MAXIMUM TEMPERATURE RANGE

Thermocouple Grade

- 328 to 2282°F

- 200 to 1250°C

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

LIMITS OF ERROR

Children of Error (whichever is greater) Standard: 2.2°C or 0.75% Above 0°C 2.2°C or 2.0% Below 0°C Special: 1.1°C or 0.4%

COMMENTS, BARE WIRE ENVIRONMENT:

Clean Oxidizing and Inert; Limited Use in Vacuum or Reducing; Wide Temperature Range; Most Popular Calibration TEMPERATURE IN DEGREES °C REFERENCE JUNCTION AT 0°C

Extension

Grade

Thermocouple Grade

Revised Thermocouple Reference Tables

Nickel-Chromium VS. Nickel-Aluminum

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



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
													250				10.276								250
													260				10.684								260
-260	-6.458	6 457	6.456	6.455	6 452	6.452	6 4EO	6 110	6 116	6 111	6 111	260	270 280				11.094 11.506								270 280
-250		-6.438												11.795											290
-240		-6.399											300				12.333								300
-230		-6.337								-6.271		-230	310				12.748								310
-220		-6.252										-220		13.040											320
-210 -200		-6.147 -6.021										-210 -200	330 340	13.457			14.000								330 340
-200	-0.033	-0.021	-0.007	-3.774	-3.700	-3.703	-3.731	-3.730	-3.722	-3.707	-3.071	-200	340	13.074	13.710	13.730	14.000	14.042	14.004	14.120	14.107	14.207	14.231	14.273	340
-190	-5.891	-5.876	-5.861	-5.845	-5.829	-5.813	-5.797	-5.780	-5.763	-5.747	-5.730	-190	350	14.293	14.335	14.377	14.419	14.461	14.503	14.545	14.587	14.629	14.671	14.713	350
-180		-5.713										-180	360	14.713											360
-170		-5.531											370				15.259								370
-160		-5.333											380				15.680								380
-150	-5.141	-5.119	-5.097	-5.074	-5.052	-5.029	-5.006	-4.983	-4.960	-4.936	-4.913	-150	390	15.975	16.017	16.059	16.102	16.144	16.186	16.228	16.270	16.313	16.355	16.397	390
-140	-4.913	-4.889	-4.865	-4.841	-4.817	-4.793	-4.768	-4.744	-4.719	-4.694	-4.669	-140	400	16.397	16.439	16.482	16.524	16.566	16.608	16.651	16.693	16.735	16.778	16.820	400
-130	-4.669	-4.644	-4.618	-4.593	-4.567	-4.542	-4.516	-4.490	-4.463	-4.437	-4.411	-130	410	16.820	16.862	16.904	16.947	16.989	17.031	17.074	17.116	17.158	17.201	17.243	410
-120		-4.384										-120	420	17.243	17.285	17.328	17.370	17.413	17.455	17.497	17.540	17.582	17.624	17.667	420
-110		-4.110											430	17.667											430
-100	-3.852	-3.823	-3.794	-3.764	-3.734	-3.705	-3.675	-3.645	-3.614	-3.584	-3.554	-100	440	18.091	18.134	18.176	18.218	18.261	18.303	18.346	18.388	18.431	18.473	18.516	440
-90	-3 554	-3.523	-3 492	-3 462	-3 431	-3 400	-3 368	-3 337	-3 306	-3 274	-3 243	-90	450	18 516	18 558	18 601	18.643	18 686	18 728	18 771	18 813	18 856	18 898	18 941	450
-80		-3.211										-80	460				19.068								460
-70		-2.887										-70	470	19.366											470
-60		-2.553										-60	480	19.792	19.835	19.877	19.920	19.962	20.005	20.048	20.090	20.133	20.175	20.218	480
-50	-2.243	-2.208	-2.173	-2.138	-2.103	-2.067	-2.032	-1.996	-1.961	-1.925	-1.889	-50	490	20.218	20.261	20.303	20.346	20.389	20.431	20.474	20.516	20.559	20.602	20.644	490
40	1 000	1 05/	1 010	1 700	1 7/5	1 700	1 472	1 (27	1 400	1 544	1 527	-40	500	20.444	20 407	20.720	20.772	20.015	20.057	20.000	20.042	20.005	21 020	21 071	EOO
-40 -30		-1.854 -1.490										-40		21.071			20.772								500 510
-20		-1.119										-20		21.497											520
-10		-0.739								-0.431		-10		21.924											530
0	-0.392	-0.353	-0.314	-0.275	-0.236	-0.197	-0.157	-0.118	-0.079	-0.039	0.000	0	540	22.350	22.393	22.435	22.478	22.521	22.563	22.606	22.649	22.691	22.734	22.776	540
0						0.198				0.357		0		22.776											550
10 20			0.477 0.879			0.597 1.000		1.081	0.718 1.122		0.798	10 20	560 570				23.331								560 570
30		1.244	1.285			1.407		1.489	1.530	1.571	1.612	30	580				24.182								580
40		1.653	1.694			1.817			1.941	1.982	2.023	40		24.480											590
50			2.106			2.230			2.354		2.436	50		24.905											600
60		2.478	2.519			2.644			2.768		2.851	60		25.330											610
70		2.893	2.934			3.059			3.184	3.225	3.267	70 80		25.755											620
80 90		3.308	3.350 3.765			3.474 3.889				4.055	3.682	90		26.179 26.602											630 640
70	3.002	3.723	3.703	5.000	3.040	3.007	3.731	3.772	4.015	4.000	4.070	70	040	20.002	20.044	20.007	20.727	20.771	20.014	20.000	20.070	20.740	20.703	27.023	040
100	4.096	4.138	4.179	4.220	4.262	4.303	4.344	4.385	4.427	4.468	4.509	100	650	27.025	27.067	27.109	27.152	27.194	27.236	27.278	27.320	27.363	27.405	27.447	650
110	4.509	4.550	4.591	4.633		4.715		4.797	4.838	4.879	4.920	110	660				27.574								660
120	4.920	4.961	5.002	5.043		5.124		5.206	5.247	5.288	5.328	120		27.869											670
130	5.328	5.369	5.410	5.450		5.532		5.613	5.653	5.694	5.735	130	680				28.416								680
140	5.735	5.775	5.815	5.856	5.896	5.937	5.977	6.017	6.058	6.098	6.138	140	690	28.710	28.752	28.794	28.835	28.877	28.919	28.961	29.003	29.045	29.087	29.129	690
150	6.138	6.179	6.219	6.259	6.299	6.339	6.380	6.420	6.460	6.500	6.540	150	700	29.129	29.171	29.213	29.255	29.297	29.338	29.380	29.422	29.464	29.506	29.548	700
160			6.620			6.741		6.821	6.861	6.901		160		29.548											710
170	6.941	6.981	7.021	7.060	7.100	7.140	7.180	7.220	7.260	7.300	7.340	170	720	29.965	30.007	30.049	30.090	30.132	30.174	30.216	30.257	30.299	30.341	30.382	720
180	7.340	7.380	7.420	7.460	7.500		7.579	7.619	7.659	7.699	7.739	180	730				30.507								730
190	7.739	7.779	7.819	7.859	7.899	7.939	7.979	8.019	8.059	8.099	8.138	190	740	30.798	30.840	30.881	30.923	30.964	31.006	31.047	31.089	31.130	31.172	31.213	740
200	8.138	8.178	8.218	8.258	8 298	8.338	8.378	8.418	8.458	8.499	8.539	200	750	31 213	31 255	31 296	31.338	31 379	31 421	31 462	31 504	31 545	31 586	31 628	750
210	8.539	8.579	8.619	8.659			8.779	8.819	8.860	8.900	8.940	210	760				31.752								760
220	8.940	8.980	9.020	9.061		9.141	9.181	9.222	9.262		9.343	220	770				32.165								770
230	9.343	9.383	9.423	9.464	9.504	9.545	9.585	9.626	9.666	9.707	9.747	230	780	32.453	32.495	32.536	32.577	32.618	32.659	32.700	32.742	32.783	32.824	32.865	780
240	9.747	9.788	9.828	9.869	9.909	9.950	9.991	10.031	10.072	10.113	10.153	240	790	32.865	32.906	32.947	32.988	33.029	33.070	33.111	33.152	33.193	33.234	33.275	790
°C	0	1	2	3	4	5	6	7	8	9	10	°C	°C	0	1	2	3	4	5	6	7	8	9	10	°C

Revised Thermocouple Reference Tables

Tables N.I.S.T. **Monograph 175** Revised to

ITS-90





Nickel-Chromium VS. Nickel-Aluminum

Extension Grade



Grade

Thermocouple

- 200 to 1250°C

Thermocouple Grade – 328 to 228²°F

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

LIMITS OF ERROR (whichever is greater) Standard: 2.2°C or 0.75% Above 0°C 2.2°C or 2.0% Below 0°C Special: 1.1°C or 0.4%

MAXIMUM TEMPERATURE RANGE

COMMENTS, BARE WIRE ENVIRONMENT:

Clean Oxidizing and Inert; Limited Use in Vacuum or Reducing; Wide Temperature
Range; Most Popular Calibration
TEMPERATURE IN DEGREES °C
REFERENCE JUNCTION AT 0°C

Thermoelectric Voltage in Millivolts

°C	0	1	2	3	4	5	6	7	8	9	10	°C	l °C	0	1	2	3	4	5	6	7	8	9	10	°C
800	33.275	33.316	33.357	33.398	33.439	33.480	33.521	33.562	33.603	33.644	33.685	800	1100	45.119	45.157	45.194	45.232	45.270	45.308	45.346	45.383	45.421	45.459	45.497	1100
810	33.685	33.726	33.767	33.808	33.848	33.889	33.930	33.971	34.012	34.053	34.093	810	1110	45.497	45.534	45.572	45.610	45.647	45.685	45.723	45.760	45.798	45.836	45.873	1110
820	34.093	34.134	34.175	34.216	34.257	34.297	34.338	34.379	34.420	34.460	34.501	820	1120	45.873	45.911	45.948	45.986	46.024	46.061	46.099	46.136	46.174	46.211	46.249	1120
830	34.501	34.542	34.582	34.623	34.664	34.704	34.745	34.786	34.826	34.867	34.908	830	1130	46.249	46.286	46.324	46.361	46.398	46.436	46.473	46.511	46.548	46.585	46.623	1130
840	34.908	34.948	34.989	35.029	35.070	35.110	35.151	35.192	35.232	35.273	35.313	840	1140	46.623	46.660	46.697	46.735	46.772	46.809	46.847	46.884	46.921	46.958	46.995	1140
850	35.313											850				47.070									
860									36.041			860				47.441									
870	36.121											870				47.811									
880									36.845			880				48.179									
890	36.925	36.965	37.006	37.046	37.086	37.126	37.166	37.206	37.246	37.286	37.326	890	1190	48.473	48.509	48.546	48.582	48.619	48.656	48.692	48.729	48.765	48.802	48.838	1190
900									37.646			900				48.911									
910									38.044			910				49.275									
920									38.442			920				49.637									
930									38.839			930				49.998									
940	38.918	38.958	38.997	39.037	39.076	39.116	39.155	39.195	39.235	39.274	39.314	940	1240	50.286	50.322	50.358	50.393	50.429	50.465	50.501	50.537	50.572	50.608	50.644	1240
050	39.314	20.252	20 202	20 422	20 471	20 511	20 550	30 E00	20 620	20 660	20 700	950	1250	EO 644	E0 490	50.715	EO 7E1	EO 707	EU 033	EU 0E0	EU 001	EU 020	E0 04E	E1 000	1250
060									40.023			960				51.071									
970									40.023			970				51.426									
970									40.807			980				51.779									
990	40.885											990				52.130									
770	40.003	40.724	40.703	41.002	41.042	41.001	41.120	41.137	41.170	41.237	41.270	770	1270	32.000	32.073	32.130	32.103	32.200	JZ.ZJJ	32.270	32.303	32.340	32.373	32.410	1270
1000	41.276	41.315	41.354	41.393	41.431	41.470	41.509	41.548	41.587	41.626	41.665	1000	1300	52,410	52,445	52,480	52.515	52.550	52.585	52.620	52.654	52.689	52.724	52.759	1300
1010	41.665	41.704	41.743	41.781	41.820	41.859	41.898	41.937	41.976	42.014	42.053	1010	1310	52.759	52.794	52.828	52.863	52.898	52.932	52.967	53.002	53.037	53.071	53.106	1310
1020	42.053	42.092	42.131	42.169	42.208	42.247	42.286	42.324	42.363	42.402	42.440	1020	1320	53.106	53.140	53.175	53.210	53.244	53.279	53.313	53.348	53.382	53.417	53.451	1320
1030	42.440	42.479	42.518	42.556	42.595	42.633	42.672	42.711	42.749	42.788	42.826	1030	1330	53.451	53.486	53.520	53.555	53.589	53.623	53.658	53.692	53.727	53.761	53.795	1330
1040	42.826	42.865	42.903	42.942	42.980	43.019	43.057	43.096	43.134	43.173	43.211	1040	1340	53.795	53.830	53.864	53.898	53.932	53.967	54.001	54.035	54.069	54.104	54.138	1340
1050	43.211	43.250	43.288	43.327	43.365	43.403	43.442	43.480	43.518	43.557	43.595	1050	1350	54.138	54.172	54.206	54.240	54.274	54.308	54.343	54.377	54.411	54.445	54.479	1350
1060	43.595	43.633	43.672	43.710	43.748	43.787	43.825	43.863	43.901	43.940	43.978	1060	1360	54.479	54.513	54.547	54.581	54.615	54.649	54.683	54.717	54.751	54.785	54.819	1360
1070	43.978	44.016	44.054	44.092	44.130	44.169	44.207	44.245	44.283	44.321	44.359	1070	1370	54.819	54.852	54.886									1370
1080									44.664																
1090	44.740	44.778	44.816	44.853	44.891	44.929	44.967	45.005	45.043	45.081	45.119	1090													
°C	0	1	2	3	4	5	6	7	8	9	10	°C	°C	0	1	2	3	4	5	6	7	8	9	10	°C

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