

CONVERSION OF TEMPERATURES FROM THE 1948 AND 1968 SCALES TO ITS-90

This table gives temperature corrections from older scales to the current International Temperature Scale of 1990 (see the preceding table for details on ITS-90). The first part of the table may be used for converting Celsius temperatures in the range -180 to 4000°C from IPTS-68 or IPTS-48 to ITS-90. Within the accuracy of the corrections, the temperature in the first column may be identified with either t_{68} , t_{48} , or t_{90} . The second part of the table is designed for use at lower temperatures to convert values expressed in kelvins from EPT-76 or IPTS-68 to ITS-90.

The references give analytical equations for expressing these relations. Note that Reference 1 supersedes Reference 2 with respect to corrections in the 630 to 1064°C range.

REFERENCES

1. Burns, G. W. et al., in *Temperature: Its Measurement and Control in Science and Industry*, Vol. 6, Schooley, J. F., Ed., American Institute of Physics, New York, 1993.
2. Goldberg, R. N. and Weir, R. D., *Pure and Appl. Chem.*, 1545, 1992.

$t/^\circ\text{C}$	$t_{90}-t_{68}$	$t_{90}-t_{48}$	$t/^\circ\text{C}$	$t_{90}-t_{68}$	$t_{90}-t_{48}$	$t/^\circ\text{C}$	$t_{90}-t_{68}$	$t_{90}-t_{48}$
-180	0.008	0.020	270	-0.039	0.028	720	0.00	0.45
-170	0.010	0.017	280	-0.039	0.030	730	0.02	0.49
-160	0.012	0.007	290	-0.039	0.032	740	0.03	0.53
-150	0.013	0.000	300	-0.039	0.034	750	0.03	0.56
-140	0.014	0.001	310	-0.039	0.035	760	0.04	0.60
-130	0.014	0.008	320	-0.039	0.036	770	0.05	0.63
-120	0.014	0.017	330	-0.040	0.036	780	0.05	0.66
-110	0.013	0.026	340	-0.040	0.037	790	0.05	0.69
-100	0.013	0.035	350	-0.041	0.036	800	0.05	0.72
-90	0.012	0.041	360	-0.042	0.035	810	0.05	0.75
-80	0.012	0.045	370	-0.043	0.034	820	0.04	0.76
-70	0.011	0.045	380	-0.045	0.032	830	0.04	0.79
-60	0.010	0.042	390	-0.046	0.030	840	0.03	0.81
-50	0.009	0.038	400	-0.048	0.028	850	0.02	0.83
-40	0.008	0.032	410	-0.051	0.024	860	0.01	0.85
-30	0.006	0.024	420	-0.053	0.022	870	0.00	0.87
-20	0.004	0.016	430	-0.056	0.019	880	-0.02	0.87
-10	0.002	0.008	440	-0.059	0.015	890	-0.03	0.89
0	0.000	0.000	450	-0.062	0.012	900	-0.05	0.90
10	-0.002	-0.006	460	-0.065	0.009	910	-0.06	0.92
20	-0.005	-0.012	470	-0.068	0.007	920	-0.08	0.93
30	-0.007	-0.016	480	-0.072	0.004	930	-0.10	0.94
40	-0.010	-0.020	490	-0.075	0.002	940	-0.11	0.96
50	-0.013	-0.023	500	-0.079	0.000	950	-0.13	0.97
60	-0.016	-0.026	510	-0.083	-0.001	960	-0.15	0.97
70	-0.018	-0.026	520	-0.087	-0.002	970	-0.16	0.99
80	-0.021	-0.027	530	-0.090	-0.001	980	-0.18	1.00
90	-0.024	-0.027	540	-0.094	0.000	990	-0.19	1.02
100	-0.026	-0.026	550	-0.098	0.002	1000	-0.20	1.04
110	-0.028	-0.024	560	-0.101	0.007	1010	-0.22	1.05
120	-0.030	-0.023	570	-0.105	0.011	1020	-0.23	1.07
130	-0.032	-0.020	580	-0.108	0.018	1030	-0.23	1.10
140	-0.034	-0.018	590	-0.112	0.025	1040	-0.24	1.12
150	-0.036	-0.016	600	-0.115	0.035	1050	-0.25	1.14
160	-0.037	-0.012	610	-0.118	0.047	1060	-0.25	1.17
170	-0.038	-0.009	620	-0.122	0.060	1070	-0.25	1.19
180	-0.039	-0.005	630	-0.125	0.075	1080	-0.26	1.20
190	-0.039	-0.001	640	-0.11	0.12	1090	-0.26	1.20
200	-0.040	0.003	650	-0.10	0.15	1100	-0.26	1.2
210	-0.040	0.007	660	-0.09	0.19	1200	-0.30	1.4
220	-0.040	0.011	670	-0.07	0.24	1300	-0.35	1.5
230	-0.040	0.014	680	-0.05	0.29	1400	-0.39	1.6
240	-0.040	0.018	690	-0.04	0.32	1500	-0.44	1.8
250	-0.040	0.021	700	-0.02	0.37	1600	-0.49	1.9
260	-0.040	0.024	710	-0.01	0.41	1700	-0.54	2.1

CONVERSION OF TEMPERATURES FROM THE 1948 AND 1968 SCALES TO ITS-90 (continued)

$t/^{\circ}\text{C}$	$t_{90}-t_{68}$	$t_{90}-t_{48}$	T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$	T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$
1800	-0.60	2.2	28		-0.005	77		0.008
1900	-0.66	2.3	29		-0.006	78		0.008
2000	-0.72	2.5	30		-0.006	79		0.008
2100	-0.79	2.7	31		-0.007	80		0.008
2200	-0.85	2.9	32		-0.008	81		0.008
2300	-0.93	3.1	33		-0.008	82		0.008
2400	-1.00	3.2	34		-0.008	83		0.008
2500	-1.07	3.4	35		-0.007	84		0.008
2600	-1.15	3.7	36		-0.007	85		0.008
2700	-1.24	3.8	37		-0.007	86		0.008
2800	-1.32	4.0	38		-0.006	87		0.008
2900	-1.41	4.2	39		-0.006	88		0.008
3000	-1.50	4.4	40		-0.006	89		0.008
3100	-1.59	4.6	41		-0.006	90		0.008
3200	-1.69	4.8	42		-0.006	91		0.008
3300	-1.78	5.1	43		-0.006	92		0.008
3400	-1.89	5.3	44		-0.006	93		0.008
3500	-1.99	5.5	45		-0.007	94		0.008
3600	-2.10	5.8	46		-0.007	95		0.008
3700	-2.21	6.0	47		-0.007	96		0.008
3800	-2.32	6.3	48		-0.006	97		0.009
3900	-2.43	6.6	49		-0.006	98		0.009
4000	-2.55	6.8	50		-0.006	99		0.009
			51		-0.005	100		0.009
			52		-0.005	110		0.011
			53		-0.004	120		0.013
			54		-0.003	130		0.014
			55		-0.002	140		0.014
			56		-0.001	150		0.014
			57		0.000	160		0.014
			58		0.001	170		0.013
			59		0.002	180		0.012
			60		0.003	190		0.012
			61		0.003	200		0.011
			62		0.004	210		0.010
			63		0.004	220		0.009
		-0.006	64		0.005	230		0.008
		-0.003	65		0.005	240		0.007
		-0.004	66		0.006	250		0.005
		-0.006	67		0.006	260		0.003
		-0.008	68		0.007	270		0.001
		-0.009	69		0.007	273.16		0.000
		-0.009	70		0.007	300		-0.006
		-0.007	71		0.007	400		-0.031
		-0.007	72		0.007	500		-0.040
		-0.006	73		0.007	600		-0.040
		-0.005	74		0.007	700		-0.055
		-0.004	75		0.008	800		-0.089
		-0.004	76		0.008	900		-0.124
T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$						
5	-0.0001							
6	-0.0002							
7	-0.0003							
8	-0.0004							
9	-0.0005							
10	-0.0006							
11	-0.0007							
12	-0.0008							
13	-0.0010							
14	-0.0011							
15	-0.0013							
16	-0.0014							
17	-0.0016							
18	-0.0018							
19	-0.0020							
20	-0.0022							
21	-0.0025							
22	-0.0027							
23	-0.0030							
24	-0.0032							
25	-0.0035							
26	-0.0038							
27	-0.0041							