

CALIBRATION OF VOLUMETRIC GLASSWARE FROM THE WEIGHT OF THE CONTAINED WATER OR MERCURY WHEN WEIGHED IN AIR WITH BRASS WEIGHTS

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A borosilicate glass vessel containing g , grams of water at a temperature of $t^\circ\text{C}$ has, at the same temperature, a volume $V_t = W_t \times g$, cubic centimeters. Similarly when filled with G , grams of mercury at a temperature of $t^\circ\text{C}$ the volume at the same temperature is given by $V_t = M_t \times G$, cubic centimeters.

When filled with g , grams of water at a temperature of $t^\circ\text{C}$ the volume of the vessel at 18°C is given by $V_{18} = W_{18} \times g$, cubic centimeters and the true volume at 25°C is given by $V_{25} = W_{25} \times g$. The volumes at 18°C and 25°C are given similarly when using mercury by using the values under M_{18} and M_{25} , respectively.

The data on water are adapted from the data of G. S. Kell, *Journal of Chemical and Engineering Data*, 12, 67-68 (1967) (Table on p. F5, 52nd Edition, this handbook) and the data on mercury are adapted from *Smithsonian Tables*, Ninth Revised Edition, Volume 120, Publication No. 4169. The coefficient of linear expansion for borosilicate glass used here is $32.5 \times 10^{-7} \text{ deg}^{-1}$ and the volume coefficient of expansion is $97.5 \times 10^{-7} \text{ deg}^{-1}$.

$t^\circ\text{C}$	W_t	W_{18}	W_{25}
0	1.001 220	1.001 396	1.001 466
1	1.001 161	1.001 327	1.001 395
2	1.001 120	1.001 276	1.001 345
3	1.001 096	1.001 242	1.001 311
4	1.001 088	1.001 225	1.001 293
5	1.001 096	1.001 223	1.001 291
6	1.001 120	1.001 237	1.001 306
7	1.001 158	1.001 265	1.001 334
8	1.001 211	1.001 309	1.001 377
9	1.001 279	1.001 367	1.001 435
10	1.001 360	1.001 438	1.001 506
11	1.001 455	1.001 523	1.001 592
12	1.001 563	1.001 622	1.001 690
13	1.001 684	1.001 733	1.001 801
14	1.001 816	1.001 855	1.001 923
15	1.001 961	1.001 990	1.002 059
16	1.002 118	1.002 138	1.002 206
17	1.002 286	1.002 296	1.002 364
18	1.002 466	1.002 466	1.002 534
19	1.002 658	1.002 648	1.002 717
20	1.002 859	1.002 839	1.002 908
21	1.003 072	1.003 043	1.003 111
22	1.003 294	1.003 255	1.003 323
23	1.003 528	1.003 479	1.003 548
24	1.003 771	1.003 712	1.003 781
25	1.004 024	1.003 955	1.004 024
26	1.004 287	1.004 209	1.004 277
27	1.004 560	1.004 472	1.004 540
28	1.004 842	1.004 744	1.004 813
29	1.005 133	1.005 025	1.005 094
30	1.005 434	1.005 316	1.005 385
31	1.005 743	1.005 615	1.005 684
32	1.006 060	1.005 923	1.005 991
33	1.006 388	1.006 241	1.006 310
34	1.006 723	1.006 566	1.006 635
35	1.007 066	1.006 899	1.006 968
36	1.007 418	1.007 242	1.007 311
37	1.007 780	1.007 593	1.007 669
38	1.008 149	1.007 952	1.008 021
39	1.008 525	1.008 318	1.008 387
40	1.008 910	1.008 694	1.008 762
41	1.009 303	1.009 077	1.009 146
42	1.009 703	1.009 467	1.009 536
43	1.010 112	1.009 866	1.009 935
44	1.010 528	1.010 272	1.010 341
45	1.010 951	1.010 685	1.010 754
46	1.011 382	1.011 106	1.011 175
47	1.011 820	1.011 534	1.011 603
48	1.012 266	1.011 970	1.012 039
49	1.012 719	1.012 413	1.012 482
50	1.013 180	1.012 864	1.012 933