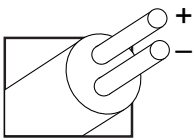


Revised Thermocouple Reference Tables

TYPE R

Reference Tables
N.I.S.T.
Monograph 175
Revised to
ITS-90

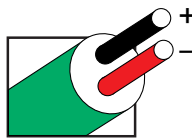


Thermocouple
Grade

NONE
ESTABLISHED

**Platinum-13% Rhodium
VS.
Platinum**

Extension
Grade



MAXIMUM TEMPERATURE RANGE

Thermocouple Grade
32 to 2642°F
0 to 1450°C
Extension Grade
32 to 300°F
0 to 150°C

LIMITS OF ERROR
(whichever is greater)
Standard: 1.5°C or 0.25%
Special: 0.6°C or 0.1%

COMMENTS, BARE WIRE ENVIRONMENT:
Oxidizing or Inert; Do Not Insert in Metal Tubes;
Beware of Contamination; High Temperature

**TEMPERATURE IN DEGREES °F
REFERENCE JUNCTION AT 32°F**

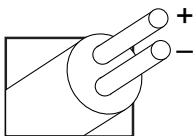
Thermoelectric Voltage in Millivolts

°F	0	1	2	3	4	5	6	7	8	9	10	°F	1400	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800	1810	1820	1830	1840	1850	1860	1870	1880	1890											
900	4.279	4.285	4.291	4.297	4.303	4.309	4.315	4.321	4.327	4.333	4.339	900	1400	7.461	7.468	7.475	7.481	7.488	7.495	7.502	7.508	7.515	7.522	7.529	1400	7.529	7.535	7.542	7.549	7.556	7.562	7.569	7.576	7.583	7.589	7.596	1410	7.596	7.603	7.610	7.616	7.623	7.630	7.637	7.644	7.650	7.657	7.664	1420	7.664	7.671	7.677	7.684	7.691	7.698	7.705	7.711	7.718	7.725	7.732	1430	7.732	7.739	7.745	7.752	7.759	7.766	7.772	7.779	7.786	7.793	7.800	1440
910	4.339	4.345	4.351	4.357	4.363	4.369	4.375	4.381	4.387	4.393	4.399	910	1450	7.800	7.807	7.813	7.820	7.827	7.834	7.841	7.847	7.854	7.861	7.868	1450	7.868	7.875	7.882	7.888	7.895	7.902	7.909	7.916	7.922	7.929	7.936	1460	7.936	7.943	7.950	7.957	7.964	7.970	7.977	7.984	7.991	7.998	8.005	1470	8.005	8.011	8.018	8.025	8.032	8.039	8.046	8.053	8.059	8.066	8.073	1480	8.073	8.080	8.087	8.094	8.101	8.108	8.114	8.121	8.128	8.135	8.142	1490
920	4.399	4.405	4.411	4.417	4.423	4.429	4.435	4.441	4.447	4.453	4.459	920	1500	8.142	8.149	8.156	8.163	8.169	8.176	8.183	8.190	8.197	8.204	8.211	1500	8.211	8.218	8.225	8.232	8.238	8.245	8.252	8.259	8.266	8.273	8.280	1510	8.280	8.287	8.294	8.301	8.308	8.314	8.321	8.328	8.335	8.342	8.349	1520	8.349	8.356	8.363	8.370	8.377	8.384	8.391	8.398	8.405	8.412	8.418	1530	8.418	8.425	8.432	8.439	8.446	8.453	8.460	8.467	8.474	8.481	8.488	1540
930	4.459	4.465	4.471	4.477	4.483	4.489	4.495	4.502	4.508	4.514	4.520	930	1550	8.488	8.495	8.502	8.509	8.516	8.523	8.530	8.537	8.544	8.551	8.557	1550	8.557	8.564	8.571	8.578	8.585	8.592	8.599	8.606	8.613	8.620	8.627	1560	8.627	8.634	8.641	8.648	8.655	8.662	8.669	8.676	8.683	8.690	8.697	1570	8.697	8.704	8.711	8.718	8.725	8.732	8.739	8.746	8.753	8.760	8.767	1580	8.767	8.774	8.781	8.788	8.795	8.802	8.809	8.816	8.823	8.830	8.837	1590
940	4.520	4.526	4.532	4.538	4.544	4.550	4.556	4.562	4.568	4.574	4.580	940	1600	8.837	8.844	8.852	8.859	8.866	8.873	8.880	8.887	8.894	8.901	8.908	1600	8.908	8.915	8.922	8.929	8.936	8.943	8.950	8.957	8.964	8.971	8.978	1610	8.978	8.985	8.992	8.999	9.007	9.014	9.021	9.028	9.035	9.042	9.049	1620	9.049	9.056	9.063	9.070	9.077	9.084	9.091	9.098	9.106	9.113	9.120	1630	9.120	9.127	9.134	9.141	9.148	9.155	9.162	9.169	9.176	9.184	9.191	1640
950	4.580	4.586	4.593	4.599	4.605	4.611	4.617	4.623	4.629	4.635	4.641	950	1650	9.191	9.198	9.205	9.212	9.219	9.226	9.233	9.240	9.248	9.255	9.262	1650	9.262	9.269	9.276	9.283	9.290	9.297	9.304	9.312	9.319	9.326	9.333	1660	9.333	9.340	9.347	9.354	9.361	9.369	9.376	9.383	9.390	9.397	9.404	1670	9.404	9.411	9.419	9.426	9.433	9.440	9.447	9.454	9.461	9.469	9.476	1680	9.476	9.483	9.490	9.497	9.504	9.512	9.519	9.526	9.533	9.540	9.547	1690
960	4.641	4.647	4.653	4.659	4.666	4.672	4.678	4.684	4.690	4.696	4.702	960	1700	9.547	9.555	9.562	9.569	9.576	9.583	9.590	9.598	9.605	9.612	9.619	1700	9.619	9.626	9.634	9.641	9.648	9.655	9.662	9.670	9.677	9.684	9.691	1710	9.691	9.698	9.706	9.713	9.720	9.727	9.734	9.742	9.749	9.756	9.763	1720	9.763	9.770	9.778	9.785	9.792	9.799	9.806	9.814	9.821	9.828	9.835	1730	9.835	9.843	9.850	9.857	9.864	9.872	9.879	9.886	9.893	9.900	9.908	1740
970	4.702	4.708	4.714	4.720	4.727	4.733	4.739	4.745	4.751	4.757	4.763	970	1750	9.908	9.915	9.922	9.929	9.937	9.944	9.951	9.958	9.966	9.973	9.980	1750	9.980	9.987	9.995	10.002	10.009	10.016	10.024	10.031	10.038	10.046	10.053	1760	10.053	10.060	10.067	10.075	10.082	10.089	10.096	10.104	10.111	10.118	10.126	1770	10.126	10.133	10.140	10.147	10.155	10.162	10.169	10.177	10.184	10.191	10.198	1780	10.198	10.206	10.213	10.220	10.228	10.235	10.242	10.250	10.257	10.264	10.271	1790
980	4.763	4.769	4.775	4.782	4.788	4.794	4.800	4.806	4.812	4.818	4.824	980	1800	10.271	10.279	10.286	10.293	10.301	10.308	10.315	10.323	10.330	10.337	10.345	1800	10.345	10.352	10.359	10.367	10.374	10.381	10.389	10.396	10.403	10.411	10.418	1810	10.418	10.425	10.433	10.440	10.447	10.455	10.462	10.469	10.477	10.484	10.491	1820	10.491	10.499	10.506	10.513	10.521	10.528	10.535	10.543	10.550	10.557	10.565	1830	10.565	10.572	10.580	10.587	10.594	10.602	10.609	10.616	10.624	10.631	10.638	1840
990	4.824	4.831	4.837	4.843	4.849	4.855	4.861	4.867	4.874	4.880	4.886	990	1850	10.638	10.646	10.653	10.661	10.668	10.675	10.683	10.690	10.698	10.705	10.712	1850	10.712	10.720	10.727	10.734	10.742	10.749	10.757	10.764	10.771	10.779	10.786	1860	10.786	10.794	10.801	10.808	10.816	10.823	10.831	10.838	10.845	10.853	10.860	1870	10.860	10.868	10.875	10.883	10.890	10.897	10.905	10.912	10.920	10.927	10.934	1880	10.934	10.942	10.949	10.957	10.964	10.972	10.979	10.986	10.994	11.001	11.009	1890

Revised Thermocouple Reference Tables

TYPE R

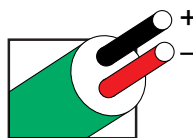
Reference Tables
N.I.S.T.
Monograph 175
Revised to
ITS-90



Thermocouple Grade
NONE ESTABLISHED

Platinum-13% Rhodium
VS.
Platinum

Extension Grade



MAXIMUM TEMPERATURE RANGE
Thermocouple Grade
32 to 2642°F
0 to 1450°C
Extension Grade
32 to 300°F
0 to 150°C
LIMITS OF ERROR
(whichever is greater)
Standard: 1.5°C or 0.25%
Special: 0.6°C or 0.1%
COMMENTS, BARE WIRE ENVIRONMENT:
Oxidizing or Inert; Do Not Insert in Metal Tubes;
Beware of Contamination; High Temperature
TEMPERATURE IN DEGREES °F
REFERENCE JUNCTION AT 32°F

Thermoelectric Voltage in Millivolts

°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
2900	18.756	18.764	18.772	18.779	18.787	18.795	18.803	18.810	18.818	18.826	18.834	2900	3100	20.281	20.289	20.296	20.304	20.311	20.319	20.326	20.333	20.341	20.348	20.356	3100
2910	18.834	18.841	18.849	18.857	18.864	18.872	18.880	18.887	18.895	18.903	18.911	2910	3110	20.356	20.363	20.371	20.378	20.385	20.393	20.400	20.407	20.415	20.422	20.430	3110
2920	18.911	18.918	18.926	18.934	18.941	18.949	18.957	18.965	18.972	18.980	18.988	2920	3120	20.430	20.437	20.444	20.452	20.459	20.466	20.474	20.481	20.488	20.496	20.503	3120
2930	18.988	18.995	19.003	19.011	19.018	19.026	19.034	19.042	19.049	19.057	19.065	2930	3130	20.503	20.510	20.518	20.525	20.532	20.540	20.547	20.554	20.562	20.569	20.576	3130
2940	19.065	19.072	19.080	19.088	19.095	19.103	19.111	19.118	19.126	19.134	19.141	2940	3140	20.576	20.583	20.591	20.598	20.605	20.612	20.620	20.627	20.634	20.641	20.649	3140
2950	19.141	19.149	19.157	19.165	19.172	19.180	19.188	19.195	19.203	19.211	19.218	2950	3150	20.649	20.656	20.663	20.670	20.678	20.685	20.692	20.699	20.706	20.714	20.721	3150
2960	19.218	19.226	19.234	19.241	19.249	19.257	19.264	19.272	19.280	19.287	19.295	2960	3160	20.721	20.728	20.735	20.742	20.749	20.756	20.764	20.771	20.778	20.785	20.792	3160
2970	19.295	19.303	19.310	19.318	19.326	19.333	19.341	19.349	19.356	19.364	19.372	2970	3170	20.792	20.799	20.806	20.813	20.821	20.828	20.835	20.842	20.849	20.856	20.863	3170
2980	19.372	19.379	19.387	19.395	19.402	19.410	19.418	19.425	19.433	19.440	19.448	2980	3180	20.863	20.870	20.877	20.884	20.891	20.898	20.905	20.912	20.919	20.926	20.933	3180
2990	19.448	19.456	19.463	19.471	19.479	19.486	19.494	19.502	19.509	19.517	19.525	2990	3190	20.933	20.940	20.947	20.954	20.961	20.968	20.975	20.982	20.989	20.996	21.003	3190
3000	19.525	19.532	19.540	19.547	19.555	19.563	19.570	19.578	19.586	19.593	19.601	3000	3200	21.003	21.010	21.016	21.023	21.030	21.037	21.044	21.051	21.058	21.065	21.071	3200
3010	19.601	19.609	19.616	19.624	19.631	19.639	19.647	19.654	19.662	19.670	19.677	3010	3210	21.071	21.078	21.085	21.092	21.099							3210
3020	19.677	19.685	19.692	19.700	19.708	19.715	19.723	19.730	19.738	19.746	19.753	3020													
3030	19.753	19.761	19.769	19.776	19.784	19.791	19.799	19.807	19.814	19.822	19.829	3030													
3040	19.829	19.837	19.845	19.852	19.860	19.867	19.875	19.882	19.890	19.898	19.905	3040													
3050	19.905	19.913	19.920	19.928	19.936	19.943	19.951	19.958	19.966	19.973	19.981	3050													
3060	19.981	19.989	19.996	20.004	20.011	20.019	20.026	20.034	20.041	20.049	20.056	3060													
3070	20.056	20.064	20.072	20.079	20.087	20.094	20.102	20.109	20.117	20.124	20.132	3070													
3080	20.132	20.139	20.147	20.154	20.162	20.169	20.177	20.184	20.192	20.199	20.207	3080													
3090	20.207	20.214	20.222	20.229	20.237	20.244	20.252	20.259	20.266	20.274	20.281	3090													
°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



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