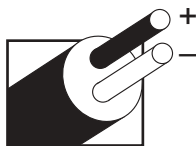


Revised Thermocouple Reference Tables

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

J

Iron
vs.
Copper-Nickel



MAXIMUM TEMPERATURE RANGE

Thermocouple Grade
0 to 750°C, 32 to 1382°F

Extension Grade
0 to 200°C, 32 to 392°F

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
Oxidising at High Temperatures;
Not Recommended for Low Temperatures

TEMPERATURE IN DEGREES °C
REFERENCE JUNCTION AT 0°C

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
-190	-8.095	-8.076	-8.057	-8.037	-8.017	-7.996	-7.976	-7.955	-7.934	-7.912	-7.890	-190	500	27.393	27.449	27.505	27.561	27.617	27.673	27.729	27.785	27.841	27.897	27.953	500
-180	-7.659	-7.634	-7.610	-7.585	-7.559	-7.534	-7.508	-7.482	-7.456	-7.429	-7.403	-180	510	27.953	28.010	28.066	28.122	28.178	28.234	28.291	28.347	28.403	28.460	28.516	510
-170	-7.403	-7.376	-7.348	-7.321	-7.293	-7.265	-7.237	-7.209	-7.181	-7.152	-7.123	-170	520	28.516	28.572	28.629	28.685	28.741	28.798	28.854	28.911	28.967	29.024	29.081	520
-160	-7.123	-7.094	-7.064	-7.035	-7.005	-6.975	-6.944	-6.914	-6.883	-6.853	-6.821	-160	530	29.080	29.137	29.194	29.250	29.307	29.363	29.420	29.477	29.534	29.590	29.647	530
-150	-6.821	-6.790	-6.759	-6.727	-6.695	-6.663	-6.631	-6.598	-6.566	-6.533	-6.500	-150	540	29.647	29.704	29.761	29.818	29.874	29.931	29.988	30.045	30.102	30.159	30.216	540
-140	-6.500	-6.467	-6.433	-6.400	-6.366	-6.332	-6.298	-6.263	-6.229	-6.194	-6.159	-140	550	30.216	30.273	30.330	30.387	30.444	30.502	30.559	30.616	30.673	30.730	30.788	550
-130	-6.159	-6.124	-6.089	-6.054	-6.018	-5.982	-5.946	-5.910	-5.874	-5.838	-5.801	-130	560	30.788	30.845	30.902	30.960	31.017	31.074	31.132	31.189	31.247	31.304	31.362	560
-120	-5.801	-5.764	-5.727	-5.690	-5.653	-5.616	-5.578	-5.541	-5.503	-5.465	-5.426	-120	570	31.362	31.419	31.477	31.535	31.592	31.650	31.708	31.766	31.823	31.881	31.939	570
-110	-5.426	-5.388	-5.350	-5.311	-5.272	-5.233	-5.194	-5.155	-5.116	-5.076	-5.037	-110	580	31.939	31.997	32.055	32.113	32.171	32.229	32.287	32.345	32.403	32.461	32.519	580
-100	-5.037	-4.997	-4.957	-4.917	-4.877	-4.836	-4.796	-4.755	-4.714	-4.674	-4.633	-100	590	32.519	32.577	32.636	32.694	32.752	32.810	32.868	32.927	32.985	33.044	33.102	590
-90	-4.633	-4.591	-4.550	-4.509	-4.467	-4.425	-4.384	-4.342	-4.300	-4.257	-4.215	-90	600	33.102	33.161	33.219	33.278	33.337	33.395	33.454	33.513	33.571	33.630	33.689	600
-80	-4.215	-4.173	-4.130	-4.088	-4.045	-4.002	-3.959	-3.916	-3.872	-3.829	-3.786	-80	610	33.689	33.748	33.807	33.866	33.925	33.984	34.043	34.102	34.161	34.220	34.279	610
-70	-3.786	-3.742	-3.698	-3.654	-3.610	-3.566	-3.522	-3.478	-3.434	-3.389	-3.344	-70	620	34.279	34.338	34.397	34.457	34.516	34.575	34.635	34.694	34.754	34.813	34.873	620
-60	-3.344	-3.300	-3.255	-3.210	-3.165	-3.120	-3.075	-3.029	-2.984	-2.938	-2.893	-60	630	34.873	34.932	34.992	35.051	35.111	35.171	35.230	35.290	35.350	35.410	35.470	630
-50	-2.893	-2.847	-2.801	-2.755	-2.709	-2.663	-2.617	-2.571	-2.524	-2.478	-2.431	-50	640	35.470	35.530	35.590	35.650	35.710	35.770	35.830	35.890	35.950	36.010	36.071	640
-40	-2.431	-2.385	-2.338	-2.291	-2.244	-2.197	-2.150	-2.103	-2.055	-2.008	-1.961	-40	650	36.071	36.131	36.191	36.251	36.311	36.371	36.431	36.491	36.551	36.611	36.671	650
-30	-1.961	-1.913	-1.865	-1.818	-1.770	-1.722	-1.674	-1.626	-1.578	-1.530	-1.482	-30	660	36.671	36.731	36.791	36.851	36.911	36.971	37.031	37.091	37.151	37.211	37.271	660
-20	-1.482	-1.433	-1.385	-1.336	-1.288	-1.239	-1.190	-1.142	-1.093	-1.044	-0.995	-20	670	37.271	37.331	37.391	37.451	37.511	37.571	37.631	37.691	37.751	37.811	37.871	670
-10	-0.995	-0.946	-0.896	-0.847	-0.797	-0.748	-0.699	-0.650	-0.600	-0.550	-0.501	-10	680	37.871	37.931	37.991	38.051	38.111	38.171	38.231	38.291	38.351	38.411	38.471	680
0	-0.501	-0.451	-0.401	-0.351	-0.301	-0.251	-0.201	-0.151	-0.101	-0.050	0.000	0	690	38.512	38.572	38.632	38.692	38.752	38.812	38.872	38.932	39.000	39.070	39.132	690
0	0.000	0.050	0.101	0.151	0.202	0.253	0.304	0.354	0.405	0.456	0.507	0	700	39.132	39.192	39.252	39.312	39.372	39.432	39.492	39.552	39.612	39.672	39.732	700
10	0.507	0.558	0.609	0.660	0.711	0.762	0.813	0.865	0.916	0.968	1.019	10	710	39.732	39.792	39.852	39.912	40.000	40.060	40.120	40.180	40.250	40.310	40.380	710
20	1.019	1.071	1.122	1.174	1.226	1.277	1.329	1.381	1.433	1.485	1.537	20	720	40.380	40.440	40.500	40.560	40.630	40.690	40.750	40.820	40.880	40.940	41.010	720
30	1.537	1.589	1.641	1.693	1.745	1.797	1.849	1.902	1.954	2.006	2.059	30	730	41.010	41.070	41.130	41.200	41.260	41.320	41.390	41.450	41.520	41.580	41.650	730
40	2.059	2.111	2.164	2.216	2.269	2.322	2.374	2.427	2.480	2.532	2.585	40	740	41.645	41.708	41.772	41.835	41.899	41.962	42.026	42.090	42.153	42.217	42.281	740
50	2.585	2.638	2.691	2.744	2.797	2.850	2.903	2.956	3.009	3.062	3.116	50	750	42.281	42.344	42.408	42.472	42.536	42.599	42.663	42.727	42.791	42.855	42.919	750
60	3.116	3.169	3.222	3.275	3.329	3.382	3.436	3.489	3.543	3.596	3.650	60	760	42.919	42.983	43.047	43.111	43.175	43.239	43.303	43.367	43.431	43.495	43.559	760
70	3.650	3.703	3.757	3.810	3.864	3.918	3.971	4.025	4.079	4.133	4.187	70	770	43.559	43.624	43.688	43.752	43.817	43.881	43.945	44.010	44.074	44.139	44.203	770
80	4.187	4.240	4.294	4.348	4.402	4.456	4.510	4.564	4.618	4.672	4.726	80	780	44.203	44.267	44.332	44.396	44.461	44.525	44.590	44.655	44.719	44.784	44.848	780
90	4.726	4.781	4.835	4.889	4.943	4.997	5.052	5.106	5.160	5.215	5.269	90	790	44.848	44.913	44.977	45.042	45.107	45.171	45.236	45.301	45.365	45.430	45.494	790
100	5.269	5.323	5.378	5.432	5.487	5.541	5.595	5.650	5.705	5.759	5.814	100	800	45.494	45.559	45.624	45.688	45.753	45.818	45.882	45.947	46.011	46.076	46.141	800
110	5.814	5.868	5.923	5.977	6.032	6.087	6.141	6.196	6.251	6.306	6.360	110	810	46.141	46.206	46.270	46.334	46.399	46.464	46.528	46.593	46.657	46.722	46.786	810
120	6.360	6.415	6.470	6.525	6.579	6.634	6.689	6.744	6.799	6.854	6.909	120	820	46.786	46.851	46.915	46.980	47.044	47.109	47.173	47.238	47.302	47.367	47.431	820
130	6.909	6.964	7.019	7.074	7.129	7.184	7.239	7.294	7.349	7.404	7.459	130	830	47.431	47.495	47.560	47.624	47.688	47.753	47.817	47.881	47.946	48.010	48.074	830
140	7.459	7.514	7.569	7.624	7.679	7.734	7.789	7.844	7.900	7.955	8.010	140	840	48.074	48.138	48.202	48.267	48.331	48.395	48.459	48.523	48.587	48.651	48.715	840
150	8.010	8.065	8.120	8.175	8.231	8.286	8.341	8.396	8.452	8.507	8.562	150	850	48.715	48.779	48.843	48.907	48.971	49.034	49.098	49.162	49.226	49.290	49.353	850
160	8.562	8.618	8.673	8.728	8.783	8.839	8.894	8.949	9.005	9.060	9.115	160	860	49.353	49.417	49.481	49.544	49.608	49.672	49.735	49.799	49.862	49.926	49.989	860
170	9.115	9.171	9.226	9.282	9.337	9.392	9.448	9.503	9.559	9.614	9.669	170	870	49.989	50.052	50.116	50.179	50.243	50.306	50.369	50.432	50.495	50.559	50.622	870
180	9.669	9.725	9.780	9.836	9.891	9.947	10.002	10.057	10.113	10.168	10.224	180	880	50.622	50.685	50.748	50.811	50.874	50.937	51.000	51.063	51.126	51.189	51.251	880
190	10.224	10.279	10.335	10.390	10.446	10.501	10.557	10.612	10.668	10.723	10.779	190	890	51.251	51.314	51.377	51.439	51.502	51.565	51.627	51.690	51.752	51.815	51.877	890
200	10.779	10.834	10.890	10.945	11.001	11.056	11.112	11.167	11.223	11.278	11.334	200	900	51.877	51.940	52.002	52.064	52.127	52.189	52.251	52.314	52.376	52.438	52.500	900
210	11.334	11.389	11.445	11.501	11.556	11.612	11.667	11.723	11.778	11.834	11.889	210	910	52.500	52.562	52.624	52.686	52.748	52.810	52.872	52.934	52.996	53.057	53.119	910
220	11.889	11.945	12.000	12.056	12.111	12.167	12.222	12.278	12.334	12.389	12.445	220	920	53.119	53.181	53.243	53.304	53.366	53.427	53.488	53.550	53.612	53.673	53.735	920
230	1																								