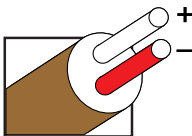


Revised Thermocouple Reference Tables

TYPE J

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



Thermocouple Grade

MAXIMUM TEMPERATURE RANGE

Thermocouple Grade

32 to 1382°F

0 to 750°C

Extension Grade

32 to 392°F

0 to 200°C

LIMITS OF ERROR

(whichever is greater)

Standard: 2.2°C or 0.75%

Special: 1.1°C or 0.4%

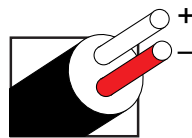
COMMENTS, BARE WIRE ENVIRONMENT:

Reducing, Vacuum, Inert; Limited Use in Oxidizing at High Temperatures; Not Recommended for Low Temperatures

TEMPERATURE IN DEGREES °C

REFERENCE JUNCTION AT 0°C

Iron vs. Copper-Nickel



Extension Grade

Thermoelectric Voltage in Millivolts

°C	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0	°C	°C	0	1	2	3	4	5	6	7	8	9	10	°C
-200	-8.095	-8.076	-8.057	-8.037	-8.017	-7.996	-7.976	-7.955	-7.934	-7.912	-7.890	-200	500	27.393	27.449	27.505	27.561	27.617	27.673	27.729	27.785	27.841	27.897	27.953	500
-190	-7.890	-7.868	-7.846	-7.824	-7.801	-7.778	-7.755	-7.731	-7.707	-7.683	-7.659	-190	510	27.953	28.010	28.066	28.122	28.178	28.234	28.291	28.347	28.403	28.460	28.516	510
-180	-7.659	-7.634	-7.610	-7.585	-7.559	-7.534	-7.508	-7.482	-7.456	-7.429	-7.403	-180	520	28.516	28.572	28.629	28.685	28.741	28.798	28.854	28.911	28.967	29.024	29.080	520
-170	-7.403	-7.376	-7.348	-7.321	-7.293	-7.265	-7.237	-7.209	-7.181	-7.152	-7.123	-170	530	29.080	29.137	29.194	29.250	29.307	29.363	29.420	29.477	29.534	29.590	29.647	530
-160	-7.123	-7.094	-7.064	-7.035	-7.005	-6.975	-6.944	-6.914	-6.883	-6.853	-6.821	-160	540	29.647	29.704	29.761	29.818	29.874	29.931	29.988	30.045	30.102	30.159	30.216	540
-150	-6.821	-6.790	-6.757	-6.722	-6.695	-6.663	-6.631	-6.598	-6.566	-6.533	-6.500	-150	550	30.216	30.273	30.330	30.387	30.444	30.502	30.559	30.616	30.673	30.730	30.788	550
-140	-6.500	-6.467	-6.433	-6.400	-6.366	-6.332	-6.298	-6.263	-6.229	-6.194	-6.159	-140	560	30.788	30.845	30.902	30.960	31.017	31.074	31.132	31.189	31.247	31.304	31.362	560
-130	-6.159	-6.124	-6.089	-6.054	-6.018	-5.982	-5.946	-5.910	-5.874	-5.838	-5.801	-130	570	31.362	31.419	31.477	31.535	31.592	31.650	31.708	31.766	31.823	31.881	31.939	570
-120	-5.801	-5.764	-5.727	-5.690	-5.653	-5.616	-5.578	-5.541	-5.503	-5.465	-5.426	-120	580	31.939	31.997	32.055	32.113	32.171	32.229	32.287	32.345	32.403	32.461	32.519	580
-110	-5.426	-5.388	-5.350	-5.311	-5.272	-5.233	-5.194	-5.155	-5.116	-5.076	-5.037	-110	590	32.519	32.577	32.635	32.693	32.751	32.809	32.867	32.925	32.983	33.041	33.099	590
-100	-5.037	-4.997	-4.957	-4.917	-4.877	-4.836	-4.796	-4.755	-4.714	-4.674	-4.633	-100	600	33.099	33.157	33.215	33.273	33.331	33.389	33.447	33.505	33.563	33.621	33.679	600
-90	-4.633	-4.591	-4.550	-4.509	-4.467	-4.425	-4.384	-4.342	-4.300	-4.257	-4.215	-90	610	33.679	33.737	33.795	33.853	33.911	33.969	34.027	34.085	34.143	34.201	34.259	610
-80	-4.215	-4.173	-4.130	-4.088	-4.045	-4.002	-3.959	-3.916	-3.872	-3.829	-3.786	-80	620	34.259	34.317	34.375	34.433	34.491	34.549	34.607	34.665	34.723	34.781	34.839	620
-70	-3.786	-3.742	-3.698	-3.654	-3.610	-3.566	-3.522	-3.478	-3.434	-3.389	-3.344	-70	630	34.839	34.897	34.955	35.013	35.071	35.129	35.187	35.245	35.303	35.361	35.419	630
-60	-3.344	-3.300	-3.255	-3.210	-3.165	-3.120	-3.075	-3.029	-2.984	-2.938	-2.893	-60	640	35.419	35.477	35.535	35.593	35.651	35.709	35.767	35.825	35.883	35.941	36.000	640
-50	-2.893	-2.847	-2.801	-2.755	-2.709	-2.663	-2.617	-2.571	-2.524	-2.478	-2.431	-50	650	36.000	36.058	36.116	36.174	36.232	36.290	36.348	36.406	36.464	36.522	36.580	650
-40	-2.431	-2.385	-2.338	-2.291	-2.244	-2.197	-2.150	-2.103	-2.055	-2.008	-1.961	-40	660	36.580	36.638	36.696	36.754	36.812	36.870	36.928	36.986	37.044	37.102	37.160	660
-30	-1.961	-1.913	-1.865	-1.818	-1.770	-1.722	-1.674	-1.626	-1.578	-1.530	-1.482	-30	670	37.160	37.218	37.276	37.334	37.392	37.450	37.508	37.566	37.624	37.682	37.740	670
-20	-1.482	-1.433	-1.385	-1.336	-1.288	-1.239	-1.190	-1.142	-1.093	-1.044	-0.995	-20	680	37.740	37.798	37.856	37.914	37.972	38.030	38.088	38.146	38.204	38.262	38.320	680
-10	-0.995	-0.946	-0.896	-0.846	-0.796	-0.746	-0.696	-0.646	-0.596	-0.545	-0.501	-10	690	38.320	38.378	38.436	38.494	38.552	38.610	38.668	38.726	38.784	38.842	690	
0	-0.501	-0.451	-0.401	-0.351	-0.301	-0.251	-0.201	-0.151	-0.101	-0.050	0.000	0	700	38.842	38.899	38.957	39.015	39.073	39.131	39.189	39.247	39.305	39.363	700	
0	0.000	0.050	0.101	0.151	0.202	0.253	0.303	0.354	0.405	0.456	0.507	0	710	39.363	39.420	39.478	39.536	39.594	39.652	39.710	39.768	39.826	39.884	710	
10	0.507	0.558	0.609	0.660	0.711	0.762	0.813	0.865	0.916	0.968	1.019	10	720	39.884	39.941	39.999	40.057	40.115	40.173	40.231	40.289	40.347	40.405	720	
20	1.019	1.071	1.122	1.174	1.226	1.277	1.329	1.381	1.433	1.485	1.537	20	730	40.405	40.462	40.520	40.578	40.636	40.694	40.752	40.810	40.868	40.926	730	
30	1.537	1.589	1.641	1.693	1.745	1.797	1.849	1.902	1.954	2.006	2.059	30	740	41.012	41.070	41.128	41.186	41.244	41.302	41.360	41.418	41.476	41.534	740	
40	2.059	2.111	2.164	2.216	2.269	2.322	2.374	2.427	2.480	2.532	2.585	40	750	41.645	41.703	41.761	41.819	41.877	41.935	41.993	42.051	42.109	42.167	750	
50	2.585	2.638	2.691	2.744	2.797	2.850	2.903	2.956	3.009	3.062	3.116	50	760	42.281	42.340	42.400	42.459	42.518	42.577	42.636	42.695	42.754	42.813	760	
60	3.116	3.169	3.222	3.275	3.328	3.382	3.436	3.489	3.543	3.596	3.650	60	770	42.813	42.872	42.931	42.990	43.049	43.108	43.167	43.226	43.285	43.344	770	
70	3.650	3.703	3.757	3.810	3.863	3.918	3.971	4.025	4.079	4.133	4.187	70	780	43.344	43.403	43.462	43.521	43.580	43.639	43.698	43.757	43.816	43.875	780	
80	4.187	4.240	4.294	4.348	4.402	4.456	4.510	4.564	4.618	4.672	4.726	80	790	44.203	44.262	44.321	44.380	44.439	44.498	44.557	44.616	44.675	44.734	790	
90	4.726	4.781	4.835	4.889	4.943	4.997	5.052	5.106	5.160	5.214	5.269	90	800	45.494	45.553	45.612	45.671	45.730	45.789	45.848	45.907	45.966	46.025	800	
100	5.269	5.323	5.378	5.432	5.487	5.541	5.595	5.650	5.705	5.759	5.814	100	810	46.141	46.200	46.259	46.318	46.377	46.436	46.495	46.554	46.613	46.672	810	
110	5.814	5.868	5.923	5.977	6.032	6.087	6.141	6.196	6.251	6.306	6.360	110	820	46.789	46.848	46.907	46.966	47.025	47.084	47.143	47.202	47.261	47.320	820	
120	6.360	6.415	6.470	6.525	6.579	6.634	6.689	6.744	6.799	6.854	6.909	120	830	47.431	47.490	47.549	47.608	47.667	47.726	47.785	47.844	47.903	47.962	830	
130	6.909	6.964	7.019	7.074	7.129	7.184	7.239	7.294	7.349	7.404	7.459	130	840	48.074	48.133	48.192	48.251	48.310	48.369	48.428	48.487	48.546	48.605	840	
140	7.459	7.514	7.569	7.624	7.679	7.734	7.789	7.844	7.900	7.955	8.010	140	850	48.717	48.776	48.835	48.894	48.953	49.012	49.071	49.130	49.189	49.248	850	
150	8.010	8.065	8.120	8.175	8.231	8.286	8.341	8.396	8.452	8.507	8.562	150	860	49.360	49.419	49.478	49.537	49.596	49.655	49.714	49.773	49.832	49.891	860	
160	8.562	8.618	8.673	8.728	8.783	8.839	8.894	8.949	9.005	9.060	9.115	160	870	49.999	50.058	50.117	50.176	50.235	50.294	50.353	50.412	50.471	50.530	870	
170	9.115	9.171	9.226	9.282	9.337	9.392	9.448																		