211	31.229	31.247	31.265	31.282	31.300	31.318	1830
1840	31.318	31.336	31.353	31.371	31.389	31.406	31.424	31.442	31.459	31.477	31.495	1840
1850	31.495	31.512	31.530	31.548	31.565	31.583	31.600	31.618	31.636	31.653	31.671	1850
1860	31.671	31.688	31.706	31.723	31.741	31.758	31.776	31.793	31.811	31.828	31.846	1860
1870	31.846	31.863	31.881	31.898	31.915	31.933	31.950	31.968	31.985	32.002	32.020	1870
1880	32.020	32.037	32.054	32.072	32.089	32.106	32.124	32.141	32.158	32.176	32.193	1880
1890	32.193	32.210	32.227	32.245	32.262	32.279	32.296	32.313	32.331	32.348	32.365	1890
1900	32.365	32.382	32.399	32.417	32.434	32.451	32.468	32.485	32.502	32.519	32.536	1900
1910	32.536	32.553	32.570	32.587	32.605	32.622	32.639	32.656	32.673	32.690	32.707	1910
1920	32.707	32.724	32.741	32.758	32.774	32.791	32.808	32.825	32.842	32.859	32.876	1920
1930	32.876	32.893	32.910	32.927	32.943	32.960	32.977	32.994	33.011	33.027	33.044	1930
1940	33.044	33.061	33.078	33.095	33.111	33.128	33.145	33.162	33.178	33.195	33.212	1940
1950	33.212	33.228	33.245	33.262	33.278	33.295	33.312	33.328	33.345	33.361	33.378	1950
1960	33.378	33.395	33.411	33.428	33.444	33.461	33.477	33.494	33.510	33.527	33.543	1960
1970	33.543	33.560	33.576	33.593	33.609	33.626	33.642	33.659	33.675	33.691	33.708	1970
1980	33.708	33.724	33.741	33.757	33.773	33.790	33.806	33.822	33.839	33.855	33.871	1980
1990	33.871	33.887	33.904	33.920	33.936	33.952	33.969	33.985	34.001	34.017	34.033	1990
2000	34.033	34.050	34.066	34.082	34.098	34.114	34.130	34.146	34.163	34.179	34.195	2000
°C	0	1	2	3	4	5	6	7	8	9	10	°C

TABLE 1 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C *Continued*

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
2000	34.033	34.050	34.066	34.082	34.098	34.114	34.130	34.146	34.163	34.179	34.195	2000
2010	34.195	34.211	34.227	34.243	34.259	34.275	34.291	34.307	34.323	34.339	34.355	2010
2020	34.355	34.371	34.387	34.403	34.419	34.435	34.451	34.467	34.482	34.498	34.514	2020
2030	34.514	34.530	34.546	34.562	34.578	34.593	34.609	34.625	34.641	34.657	34.672	2030
2040	34.672	34.688	34.704	34.720	34.735	34.751	34.767	34.782	34.798	34.814	34.829	2040
2050	34.829	34.845	34.861	34.876	34.892	34.908	34.923	34.939	34.954	34.970	34.985	2050
2060	34.985	35.001	35.016	35.032	35.047	35.063	35.078	35.094	35.109	35.125	35.140	2060
2070	35.140	35.156	35.171	35.187	35.202	35.217	35.233	35.248	35.263	35.279	35.294	2070
2080	35.294	35.309	35.325	35.340	35.355	35.371	35.386	35.401	35.416	35.432	35.447	2080
2090	35.447	35.462	35.477	35.492	35.508	35.523	35.538	35.553	35.568	35.583	35.598	2090
2100	35.598	35.613	35.629	35.644	35.659	35.674	35.689	35.704	35.719	35.734	35.749	2100
2110	35.749	35.764	35.779	35.794	35.809	35.824	35.839	35.853	35.868	35.883	35.898	2110
2120	35.898	35.913	35.928	35.943	35.958	35.972	35.987	36.002	36.017	36.032	36.046	2120
2130	36.046	36.061	36.076	36.091	36.105	36.120	36.135	36.149	36.164	36.179	36.193	2130
2140	36.193	36.208	36.223	36.237	36.252	36.266	36.281	36.296	36.310	36.325	36.339	2140
2150	36.339	36.354	36.368	36.383	36.397	36.412	36.426	36.441	36.455	36.469	36.484	2150
2160	36.484	36.498	36.513	36.527	36.541	36.556	36.570	36.584	36.599	36.613	36.627	2160
2170	36.627	36.642	36.656	36.670	36.684	36.699	36.713	36.727	36.741	36.756	36.770	2170
2180	36.770	36.784	36.798	36.812	36.826	36.840	36.855	36.869	36.883	36.897	36.911	2180
2190	36.911	36.925	36.939	36.953	36.967	36.981	36.995	37.009	37.023	37.037	37.051	2190
2200	37.051	37.065	37.079	37.092	37.106	37.120	37.134	37.148	37.162	37.176	37.189	2200
2210	37.189	37.203	37.217	37.231	37.245	37.258	37.272	37.286	37.299	37.313	37.327	2210
2220	37.327	37.341	37.354	37.368	37.381	37.395	37.409	37.422	37.436	37.449	37.463	2220
2230	37.463	37.477	37.490	37.504	37.517	37.531	37.544	37.558	37.571	37.585	37.598	2230
2240	37.598	37.611	37.625	37.638	37.652	37.665	37.678	37.692	37.705	37.718	37.732	2240
2250	37.732	37.745	37.758	37.771	37.785	37.798	37.811	37.824	37.838	37.851	37.864	2250
2260	37.864	37.877	37.890	37.903	37.917	37.930	37.943	37.956	37.969	37.982	37.995	2260
2270	37.995	38.008	38.021	38.034	38.047	38.060	38.073	38.086	38.099	38.112	38.125	2270
2280	38.125	38.138	38.151	38.163	38.176	38.189	38.202	38.215	38.228	38.240	38.253	2280
2290	38.253	38.266	38.279	38.291	38.304	38.317	38.329	38.342	38.355	38.367	38.380	2290
2300	38.380	38.393	38.405	38.418	38.431	38.443	38.456	38.468	38.481	38.493	38.506	2300
2310	38.506	38.518	38.531	38.543	38.556	38.568						2310
°C	0	1	2	3	4	5	6	7	8	9	10	°C

Coefficients and temperature ranges of equations used to compute the above ITS-90 based table for Tungsten versus Tungsten - 26% Rhenium thermocouples.

0 °C to 630.615 °C

$$\begin{aligned}
 c_0 &= 0.000\ 000\ 0 \\
 c_1 &= 1.279\ 220\ 1 \times 10^{-03} \\
 c_2 &= 2.163\ 475\ 4 \times 10^{-05} \\
 c_3 &= -1.139\ 323\ 4 \times 10^{-08} \\
 c_4 &= 4.385\ 002\ 2 \times 10^{-12} \\
 c_5 &= -1.708\ 920\ 2 \times 10^{-15}
 \end{aligned}$$

630.615 °C to 2315 °C

$$\begin{aligned}
 c_0 &= -1.106\ 441\ 2 \\
 c_1 &= 9.496\ 245\ 5 \times 10^{-03} \\
 c_2 &= -3.646\ 751\ 6 \times 10^{-06} \\
 c_3 &= 3.114\ 133\ 0 \times 10^{-08} \\
 c_4 &= -3.861\ 522\ 2 \times 10^{-11} \\
 c_5 &= 2.445\ 501\ 2 \times 10^{-14} \\
 c_6 &= -8.988\ 805\ 3 \times 10^{-18} \\
 c_7 &= 1.812\ 023\ 7 \times 10^{-21} \\
 c_8 &= -1.553\ 459\ 1 \times 10^{-25}
 \end{aligned}$$

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
30			0.000	0.001	0.001	0.002	0.003	0.004	0.005	0.005	0.006	30
40	0.006	0.007	0.008	0.009	0.009	0.010	0.011	0.012	0.013	0.014	0.015	40
50	0.015	0.016	0.017	0.018	0.019	0.020	0.021	0.022	0.023	0.024	0.025	50
60	0.025	0.026	0.027	0.028	0.030	0.031	0.032	0.033	0.034	0.035	0.037	60
70	0.037	0.038	0.039	0.040	0.041	0.043	0.044	0.045	0.047	0.048	0.049	70
80	0.049	0.051	0.052	0.053	0.055	0.056	0.058	0.059	0.060	0.062	0.063	80
90	0.063	0.065	0.066	0.068	0.069	0.071	0.072	0.074	0.075	0.077	0.079	90
100	0.079	0.080	0.082	0.083	0.085	0.087	0.088	0.090	0.092	0.093	0.095	100
110	0.095	0.097	0.099	0.100	0.102	0.104	0.106	0.107	0.109	0.111	0.113	110
120	0.113	0.115	0.117	0.119	0.120	0.122	0.124	0.126	0.128	0.130	0.132	120
130	0.132	0.134	0.136	0.138	0.140	0.142	0.144	0.146	0.148	0.150	0.152	130
140	0.152	0.154	0.156	0.159	0.161	0.163	0.165	0.167	0.169	0.172	0.174	140
150	0.174	0.176	0.178	0.180	0.183	0.185	0.187	0.189	0.192	0.194	0.196	150
160	0.196	0.199	0.201	0.203	0.206	0.208	0.211	0.213	0.215	0.218	0.220	160
170	0.220	0.223	0.225	0.228	0.230	0.233	0.235	0.238	0.240	0.243	0.245	170
180	0.245	0.248	0.250	0.253	0.256	0.258	0.261	0.264	0.266	0.269	0.272	180
190	0.272	0.274	0.277	0.280	0.282	0.285	0.288	0.291	0.293	0.296	0.299	190
200	0.299	0.302	0.305	0.307	0.310	0.313	0.316	0.319	0.322	0.325	0.327	200
210	0.327	0.330	0.333	0.336	0.339	0.342	0.345	0.348	0.351	0.354	0.357	210
220	0.357	0.360	0.363	0.366	0.369	0.372	0.375	0.379	0.382	0.385	0.388	220
230	0.388	0.391	0.394	0.397	0.401	0.404	0.407	0.410	0.413	0.417	0.420	230
240	0.420	0.423	0.426	0.430	0.433	0.436	0.440	0.443	0.446	0.450	0.453	240
250	0.453	0.456	0.460	0.463	0.466	0.470	0.473	0.477	0.480	0.484	0.487	250
260	0.487	0.491	0.494	0.498	0.501	0.505	0.508	0.512	0.515	0.519	0.522	260
270	0.522	0.526	0.529	0.533	0.537	0.540	0.544	0.548	0.551	0.555	0.559	270
280	0.559	0.562	0.566	0.570	0.573	0.577	0.581	0.585	0.588	0.592	0.596	280
290	0.596	0.600	0.604	0.607	0.611	0.615	0.619	0.623	0.627	0.631	0.634	290
300	0.634	0.638	0.642	0.646	0.650	0.654	0.658	0.662	0.666	0.670	0.674	300
310	0.674	0.678	0.682	0.686	0.690	0.694	0.698	0.702	0.706	0.710	0.715	310
320	0.715	0.719	0.723	0.727	0.731	0.735	0.739	0.744	0.748	0.752	0.756	320
330	0.756	0.760	0.765	0.769	0.773	0.777	0.782	0.786	0.790	0.794	0.799	330
340	0.799	0.803	0.807	0.812	0.816	0.820	0.825	0.829	0.834	0.838	0.842	340
350	0.842	0.847	0.851	0.856	0.860	0.865	0.869	0.874	0.878	0.883	0.887	350
360	0.887	0.892	0.896	0.901	0.905	0.910	0.914	0.919	0.923	0.928	0.933	360
370	0.933	0.937	0.942	0.947	0.951	0.956	0.961	0.965	0.970	0.975	0.979	370
380	0.979	0.984	0.989	0.993	0.998	1.003	1.008	1.013	1.017	1.022	1.027	380
390	1.027	1.032	1.037	1.041	1.046	1.051	1.056	1.061	1.066	1.071	1.076	390
400	1.076	1.080	1.085	1.090	1.095	1.100	1.105	1.110	1.115	1.120	1.125	400
410	1.125	1.130	1.135	1.140	1.145	1.150	1.155	1.160	1.165	1.170	1.176	410
420	1.176	1.181	1.186	1.191	1.196	1.201	1.206	1.211	1.217	1.222	1.227	420
430	1.227	1.232	1.237	1.243	1.248	1.253	1.258	1.264	1.269	1.274	1.279	430
440	1.279	1.285	1.290	1.295	1.301	1.306	1.311	1.317	1.322	1.327	1.333	440
450	1.333	1.338	1.343	1.349	1.354	1.360	1.365	1.371	1.376	1.381	1.387	450
460	1.387	1.392	1.398	1.403	1.409	1.414	1.420	1.425	1.431	1.437	1.442	460
470	1.442	1.448	1.453	1.459	1.464	1.470	1.476	1.481	1.487	1.492	1.498	470
480	1.498	1.504	1.509	1.515	1.521	1.526	1.532	1.538	1.544	1.549	1.555	480
490	1.555	1.561	1.567	1.572	1.578	1.584	1.590	1.595	1.601	1.607	1.613	490
500	1.613	1.619	1.625	1.630	1.636	1.642	1.648	1.654	1.660	1.666	1.672	500
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F),
reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
500	1.613	1.619	1.625	1.630	1.636	1.642	1.648	1.654	1.660	1.666	1.672	500
510	1.672	1.677	1.683	1.689	1.695	1.701	1.707	1.713	1.719	1.725	1.731	510
520	1.731	1.737	1.743	1.749	1.755	1.761	1.767	1.773	1.779	1.785	1.792	520
530	1.792	1.798	1.804	1.810	1.816	1.822	1.828	1.834	1.841	1.847	1.853	530
540	1.853	1.859	1.865	1.871	1.878	1.884	1.890	1.896	1.903	1.909	1.915	540
550	1.915	1.921	1.928	1.934	1.940	1.946	1.953	1.959	1.965	1.972	1.978	550
560	1.978	1.984	1.991	1.997	2.003	2.010	2.016	2.023	2.029	2.035	2.042	560
570	2.042	2.048	2.055	2.061	2.068	2.074	2.080	2.087	2.093	2.100	2.106	570
580	2.106	2.113	2.119	2.126	2.132	2.139	2.146	2.152	2.159	2.165	2.172	580
590	2.172	2.178	2.185	2.192	2.198	2.205	2.211	2.218	2.225	2.231	2.238	590
600	2.238	2.245	2.251	2.258	2.265	2.272	2.278	2.285	2.292	2.298	2.305	600
610	2.305	2.312	2.319	2.325	2.332	2.339	2.346	2.353	2.359	2.366	2.373	610
620	2.373	2.380	2.387	2.393	2.400	2.407	2.414	2.421	2.428	2.435	2.442	620
630	2.442	2.448	2.455	2.462	2.469	2.476	2.483	2.490	2.497	2.504	2.511	630
640	2.511	2.518	2.525	2.532	2.539	2.546	2.553	2.560	2.567	2.574	2.581	640
650	2.581	2.588	2.595	2.602	2.609	2.616	2.624	2.631	2.638	2.645	2.652	650
660	2.652	2.659	2.666	2.673	2.681	2.688	2.695	2.702	2.709	2.717	2.724	660
670	2.724	2.731	2.738	2.745	2.753	2.760	2.767	2.774	2.782	2.789	2.796	670
680	2.796	2.803	2.811	2.818	2.825	2.833	2.840	2.847	2.855	2.862	2.869	680
690	2.869	2.877	2.884	2.891	2.899	2.906	2.914	2.921	2.928	2.936	2.943	690
700	2.943	2.951	2.958	2.965	2.973	2.980	2.988	2.995	3.003	3.010	3.018	700
710	3.018	3.025	3.033	3.040	3.048	3.055	3.063	3.070	3.078	3.086	3.093	710
720	3.093	3.101	3.108	3.116	3.123	3.131	3.139	3.146	3.154	3.161	3.169	720
730	3.169	3.177	3.184	3.192	3.200	3.207	3.215	3.223	3.230	3.238	3.246	730
740	3.246	3.254	3.261	3.269	3.277	3.284	3.292	3.300	3.308	3.315	3.323	740
750	3.323	3.331	3.339	3.347	3.354	3.362	3.370	3.378	3.386	3.394	3.401	750
760	3.401	3.409	3.417	3.425	3.433	3.441	3.449	3.456	3.464	3.472	3.480	760
770	3.480	3.488	3.496	3.504	3.512	3.520	3.528	3.536	3.544	3.552	3.560	770
780	3.560	3.568	3.576	3.584	3.592	3.600	3.608	3.616	3.624	3.632	3.640	780
790	3.640	3.648	3.656	3.664	3.672	3.680	3.688	3.696	3.704	3.712	3.721	790
800	3.721	3.729	3.737	3.745	3.753	3.761	3.769	3.777	3.786	3.794	3.802	800
810	3.802	3.810	3.818	3.826	3.835	3.843	3.851	3.859	3.868	3.876	3.884	810
820	3.884	3.892	3.900	3.909	3.917	3.925	3.934	3.942	3.950	3.958	3.967	820
830	3.967	3.975	3.983	3.992	4.000	4.008	4.017	4.025	4.033	4.042	4.050	830
840	4.050	4.058	4.067	4.075	4.084	4.092	4.100	4.109	4.117	4.126	4.134	840
850	4.134	4.142	4.151	4.159	4.168	4.176	4.185	4.193	4.202	4.210	4.219	850
860	4.219	4.227	4.236	4.244	4.253	4.261	4.270	4.278	4.287	4.295	4.304	860
870	4.304	4.312	4.321	4.329	4.338	4.346	4.355	4.364	4.372	4.381	4.389	870
880	4.389	4.398	4.407	4.415	4.424	4.433	4.441	4.450	4.458	4.467	4.476	880
890	4.476	4.484	4.493	4.502	4.511	4.519	4.528	4.537	4.545	4.554	4.563	890
900	4.563	4.571	4.580	4.589	4.598	4.606	4.615	4.624	4.633	4.641	4.650	900
910	4.650	4.659	4.668	4.677	4.685	4.694	4.703	4.712	4.721	4.730	4.738	910
920	4.738	4.747	4.756	4.765	4.774	4.783	4.791	4.800	4.809	4.818	4.827	920
930	4.827	4.836	4.845	4.854	4.863	4.872	4.880	4.889	4.898	4.907	4.916	930
940	4.916	4.925	4.934	4.943	4.952	4.961	4.970	4.979	4.988	4.997	5.006	940
950	5.006	5.015	5.024	5.033	5.042	5.051	5.060	5.069	5.078	5.087	5.096	950
960	5.096	5.105	5.114	5.123	5.133	5.142	5.151	5.160	5.169	5.178	5.187	960
970	5.187	5.196	5.205	5.214	5.224	5.233	5.242	5.251	5.260	5.269	5.278	970
980	5.278	5.288	5.297	5.306	5.315	5.324	5.334	5.343	5.352	5.361	5.370	980
990	5.370	5.380	5.389	5.398	5.407	5.416	5.426	5.435	5.444	5.453	5.463	990
1000	5.463	5.472	5.481	5.491	5.500	5.509	5.518	5.528	5.537	5.546	5.556	1000
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F),
reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
1000	5.463	5.472	5.481	5.491	5.500	5.509	5.518	5.528	5.537	5.546	5.556	1000
1010	5.556	5.565	5.574	5.584	5.593	5.602	5.612	5.621	5.630	5.640	5.649	1010
1020	5.649	5.658	5.668	5.677	5.687	5.696	5.705	5.715	5.724	5.734	5.743	1020
1030	5.743	5.752	5.762	5.771	5.781	5.790	5.800	5.809	5.818	5.828	5.837	1030
1040	5.837	5.847	5.856	5.866	5.875	5.885	5.894	5.904	5.913	5.923	5.932	1040
1050	5.932	5.942	5.951	5.961	5.970	5.980	5.989	5.999	6.008	6.018	6.027	1050
1060	6.027	6.037	6.047	6.056	6.066	6.075	6.085	6.095	6.104	6.114	6.123	1060
1070	6.123	6.133	6.143	6.152	6.162	6.171	6.181	6.191	6.200	6.210	6.220	1070
1080	6.220	6.229	6.239	6.249	6.258	6.268	6.278	6.287	6.297	6.307	6.316	1080
1090	6.316	6.326	6.336	6.345	6.355	6.365	6.374	6.384	6.394	6.404	6.413	1090
1100	6.413	6.423	6.433	6.443	6.452	6.462	6.472	6.482	6.491	6.501	6.511	1100
1110	6.511	6.521	6.531	6.540	6.550	6.560	6.570	6.580	6.589	6.599	6.609	1110
1120	6.609	6.619	6.629	6.638	6.648	6.658	6.668	6.678	6.688	6.698	6.707	1120
1130	6.707	6.717	6.727	6.737	6.747	6.757	6.767	6.777	6.786	6.796	6.806	1130
1140	6.806	6.816	6.826	6.836	6.846	6.856	6.866	6.876	6.886	6.896	6.905	1140
1150	6.905	6.915	6.925	6.935	6.945	6.955	6.965	6.975	6.985	6.995	7.005	1150
1160	7.005	7.015	7.025	7.035	7.045	7.055	7.065	7.075	7.085	7.095	7.105	1160
1170	7.105	7.115	7.125	7.135	7.145	7.155	7.165	7.175	7.185	7.196	7.206	1170
1180	7.206	7.216	7.226	7.236	7.246	7.256	7.266	7.276	7.286	7.296	7.306	1180
1190	7.306	7.317	7.327	7.337	7.347	7.357	7.367	7.377	7.387	7.398	7.408	1190
1200	7.408	7.418	7.428	7.438	7.448	7.458	7.469	7.479	7.489	7.499	7.509	1200
1210	7.509	7.519	7.530	7.540	7.550	7.560	7.570	7.581	7.591	7.601	7.611	1210
1220	7.611	7.622	7.632	7.642	7.652	7.662	7.673	7.683	7.693	7.703	7.714	1220
1230	7.714	7.724	7.734	7.745	7.755	7.765	7.775	7.786	7.796	7.806	7.816	1230
1240	7.816	7.827	7.837	7.847	7.858	7.868	7.878	7.889	7.899	7.909	7.920	1240
1250	7.920	7.930	7.940	7.951	7.961	7.971	7.982	7.992	8.002	8.013	8.023	1250
1260	8.023	8.034	8.044	8.054	8.065	8.075	8.085	8.096	8.106	8.117	8.127	1260
1270	8.127	8.137	8.148	8.158	8.169	8.179	8.190	8.200	8.210	8.221	8.231	1270
1280	8.231	8.242	8.252	8.263	8.273	8.284	8.294	8.305	8.315	8.325	8.336	1280
1290	8.336	8.346	8.357	8.367	8.378	8.388	8.399	8.409	8.420	8.430	8.441	1290
1300	8.441	8.451	8.462	8.472	8.483	8.493	8.504	8.515	8.525	8.536	8.546	1300
1310	8.546	8.557	8.567	8.578	8.588	8.599	8.610	8.620	8.631	8.641	8.652	1310
1320	8.652	8.662	8.673	8.684	8.694	8.705	8.715	8.726	8.737	8.747	8.758	1320
1330	8.758	8.768	8.779	8.790	8.800	8.811	8.821	8.832	8.843	8.853	8.864	1330
1340	8.864	8.875	8.885	8.896	8.907	8.917	8.928	8.939	8.949	8.960	8.971	1340
1350	8.971	8.981	8.992	9.003	9.013	9.024	9.035	9.045	9.056	9.067	9.078	1350
1360	9.078	9.088	9.099	9.110	9.120	9.131	9.142	9.153	9.163	9.174	9.185	1360
1370	9.185	9.196	9.206	9.217	9.228	9.239	9.249	9.260	9.271	9.282	9.292	1370
1380	9.292	9.303	9.314	9.325	9.335	9.346	9.357	9.368	9.379	9.389	9.400	1380
1390	9.400	9.411	9.422	9.433	9.443	9.454	9.465	9.476	9.487	9.498	9.508	1390
1400	9.508	9.519	9.530	9.541	9.552	9.563	9.573	9.584	9.595	9.606	9.617	1400
1410	9.617	9.628	9.638	9.649	9.660	9.671	9.682	9.693	9.704	9.715	9.725	1410
1420	9.725	9.736	9.747	9.758	9.769	9.780	9.791	9.802	9.813	9.824	9.834	1420
1430	9.834	9.845	9.856	9.867	9.878	9.889	9.900	9.911	9.922	9.933	9.944	1430
1440	9.944	9.955	9.966	9.977	9.988	9.998	10.009	10.020	10.031	10.042	10.053	1440
1450	10.053	10.064	10.075	10.086	10.097	10.108	10.119	10.130	10.141	10.152	10.163	1450
1460	10.163	10.174	10.185	10.196	10.207	10.218	10.229	10.240	10.251	10.262	10.273	1460
1470	10.273	10.284	10.295	10.306	10.317	10.328	10.339	10.350	10.361	10.372	10.383	1470
1480	10.383	10.395	10.406	10.417	10.428	10.439	10.450	10.461	10.472	10.483	10.494	1480
1490	10.494	10.505	10.516	10.527	10.538	10.549	10.561	10.572	10.583	10.594	10.605	1490
1500	10.605	10.616	10.627	10.638	10.649	10.660	10.671	10.683	10.694	10.705	10.716	1500
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
1500	10.605	10.616	10.627	10.638	10.649	10.660	10.671	10.683	10.694	10.705	10.716	1500
1510	10.716	10.727	10.738	10.749	10.760	10.772	10.783	10.794	10.805	10.816	10.827	1510
1520	10.827	10.838	10.850	10.861	10.872	10.883	10.894	10.905	10.916	10.928	10.939	1520
1530	10.939	10.950	10.961	10.972	10.983	10.995	11.006	11.017	11.028	11.039	11.051	1530
1540	11.051	11.062	11.073	11.084	11.095	11.106	11.118	11.129	11.140	11.151	11.162	1540
1550	11.162	11.174	11.185	11.196	11.207	11.219	11.230	11.241	11.252	11.263	11.275	1550
1560	11.275	11.286	11.297	11.308	11.320	11.331	11.342	11.353	11.365	11.376	11.387	1560
1570	11.387	11.398	11.410	11.421	11.432	11.443	11.455	11.466	11.477	11.488	11.500	1570
1580	11.500	11.511	11.522	11.533	11.545	11.556	11.567	11.579	11.590	11.601	11.612	1580
1590	11.612	11.624	11.635	11.646	11.658	11.669	11.680	11.692	11.703	11.714	11.725	1590
1600	11.725	11.737	11.748	11.759	11.771	11.782	11.793	11.805	11.816	11.827	11.839	1600
1610	11.839	11.850	11.861	11.873	11.884	11.895	11.907	11.918	11.929	11.941	11.952	1610
1620	11.952	11.963	11.975	11.986	11.997	12.009	12.020	12.032	12.043	12.054	12.066	1620
1630	12.066	12.077	12.088	12.100	12.111	12.123	12.134	12.145	12.157	12.168	12.179	1630
1640	12.179	12.191	12.202	12.214	12.225	12.236	12.248	12.259	12.271	12.282	12.293	1640
1650	12.293	12.305	12.316	12.328	12.339	12.350	12.362	12.373	12.385	12.396	12.407	1650
1660	12.407	12.419	12.430	12.442	12.453	12.465	12.476	12.487	12.499	12.510	12.522	1660
1670	12.522	12.533	12.545	12.556	12.567	12.579	12.590	12.602	12.613	12.625	12.636	1670
1680	12.636	12.648	12.659	12.670	12.682	12.693	12.705	12.716	12.728	12.739	12.751	1680
1690	12.751	12.762	12.774	12.785	12.797	12.808	12.819	12.831	12.842	12.854	12.865	1690
1700	12.865	12.877	12.888	12.900	12.911	12.923	12.934	12.946	12.957	12.969	12.980	1700
1710	12.980	12.992	13.003	13.015	13.026	13.038	13.049	13.061	13.072	13.084	13.095	1710
1720	13.095	13.107	13.118	13.130	13.141	13.153	13.164	13.176	13.187	13.199	13.210	1720
1730	13.210	13.222	13.234	13.245	13.257	13.268	13.280	13.291	13.303	13.314	13.326	1730
1740	13.326	13.337	13.349	13.360	13.372	13.383	13.395	13.407	13.418	13.430	13.441	1740
1750	13.441	13.453	13.464	13.476	13.487	13.499	13.510	13.522	13.534	13.545	13.557	1750
1760	13.557	13.568	13.580	13.591	13.603	13.615	13.626	13.638	13.649	13.661	13.672	1760
1770	13.672	13.684	13.696	13.707	13.719	13.730	13.742	13.753	13.765	13.777	13.788	1770
1780	13.788	13.800	13.811	13.823	13.835	13.846	13.858	13.869	13.881	13.892	13.904	1780
1790	13.904	13.916	13.927	13.939	13.950	13.962	13.974	13.985	13.997	14.009	14.020	1790
1800	14.020	14.032	14.043	14.055	14.067	14.078	14.090	14.101	14.113	14.125	14.136	1800
1810	14.136	14.148	14.159	14.171	14.183	14.194	14.206	14.218	14.229	14.241	14.252	1810
1820	14.252	14.264	14.276	14.287	14.299	14.311	14.322	14.334	14.345	14.357	14.369	1820
1830	14.369	14.380	14.392	14.404	14.415	14.427	14.439	14.450	14.462	14.474	14.485	1830
1840	14.485	14.497	14.508	14.520	14.532	14.543	14.555	14.567	14.578	14.590	14.602	1840
1850	14.602	14.613	14.625	14.637	14.648	14.660	14.672	14.683	14.695	14.707	14.718	1850
1860	14.718	14.730	14.742	14.753	14.765	14.777	14.788	14.800	14.812	14.823	14.835	1860
1870	14.835	14.847	14.858	14.870	14.882	14.893	14.905	14.917	14.928	14.940	14.952	1870
1880	14.952	14.963	14.975	14.987	14.998	15.010	15.022	15.033	15.045	15.057	15.069	1880
1890	15.069	15.080	15.092	15.104	15.115	15.127	15.139	15.150	15.162	15.174	15.185	1890
1900	15.185	15.197	15.209	15.220	15.232	15.244	15.256	15.267	15.279	15.291	15.302	1900
1910	15.302	15.314	15.326	15.337	15.349	15.361	15.373	15.384	15.396	15.408	15.419	1910
1920	15.419	15.431	15.443	15.455	15.466	15.478	15.490	15.501	15.513	15.525	15.536	1920
1930	15.536	15.548	15.560	15.572	15.583	15.595	15.607	15.618	15.630	15.642	15.654	1930
1940	15.654	15.665	15.677	15.689	15.701	15.712	15.724	15.736	15.747	15.759	15.771	1940
1950	15.771	15.783	15.794	15.806	15.818	15.829	15.841	15.853	15.865	15.876	15.888	1950
1960	15.888	15.900	15.912	15.923	15.935	15.947	15.958	15.970	15.982	15.994	16.005	1960
1970	16.005	16.017	16.029	16.041	16.052	16.064	16.076	16.087	16.099	16.111	16.123	1970
1980	16.123	16.134	16.146	16.158	16.170	16.181	16.193	16.205	16.217	16.228	16.240	1980
1990	16.240	16.252	16.264	16.275	16.287	16.299	16.310	16.322	16.334	16.346	16.357	1990
2000	16.357	16.369	16.381	16.393	16.404	16.416	16.428	16.440	16.451	16.463	16.475	2000
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
2000	16.357	16.369	16.381	16.393	16.404	16.416	16.428	16.440	16.451	16.463	16.475	2000
2010	16.475	16.487	16.498	16.510	16.522	16.534	16.545	16.557	16.569	16.581	16.592	2010
2020	16.592	16.604	16.616	16.628	16.639	16.651	16.663	16.675	16.686	16.698	16.710	2020
2030	16.710	16.722	16.733	16.745	16.757	16.769	16.780	16.792	16.804	16.816	16.827	2030
2040	16.827	16.839	16.851	16.863	16.874	16.886	16.898	16.910	16.921	16.933	16.945	2040
2050	16.945	16.957	16.968	16.980	16.992	17.004	17.015	17.027	17.039	17.051	17.062	2050
2060	17.062	17.074	17.086	17.098	17.109	17.121	17.133	17.145	17.156	17.168	17.180	2060
2070	17.180	17.192	17.203	17.215	17.227	17.239	17.250	17.262	17.274	17.286	17.298	2070
2080	17.298	17.309	17.321	17.333	17.345	17.356	17.368	17.380	17.392	17.403	17.415	2080
2090	17.415	17.427	17.439	17.450	17.462	17.474	17.486	17.497	17.509	17.521	17.533	2090
2100	17.533	17.544	17.556	17.568	17.580	17.591	17.603	17.615	17.627	17.638	17.650	2100
2110	17.650	17.662	17.674	17.685	17.697	17.709	17.721	17.732	17.744	17.756	17.768	2110
2120	17.768	17.780	17.791	17.803	17.815	17.827	17.838	17.850	17.862	17.874	17.885	2120
2130	17.885	17.897	17.909	17.921	17.932	17.944	17.956	17.968	17.979	17.991	18.003	2130
2140	18.003	18.015	18.026	18.038	18.050	18.062	18.073	18.085	18.097	18.109	18.120	2140
2150	18.120	18.132	18.144	18.156	18.167	18.179	18.191	18.203	18.214	18.226	18.238	2150
2160	18.238	18.250	18.261	18.273	18.285	18.297	18.308	18.320	18.332	18.344	18.355	2160
2170	18.355	18.367	18.379	18.391	18.402	18.414	18.426	18.438	18.449	18.461	18.473	2170
2180	18.473	18.485	18.496	18.508	18.520	18.532	18.543	18.555	18.567	18.579	18.590	2180
2190	18.590	18.602	18.614	18.625	18.637	18.649	18.661	18.672	18.684	18.696	18.708	2190
2200	18.708	18.719	18.731	18.743	18.755	18.766	18.778	18.790	18.802	18.813	18.825	2200
2210	18.825	18.837	18.849	18.860	18.872	18.884	18.895	18.907	18.919	18.931	18.942	2210
2220	18.942	18.954	18.966	18.978	18.989	19.001	19.013	19.025	19.036	19.048	19.060	2220
2230	19.060	19.071	19.083	19.095	19.107	19.118	19.130	19.142	19.154	19.165	19.177	2230
2240	19.177	19.189	19.200	19.212	19.224	19.236	19.247	19.259	19.271	19.282	19.294	2240
2250	19.294	19.306	19.318	19.329	19.341	19.353	19.364	19.376	19.388	19.400	19.411	2250
2260	19.411	19.423	19.435	19.446	19.458	19.470	19.482	19.493	19.505	19.517	19.528	2260
2270	19.528	19.540	19.552	19.564	19.575	19.587	19.599	19.610	19.622	19.634	19.646	2270
2280	19.646	19.657	19.669	19.681	19.692	19.704	19.716	19.727	19.739	19.751	19.763	2280
2290	19.763	19.774	19.786	19.798	19.809	19.821	19.833	19.844	19.856	19.868	19.880	2290
2300	19.880	19.891	19.903	19.915	19.926	19.938	19.950	19.961	19.973	19.985	19.996	2300
2310	19.996	20.008	20.020	20.031	20.043	20.055	20.067	20.078	20.090	20.102	20.113	2310
2320	20.113	20.125	20.137	20.148	20.160	20.172	20.183	20.195	20.207	20.218	20.230	2320
2330	20.230	20.242	20.253	20.265	20.277	20.288	20.300	20.312	20.323	20.335	20.347	2330
2340	20.347	20.358	20.370	20.382	20.393	20.405	20.417	20.428	20.440	20.452	20.463	2340
2350	20.463	20.475	20.487	20.498	20.510	20.522	20.533	20.545	20.557	20.568	20.580	2350
2360	20.580	20.592	20.603	20.615	20.627	20.638	20.650	20.661	20.673	20.685	20.696	2360
2370	20.696	20.708	20.720	20.731	20.743	20.755	20.766	20.778	20.790	20.801	20.813	2370
2380	20.813	20.824	20.836	20.848	20.859	20.871	20.883	20.894	20.906	20.918	20.929	2380
2390	20.929	20.941	20.952	20.964	20.976	20.987	20.999	21.011	21.022	21.034	21.045	2390
2400	21.045	21.057	21.069	21.080	21.092	21.103	21.115	21.127	21.138	21.150	21.162	2400
2410	21.162	21.173	21.185	21.196	21.208	21.220	21.231	21.243	21.254	21.266	21.278	2410
2420	21.278	21.289	21.301	21.312	21.324	21.336	21.347	21.359	21.370	21.382	21.394	2420
2430	21.394	21.405	21.417	21.428	21.440	21.452	21.463	21.475	21.486	21.498	21.509	2430
2440	21.509	21.521	21.533	21.544	21.556	21.567	21.579	21.591	21.602	21.614	21.625	2440
2450	21.625	21.637	21.648	21.660	21.672	21.683	21.695	21.706	21.718	21.729	21.741	2450
2460	21.741	21.753	21.764	21.776	21.787	21.799	21.810	21.822	21.833	21.845	21.857	2460
2470	21.857	21.868	21.880	21.891	21.903	21.914	21.926	21.937	21.949	21.960	21.972	2470
2480	21.972	21.984	21.995	22.007	22.018	22.030	22.041	22.053	22.064	22.076	22.087	2480
2490	22.087	22.099	22.110	22.122	22.134	22.145	22.157	22.168	22.180	22.191	22.203	2490
2500	22.203	22.214	22.226	22.237	22.249	22.260	22.272	22.283	22.295	22.306	22.318	2500
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
2500	22.203	22.214	22.226	22.237	22.249	22.260	22.272	22.283	22.295	22.306	22.318	2500
2510	22.318	22.329	22.341	22.352	22.364	22.375	22.387	22.398	22.410	22.421	22.433	2510
2520	22.433	22.444	22.456	22.467	22.479	22.490	22.502	22.513	22.525	22.536	22.548	2520
2530	22.548	22.559	22.571	22.582	22.594	22.605	22.617	22.628	22.640	22.651	22.663	2530
2540	22.663	22.674	22.686	22.697	22.709	22.720	22.731	22.743	22.754	22.766	22.777	2540
2550	22.777	22.789	22.800	22.812	22.823	22.835	22.846	22.858	22.869	22.880	22.892	2550
2560	22.892	22.903	22.915	22.926	22.938	22.949	22.961	22.972	22.983	22.995	23.006	2560
2570	23.006	23.018	23.029	23.041	23.052	23.064	23.075	23.086	23.098	23.109	23.121	2570
2580	23.121	23.132	23.143	23.155	23.166	23.178	23.189	23.201	23.212	23.223	23.235	2580
2590	23.235	23.246	23.258	23.269	23.280	23.292	23.303	23.315	23.326	23.337	23.349	2590
2600	23.349	23.360	23.372	23.383	23.394	23.406	23.417	23.429	23.440	23.451	23.463	2600
2610	23.463	23.474	23.486	23.497	23.508	23.520	23.531	23.542	23.554	23.565	23.577	2610
2620	23.577	23.588	23.599	23.611	23.622	23.633	23.645	23.656	23.668	23.679	23.690	2620
2630	23.690	23.702	23.713	23.724	23.736	23.747	23.758	23.770	23.781	23.792	23.804	2630
2640	23.804	23.815	23.826	23.838	23.849	23.860	23.872	23.883	23.894	23.906	23.917	2640
2650	23.917	23.928	23.940	23.951	23.962	23.974	23.985	23.996	24.008	24.019	24.030	2650
2660	24.030	24.042	24.053	24.064	24.076	24.087	24.098	24.110	24.121	24.132	24.143	2660
2670	24.143	24.155	24.166	24.177	24.189	24.200	24.211	24.222	24.234	24.245	24.256	2670
2680	24.256	24.268	24.279	24.290	24.301	24.313	24.324	24.335	24.347	24.358	24.369	2680
2690	24.369	24.380	24.392	24.403	24.414	24.425	24.437	24.448	24.459	24.470	24.482	2690
2700	24.482	24.493	24.504	24.516	24.527	24.538	24.549	24.560	24.572	24.583	24.594	2700
2710	24.594	24.605	24.617	24.628	24.639	24.650	24.662	24.673	24.684	24.695	24.707	2710
2720	24.707	24.718	24.729	24.740	24.751	24.763	24.774	24.785	24.796	24.807	24.819	2720
2730	24.819	24.830	24.841	24.852	24.863	24.875	24.886	24.897	24.908	24.919	24.931	2730
2740	24.931	24.942	24.953	24.964	24.975	24.987	24.998	25.009	25.020	25.031	25.042	2740
2750	25.042	25.054	25.065	25.076	25.087	25.098	25.109	25.121	25.132	25.143	25.154	2750
2760	25.154	25.165	25.176	25.188	25.199	25.210	25.221	25.232	25.243	25.254	25.266	2760
2770	25.266	25.277	25.288	25.299	25.310	25.321	25.332	25.344	25.355	25.366	25.377	2770
2780	25.377	25.388	25.399	25.410	25.421	25.433	25.444	25.455	25.466	25.477	25.488	2780
2790	25.488	25.499	25.510	25.521	25.532	25.544	25.555	25.566	25.577	25.588	25.599	2790
2800	25.599	25.610	25.621	25.632	25.643	25.654	25.666	25.677	25.688	25.699	25.710	2800
2810	25.710	25.721	25.732	25.743	25.754	25.765	25.776	25.787	25.798	25.809	25.820	2810
2820	25.820	25.832	25.843	25.854	25.865	25.876	25.887	25.898	25.909	25.920	25.931	2820
2830	25.931	25.942	25.953	25.964	25.975	25.986	25.997	26.008	26.019	26.030	26.041	2830
2840	26.041	26.052	26.063	26.074	26.085	26.096	26.107	26.118	26.129	26.140	26.151	2840
2850	26.151	26.162	26.173	26.184	26.195	26.206	26.217	26.228	26.239	26.250	26.261	2850
2860	26.261	26.272	26.283	26.294	26.305	26.316	26.327	26.338	26.349	26.360	26.371	2860
2870	26.371	26.382	26.393	26.404	26.415	26.426	26.437	26.447	26.458	26.469	26.480	2870
2880	26.480	26.491	26.502	26.513	26.524	26.535	26.546	26.557	26.568	26.579	26.590	2880
2890	26.590	26.601	26.611	26.622	26.633	26.644	26.655	26.666	26.677	26.688	26.699	2890
2900	26.699	26.710	26.721	26.731	26.742	26.753	26.764	26.775	26.786	26.797	26.808	2900
2910	26.808	26.819	26.829	26.840	26.851	26.862	26.873	26.884	26.895	26.905	26.916	2910
2920	26.916	26.927	26.938	26.949	26.960	26.971	26.981	26.992	27.003	27.014	27.025	2920
2930	27.025	27.036	27.047	27.057	27.068	27.079	27.090	27.101	27.112	27.122	27.133	2930
2940	27.133	27.144	27.155	27.166	27.176	27.187	27.198	27.209	27.220	27.230	27.241	2940
2950	27.241	27.252	27.263	27.274	27.284	27.295	27.306	27.317	27.328	27.338	27.349	2950
2960	27.349	27.360	27.371	27.382	27.392	27.403	27.414	27.425	27.435	27.446	27.457	2960
2970	27.457	27.468	27.478	27.489	27.500	27.511	27.521	27.532	27.543	27.554	27.564	2970
2980	27.564	27.575	27.586	27.597	27.607	27.618	27.629	27.639	27.650	27.661	27.672	2980
2990	27.672	27.682	27.693	27.704	27.714	27.725	27.736	27.747	27.757	27.768	27.779	2990
3000	27.779	27.789	27.800	27.811	27.821	27.832	27.843	27.854	27.864	27.875	27.886	3000
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
3000	27.779	27.789	27.800	27.811	27.821	27.832	27.843	27.854	27.864	27.875	27.886	3000
3010	27.886	27.896	27.907	27.918	27.928	27.939	27.950	27.960	27.971	27.982	27.992	3010
3020	27.992	28.003	28.013	28.024	28.035	28.045	28.056	28.067	28.077	28.088	28.099	3020
3030	28.099	28.109	28.120	28.130	28.141	28.152	28.162	28.173	28.184	28.194	28.205	3030
3040	28.205	28.215	28.226	28.237	28.247	28.258	28.268	28.279	28.290	28.300	28.311	3040
3050	28.311	28.321	28.332	28.342	28.353	28.364	28.374	28.385	28.395	28.406	28.416	3050
3060	28.416	28.427	28.438	28.448	28.459	28.469	28.480	28.490	28.501	28.511	28.522	3060
3070	28.522	28.533	28.543	28.554	28.564	28.575	28.585	28.596	28.606	28.617	28.627	3070
3080	28.627	28.638	28.648	28.659	28.669	28.680	28.690	28.701	28.711	28.722	28.732	3080
3090	28.732	28.743	28.753	28.764	28.774	28.785	28.795	28.806	28.816	28.827	28.837	3090
3100	28.837	28.848	28.858	28.869	28.879	28.889	28.900	28.910	28.921	28.931	28.942	3100
3110	28.942	28.952	28.963	28.973	28.983	28.994	29.004	29.015	29.025	29.036	29.046	3110
3120	29.046	29.056	29.067	29.077	29.088	29.098	29.109	29.119	29.129	29.140	29.150	3120
3130	29.150	29.161	29.171	29.181	29.192	29.202	29.213	29.223	29.233	29.244	29.254	3130
3140	29.254	29.264	29.275	29.285	29.296	29.306	29.316	29.327	29.337	29.347	29.358	3140
3150	29.358	29.368	29.378	29.389	29.399	29.409	29.420	29.430	29.440	29.451	29.461	3150
3160	29.461	29.471	29.482	29.492	29.502	29.513	29.523	29.533	29.544	29.554	29.564	3160
3170	29.564	29.575	29.585	29.595	29.605	29.616	29.626	29.636	29.647	29.657	29.667	3170
3180	29.667	29.677	29.688	29.698	29.708	29.718	29.729	29.739	29.749	29.760	29.770	3180
3190	29.770	29.780	29.790	29.801	29.811	29.821	29.831	29.841	29.852	29.862	29.872	3190
3200	29.872	29.882	29.893	29.903	29.913	29.923	29.933	29.944	29.954	29.964	29.974	3200
3210	29.974	29.985	29.995	30.005	30.015	30.025	30.035	30.046	30.056	30.066	30.076	3210
3220	30.076	30.086	30.097	30.107	30.117	30.127	30.137	30.147	30.158	30.168	30.178	3220
3230	30.178	30.188	30.198	30.208	30.218	30.229	30.239	30.249	30.259	30.269	30.279	3230
3240	30.279	30.289	30.299	30.310	30.320	30.330	30.340	30.350	30.360	30.370	30.380	3240
3250	30.380	30.390	30.401	30.411	30.421	30.431	30.441	30.451	30.461	30.471	30.481	3250
3260	30.481	30.491	30.501	30.511	30.521	30.532	30.542	30.552	30.562	30.572	30.582	3260
3270	30.582	30.592	30.602	30.612	30.622	30.632	30.642	30.652	30.662	30.672	30.682	3270
3280	30.682	30.692	30.702	30.712	30.722	30.732	30.742	30.752	30.762	30.772	30.782	3280
3290	30.782	30.792	30.802	30.812	30.822	30.832	30.842	30.852	30.862	30.872	30.882	3290
3300	30.882	30.892	30.902	30.912	30.922	30.932	30.942	30.952	30.962	30.972	30.982	3300
3310	30.982	30.991	31.001	31.011	31.021	31.031	31.041	31.051	31.061	31.071	31.081	3310
3320	31.081	31.091	31.101	31.111	31.120	31.130	31.140	31.150	31.160	31.170	31.180	3320
3330	31.180	31.190	31.200	31.209	31.219	31.229	31.239	31.249	31.259	31.269	31.279	3330
3340	31.279	31.288	31.298	31.308	31.318	31.328	31.338	31.347	31.357	31.367	31.377	3340
3350	31.377	31.387	31.397	31.406	31.416	31.426	31.436	31.446	31.456	31.465	31.475	3350
3360	31.475	31.485	31.495	31.505	31.514	31.524	31.534	31.544	31.553	31.563	31.573	3360
3370	31.573	31.583	31.593	31.602	31.612	31.622	31.632	31.641	31.651	31.661	31.671	3370
3380	31.671	31.680	31.690	31.700	31.710	31.719	31.729	31.739	31.749	31.758	31.768	3380
3390	31.768	31.778	31.787	31.797	31.807	31.817	31.826	31.836	31.846	31.855	31.865	3390
3400	31.865	31.875	31.884	31.894	31.904	31.913	31.923	31.933	31.942	31.952	31.962	3400
3410	31.962	31.971	31.981	31.991	32.000	32.010	32.020	32.029	32.039	32.049	32.058	3410
3420	32.058	32.068	32.078	32.087	32.097	32.106	32.116	32.126	32.135	32.145	32.154	3420
3430	32.154	32.164	32.174	32.183	32.193	32.202	32.212	32.222	32.231	32.241	32.250	3430
3440	32.250	32.260	32.270	32.279	32.289	32.298	32.308	32.317	32.327	32.336	32.346	3440
3450	32.346	32.356	32.365	32.375	32.384	32.394	32.403	32.413	32.422	32.432	32.441	3450
3460	32.441	32.451	32.460	32.470	32.479	32.489	32.498	32.508	32.517	32.527	32.536	3460
3470	32.536	32.546	32.555	32.565	32.574	32.584	32.593	32.603	32.612	32.622	32.631	3470
3480	32.631	32.640	32.650	32.659	32.669	32.678	32.688	32.697	32.707	32.716	32.725	3480
3490	32.725	32.735	32.744	32.754	32.763	32.773	32.782	32.791	32.801	32.810	32.820	3490
3500	32.820	32.829	32.838	32.848	32.857	32.867	32.876	32.885	32.895	32.904	32.913	3500
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
3500	32.820	32.829	32.838	32.848	32.857	32.867	32.876	32.885	32.895	32.904	32.913	3500
3510	32.913	32.923	32.932	32.942	32.951	32.960	32.970	32.979	32.988	32.998	33.007	3510
3520	33.007	33.016	33.026	33.035	33.044	33.054	33.063	33.072	33.082	33.091	33.100	3520
3530	33.100	33.109	33.119	33.128	33.137	33.147	33.156	33.165	33.175	33.184	33.193	3530
3540	33.193	33.202	33.212	33.221	33.230	33.239	33.249	33.258	33.267	33.276	33.286	3540
3550	33.286	33.295	33.304	33.313	33.323	33.332	33.341	33.350	33.360	33.369	33.378	3550
3560	33.378	33.387	33.396	33.406	33.415	33.424	33.433	33.442	33.452	33.461	33.470	3560
3570	33.470	33.479	33.488	33.498	33.507	33.516	33.525	33.534	33.543	33.553	33.562	3570
3580	33.562	33.571	33.580	33.589	33.598	33.607	33.617	33.626	33.635	33.644	33.653	3580
3590	33.653	33.662	33.671	33.680	33.690	33.699	33.708	33.717	33.726	33.735	33.744	3590
3600	33.744	33.753	33.762	33.771	33.781	33.790	33.799	33.808	33.817	33.826	33.835	3600
3610	33.835	33.844	33.853	33.862	33.871	33.880	33.889	33.898	33.907	33.916	33.925	3610
3620	33.925	33.934	33.943	33.952	33.961	33.970	33.979	33.988	33.997	34.006	34.015	3620
3630	34.015	34.024	34.033	34.042	34.051	34.060	34.069	34.078	34.087	34.096	34.105	3630
3640	34.105	34.114	34.123	34.132	34.141	34.150	34.159	34.168	34.177	34.186	34.195	3640
3650	34.195	34.204	34.213	34.222	34.230	34.239	34.248	34.257	34.266	34.275	34.284	3650
3660	34.284	34.293	34.302	34.311	34.319	34.328	34.337	34.346	34.355	34.364	34.373	3660
3670	34.373	34.382	34.390	34.399	34.408	34.417	34.426	34.435	34.444	34.452	34.461	3670
3680	34.461	34.470	34.479	34.488	34.497	34.505	34.514	34.523	34.532	34.541	34.549	3680
3690	34.549	34.558	34.567	34.576	34.585	34.593	34.602	34.611	34.620	34.629	34.637	3690
3700	34.637	34.646	34.655	34.664	34.672	34.681	34.690	34.699	34.707	34.716	34.725	3700
3710	34.725	34.734	34.742	34.751	34.760	34.768	34.777	34.786	34.795	34.803	34.812	3710
3720	34.812	34.821	34.829	34.838	34.847	34.855	34.864	34.873	34.881	34.890	34.899	3720
3730	34.899	34.908	34.916	34.925	34.933	34.942	34.951	34.959	34.968	34.977	34.985	3730
3740	34.985	34.994	35.003	35.011	35.020	35.029	35.037	35.046	35.054	35.063	35.072	3740
3750	35.072	35.080	35.089	35.097	35.106	35.115	35.123	35.132	35.140	35.149	35.157	3750
3760	35.157	35.166	35.175	35.183	35.192	35.200	35.209	35.217	35.226	35.234	35.243	3760
3770	35.243	35.251	35.260	35.269	35.277	35.286	35.294	35.303	35.311	35.320	35.328	3770
3780	35.328	35.337	35.345	35.354	35.362	35.371	35.379	35.388	35.396	35.404	35.413	3780
3790	35.413	35.421	35.430	35.438	35.447	35.455	35.464	35.472	35.481	35.489	35.497	3790
3800	35.497	35.506	35.514	35.523	35.531	35.540	35.548	35.556	35.565	35.573	35.582	3800
3810	35.582	35.590	35.598	35.607	35.615	35.623	35.632	35.640	35.649	35.657	35.665	3810
3820	35.665	35.674	35.682	35.690	35.699	35.707	35.715	35.724	35.732	35.740	35.749	3820
3830	35.749	35.757	35.765	35.774	35.782	35.790	35.799	35.807	35.815	35.824	35.832	3830
3840	35.832	35.840	35.848	35.857	35.865	35.873	35.882	35.890	35.898	35.906	35.915	3840
3850	35.915	35.923	35.931	35.939	35.948	35.956	35.964	35.972	35.981	35.989	35.997	3850
3860	35.997	36.005	36.013	36.022	36.030	36.038	36.046	36.054	36.063	36.071	36.079	3860
3870	36.079	36.087	36.095	36.104	36.112	36.120	36.128	36.136	36.144	36.153	36.161	3870
3880	36.161	36.169	36.177	36.185	36.193	36.201	36.210	36.218	36.226	36.234	36.242	3880
3890	36.242	36.250	36.258	36.266	36.275	36.283	36.291	36.299	36.307	36.315	36.323	3890
3900	36.323	36.331	36.339	36.347	36.355	36.363	36.371	36.380	36.388	36.396	36.404	3900
3910	36.404	36.412	36.420	36.428	36.436	36.444	36.452	36.460	36.468	36.476	36.484	3910
3920	36.484	36.492	36.500	36.508	36.516	36.524	36.532	36.540	36.548	36.556	36.564	3920
3930	36.564	36.572	36.580	36.588	36.596	36.604	36.612	36.619	36.627	36.635	36.643	3930
3940	36.643	36.651	36.659	36.667	36.675	36.683	36.691	36.699	36.707	36.715	36.722	3940
3950	36.722	36.730	36.738	36.746	36.754	36.762	36.770	36.778	36.785	36.793	36.801	3950
3960	36.801	36.809	36.817	36.825	36.833	36.840	36.848	36.856	36.864	36.872	36.880	3960
3970	36.880	36.887	36.895	36.903	36.911	36.919	36.926	36.934	36.942	36.950	36.958	3970
3980	36.958	36.965	36.973	36.981	36.989	36.996	37.004	37.012	37.020	37.028	37.035	3980
3990	37.035	37.043	37.051	37.058	37.066	37.074	37.082	37.089	37.097	37.105	37.113	3990
4000	37.113	37.120	37.128	37.136	37.143	37.151	37.159	37.166	37.174	37.182	37.189	4000
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 2 Tungsten versus Tungsten-26 % Rhenium thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
4000	37.113	37.120	37.128	37.136	37.143	37.151	37.159	37.166	37.174	37.182	37.189	4000
4010	37.189	37.197	37.205	37.212	37.220	37.228	37.235	37.243	37.251	37.258	37.266	4010
4020	37.266	37.274	37.281	37.289	37.296	37.304	37.312	37.319	37.327	37.334	37.342	4020
4030	37.342	37.350	37.357	37.365	37.372	37.380	37.388	37.395	37.403	37.410	37.418	4030
4040	37.418	37.425	37.433	37.440	37.448	37.456	37.463	37.471	37.478	37.486	37.493	4040
4050	37.493	37.501	37.508	37.516	37.523	37.531	37.538	37.546	37.553	37.561	37.568	4050
4060	37.568	37.576	37.583	37.590	37.598	37.605	37.613	37.620	37.628	37.635	37.643	4060
4070	37.643	37.650	37.658	37.665	37.672	37.680	37.687	37.695	37.702	37.709	37.717	4070
4080	37.717	37.724	37.732	37.739	37.746	37.754	37.761	37.768	37.776	37.783	37.791	4080
4090	37.791	37.798	37.805	37.813	37.820	37.827	37.835	37.842	37.849	37.857	37.864	4090
4100	37.864	37.871	37.879	37.886	37.893	37.900	37.908	37.915	37.922	37.930	37.937	4100
4110	37.937	37.944	37.951	37.959	37.966	37.973	37.980	37.988	37.995	38.002	38.009	4110
4120	38.009	38.017	38.024	38.031	38.038	38.046	38.053	38.060	38.067	38.074	38.082	4120
4130	38.082	38.089	38.096	38.103	38.110	38.118	38.125	38.132	38.139	38.146	38.153	4130
4140	38.153	38.161	38.168	38.175	38.182	38.189	38.196	38.203	38.210	38.218	38.225	4140
4150	38.225	38.232	38.239	38.246	38.253	38.260	38.267	38.274	38.281	38.289	38.296	4150
4160	38.296	38.303	38.310	38.317	38.324	38.331	38.338	38.345	38.352	38.359	38.366	4160
4170	38.366	38.373	38.380	38.387	38.394	38.401	38.408	38.415	38.422	38.429	38.436	4170
4180	38.436	38.443	38.450	38.457	38.464	38.471	38.478	38.485	38.492	38.499	38.506	4180
4190	38.506	38.513	38.520	38.527	38.534	38.540	38.547	38.554	38.561	38.568	38.575	4190
4200	38.575											4200
°F	0	1	2	3	4	5	6	7	8	9	10	°F

Coefficients and temperature ranges of equations used to compute the above ITS-90 based table for Tungsten versus Tungsten - 26% Rhenium thermocouples.

32 °F to 1167.107 °F

$$\begin{aligned}
 c_0 &= -1.583\,958\,522 \times 10^{-02} \\
 c_1 &= 2.772\,681\,020 \times 10^{-04} \\
 c_2 &= 6.867\,532\,076 \times 10^{-06} \\
 c_3 &= -2.007\,966\,008 \times 10^{-09} \\
 c_4 &= 4.321\,850\,871 \times 10^{-13} \\
 c_5 &= -9.043\,972\,880 \times 10^{-17}
 \end{aligned}$$

1167.107 °F to 4200 °F

$$\begin{aligned}
 c_0 &= -1.276\,594\,726 \\
 c_1 &= 5.364\,619\,207 \times 10^{-03} \\
 c_2 &= -1.661\,183\,970 \times 10^{-06} \\
 c_3 &= 5.824\,006\,857 \times 10^{-09} \\
 c_4 &= -3.889\,648\,278 \times 10^{-12} \\
 c_5 &= 1.345\,592\,929 \times 10^{-15} \\
 c_6 &= -2.709\,518\,871 \times 10^{-19} \\
 c_7 &= 2.995\,846\,596 \times 10^{-23} \\
 c_8 &= -1.409\,677\,575 \times 10^{-27}
 \end{aligned}$$

TABLE 3 Platinum II thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
0	0.000	0.030	0.060	0.090	0.120	0.150	0.180	0.210	0.241	0.271	0.302	0
10	0.302	0.332	0.363	0.394	0.424	0.455	0.486	0.517	0.548	0.579	0.610	10
20	0.610	0.641	0.673	0.704	0.735	0.767	0.798	0.830	0.862	0.894	0.925	20
30	0.925	0.957	0.989	1.021	1.053	1.085	1.117	1.150	1.182	1.214	1.247	30
40	1.247	1.279	1.312	1.345	1.377	1.410	1.443	1.476	1.509	1.542	1.575	40
50	1.575	1.608	1.641	1.674	1.707	1.741	1.774	1.808	1.841	1.875	1.908	50
60	1.908	1.942	1.976	2.010	2.044	2.078	2.112	2.146	2.180	2.214	2.248	60
70	2.248	2.282	2.317	2.351	2.386	2.420	2.455	2.489	2.524	2.559	2.593	70
80	2.593	2.628	2.663	2.698	2.733	2.768	2.803	2.838	2.874	2.909	2.944	80
90	2.944	2.980	3.015	3.050	3.086	3.122	3.157	3.193	3.229	3.264	3.300	90
100	3.300	3.336	3.372	3.408	3.444	3.480	3.516	3.553	3.589	3.625	3.661	100
110	3.661	3.698	3.734	3.771	3.807	3.844	3.881	3.917	3.954	3.991	4.028	110
120	4.028	4.064	4.101	4.138	4.175	4.212	4.250	4.287	4.324	4.361	4.399	120
130	4.399	4.436	4.473	4.511	4.548	4.586	4.623	4.661	4.699	4.736	4.774	130
140	4.774	4.812	4.850	4.888	4.925	4.963	5.001	5.039	5.078	5.116	5.154	140
150	5.154	5.192	5.230	5.269	5.307	5.346	5.384	5.422	5.461	5.500	5.538	150
160	5.538	5.577	5.615	5.654	5.693	5.732	5.771	5.810	5.848	5.887	5.926	160
170	5.926	5.965	6.005	6.044	6.083	6.122	6.161	6.201	6.240	6.279	6.319	170
180	6.319	6.358	6.398	6.437	6.477	6.516	6.556	6.596	6.635	6.675	6.715	180
190	6.715	6.755	6.794	6.834	6.874	6.914	6.954	6.994	7.034	7.074	7.115	190
200	7.115	7.155	7.195	7.235	7.275	7.316	7.356	7.396	7.437	7.477	7.518	200
210	7.518	7.558	7.599	7.639	7.680	7.721	7.761	7.802	7.843	7.884	7.924	210
220	7.924	7.965	8.006	8.047	8.088	8.129	8.170	8.211	8.252	8.293	8.334	220
230	8.334	8.375	8.416	8.458	8.499	8.540	8.582	8.623	8.664	8.706	8.747	230
240	8.747	8.788	8.830	8.871	8.913	8.955	8.996	9.038	9.079	9.121	9.163	240
250	9.163	9.205	9.246	9.288	9.330	9.372	9.414	9.456	9.498	9.540	9.581	250
260	9.581	9.623	9.666	9.708	9.750	9.792	9.834	9.876	9.918	9.961	10.003	260
270	10.003	10.045	10.087	10.130	10.172	10.214	10.257	10.299	10.342	10.384	10.427	270
280	10.427	10.469	10.512	10.554	10.597	10.639	10.682	10.725	10.767	10.810	10.853	280
290	10.853	10.896	10.938	10.981	11.024	11.067	11.110	11.153	11.196	11.238	11.281	290
300	11.281	11.324	11.367	11.410	11.453	11.497	11.540	11.583	11.626	11.669	11.712	300
310	11.712	11.755	11.799	11.842	11.885	11.928	11.972	12.015	12.058	12.102	12.145	310
320	12.145	12.188	12.232	12.275	12.319	12.362	12.405	12.449	12.492	12.536	12.580	320
330	12.580	12.623	12.667	12.710	12.754	12.798	12.841	12.885	12.929	12.972	13.016	330
340	13.016	13.060	13.104	13.147	13.191	13.235	13.279	13.323	13.366	13.410	13.454	340
350	13.454	13.498	13.542	13.586	13.630	13.674	13.718	13.762	13.806	13.850	13.894	350
360	13.894	13.938	13.982	14.026	14.070	14.114	14.159	14.203	14.247	14.291	14.335	360
370	14.335	14.379	14.424	14.468	14.512	14.556	14.601	14.645	14.689	14.733	14.778	370
380	14.778	14.822	14.866	14.911	14.955	15.000	15.044	15.088	15.133	15.177	15.222	380
390	15.222	15.266	15.311	15.355	15.400	15.444	15.489	15.533	15.578	15.622	15.667	390
400	15.667	15.711	15.756	15.800	15.845	15.890	15.934	15.979	16.023	16.068	16.113	400
410	16.113	16.157	16.202	16.247	16.291	16.336	16.381	16.425	16.470	16.515	16.560	410
420	16.560	16.604	16.649	16.694	16.739	16.784	16.828	16.873	16.918	16.963	17.008	420
430	17.008	17.052	17.097	17.142	17.187	17.232	17.277	17.321	17.366	17.411	17.456	430
440	17.456	17.501	17.546	17.591	17.636	17.681	17.726	17.771	17.816	17.860	17.905	440
450	17.905	17.950	17.995	18.040	18.085	18.130	18.175	18.220	18.265	18.310	18.355	450
460	18.355	18.400	18.445	18.490	18.535	18.580	18.625	18.670	18.715	18.760	18.806	460
470	18.806	18.851	18.896	18.941	18.986	19.031	19.076	19.121	19.166	19.211	19.256	470
480	19.256	19.301	19.346	19.391	19.437	19.482	19.527	19.572	19.617	19.662	19.707	480
490	19.707	19.752	19.797	19.843	19.888	19.933	19.978	20.023	20.068	20.113	20.158	490
500	20.158	20.204	20.249	20.294	20.339	20.384	20.429	20.474	20.519	20.565	20.610	500
°C	0	1	2	3	4	5	6	7	8	9	10	°C

TABLE 3 **Platinel II thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C** *Continued*

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
500	20.158	20.204	20.249	20.294	20.339	20.384	20.429	20.474	20.519	20.565	20.610	500
510	20.610	20.655	20.700	20.745	20.790	20.835	20.880	20.926	20.971	21.016	21.061	510
520	21.061	21.106	21.151	21.196	21.242	21.287	21.332	21.377	21.422	21.467	21.512	520
530	21.512	21.557	21.603	21.648	21.693	21.738	21.783	21.828	21.873	21.918	21.963	530
540	21.963	22.009	22.054	22.099	22.144	22.189	22.234	22.279	22.324	22.369	22.414	540
550	22.414	22.459	22.504	22.550	22.595	22.640	22.685	22.730	22.775	22.820	22.865	550
560	22.865	22.910	22.955	23.000	23.045	23.090	23.135	23.180	23.225	23.270	23.315	560
570	23.315	23.360	23.405	23.450	23.495	23.540	23.585	23.630	23.675	23.720	23.765	570
580	23.765	23.810	23.855	23.900	23.945	23.990	24.035	24.080	24.125	24.169	24.214	580
590	24.214	24.259	24.304	24.349	24.394	24.439	24.484	24.528	24.573	24.618	24.663	590
600	24.663	24.708	24.753	24.797	24.842	24.887	24.932	24.977	25.021	25.066	25.111	600
610	25.111	25.156	25.201	25.245	25.290	25.335	25.379	25.424	25.469	25.514	25.558	610
620	25.558	25.603	25.648	25.692	25.737	25.782	25.826	25.871	25.915	25.960	26.005	620
630	26.005	26.049	26.094	26.138	26.183	26.228	26.272	26.317	26.361	26.406	26.450	630
640	26.450	26.495	26.539	26.584	26.628	26.673	26.717	26.762	26.806	26.850	26.895	640
650	26.895	26.939	26.984	27.028	27.072	27.117	27.161	27.205	27.250	27.294	27.338	650
660	27.338	27.383	27.427	27.471	27.515	27.560	27.604	27.648	27.692	27.737	27.781	660
670	27.781	27.825	27.869	27.913	27.957	28.002	28.046	28.090	28.134	28.178	28.222	670
680	28.222	28.266	28.310	28.354	28.398	28.442	28.486	28.530	28.574	28.618	28.662	680
690	28.662	28.706	28.750	28.794	28.838	28.882	28.925	28.969	29.013	29.057	29.101	690
700	29.101	29.145	29.188	29.232	29.276	29.320	29.363	29.407	29.451	29.494	29.538	700
710	29.538	29.582	29.625	29.669	29.713	29.756	29.800	29.843	29.887	29.930	29.974	710
720	29.974	30.017	30.061	30.104	30.148	30.191	30.235	30.278	30.322	30.365	30.408	720
730	30.408	30.452	30.495	30.538	30.582	30.625	30.668	30.711	30.755	30.798	30.841	730
740	30.841	30.884	30.928	30.971	31.014	31.057	31.100	31.143	31.186	31.229	31.272	740
750	31.272	31.315	31.358	31.401	31.444	31.487	31.530	31.573	31.616	31.659	31.702	750
760	31.702	31.745	31.788	31.831	31.874	31.916	31.959	32.002	32.045	32.088	32.130	760
770	32.130	32.173	32.216	32.259	32.301	32.344	32.387	32.429	32.472	32.514	32.557	770
780	32.557	32.600	32.642	32.685	32.727	32.770	32.812	32.855	32.897	32.940	32.982	780
790	32.982	33.025	33.067	33.110	33.152	33.195	33.237	33.279	33.322	33.364	33.406	790
800	33.406	33.449	33.491	33.533	33.575	33.618	33.660	33.702	33.744	33.786	33.828	800
810	33.828	33.871	33.913	33.955	33.997	34.039	34.081	34.123	34.165	34.207	34.249	810
820	34.249	34.291	34.333	34.375	34.417	34.459	34.501	34.543	34.585	34.626	34.668	820
830	34.668	34.710	34.752	34.794	34.836	34.877	34.919	34.961	35.002	35.044	35.086	830
840	35.086	35.127	35.169	35.211	35.252	35.294	35.336	35.377	35.419	35.460	35.502	840
850	35.502	35.543	35.585	35.626	35.668	35.709	35.750	35.792	35.833	35.875	35.916	850
860	35.916	35.957	35.999	36.040	36.081	36.122	36.164	36.205	36.246	36.287	36.328	860
870	36.328	36.370	36.411	36.452	36.493	36.534	36.575	36.616	36.657	36.698	36.739	870
880	36.739	36.780	36.821	36.862	36.903	36.944	36.985	37.026	37.067	37.108	37.148	880
890	37.148	37.189	37.230	37.271	37.312	37.352	37.393	37.434	37.474	37.515	37.556	890
900	37.556	37.596	37.637	37.678	37.718	37.759	37.799	37.840	37.880	37.921	37.961	900
910	37.961	38.002	38.042	38.083	38.123	38.163	38.204	38.244	38.284	38.325	38.365	910
920	38.365	38.405	38.446	38.486	38.526	38.566	38.606	38.647	38.687	38.727	38.767	920
930	38.767	38.807	38.847	38.887	38.927	38.967	39.007	39.047	39.087	39.127	39.167	930
940	39.167	39.207	39.247	39.287	39.327	39.367	39.406	39.446	39.486	39.526	39.565	940
950	39.565	39.605	39.645	39.685	39.724	39.764	39.804	39.843	39.883	39.922	39.962	950
960	39.962	40.001	40.041	40.080	40.120	40.159	40.199	40.238	40.278	40.317	40.356	960
970	40.356	40.396	40.435	40.474	40.514	40.553	40.592	40.631	40.671	40.710	40.749	970
980	40.749	40.788	40.827	40.866	40.906	40.945	40.984	41.023	41.062	41.101	41.140	980
990	41.140	41.179	41.218	41.257	41.295	41.334	41.373	41.412	41.451	41.490	41.529	990
1000	41.529	41.567	41.606	41.645	41.684	41.722	41.761	41.800	41.838	41.877	41.915	1000
°C	0	1	2	3	4	5	6	7	8	9	10	°C

TABLE 3 Platinel II thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C *Continued*

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
1000	41.529	41.567	41.606	41.645	41.684	41.722	41.761	41.800	41.838	41.877	41.915	1000
1010	41.915	41.954	41.993	42.031	42.070	42.108	42.147	42.185	42.223	42.262	42.300	1010
1020	42.300	42.339	42.377	42.415	42.454	42.492	42.530	42.569	42.607	42.645	42.683	1020
1030	42.683	42.721	42.760	42.798	42.836	42.874	42.912	42.950	42.988	43.026	43.064	1030
1040	43.064	43.102	43.140	43.178	43.216	43.254	43.292	43.330	43.368	43.405	43.443	1040
1050	43.443	43.481	43.519	43.557	43.594	43.632	43.670	43.707	43.745	43.783	43.820	1050
1060	43.820	43.858	43.895	43.933	43.971	44.008	44.046	44.083	44.120	44.158	44.195	1060
1070	44.195	44.233	44.270	44.307	44.345	44.382	44.419	44.457	44.494	44.531	44.568	1070
1080	44.568	44.605	44.643	44.680	44.717	44.754	44.791	44.828	44.865	44.902	44.939	1080
1090	44.939	44.976	45.013	45.050	45.087	45.124	45.161	45.198	45.235	45.272	45.308	1090
1100	45.308	45.345	45.382	45.419	45.455	45.492	45.529	45.565	45.602	45.639	45.675	1100
1110	45.675	45.712	45.748	45.785	45.822	45.858	45.895	45.931	45.967	46.004	46.040	1110
1120	46.040	46.077	46.113	46.149	46.186	46.222	46.258	46.295	46.331	46.367	46.403	1120
1130	46.403	46.439	46.476	46.512	46.548	46.584	46.620	46.656	46.692	46.728	46.764	1130
1140	46.764	46.800	46.836	46.872	46.908	46.944	46.980	47.016	47.051	47.087	47.123	1140
1150	47.123	47.159	47.195	47.230	47.266	47.302	47.337	47.373	47.409	47.444	47.480	1150
1160	47.480	47.515	47.551	47.586	47.622	47.657	47.693	47.728	47.764	47.799	47.835	1160
1170	47.835	47.870	47.905	47.941	47.976	48.011	48.046	48.082	48.117	48.152	48.187	1170
1180	48.187	48.223	48.258	48.293	48.328	48.363	48.398	48.433	48.468	48.503	48.538	1180
1190	48.538	48.573	48.608	48.643	48.678	48.713	48.747	48.782	48.817	48.852	48.887	1190
1200	48.887	48.921	48.956	48.991	49.026	49.060	49.095	49.129	49.164	49.199	49.233	1200
1210	49.233	49.268	49.302	49.337	49.371	49.406	49.440	49.475	49.509	49.543	49.578	1210
1220	49.578	49.612	49.646	49.681	49.715	49.749	49.783	49.818	49.852	49.886	49.920	1220
1230	49.920	49.954	49.988	50.023	50.057	50.091	50.125	50.159	50.193	50.227	50.261	1230
1240	50.261	50.294	50.328	50.362	50.396	50.430	50.464	50.498	50.531	50.565	50.599	1240
1250	50.599	50.632	50.666	50.700	50.734	50.767	50.801	50.834	50.868	50.901	50.935	1250
1260	50.935	50.968	51.002	51.035	51.069	51.102	51.136	51.169	51.202	51.236	51.269	1260
1270	51.269	51.302	51.336	51.369	51.402	51.435	51.468	51.502	51.535	51.568	51.601	1270
1280	51.601	51.634	51.667	51.700	51.733	51.766	51.799	51.832	51.865	51.898	51.931	1280
1290	51.931	51.963	51.996	52.029	52.062	52.095	52.127	52.160	52.193	52.226	52.258	1290
1300	52.258	52.291	52.323	52.356	52.389	52.421	52.454	52.486	52.519	52.551	52.584	1300
1310	52.584	52.616	52.648	52.681	52.713	52.745	52.778	52.810	52.842	52.875	52.907	1310
1320	52.907	52.939	52.971	53.003	53.035	53.067	53.100	53.132	53.164	53.196	53.228	1320
1330	53.228	53.260	53.292	53.324	53.355	53.387	53.419	53.451	53.483	53.515	53.546	1330
1340	53.546	53.578	53.610	53.641	53.673	53.705	53.736	53.768	53.800	53.831	53.863	1340
1350	53.863	53.894	53.926	53.957	53.989	54.020	54.051	54.083	54.114	54.145	54.177	1350
1360	54.177	54.208	54.239	54.270	54.302	54.333	54.364	54.395	54.426	54.457	54.488	1360
1370	54.488	54.519	54.550	54.581	54.612	54.643	54.674	54.705	54.736	54.767	54.798	1370
1380	54.798	54.828	54.859	54.890	54.921	54.951	54.982	55.013	55.043	55.074	55.104	1380
1390	55.104	55.135	55.165	55.196	55.226	55.257						1390
°C	0	1	2	3	4	5	6	7	8	9	10	°C

Coefficients and temperature ranges of equations used to compute the above ITS-90 based table for Platinel II thermocouples.

0 °C to 746.6 °C

$$\begin{aligned}
 C_0 &= 0.000\,000\,0 \\
 C_1 &= 2.981\,971\,6 \times 10^{-02} \\
 C_2 &= 3.517\,515\,2 \times 10^{-05} \\
 C_3 &= -3.487\,842\,8 \times 10^{-08} \\
 C_4 &= 1.485\,132\,7 \times 10^{-11} \\
 C_5 &= -3.637\,546\,7 \times 10^{-15}
 \end{aligned}$$

746.6 °C to 1395 °C

$$\begin{aligned}
 C_0 &= -8.962\,183\,8 \\
 C_1 &= 8.537\,720\,0 \times 10^{-02} \\
 C_2 &= -1.057\,023\,3 \times 10^{-04} \\
 C_3 &= 1.542\,493\,7 \times 10^{-07} \\
 C_4 &= -1.285\,511\,5 \times 10^{-10} \\
 C_5 &= 5.443\,876\,0 \times 10^{-14} \\
 C_6 &= -9.321\,126\,9 \times 10^{-18}
 \end{aligned}$$

TABLE 4 Platinum II thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
30			0.000	0.017	0.033	0.050	0.066	0.083	0.100	0.116	0.133	30
40	0.133	0.150	0.167	0.184	0.200	0.217	0.234	0.251	0.268	0.285	0.302	40
50	0.302	0.319	0.336	0.353	0.370	0.387	0.404	0.421	0.438	0.455	0.472	50
60	0.472	0.489	0.507	0.524	0.541	0.558	0.576	0.593	0.610	0.628	0.645	60
70	0.645	0.662	0.680	0.697	0.715	0.732	0.749	0.767	0.784	0.802	0.820	70
80	0.820	0.837	0.855	0.872	0.890	0.908	0.925	0.943	0.961	0.978	0.996	80
90	0.996	1.014	1.032	1.050	1.067	1.085	1.103	1.121	1.139	1.157	1.175	90
100	1.175	1.193	1.211	1.229	1.247	1.265	1.283	1.301	1.319	1.337	1.355	100
110	1.355	1.374	1.392	1.410	1.428	1.446	1.465	1.483	1.501	1.520	1.538	110
120	1.538	1.556	1.575	1.593	1.611	1.630	1.648	1.667	1.685	1.704	1.722	120
130	1.722	1.741	1.759	1.778	1.797	1.815	1.834	1.852	1.871	1.890	1.908	130
140	1.908	1.927	1.946	1.965	1.983	2.002	2.021	2.040	2.059	2.078	2.096	140
150	2.096	2.115	2.134	2.153	2.172	2.191	2.210	2.229	2.248	2.267	2.286	150
160	2.286	2.305	2.324	2.343	2.363	2.382	2.401	2.420	2.439	2.458	2.478	160
170	2.478	2.497	2.516	2.536	2.555	2.574	2.593	2.613	2.632	2.652	2.671	170
180	2.671	2.690	2.710	2.729	2.749	2.768	2.788	2.807	2.827	2.846	2.866	180
190	2.866	2.885	2.905	2.925	2.944	2.964	2.984	3.003	3.023	3.043	3.062	190
200	3.062	3.082	3.102	3.122	3.141	3.161	3.181	3.201	3.221	3.241	3.260	200
210	3.260	3.280	3.300	3.320	3.340	3.360	3.380	3.400	3.420	3.440	3.460	210
220	3.460	3.480	3.500	3.520	3.541	3.561	3.581	3.601	3.621	3.641	3.661	220
230	3.661	3.682	3.702	3.722	3.742	3.763	3.783	3.803	3.824	3.844	3.864	230
240	3.864	3.885	3.905	3.925	3.946	3.966	3.987	4.007	4.028	4.048	4.069	240
250	4.069	4.089	4.110	4.130	4.151	4.171	4.192	4.212	4.233	4.254	4.274	250
260	4.274	4.295	4.316	4.336	4.357	4.378	4.399	4.419	4.440	4.461	4.482	260
270	4.482	4.502	4.523	4.544	4.565	4.586	4.607	4.627	4.648	4.669	4.690	270
280	4.690	4.711	4.732	4.753	4.774	4.795	4.816	4.837	4.858	4.879	4.900	280
290	4.900	4.921	4.942	4.963	4.985	5.006	5.027	5.048	5.069	5.090	5.111	290
300	5.111	5.133	5.154	5.175	5.196	5.218	5.239	5.260	5.282	5.303	5.324	300
310	5.324	5.346	5.367	5.388	5.410	5.431	5.452	5.474	5.495	5.517	5.538	310
320	5.538	5.560	5.581	5.603	5.624	5.646	5.667	5.689	5.710	5.732	5.753	320
330	5.753	5.775	5.797	5.818	5.840	5.861	5.883	5.905	5.926	5.948	5.970	330
340	5.970	5.992	6.013	6.035	6.057	6.079	6.100	6.122	6.144	6.166	6.188	340
350	6.188	6.209	6.231	6.253	6.275	6.297	6.319	6.341	6.363	6.384	6.406	350
360	6.406	6.428	6.450	6.472	6.494	6.516	6.538	6.560	6.582	6.604	6.626	360
370	6.626	6.649	6.671	6.693	6.715	6.737	6.759	6.781	6.803	6.825	6.848	370
380	6.848	6.870	6.892	6.914	6.936	6.959	6.981	7.003	7.025	7.048	7.070	380
390	7.070	7.092	7.115	7.137	7.159	7.181	7.204	7.226	7.249	7.271	7.293	390
400	7.293	7.316	7.338	7.361	7.383	7.405	7.428	7.450	7.473	7.495	7.518	400
410	7.518	7.540	7.563	7.585	7.608	7.630	7.653	7.675	7.698	7.721	7.743	410
420	7.743	7.766	7.788	7.811	7.834	7.856	7.879	7.902	7.924	7.947	7.970	420
430	7.970	7.992	8.015	8.038	8.061	8.083	8.106	8.129	8.152	8.174	8.197	430
440	8.197	8.220	8.243	8.266	8.288	8.311	8.334	8.357	8.380	8.403	8.426	440
450	8.426	8.449	8.471	8.494	8.517	8.540	8.563	8.586	8.609	8.632	8.655	450
460	8.655	8.678	8.701	8.724	8.747	8.770	8.793	8.816	8.839	8.862	8.885	460
470	8.885	8.908	8.931	8.955	8.978	9.001	9.024	9.047	9.070	9.093	9.117	470
480	9.117	9.140	9.163	9.186	9.209	9.232	9.256	9.279	9.302	9.325	9.349	480
490	9.349	9.372	9.395	9.418	9.442	9.465	9.488	9.512	9.535	9.558	9.581	490
500	9.581	9.605	9.628	9.652	9.675	9.698	9.722	9.745	9.768	9.792	9.815	500
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 4 Platinel II thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
500	9.581	9.605	9.628	9.652	9.675	9.698	9.722	9.745	9.768	9.792	9.815	500
510	9.815	9.839	9.862	9.885	9.909	9.932	9.956	9.979	10.003	10.026	10.050	510
520	10.050	10.073	10.097	10.120	10.144	10.167	10.191	10.214	10.238	10.262	10.285	520
530	10.285	10.309	10.332	10.356	10.379	10.403	10.427	10.450	10.474	10.498	10.521	530
540	10.521	10.545	10.568	10.592	10.616	10.639	10.663	10.687	10.711	10.734	10.758	540
550	10.758	10.782	10.805	10.829	10.853	10.877	10.900	10.924	10.948	10.972	10.995	550
560	10.995	11.019	11.043	11.067	11.091	11.114	11.138	11.162	11.186	11.210	11.234	560
570	11.234	11.258	11.281	11.305	11.329	11.353	11.377	11.401	11.425	11.449	11.473	570
580	11.473	11.497	11.520	11.544	11.568	11.592	11.616	11.640	11.664	11.688	11.712	580
590	11.712	11.736	11.760	11.784	11.808	11.832	11.856	11.880	11.904	11.928	11.952	590
600	11.952	11.976	12.000	12.024	12.049	12.073	12.097	12.121	12.145	12.169	12.193	600
610	12.193	12.217	12.241	12.265	12.290	12.314	12.338	12.362	12.386	12.410	12.434	610
620	12.434	12.459	12.483	12.507	12.531	12.555	12.580	12.604	12.628	12.652	12.676	620
630	12.676	12.701	12.725	12.749	12.773	12.798	12.822	12.846	12.870	12.895	12.919	630
640	12.919	12.943	12.967	12.992	13.016	13.040	13.065	13.089	13.113	13.138	13.162	640
650	13.162	13.186	13.211	13.235	13.259	13.284	13.308	13.332	13.357	13.381	13.405	650
660	13.405	13.430	13.454	13.479	13.503	13.527	13.552	13.576	13.601	13.625	13.649	660
670	13.649	13.674	13.698	13.723	13.747	13.772	13.796	13.821	13.845	13.869	13.894	670
680	13.894	13.918	13.943	13.967	13.992	14.016	14.041	14.065	14.090	14.114	14.139	680
690	14.139	14.163	14.188	14.212	14.237	14.262	14.286	14.311	14.335	14.360	14.384	690
700	14.384	14.409	14.433	14.458	14.483	14.507	14.532	14.556	14.581	14.606	14.630	700
710	14.630	14.655	14.679	14.704	14.729	14.753	14.778	14.802	14.827	14.852	14.876	710
720	14.876	14.901	14.926	14.950	14.975	15.000	15.024	15.049	15.074	15.098	15.123	720
730	15.123	15.148	15.172	15.197	15.222	15.246	15.271	15.296	15.320	15.345	15.370	730
740	15.370	15.395	15.419	15.444	15.469	15.493	15.518	15.543	15.568	15.592	15.617	740
750	15.617	15.642	15.667	15.691	15.716	15.741	15.766	15.790	15.815	15.840	15.865	750
760	15.865	15.890	15.914	15.939	15.964	15.989	16.013	16.038	16.063	16.088	16.113	760
770	16.113	16.137	16.162	16.187	16.212	16.237	16.262	16.286	16.311	16.336	16.361	770
780	16.361	16.386	16.411	16.435	16.460	16.485	16.510	16.535	16.560	16.585	16.609	780
790	16.609	16.634	16.659	16.684	16.709	16.734	16.759	16.784	16.808	16.833	16.858	790
800	16.858	16.883	16.908	16.933	16.958	16.983	17.008	17.032	17.057	17.082	17.107	800
810	17.107	17.132	17.157	17.182	17.207	17.232	17.257	17.282	17.307	17.331	17.356	810
820	17.356	17.381	17.406	17.431	17.456	17.481	17.506	17.531	17.556	17.581	17.606	820
830	17.606	17.631	17.656	17.681	17.706	17.731	17.756	17.781	17.806	17.830	17.855	830
840	17.855	17.880	17.905	17.930	17.955	17.980	18.005	18.030	18.055	18.080	18.105	840
850	18.105	18.130	18.155	18.180	18.205	18.230	18.255	18.280	18.305	18.330	18.355	850
860	18.355	18.380	18.405	18.430	18.455	18.480	18.505	18.530	18.555	18.580	18.605	860
870	18.605	18.630	18.655	18.680	18.705	18.730	18.755	18.781	18.806	18.831	18.856	870
880	18.856	18.881	18.906	18.931	18.956	18.981	19.006	19.031	19.056	19.081	19.106	880
890	19.106	19.131	19.156	19.181	19.206	19.231	19.256	19.281	19.306	19.331	19.356	890
900	19.356	19.381	19.407	19.432	19.457	19.482	19.507	19.532	19.557	19.582	19.607	900
910	19.607	19.632	19.657	19.682	19.707	19.732	19.757	19.782	19.807	19.833	19.858	910
920	19.858	19.883	19.908	19.933	19.958	19.983	20.008	20.033	20.058	20.083	20.108	920
930	20.108	20.133	20.158	20.183	20.209	20.234	20.259	20.284	20.309	20.334	20.359	930
940	20.359	20.384	20.409	20.434	20.459	20.484	20.509	20.534	20.560	20.585	20.610	940
950	20.610	20.635	20.660	20.685	20.710	20.735	20.760	20.785	20.810	20.835	20.860	950
960	20.860	20.885	20.911	20.936	20.961	20.986	21.011	21.036	21.061	21.086	21.111	960
970	21.111	21.136	21.161	21.186	21.211	21.237	21.262	21.287	21.312	21.337	21.362	970
980	21.362	21.387	21.412	21.437	21.462	21.487	21.512	21.537	21.562	21.587	21.613	980
990	21.613	21.638	21.663	21.688	21.713	21.738	21.763	21.788	21.813	21.838	21.863	990
1000	21.863	21.888	21.913	21.938	21.963	21.988	22.014	22.039	22.064	22.089	22.114	1000
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 4 Platinel II thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
1000	21.863	21.888	21.913	21.938	21.963	21.988	22.014	22.039	22.064	22.089	22.114	1000
1010	22.114	22.139	22.164	22.189	22.214	22.239	22.264	22.289	22.314	22.339	22.364	1010
1020	22.364	22.389	22.414	22.439	22.464	22.489	22.515	22.540	22.565	22.590	22.615	1020
1030	22.615	22.640	22.665	22.690	22.715	22.740	22.765	22.790	22.815	22.840	22.865	1030
1040	22.865	22.890	22.915	22.940	22.965	22.990	23.015	23.040	23.065	23.090	23.115	1040
1050	23.115	23.140	23.165	23.190	23.215	23.240	23.265	23.290	23.315	23.340	23.365	1050
1060	23.365	23.390	23.415	23.440	23.465	23.490	23.515	23.540	23.565	23.590	23.615	1060
1070	23.615	23.640	23.665	23.690	23.715	23.740	23.765	23.790	23.815	23.840	23.865	1070
1080	23.865	23.890	23.915	23.940	23.965	23.990	24.015	24.040	24.065	24.090	24.115	1080
1090	24.115	24.139	24.164	24.189	24.214	24.239	24.264	24.289	24.314	24.339	24.364	1090
1100	24.364	24.389	24.414	24.439	24.464	24.489	24.514	24.538	24.563	24.588	24.613	1100
1110	24.613	24.638	24.663	24.688	24.713	24.738	24.763	24.788	24.812	24.837	24.862	1110
1120	24.862	24.887	24.912	24.937	24.962	24.987	25.012	25.036	25.061	25.086	25.111	1120
1130	25.111	25.136	25.161	25.186	25.210	25.235	25.260	25.285	25.310	25.335	25.360	1130
1140	25.360	25.384	25.409	25.434	25.459	25.484	25.509	25.533	25.558	25.583	25.608	1140
1150	25.608	25.633	25.658	25.682	25.707	25.732	25.757	25.782	25.806	25.831	25.856	1150
1160	25.856	25.881	25.906	25.930	25.955	25.980	26.005	26.029	26.054	26.079	26.104	1160
1170	26.104	26.129	26.153	26.178	26.203	26.228	26.252	26.277	26.302	26.327	26.351	1170
1180	26.351	26.376	26.401	26.426	26.450	26.475	26.500	26.524	26.549	26.574	26.599	1180
1190	26.599	26.623	26.648	26.673	26.697	26.722	26.747	26.771	26.796	26.821	26.845	1190
1200	26.845	26.870	26.895	26.919	26.944	26.969	26.993	27.018	27.043	27.067	27.092	1200
1210	27.092	27.117	27.141	27.166	27.191	27.215	27.240	27.265	27.289	27.314	27.338	1210
1220	27.338	27.363	27.388	27.412	27.437	27.461	27.486	27.511	27.535	27.560	27.584	1220
1230	27.584	27.609	27.633	27.658	27.683	27.707	27.732	27.756	27.781	27.805	27.830	1230
1240	27.830	27.854	27.879	27.903	27.928	27.953	27.977	28.002	28.026	28.051	28.075	1240
1250	28.075	28.100	28.124	28.149	28.173	28.198	28.222	28.247	28.271	28.295	28.320	1250
1260	28.320	28.344	28.369	28.393	28.418	28.442	28.467	28.491	28.516	28.540	28.564	1260
1270	28.564	28.589	28.613	28.638	28.662	28.686	28.711	28.735	28.760	28.784	28.808	1270
1280	28.808	28.833	28.857	28.882	28.906	28.930	28.955	28.979	29.003	29.028	29.052	1280
1290	29.052	29.076	29.101	29.125	29.149	29.174	29.198	29.222	29.247	29.271	29.295	1290
1300	29.295	29.320	29.344	29.368	29.392	29.417	29.441	29.465	29.490	29.514	29.538	1300
1310	29.538	29.562	29.587	29.611	29.635	29.659	29.684	29.708	29.732	29.756	29.780	1310
1320	29.780	29.805	29.829	29.853	29.877	29.901	29.926	29.950	29.974	29.998	30.022	1320
1330	30.022	30.046	30.071	30.095	30.119	30.143	30.167	30.191	30.215	30.240	30.264	1330
1340	30.264	30.288	30.312	30.336	30.360	30.384	30.408	30.432	30.457	30.481	30.505	1340
1350	30.505	30.529	30.553	30.577	30.601	30.625	30.649	30.673	30.697	30.721	30.745	1350
1360	30.745	30.769	30.793	30.817	30.841	30.865	30.889	30.913	30.937	30.961	30.985	1360
1370	30.985	31.009	31.033	31.057	31.081	31.105	31.129	31.153	31.177	31.201	31.225	1370
1380	31.225	31.248	31.272	31.296	31.320	31.344	31.368	31.392	31.416	31.440	31.463	1380
1390	31.463	31.487	31.511	31.535	31.559	31.583	31.607	31.631	31.654	31.678	31.702	1390
1400	31.702	31.726	31.750	31.774	31.797	31.821	31.845	31.869	31.893	31.916	31.940	1400
1410	31.940	31.964	31.988	32.011	32.035	32.059	32.083	32.107	32.130	32.154	32.178	1410
1420	32.178	32.202	32.225	32.249	32.273	32.296	32.320	32.344	32.368	32.391	32.415	1420
1430	32.415	32.439	32.462	32.486	32.510	32.533	32.557	32.581	32.604	32.628	32.652	1430
1440	32.652	32.675	32.699	32.723	32.746	32.770	32.794	32.817	32.841	32.864	32.888	1440
1450	32.888	32.912	32.935	32.959	32.982	33.006	33.030	33.053	33.077	33.100	33.124	1450
1460	33.124	33.147	33.171	33.195	33.218	33.242	33.265	33.289	33.312	33.336	33.359	1460
1470	33.359	33.383	33.406	33.430	33.453	33.477	33.500	33.524	33.547	33.571	33.594	1470
1480	33.594	33.618	33.641	33.664	33.688	33.711	33.735	33.758	33.782	33.805	33.828	1480
1490	33.828	33.852	33.875	33.899	33.922	33.946	33.969	33.992	34.016	34.039	34.062	1490
1500	34.062	34.086	34.109	34.132	34.156	34.179	34.203	34.226	34.249	34.273	34.296	1500
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 4 Platinel II thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
1500	34.062	34.086	34.109	34.132	34.156	34.179	34.203	34.226	34.249	34.273	34.296	1500
1510	34.296	34.319	34.342	34.366	34.389	34.412	34.436	34.459	34.482	34.506	34.529	1510
1520	34.529	34.552	34.575	34.599	34.622	34.645	34.668	34.692	34.715	34.738	34.761	1520
1530	34.761	34.784	34.808	34.831	34.854	34.877	34.900	34.924	34.947	34.970	34.993	1530
1540	34.993	35.016	35.040	35.063	35.086	35.109	35.132	35.155	35.178	35.202	35.225	1540
1550	35.225	35.248	35.271	35.294	35.317	35.340	35.363	35.386	35.409	35.433	35.456	1550
1560	35.456	35.479	35.502	35.525	35.548	35.571	35.594	35.617	35.640	35.663	35.686	1560
1570	35.686	35.709	35.732	35.755	35.778	35.801	35.824	35.847	35.870	35.893	35.916	1570
1580	35.916	35.939	35.962	35.985	36.008	36.031	36.054	36.077	36.099	36.122	36.145	1580
1590	36.145	36.168	36.191	36.214	36.237	36.260	36.283	36.306	36.328	36.351	36.374	1590
1600	36.374	36.397	36.420	36.443	36.466	36.488	36.511	36.534	36.557	36.580	36.603	1600
1610	36.603	36.625	36.648	36.671	36.694	36.716	36.739	36.762	36.785	36.808	36.830	1610
1620	36.830	36.853	36.876	36.899	36.921	36.944	36.967	36.989	37.012	37.035	37.058	1620
1630	37.058	37.080	37.103	37.126	37.148	37.171	37.194	37.216	37.239	37.262	37.284	1630
1640	37.284	37.307	37.330	37.352	37.375	37.398	37.420	37.443	37.465	37.488	37.511	1640
1650	37.511	37.533	37.556	37.578	37.601	37.623	37.646	37.669	37.691	37.714	37.736	1650
1660	37.736	37.759	37.781	37.804	37.826	37.849	37.871	37.894	37.916	37.939	37.961	1660
1670	37.961	37.984	38.006	38.029	38.051	38.074	38.096	38.119	38.141	38.163	38.186	1670
1680	38.186	38.208	38.231	38.253	38.275	38.298	38.320	38.343	38.365	38.387	38.410	1680
1690	38.410	38.432	38.455	38.477	38.499	38.522	38.544	38.566	38.589	38.611	38.633	1690
1700	38.633	38.656	38.678	38.700	38.722	38.745	38.767	38.789	38.812	38.834	38.856	1700
1710	38.856	38.878	38.901	38.923	38.945	38.967	38.990	39.012	39.034	39.056	39.078	1710
1720	39.078	39.101	39.123	39.145	39.167	39.189	39.211	39.234	39.256	39.278	39.300	1720
1730	39.300	39.322	39.344	39.367	39.389	39.411	39.433	39.455	39.477	39.499	39.521	1730
1740	39.521	39.543	39.565	39.588	39.610	39.632	39.654	39.676	39.698	39.720	39.742	1740
1750	39.742	39.764	39.786	39.808	39.830	39.852	39.874	39.896	39.918	39.940	39.962	1750
1760	39.962	39.984	40.006	40.028	40.050	40.072	40.094	40.116	40.137	40.159	40.181	1760
1770	40.181	40.203	40.225	40.247	40.269	40.291	40.313	40.335	40.356	40.378	40.400	1770
1780	40.400	40.422	40.444	40.466	40.487	40.509	40.531	40.553	40.575	40.597	40.618	1780
1790	40.618	40.640	40.662	40.684	40.705	40.727	40.749	40.771	40.793	40.814	40.836	1790
1800	40.836	40.858	40.879	40.901	40.923	40.945	40.966	40.988	41.010	41.031	41.053	1800
1810	41.053	41.075	41.096	41.118	41.140	41.161	41.183	41.205	41.226	41.248	41.270	1810
1820	41.270	41.291	41.313	41.334	41.356	41.378	41.399	41.421	41.442	41.464	41.485	1820
1830	41.485	41.507	41.529	41.550	41.572	41.593	41.615	41.636	41.658	41.679	41.701	1830
1840	41.701	41.722	41.744	41.765	41.787	41.808	41.830	41.851	41.873	41.894	41.915	1840
1850	41.915	41.937	41.958	41.980	42.001	42.023	42.044	42.065	42.087	42.108	42.129	1850
1860	42.129	42.151	42.172	42.194	42.215	42.236	42.258	42.279	42.300	42.322	42.343	1860
1870	42.343	42.364	42.386	42.407	42.428	42.449	42.471	42.492	42.513	42.535	42.556	1870
1880	42.556	42.577	42.598	42.620	42.641	42.662	42.683	42.704	42.726	42.747	42.768	1880
1890	42.768	42.789	42.810	42.832	42.853	42.874	42.895	42.916	42.937	42.959	42.980	1890
1900	42.980	43.001	43.022	43.043	43.064	43.085	43.106	43.128	43.149	43.170	43.191	1900
1910	43.191	43.212	43.233	43.254	43.275	43.296	43.317	43.338	43.359	43.380	43.401	1910
1920	43.401	43.422	43.443	43.464	43.485	43.506	43.527	43.548	43.569	43.590	43.611	1920
1930	43.611	43.632	43.653	43.674	43.695	43.716	43.737	43.758	43.778	43.799	43.820	1930
1940	43.820	43.841	43.862	43.883	43.904	43.925	43.945	43.966	43.987	44.008	44.029	1940
1950	44.029	44.050	44.070	44.091	44.112	44.133	44.154	44.175	44.195	44.216	44.237	1950
1960	44.237	44.258	44.278	44.299	44.320	44.341	44.361	44.382	44.403	44.423	44.444	1960
1970	44.444	44.465	44.486	44.506	44.527	44.548	44.568	44.589	44.610	44.630	44.651	1970
1980	44.651	44.672	44.692	44.713	44.733	44.754	44.775	44.795	44.816	44.836	44.857	1980
1990	44.857	44.878	44.898	44.919	44.939	44.960	44.980	45.001	45.021	45.042	45.063	1990
2000	45.063	45.083	45.104	45.124	45.145	45.165	45.186	45.206	45.226	45.247	45.267	2000
°F	0	1	2	3	4	5	6	7	8	9	10	°F

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
2000	45.063	45.083	45.104	45.124	45.145	45.165	45.186	45.206	45.226	45.247	45.267	2000
2010	45.267	45.288	45.308	45.329	45.349	45.370	45.390	45.410	45.431	45.451	45.472	2010
2020	45.472	45.492	45.512	45.533	45.553	45.574	45.594	45.614	45.635	45.655	45.675	2020
2030	45.675	45.696	45.716	45.736	45.757	45.777	45.797	45.817	45.838	45.858	45.878	2030
2040	45.878	45.899	45.919	45.939	45.959	45.980	46.000	46.020	46.040	46.060	46.081	2040
2050	46.081	46.101	46.121	46.141	46.161	46.182	46.202	46.222	46.242	46.262	46.282	2050
2060	46.282	46.303	46.323	46.343	46.363	46.383	46.403	46.423	46.443	46.463	46.484	2060
2070	46.484	46.504	46.524	46.544	46.564	46.584	46.604	46.624	46.644	46.664	46.684	2070
2080	46.684	46.704	46.724	46.744	46.764	46.784	46.804	46.824	46.844	46.864	46.884	2080
2090	46.884	46.904	46.924	46.944	46.964	46.984	47.004	47.023	47.043	47.063	47.083	2090
2100	47.083	47.103	47.123	47.143	47.163	47.183	47.202	47.222	47.242	47.262	47.282	2100
2110	47.282	47.302	47.321	47.341	47.361	47.381	47.401	47.420	47.440	47.460	47.480	2110
2120	47.480	47.500	47.519	47.539	47.559	47.579	47.598	47.618	47.638	47.657	47.677	2120
2130	47.677	47.697	47.717	47.736	47.756	47.776	47.795	47.815	47.835	47.854	47.874	2130
2140	47.874	47.894	47.913	47.933	47.952	47.972	47.992	48.011	48.031	48.050	48.070	2140
2150	48.070	48.090	48.109	48.129	48.148	48.168	48.187	48.207	48.226	48.246	48.265	2150
2160	48.265	48.285	48.304	48.324	48.343	48.363	48.382	48.402	48.421	48.441	48.460	2160
2170	48.460	48.480	48.499	48.519	48.538	48.557	48.577	48.596	48.616	48.635	48.654	2170
2180	48.654	48.674	48.693	48.713	48.732	48.751	48.771	48.790	48.809	48.829	48.848	2180
2190	48.848	48.867	48.887	48.906	48.925	48.945	48.964	48.983	49.002	49.022	49.041	2190
2200	49.041	49.060	49.079	49.099	49.118	49.137	49.156	49.176	49.195	49.214	49.233	2200
2210	49.233	49.252	49.272	49.291	49.310	49.329	49.348	49.367	49.387	49.406	49.425	2210
2220	49.425	49.444	49.463	49.482	49.501	49.520	49.540	49.559	49.578	49.597	49.616	2220
2230	49.616	49.635	49.654	49.673	49.692	49.711	49.730	49.749	49.768	49.787	49.806	2230
2240	49.806	49.825	49.844	49.863	49.882	49.901	49.920	49.939	49.958	49.977	49.996	2240
2250	49.996	50.015	50.034	50.053	50.072	50.091	50.110	50.128	50.147	50.166	50.185	2250
2260	50.185	50.204	50.223	50.242	50.261	50.279	50.298	50.317	50.336	50.355	50.374	2260
2270	50.374	50.392	50.411	50.430	50.449	50.467	50.486	50.505	50.524	50.543	50.561	2270
2280	50.561	50.580	50.599	50.618	50.636	50.655	50.674	50.692	50.711	50.730	50.748	2280
2290	50.748	50.767	50.786	50.804	50.823	50.842	50.860	50.879	50.898	50.916	50.935	2290
2300	50.935	50.954	50.972	50.991	51.009	51.028	51.047	51.065	51.084	51.102	51.121	2300
2310	51.121	51.139	51.158	51.176	51.195	51.213	51.232	51.250	51.269	51.287	51.306	2310
2320	51.306	51.324	51.343	51.361	51.380	51.398	51.417	51.435	51.454	51.472	51.490	2320
2330	51.490	51.509	51.527	51.546	51.564	51.582	51.601	51.619	51.638	51.656	51.674	2330
2340	51.674	51.693	51.711	51.729	51.748	51.766	51.784	51.803	51.821	51.839	51.858	2340
2350	51.858	51.876	51.894	51.912	51.931	51.949	51.967	51.985	52.004	52.022	52.040	2350
2360	52.040	52.058	52.076	52.095	52.113	52.131	52.149	52.167	52.186	52.204	52.222	2360
2370	52.222	52.240	52.258	52.276	52.294	52.313	52.331	52.349	52.367	52.385	52.403	2370
2380	52.403	52.421	52.439	52.457	52.475	52.493	52.511	52.529	52.548	52.566	52.584	2380
2390	52.584	52.602	52.620	52.638	52.656	52.674	52.692	52.710	52.727	52.745	52.763	2390
2400	52.763	52.781	52.799	52.817	52.835	52.853	52.871	52.889	52.907	52.925	52.943	2400
2410	52.943	52.960	52.978	52.996	53.014	53.032	53.050	53.067	53.085	53.103	53.121	2410
2420	53.121	53.139	53.157	53.174	53.192	53.210	53.228	53.245	53.263	53.281	53.299	2420
2430	53.299	53.316	53.334	53.352	53.370	53.387	53.405	53.423	53.440	53.458	53.476	2430
2440	53.476	53.493	53.511	53.529	53.546	53.564	53.582	53.599	53.617	53.634	53.652	2440
2450	53.652	53.670	53.687	53.705	53.722	53.740	53.757	53.775	53.793	53.810	53.828	2450
2460	53.828	53.845	53.863	53.880	53.898	53.915	53.933	53.950	53.968	53.985	54.003	2460
2470	54.003	54.020	54.037	54.055	54.072	54.090	54.107	54.125	54.142	54.159	54.177	2470
2480	54.177	54.194	54.211	54.229	54.246	54.264	54.281	54.298	54.316	54.333	54.350	2480
2490	54.350	54.367	54.385	54.402	54.419	54.437	54.454	54.471	54.488	54.506	54.523	2490
2500	54.523	54.540	54.557	54.574	54.592	54.609	54.626	54.643	54.660	54.678	54.695	2500
°F	0	1	2	3	4	5	6	7	8	9	10	°F

TABLE 4 Platinel II thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
2500	54.523	54.540	54.557	54.574	54.592	54.609	54.626	54.643	54.660	54.678	54.695	2500
2510	54.695	54.712	54.729	54.746	54.763	54.780	54.798	54.815	54.832	54.849	54.866	2510
2520	54.866	54.883	54.900	54.917	54.934	54.951	54.968	54.985	55.002	55.019	55.036	2520
2530	55.036	55.053	55.070	55.087	55.104	55.121	55.138	55.155	55.172	55.189	55.206	2530
2540	55.206	55.223	55.240	55.257								2540
°F	0	1	2	3	4	5	6	7	8	9	10	°F

Coefficients and temperature ranges of equations used to compute the above ITS-90 based table for Platinel II thermocouples.

32 °F to 1375.88 °F

$$\begin{aligned}
 c_0 &= -5.188\,137\,362 \times 10^{-01} \\
 c_1 &= 1.585\,313\,235 \times 10^{-02} \\
 c_2 &= 1.143\,941\,401 \times 10^{-05} \\
 c_3 &= -6.163\,583\,517 \times 10^{-09} \\
 c_4 &= 1.445\,536\,537 \times 10^{-12} \\
 c_5 &= -1.925\,067\,920 \times 10^{-16}
 \end{aligned}$$

1375.88 °F to 2543 °F

$$\begin{aligned}
 c_0 &= -1.051\,428\,746 \times 10^{01} \\
 c_1 &= 4.960\,259\,574 \times 10^{-02} \\
 c_2 &= -3.523\,944\,748 \times 10^{-05} \\
 c_3 &= 2.804\,593\,445 \times 10^{-08} \\
 c_4 &= -1.271\,093\,742 \times 10^{-11} \\
 c_5 &= 2.933\,634\,241 \times 10^{-15} \\
 c_6 &= -2.740\,522\,611 \times 10^{-19}
 \end{aligned}$$

TABLE 5 K (Positive) versus Gold-0.07 % Iron thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C

°C	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	°C
Thermoelectric Voltage in Millivolts												
-270	-5.279	-5.290	-5.300	-5.308								-270
-260	-5.130	-5.147	-5.163	-5.179	-5.195	-5.211	-5.226	-5.241	-5.254	-5.267	-5.279	-260
-250	-4.961	-4.978	-4.995	-5.011	-5.028	-5.045	-5.062	-5.079	-5.096	-5.113	-5.130	-250
-240	-4.794	-4.811	-4.827	-4.844	-4.860	-4.877	-4.894	-4.910	-4.927	-4.944	-4.961	-240
-230	-4.630	-4.646	-4.663	-4.679	-4.696	-4.712	-4.728	-4.745	-4.761	-4.778	-4.794	-230
-220	-4.463	-4.480	-4.497	-4.513	-4.530	-4.547	-4.563	-4.580	-4.596	-4.613	-4.630	-220
-210	-4.292	-4.310	-4.327	-4.344	-4.361	-4.378	-4.395	-4.412	-4.429	-4.446	-4.463	-210
-200	-4.117	-4.135	-4.153	-4.170	-4.188	-4.205	-4.223	-4.240	-4.258	-4.275	-4.292	-200
-190	-3.938	-3.956	-3.974	-3.992	-4.010	-4.028	-4.046	-4.064	-4.082	-4.100	-4.117	-190
-180	-3.755	-3.773	-3.792	-3.810	-3.829	-3.847	-3.865	-3.884	-3.902	-3.920	-3.938	-180
-170	-3.568	-3.586	-3.605	-3.624	-3.643	-3.662	-3.680	-3.699	-3.718	-3.736	-3.755	-170
-160	-3.377	-3.396	-3.415	-3.434	-3.453	-3.472	-3.492	-3.511	-3.530	-3.549	-3.568	-160
-150	-3.182	-3.202	-3.221	-3.241	-3.260	-3.280	-3.299	-3.318	-3.338	-3.357	-3.377	-150
-140	-2.984	-3.004	-3.024	-3.044	-3.064	-3.084	-3.103	-3.123	-3.143	-3.162	-3.182	-140
-130	-2.784	-2.804	-2.824	-2.844	-2.864	-2.885	-2.905	-2.925	-2.945	-2.964	-2.984	-130
-120	-2.581	-2.601	-2.622	-2.642	-2.662	-2.683	-2.703	-2.723	-2.744	-2.764	-2.784	-120
-110	-2.375	-2.396	-2.417	-2.437	-2.458	-2.478	-2.499	-2.520	-2.540	-2.560	-2.581	-110
-100	-2.168	-2.189	-2.209	-2.230	-2.251	-2.272	-2.293	-2.313	-2.334	-2.355	-2.375	-100
-90	-1.958	-1.979	-2.000	-2.021	-2.042	-2.063	-2.084	-2.105	-2.126	-2.147	-2.168	-90
-80	-1.746	-1.767	-1.789	-1.810	-1.831	-1.852	-1.873	-1.895	-1.916	-1.937	-1.958	-80
-70	-1.533	-1.554	-1.575	-1.597	-1.618	-1.640	-1.661	-1.682	-1.704	-1.725	-1.746	-70
-60	-1.317	-1.339	-1.361	-1.382	-1.404	-1.425	-1.447	-1.468	-1.490	-1.511	-1.533	-60
-50	-1.101	-1.122	-1.144	-1.166	-1.188	-1.209	-1.231	-1.253	-1.274	-1.296	-1.317	-50
-40	-0.883	-0.904	-0.926	-0.948	-0.970	-0.992	-1.014	-1.035	-1.057	-1.079	-1.101	-40
-30	-0.663	-0.685	-0.707	-0.729	-0.751	-0.773	-0.795	-0.817	-0.839	-0.861	-0.883	-30
-20	-0.443	-0.465	-0.487	-0.510	-0.532	-0.554	-0.576	-0.598	-0.620	-0.642	-0.663	-20
-10	-0.222	-0.244	-0.267	-0.289	-0.311	-0.333	-0.355	-0.377	-0.399	-0.421	-0.443	-10
0	0.000	-0.022	-0.045	-0.067	-0.089	-0.111	-0.133	-0.156	-0.178	-0.200	-0.222	0
°C	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	°C

TABLE 5 K (Positive) versus Gold-0.07 % Iron thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C *Continued*

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
0	0.000	0.022	0.045	0.067	0.089	0.111	0.134	0.156				0
°C	0	1	2	3	4	5	6	7	8	9	10	°C

Coefficients and temperature ranges of equations used to compute the above ITS-90 based table for K (Positive) versus Gold - 0.07% Iron thermocouples.

−273 °C to 7 °C

c_0	=	0.000 000 000 0
c_1	=	$2.227\ 236\ 746\ 6 \times 10^{-02}$
c_2	=	$3.640\ 617\ 966\ 4 \times 10^{-06}$
c_3	=	$-1.596\ 792\ 820\ 2 \times 10^{-07}$
c_4	=	$-4.526\ 016\ 988\ 8 \times 10^{-09}$
c_5	=	$4.043\ 255\ 576\ 9 \times 10^{-11}$
c_6	=	$4.906\ 303\ 576\ 5 \times 10^{-12}$
c_7	=	$1.227\ 234\ 848\ 4 \times 10^{-13}$
c_8	=	$1.682\ 977\ 369\ 7 \times 10^{-15}$
c_9	=	$1.463\ 645\ 014\ 9 \times 10^{-17}$
c_{10}	=	$8.428\ 790\ 974\ 7 \times 10^{-20}$
c_{11}	=	$3.214\ 663\ 938\ 7 \times 10^{-22}$
c_{12}	=	$7.822\ 543\ 048\ 3 \times 10^{-25}$
c_{13}	=	$1.101\ 093\ 059\ 6 \times 10^{-27}$
c_{14}	=	$6.826\ 366\ 158\ 0 \times 10^{-31}$

TABLE 6 K (Positive) versus Gold-0.07 % Iron thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F

°F	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	°F
Thermoelectric Voltage in Millivolts												
-450	-5.251	-5.259	-5.266	-5.273	-5.279	-5.286	-5.292	-5.297	-5.302	-5.307		-450
-440	-5.167	-5.176	-5.185	-5.194	-5.202	-5.211	-5.219	-5.228	-5.236	-5.244	-5.251	-440
-430	-5.074	-5.083	-5.093	-5.102	-5.111	-5.121	-5.130	-5.139	-5.149	-5.158	-5.167	-430
-420	-4.980	-4.989	-4.998	-5.008	-5.017	-5.027	-5.036	-5.045	-5.055	-5.064	-5.074	-420
-410	-4.886	-4.896	-4.905	-4.914	-4.923	-4.933	-4.942	-4.951	-4.961	-4.970	-4.980	-410
-400	-4.794	-4.803	-4.813	-4.822	-4.831	-4.840	-4.849	-4.859	-4.868	-4.877	-4.886	-400
-390	-4.703	-4.712	-4.721	-4.730	-4.739	-4.749	-4.758	-4.767	-4.776	-4.785	-4.794	-390
-380	-4.611	-4.620	-4.630	-4.639	-4.648	-4.657	-4.666	-4.675	-4.685	-4.694	-4.703	-380
-370	-4.519	-4.528	-4.537	-4.547	-4.556	-4.565	-4.574	-4.584	-4.593	-4.602	-4.611	-370
-360	-4.425	-4.435	-4.444	-4.454	-4.463	-4.472	-4.482	-4.491	-4.500	-4.510	-4.519	-360
-350	-4.331	-4.340	-4.350	-4.359	-4.369	-4.378	-4.388	-4.397	-4.407	-4.416	-4.425	-350
-340	-4.235	-4.244	-4.254	-4.263	-4.273	-4.283	-4.292	-4.302	-4.312	-4.321	-4.331	-340
-330	-4.137	-4.147	-4.157	-4.166	-4.176	-4.186	-4.196	-4.205	-4.215	-4.225	-4.235	-330
-320	-4.038	-4.048	-4.058	-4.068	-4.078	-4.088	-4.098	-4.108	-4.117	-4.127	-4.137	-320
-310	-3.938	-3.948	-3.958	-3.968	-3.978	-3.988	-3.998	-4.008	-4.018	-4.028	-4.038	-310
-300	-3.837	-3.847	-3.857	-3.867	-3.878	-3.888	-3.898	-3.908	-3.918	-3.928	-3.938	-300
-290	-3.734	-3.745	-3.755	-3.765	-3.776	-3.786	-3.796	-3.806	-3.816	-3.827	-3.837	-290
-280	-3.630	-3.641	-3.651	-3.662	-3.672	-3.683	-3.693	-3.703	-3.714	-3.724	-3.734	-280
-270	-3.525	-3.536	-3.547	-3.557	-3.568	-3.578	-3.589	-3.599	-3.610	-3.620	-3.630	-270
-260	-3.419	-3.430	-3.441	-3.451	-3.462	-3.472	-3.483	-3.494	-3.504	-3.515	-3.525	-260
-250	-3.312	-3.323	-3.334	-3.344	-3.355	-3.366	-3.377	-3.387	-3.398	-3.409	-3.419	-250
-240	-3.204	-3.215	-3.225	-3.236	-3.247	-3.258	-3.269	-3.280	-3.290	-3.301	-3.312	-240
-230	-3.095	-3.106	-3.116	-3.127	-3.138	-3.149	-3.160	-3.171	-3.182	-3.193	-3.204	-230
-220	-2.984	-2.995	-3.006	-3.018	-3.029	-3.040	-3.051	-3.062	-3.073	-3.084	-3.095	-220
-210	-2.873	-2.885	-2.896	-2.907	-2.918	-2.929	-2.940	-2.951	-2.962	-2.973	-2.984	-210
-200	-2.762	-2.773	-2.784	-2.795	-2.806	-2.818	-2.829	-2.840	-2.851	-2.862	-2.873	-200
-190	-2.649	-2.660	-2.671	-2.683	-2.694	-2.705	-2.717	-2.728	-2.739	-2.750	-2.762	-190
-180	-2.535	-2.547	-2.558	-2.570	-2.581	-2.592	-2.604	-2.615	-2.626	-2.638	-2.649	-180
-170	-2.421	-2.433	-2.444	-2.456	-2.467	-2.478	-2.490	-2.501	-2.513	-2.524	-2.535	-170
-160	-2.306	-2.318	-2.329	-2.341	-2.352	-2.364	-2.375	-2.387	-2.398	-2.410	-2.421	-160
-150	-2.191	-2.202	-2.214	-2.226	-2.237	-2.249	-2.260	-2.272	-2.283	-2.295	-2.306	-150
-140	-2.075	-2.086	-2.098	-2.110	-2.121	-2.133	-2.144	-2.156	-2.168	-2.179	-2.191	-140
-130	-1.958	-1.970	-1.981	-1.993	-2.005	-2.016	-2.028	-2.040	-2.051	-2.063	-2.075	-130
-120	-1.840	-1.852	-1.864	-1.876	-1.888	-1.899	-1.911	-1.923	-1.934	-1.946	-1.958	-120
-110	-1.723	-1.734	-1.746	-1.758	-1.770	-1.782	-1.793	-1.805	-1.817	-1.829	-1.840	-110
-100	-1.604	-1.616	-1.628	-1.640	-1.651	-1.663	-1.675	-1.687	-1.699	-1.711	-1.723	-100
-90	-1.485	-1.497	-1.509	-1.521	-1.533	-1.545	-1.556	-1.568	-1.580	-1.592	-1.604	-90
-80	-1.365	-1.377	-1.389	-1.401	-1.413	-1.425	-1.437	-1.449	-1.461	-1.473	-1.485	-80
-70	-1.245	-1.257	-1.269	-1.281	-1.293	-1.305	-1.317	-1.329	-1.341	-1.353	-1.365	-70
-60	-1.125	-1.137	-1.149	-1.161	-1.173	-1.185	-1.197	-1.209	-1.221	-1.233	-1.245	-60
-50	-1.004	-1.016	-1.028	-1.040	-1.052	-1.064	-1.077	-1.089	-1.101	-1.113	-1.125	-50
-40	-0.883	-0.895	-0.907	-0.919	-0.931	-0.943	-0.955	-0.968	-0.980	-0.992	-1.004	-40
-30	-0.761	-0.773	-0.785	-0.798	-0.810	-0.822	-0.834	-0.846	-0.858	-0.870	-0.883	-30
-20	-0.639	-0.651	-0.663	-0.676	-0.688	-0.700	-0.712	-0.724	-0.737	-0.749	-0.761	-20
-10	-0.517	-0.529	-0.541	-0.554	-0.566	-0.578	-0.590	-0.602	-0.615	-0.627	-0.639	-10
0	-0.394	-0.407	-0.419	-0.431	-0.443	-0.456	-0.468	-0.480	-0.492	-0.505	-0.517	0
°F	0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	°F

TABLE 6 K (Positive) versus Gold-0.07 % Iron thermocouples—thermoelectric voltage as a function of temperature (°F), reference junctions at 32°F *Continued*

°F	0	1	2	3	4	5	6	7	8	9	10	°F
Thermoelectric Voltage in Millivolts												
0	-0.394	-0.382	-0.370	-0.358	-0.345	-0.333	-0.321	-0.308	-0.296	-0.284	-0.271	0
10	-0.271	-0.259	-0.247	-0.235	-0.222	-0.210	-0.198	-0.185	-0.173	-0.161	-0.148	10
20	-0.148	-0.136	-0.124	-0.111	-0.099	-0.087	-0.074	-0.062	-0.049	-0.037	-0.025	20
30	-0.025	-0.012	0.000	0.012	0.025	0.037	0.050	0.062	0.074	0.087	0.099	30
40	0.099	0.111	0.124	0.136	0.149							40
°F	0	1	2	3	4	5	6	7	8	9	10	°F

Coefficients and temperature ranges of equations used to compute the above ITS-90 based table for K (Positive) versus Gold - 0.07% Iron thermocouples.

-459 °F to 44 °F

c_0	=	-3.943 288 352 83 X 10 ⁻⁰¹
c_1	=	1.226 772 330 60 X 10 ⁻⁰²
c_2	=	1.636 991 958 17 X 10 ⁻⁰⁶
c_3	=	5.820 356 987 29 X 10 ⁻⁰⁹
c_4	=	1.164 639 407 70 X 10 ⁻¹³
c_5	=	-2.491 493 507 12 X 10 ⁻¹²
c_6	=	-2.512 241 604 00 X 10 ⁻¹⁴
c_7	=	4.281 794 129 16 X 10 ⁻¹⁷
c_8	=	2.523 678 880 90 X 10 ⁻¹⁸
c_9	=	2.192 565 088 72 X 10 ⁻²⁰
c_{10}	=	1.009 377 284 90 X 10 ⁻²²
c_{11}	=	2.805 940 527 01 X 10 ⁻²⁵
c_{12}	=	4.731 998 451 57 X 10 ⁻²⁸
c_{13}	=	4.471 949 104 20 X 10 ⁻³¹
c_{14}	=	1.821 270 730 56 X 10 ⁻³⁴

TABLE 7 Platinum–5 % Molybdenum versus Platinum–0.1 % Molybdenum thermocouples—thermoelectric voltage as a function of temperature (°C), reference junctions at 0°C

°C	0	1	2	3	4	5	6	7	8	9	10	°C
Thermoelectric Voltage in Millivolts												
0	0.000	0.011	0.021	0.032	0.042	0.053	0.064	0.075	0.086	0.097	0.108	0
10	0.108	0.119	0.130	0.141	0.152	0.164	0.175	0.187	0.198	0.209	0.221	10
20	0.221	0.233	0.244	0.256	0.268	0.280	0.292	0.303	0.315	0.327	0.340	20
30	0.340	0.352	0.364	0.376	0.388	0.401	0.413	0.425	0.438	0.450	0.463	30
40	0.463	0.476	0.488	0.501	0.514	0.527	0.539	0.552	0.565	0.578	0.591	40
50	0.591	0.604	0.617	0.631	0.644	0.657	0.670	0.684	0.697	0.711	0.724	50
60	0.724	0.738	0.751	0.765	0.779	0.792	0.806	0.820	0.834	0.848	0.862	60
70	0.862	0.876	0.890	0.904	0.918	0.932	0.946	0.960	0.975	0.989	1.003	70
80	1.003	1.018	1.032	1.047	1.061	1.076	1.090	1.105	1.120	1.135	1.149	80
90	1.149	1.164	1.179	1.194	1.209	1.224	1.239	1.254	1.269	1.284	1.299	90
100	1.299	1.315	1.330	1.345	1.361	1.376	1.391	1.407	1.422	1.438	1.453	100
110	1.453	1.469	1.485	1.500	1.516	1.532	1.548	1.564	1.579	1.595	1.611	110
120	1.611	1.627	1.643	1.659	1.676	1.692	1.708	1.724	1.740	1.757	1.773	120
130	1.773	1.789	1.806	1.822	1.839	1.855	1.872	1.888	1.905	1.922	1.938	130
140	1.938	1.955	1.972	1.988	2.005	2.022	2.039	2.056	2.073	2.090	2.107	140
150	2.107	2.124	2.141	2.158	2.176	2.193	2.210	2.227	2.245	2.262	2.279	150
160	2.279	2.297	2.314	2.332	2.349	2.367	2.384	2.402	2.420	2.437	2.455	160
170	2.455	2.473	2.491	2.508	2.526	2.544	2.562	2.580	2.598	2.616	2.634	170
180	2.634	2.652	2.670	2.688	2.707	2.725	2.743	2.761	2.780	2.798	2.816	180
190	2.816	2.835	2.853	2.872	2.890	2.909	2.927	2.946	2.964	2.983	3.002	190
200	3.002	3.020	3.039	3.058	3.077	3.096	3.114	3.133	3.152	3.171	3.190	200
210	3.190	3.209	3.228	3.247	3.266	3.286	3.305	3.324	3.343	3.362	3.382	210
220	3.382	3.401	3.420	3.440	3.459	3.479	3.498	3.518	3.537	3.557	3.576	220
230	3.576	3.596	3.615	3.635	3.655	3.674	3.694	3.714	3.734	3.754	3.774	230
240	3.774	3.793	3.813	3.833	3.853	3.873	3.893	3.913	3.933	3.954	3.974	240
250	3.974	3.994	4.014	4.034	4.055	4.075	4.095	4.115	4.136	4.156	4.177	250
260	4.177	4.197	4.218	4.238	4.259	4.279	4.300	4.320	4.341	4.362	4.382	260
270	4.382	4.403	4.424	4.444	4.465	4.486	4.507	4.528	4.549	4.570	4.591	270
280	4.591	4.612	4.633	4.654	4.675	4.696	4.717	4.738	4.759	4.780	4.801	280
290	4.801	4.823	4.844	4.865	4.887	4.908	4.929	4.951	4.972	4.994	5.015	290
300	5.015	5.036	5.058	5.080	5.101	5.123	5.144	5.166	5.188	5.209	5.231	300
310	5.231	5.253	5.275	5.296	5.318	5.340	5.362	5.384	5.406	5.428	5.450	310
320	5.450	5.472	5.494	5.516	5.538	5.560	5.582	5.604	5.626	5.648	5.671	320
330	5.671	5.693	5.715	5.737	5.760	5.782	5.804	5.827	5.849	5.871	5.894	330
340	5.894	5.916	5.939	5.961	5.984	6.006	6.029	6.052	6.074	6.097	6.120	340
350	6.120	6.142	6.165	6.188	6.211	6.233	6.256	6.279	6.302	6.325	6.348	350
360	6.348	6.371	6.394	6.417	6.440	6.463	6.486	6.509	6.532	6.555	6.578	360
370	6.578	6.601	6.625	6.648	6.671	6.694	6.718	6.741	6.764	6.788	6.811	370
380	6.811	6.834	6.858	6.881	6.905	6.928	6.952	6.975	6.999	7.022	7.046	380
390	7.046	7.069	7.093	7.117	7.140	7.164	7.188	7.212	7.235	7.259	7.283	390
400	7.283	7.307	7.331	7.355	7.379	7.402	7.426	7.450	7.474	7.498	7.522	400
410	7.522	7.546	7.571	7.595	7.619	7.643	7.667	7.691	7.715	7.740	7.764	410
420	7.764	7.788	7.812	7.837	7.861	7.885	7.910	7.934	7.959	7.983	8.007	420
430	8.007	8.032	8.056	8.081	8.105	8.130	8.155	8.179	8.204	8.228	8.253	430
440	8.253	8.278	8.302	8.327	8.352	8.377	8.401	8.426	8.451	8.476	8.501	440
450	8.501	8.525	8.550	8.575	8.600	8.625	8.650	8.675	8.700	8.725	8.750	450
460	8.750	8.775	8.800	8.825	8.850	8.875	8.901	8.926	8.951	8.976	9.001	460
470	9.001	9.026	9.052	9.077	9.102	9.127	9.153	9.178	9.203	9.229	9.254	470
480	9.254	9.280	9.305	9.330	9.356	9.381	9.407	9.432	9.458	9.483	9.509	480
490	9.509	9.534	9.560	9.585	9.611	9.637	9.662	9.688	9.714	9.739	9.765	490
500	9.765	9.791	9.817	9.842	9.868	9.894	9.920	9.946	9.972	9.998	10.024	500
°C	0	1	2	3	4	5	6	7	8	9	10	°C