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.

$t/°C$	$t_{90}-t_{68}$	$t_{90}-t_{48}$	$t/°C$	$t_{90}-t_{68}$	$t_{90}-t_{48}$	$t/°C$	$t_{90}-t_{68}$	$t_{90}-t_{48}$
-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)

$t/°C$	$t_{90}-t_{68}$	$t_{90}-t_{48}$	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
T/K	$T_{90}-T_{76}$	$T_{90}-T_{68}$	52		-0.005	110		0.011
			53		-0.004	120		0.013
5	-0.0001		54		-0.003	130		0.014
6	-0.0002		55		-0.002	140		0.014
7	-0.0003		56		-0.001	150		0.014
8	-0.0004		57		0.000	160		0.014
9	-0.0005		58		0.001	170		0.013
10	-0.0006		59		0.002	180		0.012
11	-0.0007		60		0.003	190		0.012
12	-0.0008		61		0.003	200		0.011
13	-0.0010		62		0.004	210		0.010
14	-0.0011	-0.006	63		0.004	220		0.009
15	-0.0013	-0.003	64		0.005	230		0.008
16	-0.0014	-0.004	65		0.005	240		0.007
17	-0.0016	-0.006	66		0.006	250		0.005
18	-0.0018	-0.008	67		0.006	260		0.003
19	-0.0020	-0.009	68		0.007	270		0.001
20	-0.0022	-0.009	69		0.007	273.16		0.000
21	-0.0025	-0.008	70		0.007	300		-0.006
22	-0.0027	-0.007	71		0.007	400		-0.031
23	-0.0030	-0.007	72		0.007	500		-0.040
24	-0.0032	-0.006	73		0.007	600		-0.040
25	-0.0035	-0.005	74		0.007	700		-0.055
26	-0.0038	-0.004	75		0.008	800		-0.089
27	-0.0041	-0.004	76		0.008	900		-0.124