

DEPARTMENT OF COMMERCE AND LABOR

CIRCULAR
OF THE
BUREAU OF STANDARDS

S. W. STRATTON, DIRECTOR

No. 19

STANDARD DENSITY AND VOLUMETRIC TABLES

[2d Edition]

Issued September 15, 1911



WASHINGTON
GOVERNMENT PRINTING OFFICE

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INTRODUCTION

The wide application of hydrometers as measuring instruments in the collection of revenues in commerce and in the industries makes it very important to define the various scales of indication of these instruments in terms of fundamental units.

The confusion and discordance heretofore resulting from the use of various insufficiently defined hydrometer scales, and the lack of opportunity for verifying standards on a uniform basis, led the Bureau to investigate the problems connected with hydrometry and to prepare standard density tables for definition of hydrometer scales.

In Bureau Circular No. 16 the conditions are announced under which the testing of hydrometers will be conducted, and specifications are given as to the construction, standardization, and accuracy required for hydrometers in order that they be approved as precision instruments.

The present circular comprises the density tables which have been adopted for definition of hydrometer scales, auxiliary tables which have been prepared for reduction of hydrometer readings, tables for computation of volumetric capacity, and others of similar nature giving physical constants for which the Bureau receives frequent inquiries.

In all tables found in this circular the term DENSITY is used to represent the MASS per UNIT VOLUME and is expressed in GRAMS per MILLILITER; that is, all densities are referred to water at 4° C as unity.

The term SPECIFIC GRAVITY is used to express the RELATIVE MASSES of EQUAL VOLUMES of the liquid in question and of water, EACH LIQUID being at a DEFINITELY STATED TEMPERATURE. For example, specific gravity at $\frac{60^\circ}{60^\circ}$ F means the specific gravity of the liquid at 60° F referred to water at 60° F as unity.

For the sake of uniformity the same abbreviation, D, with the proper temperature basis, is used for both density and specific gravity.

S. W. STRATTON,
Director.

Approved:

BENJ. S. CABLE,
Acting Secretary.

TABLE 1.—Density of Pure Water Free from Air

[Under standard pressure (76 cm), at every tenth part of a degree of the international hydrogen scale from 0° to 41° C, referred to water at 4° C as unity¹]

De- grees Cen- ti- grade	Tenths of Degrees										Mean Differ- ences	
	0	1	2	3	4	5	6	7	8	9		
0	0.999 8681	8747	8812	8875	8936	8996	9053	9109	9163	9216	+ 59	
1		9267	9315	9363	9408	9452	9494	9534	9573	9610	+ 41	
2		9679	9711	9741	9769	9796	9821	9844	9866	9887	+ 24	
3		9922	9951	9962	9973	9981	9988	9994	9998	*0000	+ 8	
4	1.000 0000	*9999	*9996	*9992	*9986	*9979	*9970	*9960	*9947	*9934	- 8	
5	0.999 9919	9902	9884	9864	9842	9819	9795	9769	9742	9713	- 24	
6		9682	9650	9617	9582	9545	9507	9468	9427	9385	- 39	
7		9296	9249	9201	9151	9100	9048	8994	8938	8881	- 53	
8		8764	8703	8641	8577	8512	8445	8377	8308	8237	- 67	
9		8091	8017	7940	7863	7784	7704	7622	7539	7455	- 81	
10		7282	7194	7105	7014	6921	6826	6729	6632	6533	- 95	
11		6331	6228	6124	6020	5913	5805	5696	5586	5474	-108	
12		5248	5132	5016	4898	4780	4660	4538	4415	4291	-121	
13		4040	3912	3784	3654	3523	3391	3257	3122	2986	-133	
14		2712	2572	2431	2289	2147	2003	1858	1711	1564	-145	
15		1266	1114	0962	0809	0655	0499	0343	0185	0026	*9865	-156
16	0.998 9705	9542	9378	9214	9048	8881	8713	8544	8373	8202	-168	
17		8029	7856	7681	7505	7328	7150	6971	6791	6610	-178	
18		6244	6058	5873	5686	5498	5309	5119	4927	4735	-190	
19		4347	4152	3955	3757	3558	3358	3158	2955	2752	-200	
20		2343	2137	1930	1722	1511	1301	1090	0878	0663	-211	
21		0233	0016	*9799	*9580	*9359	*9139	*8917	*8694	*8470	-221	
22	0.997 8019	7792	7564	7335	7104	6873	6641	6408	6173	5938	-232	
23		5702	5466	5227	4988	4747	4506	4264	4021	3777	-242	
24		3286	3039	2790	2541	2291	2040	1788	1535	1280	-252	
25		0770	0513	0255	*9997	*9736	*9476	*9214	*8951	*8688	*8423	-261
26	0.996 8158	7892	7624	7356	7087	6817	6545	6273	6000	5726	-271	
27		5451	5176	4898	4620	4342	4062	3782	3500	3218	-280	
28		2652	2366	2080	1793	1505	1217	0928	0637	0346	-289	
29	0.995 9761	9466	9171	8876	8579	8282	7983	7684	7383	7083	-298	
30		6780	6478	6174	5869	5564	5258	4950	4642	4334	-307	
31		3714	3401	3089	2776	2462	2147	1832	1515	1198	-315	
32		0561	0241	*9920	*9599	*9276	*8954	*8630	*8304	*7979	*7653	-324
33	0.994 7325	6997	6668	6338	6007	5676	5345	5011	4678	4343	-332	
34		4007	3671	3335	2997	2659	2318	1978	1638	1296	-340	
35		0610	0267	*9922	*9576	*9230	*8883	*8534	*8186	*7837	*7486	-347
36	0.993 7136	6784	6432	6078	5725	5369	5014	4658	4301	3943	-355	
37		3585	3226	2866	2505	2144	1782	1419	1055	0691	-362	
38	0.992 9960	9593	9227	8859	8490	8120	7751	7380	7008	6636	-370	
39		6263	5890	5516	5140	4765	4389	4011	3634	3255	-377	
40		2497	2116	1734	1352	0971	0587	0203	*9818	*9433	*9047	-384
41	0.991 8661											

¹ According to P. Chappuis, Bureau international des Poids et Mesures, Travaux et Mémoires, XIII, 1907.

TABLE 2.—Density of Mixtures (by Weight) of Ethyl Alcohol and Water ²

Per Cent Alcohol by Weight	D _{4°C} ^{15°} C*	D _{4°C} ^{20°} C	D _{4°C} ^{25°} C	Per Cent Alcohol by Weight	D _{4°C} ^{15°} C*	D _{4°C} ^{20°} C	D _{4°C} ^{25°} C
0	99913	99823	99708	50	91776	91384	90985
1	99725	99636	99520	51	91555	91161	90760
2	99542	99453	99336	52	91333	90937	90534
3	99367	99276	99158	53	91110	90712	90307
4	99195	99104	98984	54	90885	90486	90079
5	99032	98939	98817	55	90659	90258	89850
6	98878	98781	98656	56	90433	90031	89621
7	98729	98629	98500	57	90208	89803	89392
8	98582	98479	98345	58	89980	89574	89162
9	98442	98331	98193	59	89752	89345	88931
10	98304	98187	98043	60	89523	89114	88699
11	98171	98047	97897	61	89292	88882	88466
12	98041	97910	97753	62	89062	88651	88233
13	97914	97775	97611	63	88829	88417	87998
14	97790	97643	97472	64	88597	88183	87763
15	97669	97514	97334	65	88363	87948	87527
16	97551	97387	97199	66	88129	87713	87291
17	97432	97259	97062	67	87895	87478	87055
18	97312	97129	96923	68	87660	87242	86818
19	97190	96997	96782	69	87424	87005	86580
20	97069	96864	96639	70	87187	86766	86340
21	96946	96730	96495	71	86951	86529	86102
22	96818	96592	96348	72	86712	86289	85861
23	96689	96453	96199	73	86471	86048	85619
24	96558	96311	96048	74	86231	85806	85376
25	96425	96168	95895	75	85990	85564	85134
26	96288	96020	95738	76	85748	85322	84891
27	96145	95867	95576	77	85505	85078	84647
28	95997	95709	95410	78	85263	84835	84403
29	95845	95548	95241	79	85018	84590	84158
30	95686	95382	95067	80	84772	84344	83911
31	95524	95213	94891	81	84526	84097	83664
32	95358	95039	94710	82	84278	83849	83415
33	95186	94861	94525	83	84029	83598	83164
34	95011	94679	94337	84	83778	83347	82912
35	94832	94494	94146	85	83525	83095	82660
36	94648	94304	93951	86	83270	82839	82404
37	94463	94113	93755	87	83014	82583	82148
38	94272	93918	93555	88	82754	82323	81888
39	94079	93720	93353	89	82492	82061	81626
40	93883	93519	93148	90	82228	81797	81362
41	93683	93316	92941	91	81960	81529	81094
42	93480	93109	92731	92	81688	81257	80823
43	93273	92899	92518	93	81414	80982	80549
44	93065	92687	92303	94	81135	80705	80272
45	92852	92472	92085	95	80853	80423	79991
46	92641	92257	91868	96	80567	80137	79706
47	92425	92041	91649	97	80274	79845	79415
48	92211	91823	91429	98	79974	79547	79117
49	91995	91605	91208	99	79670	79243	78814
50	91776	91384	90985	100	79360	78934	78506

* D_{4°C}^{15°}C = density at 15° C referred to water at 4° C as unity.

² Tables 2, 3, 4, 5, and 6 of this circular are based on work done at this Bureau and completed in 1910. A complete account of this work will be published in the Bulletin of the Bureau of Standards.

TABLE 3.—Density of Mixtures (by Weight) of Ethyl Alcohol and Water at 20° C

Per Cent Alcohol by Weight	Tenths of Per Cent									
	0	1	2	3	4	5	6	7	8	9
0	0.99823	804	785	766	748	729	710	692	673	654
1	.99636	618	599	580	562	544	526	507	489	471
2	.99453	435	417	399	381	364	346	328	311	293
3	.99276	259	241	224	206	189	172	155	138	121
4	.99104	087	070	054	037	021	004	*988	*971	*955
5	.98939	923	907	890	875	859	843	828	812	796
6	.98781	766	750	735	720	705	690	674	659	644
7	.98629	614	599	584	569	554	539	524	509	494
8	.98479	464	449	434	419	405	390	375	360	346
9	.98331	316	302	287	273	258	244	230	215	201
10	.98187	173	159	144	130	116	102	088	075	061
11	.98047	033	019	006	*992	*978	*964	*951	*937	*924
12	.97910	896	883	869	856	842	829	815	802	788
13	.97775	762	748	735	722	708	695	682	669	656
14	.97643	630	617	604	591	578	565	552	540	527
15	.97514	501	489	476	463	450	438	425	412	400
16	.97387	374	361	349	336	323	310	297	285	272
17	.97259	246	233	220	207	194	181	168	155	142
18	.97129	116	103	089	076	063	050	037	023	010
19	.96997	984	971	957	944	931	918	904	891	877
20	.96864	851	837	824	810	797	784	770	757	743
21	.96730	716	702	689	675	661	647	633	620	606
22	.96592	578	564	551	537	523	509	495	481	467
23	.96453	439	425	410	396	382	368	354	339	325
24	.96311	297	283	268	254	240	226	211	197	183
25	.96168	153	139	124	109	095	080	065	050	035
26	.96020	005	*990	*975	*960	*944	*929	*914	*898	*883
27	.95867	851	836	820	804	789	773	757	741	725
28	.95709	693	677	661	645	629	613	597	580	564
29	.95548	532	515	499	482	466	449	432	416	399
30	.95382	365	348	332	315	298	281	264	247	230
31	.95213	196	179	161	144	127	109	092	074	057
32	.95039	021	004	*986	*968	*951	*933	*915	*897	*879
33	.94861	843	825	807	789	771	752	734	716	697
34	.94679	661	642	624	605	587	568	550	531	513
35	.94494	475	456	437	418	399	380	361	342	323
36	.94304	285	266	247	228	209	190	171	152	132
37	.94113	094	074	055	035	016	*996	*977	*957	*938
38	.93918	898	879	859	839	820	800	780	760	740
39	.93720	700	680	660	640	620	600	580	559	539
40	.93519	499	479	458	438	418	398	377	357	336
41	.93316	296	275	254	234	213	192	171	151	130
42	.93109	088	067	046	025	004	*983	*962	*941	*920
43	.92899	878	857	836	815	793	772	751	730	708
44	.92687	666	644	622	601	580	558	536	515	494
45	.92472	450	429	408	386	364	343	322	300	278
46	.92257	235	214	192	171	149	127	106	084	063
47	.92041	019	*997	*976	*954	*932	*910	*888	*867	*845
48	.91823	801	779	758	736	714	692	670	649	627
49	.91605	583	561	539	517	495	473	451	428	406
50	.91384	362	340	317	295	273	250	228	206	183

TABLE 4.—Specific Gravity at $\frac{60^\circ}{60^\circ}$ F ($\frac{15^\circ56}{15^\circ56}$ C) of Mixtures (by Volume) of Ethyl Alcohol and Water

Per Cent Alcohol by Volume at 60° F	Tenths of Per Cent									
	0	1	2	3	4	5	6	7	8	9
0	1.00000	*985	*970	*955	*940	*925	*910	*895	*880	*866
1	.99851	836	821	806	792	777	762	747	732	718
2	.99703	688	674	660	645	631	616	602	588	574
3	.99560	546	532	518	504	490	477	463	449	435
4	.99421	407	393	379	365	352	338	324	310	296
5	.99282	268	255	241	228	215	201	188	175	162
6	.99149	136	123	110	098	085	072	060	047	034
7	.99022	010	*997	*984	*972	*960	*948	*936	*923	*911
8	.98899	887	875	863	851	839	827	815	803	791
9	.98779	767	755	743	731	719	707	695	683	671
10	.98659	647	636	624	613	601	590	578	567	555
11	.98544	533	521	510	498	487	476	464	453	441
12	.98430	419	407	396	385	374	362	351	340	329
13	.98318	307	296	285	274	264	253	242	231	221
14	.98210	199	189	178	168	157	146	136	125	115
15	.98104	093	083	072	062	051	041	030	020	010
16	.97999	989	978	968	957	947	936	926	916	905
17	.97895	885	874	864	854	844	834	823	813	803
18	.97793	783	773	763	753	744	734	724	714	704
19	.97694	684	674	664	654	644	635	625	615	605
20	.97595	585	575	565	555	545	535	525	515	505
21	.97495	485	475	465	455	445	435	424	414	404
22	.97394	384	374	364	353	343	333	323	312	302
23	.97292	282	271	261	251	240	230	220	210	199
24	.97189	179	168	158	148	138	127	117	107	096
25	.97086	076	065	055	044	034	023	012	002	*991
26	.96980	969	958	947	936	925	914	903	892	881
27	.96870	859	848	837	826	815	804	793	782	771
28	.96760	749	738	726	715	704	693	682	670	659
29	.96648	637	626	614	603	592	580	569	558	546
30	.96535	524	512	500	489	477	466	454	443	431
31	.96419	407	395	383	371	359	347	335	323	310
32	.96298	286	273	261	248	236	223	210	198	185
33	.96172	159	146	133	120	107	094	081	068	055
34	.96042	029	016	003	*990	*976	*963	*950	*937	*924
35	.95910	896	883	869	855	841	827	813	799	785
36	.95771	757	743	728	714	700	686	672	657	643
37	.95629	615	600	586	572	557	543	528	514	499
38	.95484	469	454	440	425	410	395	380	364	349
39	.95334	319	304	288	273	257	242	226	210	195
40	.95179	163	148	132	116	101	085	069	053	037
41	.95021	005	*989	*973	*957	*941	*924	*908	*892	*875
42	.94859	843	826	809	792	776	759	742	726	709
43	.94692	675	658	642	625	608	592	575	558	541
44	.94524	507	490	472	455	438	420	403	385	368
45	.94350	332	315	297	279	262	244	226	208	191
46	.94173	155	138	120	102	084	066	048	030	011
47	.93993	975	957	938	920	902	883	865	846	828
48	.93809	790	772	753	735	716	697	678	659	640
49	.93621	602	583	564	545	525	506	486	467	448
50	.93428	409	389	370	350	330	311	291	272	252

TABLE 5.—Per Cent by Volume at 60° F, Corresponding to Various Per Cent by Weight in Mixtures of Ethyl Alcohol and Water

Per Cent Alcohol by Weight	Tenths of Per Cent									
	0	1	2	3	4	5	6	7	8	9
0	0.000	0.126	0.252	0.378	0.503	0.629	0.755	0.880	1.006	1.132
1	1.257	1.382	1.508	1.634	1.759	1.884	2.010	2.135	2.260	2.385
2	2.510	2.635	2.760	2.885	3.010	3.135	3.260	3.384	3.509	3.633
3	3.758	3.883	4.007	4.132	4.256	4.381	4.505	4.629	4.754	4.878
4	5.002	5.126	5.250	5.375	5.499	5.623	5.747	5.871	5.995	6.119
5	6.243	6.367	6.491	6.614	6.738	6.862	6.985	7.108	7.232	7.355
6	7.479	7.602	7.726	7.850	7.973	8.096	8.220	8.343	8.467	8.590
7	8.713	8.836	8.959	9.083	9.206	9.329	9.452	9.574	9.697	9.820
8	9.943	10.066	10.189	10.312	10.434	10.557	10.680	10.802	10.925	11.048
9	11.170	11.292	11.415	11.537	11.660	11.782	11.904	12.026	12.149	12.271
10	12.393	12.515	12.637	12.760	12.882	13.004	13.126	13.248	13.370	13.492
11	13.614	13.736	13.858	13.980	14.102	14.224	14.345	14.467	14.589	14.710
12	14.832	14.954	15.075	15.197	15.318	15.440	15.561	15.683	15.804	15.926
13	16.047	16.168	16.290	16.411	16.532	16.653	16.774	16.896	17.017	17.138
14	17.259	17.380	17.501	17.622	17.743	17.864	17.985	18.106	18.227	18.348
15	18.469	18.590	18.711	18.832	18.952	19.073	19.194	19.314	19.435	19.555
16	19.676	19.797	19.917	20.038	20.158	20.278	20.399	20.519	20.640	20.760
17	20.880	21.000	21.120	21.241	21.361	21.481	21.601	21.721	21.841	21.961
18	22.081	22.201	22.321	22.440	22.560	22.680	22.800	22.919	23.039	23.158
19	23.278	23.398	23.517	23.637	23.756	23.876	23.995	24.114	24.234	24.353
20	24.472	24.591	24.710	24.830	24.949	25.068	25.187	25.306	25.425	25.544
21	25.663	25.782	25.901	26.020	26.138	26.257	26.375	26.494	26.612	26.731
22	26.849	26.967	27.086	27.204	27.323	27.441	27.559	27.678	27.796	27.914
23	28.032	28.150	28.268	28.386	28.504	28.622	28.740	28.858	28.976	29.093
24	29.211	29.329	29.446	29.564	29.682	29.800	29.917	30.034	30.152	30.269
25	30.386	30.503	30.620	30.738	30.855	30.972	31.089	31.206	31.323	31.439
26	31.556	31.673	31.789	31.906	32.022	32.139	32.255	32.371	32.488	32.604
27	32.720	32.836	32.952	33.068	33.184	33.300	33.416	33.532	33.648	33.763
28	33.879	33.995	34.110	34.226	34.342	34.457	34.573	34.688	34.804	34.919
29	35.034	35.149	35.264	35.379	35.494	35.608	35.723	35.838	35.952	36.066
30	36.181	36.296	36.410	36.524	36.639	36.753	36.868	36.982	37.096	37.210
31	37.324	37.438	37.552	37.666	37.780	37.893	38.007	38.120	38.233	38.347
32	38.460	38.573	38.687	38.800	38.913	39.026	39.139	39.252	39.364	39.477
33	39.590	39.703	39.816	39.928	40.041	40.154	40.266	40.378	40.491	40.603
34	40.715	40.827	40.939	41.052	41.163	41.275	41.387	41.499	41.610	41.722
35	41.833	41.944	42.056	42.167	42.278	42.389	42.500	42.611	42.722	42.833
36	42.944	43.055	43.166	43.276	43.387	43.498	43.608	43.719	43.830	43.940
37	44.050	44.160	44.270	44.381	44.490	44.600	44.710	44.820	44.930	45.039
38	45.149	45.259	45.368	45.478	45.587	45.696	45.806	45.915	46.024	46.133
39	46.242	46.351	46.460	46.569	46.678	46.787	46.895	47.004	47.112	47.221
40	47.329	47.437	47.546	47.654	47.762	47.870	47.978	48.085	48.193	48.300
41	48.408	48.516	48.623	48.731	48.838	48.946	49.053	49.160	49.267	49.374
42	49.481	49.588	49.695	49.802	49.908	50.015	50.122	50.228	50.334	50.441
43	50.547	50.653	50.760	50.866	50.972	51.078	51.183	51.289	51.395	51.500
44	51.606	51.712	51.817	51.923	52.028	52.133	52.239	52.344	52.449	52.554
45	52.659	52.764	52.869	52.974	53.079	53.183	53.288	53.393	53.497	53.602
46	53.706	53.810	53.915	54.019	54.123	54.227	54.331	54.435	54.539	54.642
47	54.746	54.850	54.953	55.057	55.160	55.264	55.367	55.470	55.574	55.677
48	55.780	55.883	55.986	56.090	56.193	56.296	56.398	56.501	56.604	56.707
49	56.809	56.912	57.014	57.116	57.219	57.321	57.423	57.525	57.626	57.728
50	57.830	57.932	58.034	58.135	58.237	58.339	58.440	58.542	58.643	58.744

TABLE 6.—Per Cents by Weight Corresponding to Various Per Cents by Volume at 60° F in Mixtures of Ethyl Alcohol and Water

Per Cent Alcohol by Volume at 60° F	Per Cent Alcohol by Weight	Differ-ences	Per Cent Alcohol by Volume at 60° F	Per Cent Alcohol by Weight	Differ-ences	Per Cent Alcohol by Volume at 60° F	Per Cent Alcohol by Weight	Differ-ences	Per Cent Alcohol by Volume at 60° F	Per Cent Alcohol by Weight	Differ-ences
0	0.00		25	20.44		50	42.48		75	67.87	
1	.80	0.80	26	21.23	0.84	51	43.43	0.95	76	68.98	1.11
2	1.59	.79	27	22.13	.85	52	44.37	.94	77	70.10	1.12
3	2.39	.80	28	22.97	.84	53	45.32	.95	78	71.23	1.13
4	3.19	.80	29	23.82	.85	54	46.28	.96	79	72.37	1.14
5	4.00	.81	30	24.67	.85	55	47.24	.96	80	73.52	1.15
6	4.80	.80	31	25.52	.85	56	48.21	.97	81	74.68	1.16
7	5.61	.81	32	26.38	.86	57	49.19	.98	82	75.86	1.18
8	6.42	.81	33	27.24	.86	58	50.17	.98	83	77.04	1.18
9	7.23	.81	34	28.10	.86	59	51.15	.98	84	78.23	1.19
10	8.05	.82	35	28.97	.87	60	52.15	1.00	85	79.44	1.21
11	8.86	.81	36	29.84	.87	61	53.15	1.00	86	80.66	1.22
12	9.68	.82	37	30.72	.88	62	54.15	1.00	87	81.90	1.24
13	10.50	.82	38	31.59	.87	63	55.16	1.01	88	83.14	1.24
14	11.32	.82	39	32.48	.89	64	56.18	1.02	89	84.41	1.27
15	12.14	.82	40	33.36	.88	65	57.21	1.03	90	85.69	1.28
16	12.96	.82	41	34.25	.89	66	58.24	1.03	91	86.99	1.30
17	13.79	.83	42	35.15	.90	67	59.28	1.04	92	88.31	1.32
18	14.61	.82	43	36.05	.90	68	60.32	1.04	93	89.65	1.34
19	15.44	.83	44	36.95	.90	69	61.38	1.06	94	91.02	1.37
20	16.27	.83	45	37.86	.91	70	62.44	1.06	95	92.42	1.40
21	17.10	.83	46	38.78	.92	71	63.51	1.07	96	93.85	1.43
22	17.93	.83	47	39.70	.92	72	64.59	1.08	97	95.31	1.46
23	18.77	.84	48	40.62	.92	73	65.67	1.08	98	96.82	1.51
24	19.60	.83	49	41.55	.93	74	66.77	1.10	99	98.38	1.56
25	20.44	.84	50	42.48	.93	75	67.87	1.10	100	100.00	1.62

TABLE 7.—Density at 15° C of Mixtures (by weight) of Methyl Alcohol and Water

[Calculated from the specific gravity determinations of Doroshevskii and Rozhdstvenskii at $\frac{15^\circ}{15^\circ}$ C³]

Per Cent Methyl Alcohol by Weight	D ₄ ^{15°} C	Differences	Per Cent Methyl Alcohol by Weight	D ₄ ^{15°} C	Differences
0	.99913		50	.91852	
1	.99727	0.00186	51	.91653	0.00199
2	.99543	184	52	.91451	202
3	.99370	173	53	.91248	203
4	.99198	172	54	.91044	204
		169			205
5	.99029	165	55	.90839	208
6	.98864	163	56	.90631	210
7	.98701	154	57	.90421	211
8	.98547	153	58	.90210	214
9	.98394	153	59	.89996	215
10	.98241		60	.89781	218
11	.98093	148	61	.89563	222
12	.97945	148	62	.89341	222
13	.97802	143	63	.89117	224
14	.97660	142	64	.88890	227
		142			228
15	.97518	141	65	.88662	229
16	.97377	140	66	.88433	230
17	.97237	140	67	.88203	232
18	.97096	141	68	.87971	232
19	.96955	141	69	.87739	232
20	.96814		70	.87507	236
21	.96673	141	71	.87271	238
22	.96533	140	72	.87033	241
23	.96392	141	73	.86792	241
24	.96251	141	74	.86546	246
		143			246
25	.96108	145	75	.86300	249
26	.95963	146	76	.86051	250
27	.95817	149	77	.85801	250
28	.95668	150	78	.85551	251
29	.95518	152	79	.85300	252
30	.95366		80	.85048	254
31	.95213	153	81	.84794	258
32	.95056	157	82	.84536	262
33	.94896	160	83	.84274	262
34	.94734	162	84	.84009	265
		164			267
35	.94570	166	85	.83742	267
36	.94404	167	86	.83475	268
37	.94237	170	87	.83207	270
38	.94067	173	88	.82937	270
39	.93894	174	89	.82667	271
40	.93720		90	.82396	272
41	.93543	177	91	.82124	275
42	.93365	178	92	.81849	281
43	.93185	180	93	.81568	281
44	.93001	184	94	.81285	283
		186			286
45	.92815	188	95	.80999	286
46	.92627	191	96	.80713	285
47	.92436	191	97	.80428	285
48	.92242	194	98	.80143	284
49	.92048	194	99	.79859	284
		196			282
50	.91852		100	.79577	

³ J. Russ., Phys. Chem. Soc., 41, pp. 977-996 (1909).

TABLE 8.—Specific Gravity at 15°C of Mixtures (by Volume) of Methyl Alcohol and Water

[Calculated from the same data as Table 7]

Per Cent Alcohol by Volume at 15°C	D 15°C	Differences	Per Cent Alcohol by Volume at 15°C	D 15°C	Differences
0	1.00000		50	0.93326	
1	.99851	0.00149	51	.93155	0.00171
2	.99703	148	52	.92982	173
3	.99560	143	53	.92806	176
4	.99422	138	54	.92626	180
		139			183
5	.99283	137	55	.92443	187
6	.99146	135	56	.92256	189
7	.99011	134	57	.92067	190
8	.98877	131	58	.91877	195
9	.98746	125	59	.91682	199
10	.98621	125	60	.91483	201
11	.98496	126	61	.91282	203
12	.98370	123	62	.91079	206
13	.98247	122	63	.90873	210
14	.98125	122	64	.90663	213
15	.98003	119	65	.90450	216
16	.97884	118	66	.90234	220
17	.97766	118	67	.90014	224
18	.97648	118	68	.89790	229
19	.97530	117	69	.89561	234
20	.97413	118	70	.89327	239
21	.97295	118	71	.89088	244
22	.97177	119	72	.88844	248
23	.97058	119	73	.88596	250
24	.96939	119	74	.88346	254
25	.96820	120	75	.88092	256
26	.96700	120	76	.87836	258
27	.96580	121	77	.87578	266
28	.96459	121	78	.87312	272
29	.96338	122	79	.87040	280
30	.96216	125	80	.86760	286
31	.96091	125	81	.86474	294
32	.95966	128	82	.86180	297
33	.95838	130	83	.85883	301
34	.95708	132	84	.85582	306
35	.95576	133	85	.85276	309
36	.95443	135	86	.84967	321
37	.95308	138	87	.84646	332
38	.95170	141	88	.84314	343
39	.95029	143	89	.83971	348
40	.94886	145	90	.83623	354
41	.94741	148	91	.83269	362
42	.94593	150	92	.82907	369
43	.94443	152	93	.82538	375
44	.94291	155	94	.82163	391
45	.94136	157	95	.81772	409
46	.93979	159	96	.81363	421
47	.93820	163	97	.80942	428
48	.93657	164	98	.80514	432
49	.93493	167	99	.80082	435
50	.93326		100	.79647	

TABLE 9.—Per Cents by Volume at 15° C, Corresponding to Various Per Cents by Weight in Mixtures of Methyl Alcohol and Water

Per Cent by Weight	Per Cent by Volume at 15° C	Differences	Per Cent by Weight	Per Cent by Volume at 15° C	Differences
0	0.000		50	57.712	
1	1.253	1.253	51	58.739	1.027
2	2.502	1.249	52	59.759	1.020
3	3.746	1.244	53	60.773	1.014
4	4.986	1.240	54	61.781	1.008
		1.236			1.002
5	6.222		55	62.783	
6	7.454	1.232	56	63.778	.995
7	8.682	1.228	57	64.767	.989
8	9.907	1.225	58	65.750	.983
9	11.128	1.221	59	66.725	.975
		1.217			.968
10	12.345		60	67.693	
11	13.559	1.214	61	68.654	.961
12	14.770	1.211	62	69.607	.953
13	15.977	1.207	63	70.552	.945
14	17.181	1.204	64	71.490	.938
		1.201			.930
15	18.382		65	72.420	
16	19.579	1.197	66	73.344	.924
17	20.773	1.194	67	74.262	.918
18	21.963	1.190	68	75.172	.910
19	23.149	1.186	69	76.077	.905
		1.183			.899
20	24.332		70	76.976	
21	25.512	1.180	71	77.864	.888
22	26.688	1.176	72	78.746	.882
23	27.860	1.172	73	79.618	.872
24	29.029	1.169	74	80.480	.862
		1.164			.856
25	30.193		75	81.336	
26	31.354	1.161	76	82.182	.846
27	32.510	1.156	77	83.022	.840
28	33.662	1.152	78	83.855	.833
29	34.809	1.147	79	84.680	.825
		1.143			.815
30	35.952		80	85.499	
31	37.091	1.139	81	86.310	.811
32	38.224	1.133	82	87.110	.800
33	39.352	1.128	83	87.899	.789
34	40.476	1.124	84	88.677	.778
		1.118			.771
35	41.594		85	89.448	
36	42.708	1.114	86	90.212	.764
37	43.816	1.108	87	90.968	.756
38	44.919	1.103	88	91.716	.748
39	46.016	1.097	89	92.456	.740
		1.093			.732
40	47.109		90	93.188	
41	48.195	1.086	91	93.912	.724
42	49.277	1.082	92	94.627	.715
43	50.353	1.076	93	95.326	.699
44	51.422	1.069	94	96.017	.691
		1.064			.680
45	52.486		95	96.697	
46	53.544	1.058	96	97.370	.673
47	54.595	1.051	97	98.036	.666
48	55.639	1.044	98	98.696	.660
49	56.678	1.039	99	99.351	.655
		1.034			.649
50	57.712		100	100.000	

TABLE 10.—Temperature Corrections to Saccharometer Readings (Standard at 20° C)

[This table is calculated using the data on thermal expansion of sugar solutions by Plato⁴, assuming the instrument to be of Jena 16^{III} glass. The table should be used with caution and only for approximate results when the temperature differs much from the standard temperature or from the temperature of the surrounding air]

Temperature in Degrees Centigrade	Observed Per Cent of Sugar													
	0	5	10	15	20	25	30	35	40	45	50	55	60	70
	Subtract from Observed Per cent													
0	0.30	0.49	0.65	0.77	0.89	0.99	1.08	1.16	1.24	1.31	1.37	1.41	1.44	1.49
5	.36	.47	.56	.65	.73	.80	.86	.91	.97	1.01	1.05	1.08	1.10	1.14
10	.32	.38	.43	.48	.52	.57	.60	.64	.67	.70	.72	.74	.75	.77
11	.31	.35	.40	.44	.48	.51	.55	.58	.60	.63	.65	.66	.68	.70
12	.29	.32	.36	.40	.43	.46	.50	.52	.54	.56	.58	.59	.60	.62
13	.26	.29	.32	.35	.38	.41	.44	.46	.48	.49	.51	.52	.53	.55
14	.24	.26	.29	.31	.34	.36	.38	.40	.41	.42	.44	.45	.46	.47
15	.20	.22	.24	.26	.28	.30	.32	.33	.34	.36	.36	.37	.38	.39
16	.17	.18	.20	.22	.23	.25	.26	.27	.28	.28	.29	.30	.31	.32
17	.13	.14	.15	.16	.18	.19	.20	.20	.21	.21	.22	.23	.23	.24
18	.09	.10	.10	.11	.12	.13	.13	.14	.14	.14	.15	.15	.15	.16
19	.05	.05	.05	.06	.06	.06	.07	.07	.07	.07	.08	.08	.08	.08
17.5	.11	.12	.12	.14	.15	.16	.16	.17	.17	.18	.18	.19	.19	.20
15.56 (60° F)	.18	.20	.22	.24	.25	.28	.29	.30	.30	.32	.33	.33	.34	.34
	Add to Observed Per Cent													
21	0.04	0.05	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.09
22	.10	.10	.11	.12	.12	.13	.14	.14	.15	.15	.16	.16	.16	.16
23	.16	.16	.17	.17	.19	.20	.21	.21	.22	.23	.24	.24	.24	.24
24	.21	.22	.23	.24	.26	.27	.28	.29	.30	.31	.32	.32	.32	.32
25	.27	.28	.30	.31	.32	.34	.35	.36	.38	.38	.39	.39	.40	.39
26	.33	.34	.36	.37	.40	.40	.42	.44	.46	.47	.47	.48	.48	.48
27	.40	.41	.42	.44	.46	.48	.50	.52	.54	.54	.55	.56	.56	.56
28	.46	.47	.49	.51	.54	.56	.58	.60	.61	.62	.63	.64	.64	.64
29	.54	.55	.56	.59	.61	.63	.66	.68	.70	.70	.71	.72	.72	.72
30	.61	.62	.63	.66	.68	.71	.73	.76	.78	.78	.79	.80	.80	.81
35	.99	1.01	1.02	1.06	1.10	1.13	1.16	1.18	1.20	1.21	1.22	1.22	1.23	1.22
40	1.42	1.45	1.47	1.51	1.54	1.57	1.60	1.62	1.64	1.65	1.65	1.65	1.66	1.65
45	1.91	1.94	1.96	2.00	2.03	2.05	2.07	2.09	2.10	2.10	2.10	2.10	2.10	2.08
50	2.46	2.48	2.50	2.53	2.56	2.57	2.58	2.59	2.59	2.58	2.58	2.57	2.56	2.52
55	3.05	3.07	3.09	3.12	3.12	3.12	3.12	3.11	3.10	3.08	3.07	3.05	3.03	2.97
60	3.69	3.72	3.73	3.73	3.72	3.70	3.67	3.65	3.62	3.60	3.57	3.54	3.50	3.43
27.5	0.43	0.44	0.46	0.48	0.50	0.52	0.54	0.56	0.58	0.58	0.59	0.60	0.60	0.60

⁴ Wiss. Abh. der Kaiserlichen Normal-Eichungs-Kommission, 2, p. 140; 1900.

TABLE 11.—Density⁵ of Solutions of Cane Sugar at 20° C

[This table is the basis for standardizing hydrometers indicating per cent of sugar at 20° C]

Per Cent Sugar	Tenths of Per Cent									
	0	1	2	3	4	5	6	7	8	9
0	0.998234	0.998622	0.999010	0.999398	0.999786	1.000174	1.000563	1.000952	1.001342	1.001731
1	1.002120	1.002509	1.002897	1.003286	1.003675	1.004064	1.004453	1.004844	1.005234	1.005624
2	1.006015	1.006405	1.006796	1.007188	1.007580	1.007972	1.008363	1.008755	1.009148	1.009541
3	1.009934	1.010327	1.010721	1.011115	1.011510	1.011904	1.012298	1.012694	1.013089	1.013485
4	1.013881	1.014277	1.014673	1.015070	1.015467	1.015864	1.016261	1.016659	1.017058	1.017456
5	1.017854	1.018253	1.018652	1.019052	1.019451	1.019851	1.020251	1.020651	1.021053	1.021454
6	1.021855	1.022257	1.022659	1.023061	1.023463	1.023867	1.024270	1.024673	1.025077	1.025481
7	1.025885	1.026289	1.026694	1.027099	1.027504	1.027910	1.028316	1.028722	1.029128	1.029535
8	1.029942	1.030349	1.030757	1.031165	1.031573	1.031982	1.032391	1.032800	1.033209	1.033619
9	1.034029	1.034439	1.034850	1.035260	1.035671	1.036082	1.036494	1.036906	1.037318	1.037730
10	1.038143	1.038556	1.038970	1.039383	1.039797	1.040212	1.040626	1.041041	1.041456	1.041872
11	1.042288	1.042704	1.043121	1.043537	1.043954	1.044370	1.044788	1.045206	1.045625	1.046043
12	1.046462	1.046881	1.047300	1.047720	1.048140	1.048559	1.048980	1.049401	1.049822	1.050243
13	1.050665	1.051087	1.051510	1.051933	1.052356	1.052778	1.053202	1.053626	1.054050	1.054475
14	1.054900	1.055325	1.055751	1.056176	1.056602	1.057029	1.057455	1.057882	1.058310	1.058737
15	1.059165	1.059593	1.060022	1.060451	1.060880	1.061308	1.061738	1.062168	1.062598	1.063029
16	1.063460	1.063892	1.064324	1.064756	1.065188	1.065621	1.066054	1.066487	1.066921	1.067355
17	1.067789	1.068223	1.068658	1.069093	1.069529	1.069964	1.070400	1.070836	1.071273	1.071710
18	1.072147	1.072585	1.073023	1.073461	1.073900	1.074338	1.074777	1.075217	1.075657	1.076097
19	1.076537	1.076978	1.077419	1.077860	1.078302	1.078744	1.079187	1.079629	1.080072	1.080515
20	1.080959	1.081403	1.081848	1.082292	1.082737	1.083182	1.083628	1.084074	1.084520	1.084967
21	1.085414	1.085861	1.086309	1.086757	1.087205	1.087652	1.088101	1.088550	1.089000	1.089450
22	1.089900	1.090351	1.090802	1.091253	1.091704	1.092155	1.092607	1.093060	1.093513	1.093966
23	1.094420	1.094874	1.095328	1.095782	1.096236	1.096691	1.097147	1.097603	1.098058	1.098514
24	1.098971	1.099428	1.099886	1.100344	1.100802	1.101259	1.101718	1.102177	1.102637	1.103097
25	1.103557	1.104017	1.104478	1.104938	1.105400	1.105862	1.106324	1.106786	1.107248	1.107711
26	1.108175	1.108639	1.109103	1.109568	1.110033	1.110497	1.110963	1.111429	1.111895	1.112361
27	1.112828	1.113295	1.113763	1.114229	1.114697	1.115166	1.115635	1.116104	1.116572	1.117042
28	1.117512	1.117982	1.118453	1.118923	1.119395	1.119867	1.120339	1.120812	1.121284	1.121757
29	1.122331	1.122705	1.123179	1.123653	1.124128	1.124603	1.125079	1.125555	1.126030	1.126507
30	1.126984	1.127461	1.127939	1.128417	1.128896	1.129374	1.129853	1.130332	1.130812	1.131292
31	1.131773	1.132254	1.132735	1.133216	1.133698	1.134180	1.134663	1.135146	1.135628	1.136112
32	1.136596	1.137080	1.137565	1.138049	1.138534	1.139020	1.139506	1.139993	1.140479	1.140966
33	1.141453	1.141941	1.142429	1.142916	1.143405	1.143894	1.144384	1.144874	1.145363	1.145854
34	1.146345	1.146836	1.147328	1.147820	1.148313	1.148805	1.149298	1.149792	1.150286	1.150780
35	1.151275	1.151770	1.152265	1.152760	1.153256	1.153752	1.154249	1.154746	1.155242	1.155740
36	1.156238	1.156736	1.157235	1.157733	1.158233	1.158733	1.159233	1.159733	1.160233	1.160734
37	1.161236	1.161738	1.162240	1.162742	1.163245	1.163748	1.164252	1.164756	1.165259	1.165764
38	1.166269	1.166775	1.167281	1.167786	1.168293	1.168800	1.169307	1.169815	1.170322	1.170831
39	1.171340	1.171849	1.172359	1.172869	1.173379	1.173889	1.174400	1.174911	1.175423	1.175935
40	1.176447	1.176960	1.177473	1.177987	1.178501	1.179014	1.179527	1.180044	1.180560	1.181076
41	1.181592	1.182108	1.182625	1.183142	1.183660	1.184178	1.184696	1.185215	1.185734	1.186253
42	1.186773	1.187293	1.187814	1.188335	1.188856	1.189379	1.189901	1.190423	1.190946	1.191469
43	1.191993	1.192517	1.193041	1.193565	1.194090	1.194616	1.195141	1.195667	1.196193	1.196720
44	1.197247	1.197775	1.198303	1.198832	1.199360	1.199890	1.200420	1.200950	1.201480	1.202010
45	1.202540	1.203071	1.203603	1.204136	1.204668	1.205200	1.205733	1.206266	1.206801	1.207335
46	1.207870	1.208405	1.208940	1.209477	1.210013	1.210549	1.211086	1.211623	1.212162	1.212700
47	1.213238	1.213777	1.214317	1.214856	1.215395	1.215936	1.216476	1.217017	1.217559	1.218100
48	1.218643	1.219185	1.219729	1.220272	1.220815	1.221360	1.221904	1.222449	1.222995	1.223540
49	1.224086	1.224632	1.225180	1.225727	1.226274	1.226823	1.227371	1.227919	1.228469	1.229018
50	1.229567	1.230117	1.230668	1.231219	1.231770	1.232322	1.232874	1.233426	1.233979	1.234532

⁵ According to Dr. F. Plato (Kaiserlichen Normal-Eichungs-Kommission, Wiss. Abh., 2, p. 153; 1900).

TABLE 12.—Density of Solutions of Sulphuric Acid (H_2SO_4) at 20° C[Calculated from Dr. J. Domke's table,⁶ Adopted as the basis for standardization of hydrometers indicating per cent of sulphuric acid at 20° C]

Per Cent H_2SO_4	$D_{4}^{20} C$	Per Cent H_2SO_4	$D_{4}^{20} C$	Per Cent H_2SO_4	$D_{4}^{20} C$
0	0.99823	50	1.39505	91.0	1.81950
1	1.00506	51	1.40487	91.2	1.82045
2	1.01178	52	1.41481	91.4	1.82137
3	1.01839	53	1.42487	91.6	1.82227
4	1.02500	54	1.43503	91.8	1.82315
5	1.03158	55	1.44530	92.0	1.82401
6	1.03843	56	1.45568	92.2	1.82484
7	1.04527	57	1.46615	92.4	1.82564
8	1.05216	58	1.47673	92.6	1.82641
9	1.05909	59	1.48740	92.8	1.82717
10	1.06609	60	1.49818	93.0	1.82790
11	1.07314	61	1.50904	93.2	1.82860
12	1.08026	62	1.51999	93.4	1.82928
13	1.08744	63	1.53102	93.6	1.82993
14	1.09468	64	1.54213	93.8	1.83055
15	1.10199	65	1.55333	94.0	1.83115
16	1.10936	66	1.56460	94.2	1.83172
17	1.11679	67	1.57595	94.4	1.83226
18	1.12428	68	1.58739	94.6	1.83276
19	1.13183	69	1.59890	94.8	1.83324
20	1.13943	70	1.61048	95.0	1.83368
21	1.14709	71	1.62213	95.1	1.83389
22	1.15480	72	1.63384	95.2	1.83410
23	1.16258	73	1.64560	95.3	1.83430
24	1.17041	74	1.65738	95.4	1.83449
25	1.17830	75	1.66917	95.5	1.83469
26	1.18624	76	1.68095	95.6	1.83486
27	1.19423	77	1.69268	95.7	1.83503
28	1.20227	78	1.70433	95.8	1.83520
29	1.21036	79	1.71585	95.9	1.83534
30	1.21850	80	1.72717	96.0	1.83548
31	1.22669	81	1.73827	96.1	1.83560
32	1.23492	82	1.74904	96.2	1.83572
33	1.24320	83	1.75943	96.3	1.83584
34	1.25154	84	1.76932	96.4	1.83594
35	1.25992	85	1.77860	96.5	1.83604
36	1.26836	85.5	1.78300	96.6	1.83613
37	1.27685	86	1.78721	96.7	1.83621
38	1.28543	86.5	1.79124	96.8	1.83628
39	1.29407	87	1.79509	96.9	1.83634
40	1.30278	87.5	1.79875	97.0	1.83637
41	1.31157	88	1.80223	97.1	1.83639
42	1.32043	88.5	1.80552	97.2	1.83640
43	1.32938	89	1.80864	97.3	1.83640
44	1.33843	89.5	1.81159	97.4	1.83639
45	1.34759	90	1.81438	97.5	1.83637
46	1.35685	90.2	1.81545	97.6	1.83634
47	1.36625	90.4	1.81650	97.7	1.83629
48	1.37574	90.6	1.81753	97.8	1.83623
49	1.38533	90.8	1.81853	97.9	1.83615
50	1.39505	91.0	1.81950	98.0	1.83605

⁶ Wissenschaftliche Abhandlungen der Kaiserlichen Normal-Eichungs-Kommission, 5, p. 131; 1900.

TABLE 14.—Degrees Baumé Corresponding to Specific Gravities at $\frac{60^\circ}{60^\circ}$ F ($\frac{15^\circ56}{15^\circ56}$ C)
Greater than 1

[Calculated from the formula degrees Baumé = $145 - \frac{145}{D - \frac{60^\circ}{60^\circ} F}$, which defines the Baumé scale, in general use in the United States, for liquids heavier than water]

D $\frac{15^\circ56}{15^\circ56}$ C	0	1	2	3	4	5	6	7	8	9	Diff.
1.00	0.000	0.145	0.289	0.434	0.578	0.721	0.865	1.008	1.151	1.293	143
1.01	1.436	1.578	1.719	1.861	2.002	2.143	2.283	2.424	2.564	2.704	141
1.02	2.843	2.982	3.121	3.260	3.399	3.537	3.675	3.812	3.950	4.087	138
1.03	4.223	4.360	4.496	4.632	4.768	4.903	5.038	5.174	5.308	5.443	136
1.04	5.577	5.711	5.845	5.978	6.111	6.244	6.377	6.509	6.641	6.773	133
1.05	6.905	7.036	7.167	7.298	7.429	7.559	7.689	7.819	7.949	8.078	130
1.06	8.208	8.336	8.465	8.594	8.722	8.850	8.978	9.105	9.232	9.359	128
1.07	9.486	9.613	9.739	9.865	9.991	10.116	10.242	10.367	10.492	10.616	126
1.08	10.741	10.865	10.989	11.113	11.236	11.359	11.483	11.605	11.728	11.850	124
1.09	11.972	12.094	12.216	12.338	12.459	12.580	12.701	12.821	12.942	13.062	121
1.10	13.182	13.302	13.421	13.540	13.659	13.778	13.897	14.015	14.134	14.252	119
1.11	14.370	14.487	14.604	14.721	14.838	14.955	15.072	15.188	15.304	15.420	117
1.12	15.536	15.651	15.767	15.882	15.997	16.111	16.226	16.340	16.454	16.568	115
1.13	16.682	16.795	16.908	17.021	17.134	17.247	17.359	17.471	17.583	17.695	113
1.14	17.807	17.919	18.030	18.141	18.252	18.363	18.473	18.583	18.693	18.803	111
1.15	18.913	19.023	19.132	19.241	19.350	19.459	19.568	19.676	19.784	19.892	109
1.16	20.000	20.108	20.215	20.322	20.430	20.536	20.643	20.750	20.856	20.962	107
1.17	21.068	21.174	21.280	21.385	21.491	21.596	21.701	21.806	21.910	22.014	105
1.18	22.119	22.223	22.327	22.430	22.534	22.637	22.740	22.843	22.946	23.049	103
1.19	23.151	23.254	23.356	23.458	23.560	23.661	23.763	23.864	23.965	24.066	101
1.20	24.167	24.267	24.368	24.468	24.568	24.668	24.768	24.868	24.967	25.066	100
1.21	25.165	25.264	25.363	25.462	25.560	25.658	25.755	25.855	25.952	26.050	98
1.22	26.148	26.245	26.342	26.439	26.536	26.633	26.729	26.826	26.922	27.018	97
1.23	27.114	27.210	27.305	27.401	27.496	27.591	27.686	27.781	27.876	27.970	95
1.24	28.065	28.159	28.253	28.347	28.441	28.534	28.628	28.721	28.814	28.907	94
1.25	29.000	29.093	29.185	29.278	29.370	29.462	29.554	29.646	29.738	29.829	92
1.26	29.921	30.012	30.103	30.194	30.285	30.376	30.466	30.556	30.647	30.737	91
1.27	30.827	30.917	31.006	31.096	31.185	31.275	31.364	31.453	31.542	31.630	89
1.28	31.719	31.807	31.896	31.984	32.072	32.160	32.247	32.335	32.422	32.510	88
1.29	32.597	32.684	32.771	32.858	32.944	33.031	33.117	33.204	33.290	33.376	87
1.30	33.462	33.547	33.633	33.718	33.804	33.889	33.974	34.059	34.144	34.229	85
1.31	34.313	34.397	34.482	34.566	34.650	34.734	34.818	34.901	34.985	35.068	84
1.32	35.152	35.235	35.318	35.401	35.483	35.566	35.649	35.731	35.813	35.895	83
1.33	35.977	36.059	36.141	36.223	36.304	36.386	36.467	36.548	36.629	36.710	81
1.34	36.791	36.872	36.952	37.033	37.113	37.193	37.273	37.353	37.433	37.513	80
1.35	37.593	37.672	37.751	37.831	37.910	37.989	38.068	38.147	38.225	38.304	79
1.36	38.382	38.461	38.539	38.617	38.695	38.773	38.851	38.928	39.006	39.083	78
1.37	39.161	39.238	39.315	39.392	39.469	39.546	39.622	39.699	39.775	39.851	77
1.38	39.928	40.004	40.080	40.156	40.231	40.307	40.382	40.458	40.533	40.608	76
1.39	40.683	40.758	40.833	40.908	40.983	41.057	41.132	41.206	41.280	41.355	75
1.40	41.429	41.503	41.576	41.650	41.724	41.797	41.871	41.944	42.017	42.090	74
1.41	42.163	42.236	42.309	42.381	42.454	42.527	42.599	42.671	42.743	42.815	73

TABLE 16.—Conversion of Density Basis

Prepared for use in reducing readings of a hydrometer graduated to indicate density or specific gravity at a specified standard temperature, T, referred to water at a specified temperature, T', as unity, to the basis of another standard temperature, t, and reference temperature, t'.

The factor Δ (given in units of the sixth decimal place), multiplied by the density or specific-gravity reading, gives the correction to be applied to the reading to reduce it to the required basis.

For example, if a maker using standards indicating $D_{15^{56}}^{15^{56}}C$ wishes to graduate a hydrometer to indicate density at 20° C referred to water at 4° C (D_{4}^{20}), the readings of the standard must be corrected by use of the factor +0.001062.

Suppose the standard reads 1.5760

The corresponding correction is $1.6 \times .001062 =$ +0.0017

Corrected reading 1.5777

The table is calculated for Jena 16^{III} glass.

Given Basis of Density	Required Basis of Density									
	$D_{4}^{25^{\circ}C}$	D_{4}^{20}	$D_{4}^{17.5}$	$D_{4}^{15.56}$	D_{4}^{15}	D_{15}^{15}	$D_{15.56}^{15.56}$	$D_{17.5}^{17.5}$	D_{20}^{20}	D_{25}^{25}
$\frac{T}{T'}$	Δ (In Units of the Sixth Decimal Place)									
$D_{4}^{25^{\circ}C}$	0	+ 115	+ 172	+ 217	+ 230	+1104	+1177	+1459	+1884	+2931
$D_{4}^{20}C$	- 115	0	+ 58	+ 102	+ 115	+ 989	+1062	+1345	+1769	+2816
$D_{4}^{17.5}C$	- 172	- 58	0	+ 45	+ 58	+ 932	+1005	+1287	+1711	+2758
$D_{4}^{15.56}C$	- 217	- 102	- 45	0	+ 13	+ 887	+ 960	+1242	+1667	+2713
$D_{4}^{15}C$	- 230	- 115	- 58	- 13	0	+ 874	+ 947	+1229	+1654	+2700
$D_{15}^{15}C$	-1103	- 988	- 931	- 886	- 873	0	+ 73	+ 354	+ 779	+1826
$D_{15.56}^{15.56}C$	-1176	-1061	-1004	- 960	- 947	- 73	0	+ 281	+ 706	+1752
$D_{17.5}^{17.5}C$	-1457	-1343	-1285	-1240	-1227	- 354	- 281	0	+ 424	+1471
$D_{20}^{20}C$	-1881	-1766	-1708	-1664	-1651	- 778	- 705	- 423	0	+1046
$D_{25}^{25}C$	-2923	-2808	-2751	-2707	-2694	-1821	-1748	-1468	-1044	0

TABLE 17.—Weight in Grams of 1 Liter of Dry Air at Various Pressures and Temperatures Containing 0.04 Per Cent of CO₂

[Computed from the formula $C = \frac{1.293052}{1 - 0.00367t} \times \frac{h}{760}$, where h is pressure in mm of mercury at 0° C, and standard gravity, and t is temperature in degrees centigrade]

Temperature in Deg. C	Pressure in mm of Hg (0° C, Standard Gravity)											
	720	725	730	735	740	745	750	755	760	765	770	775
15	1.1611	1.1691	1.1772	1.1853	1.1933	1.2014	1.2095	1.2175	1.2256	1.2336	1.2417	1.2498
16	1.1571	1.1651	1.1731	1.1812	1.1892	1.1972	1.2053	1.2133	1.2213	1.2294	1.2374	1.2454
17	1.1531	1.1611	1.1691	1.1771	1.1851	1.1931	1.2011	1.2091	1.2171	1.2251	1.2331	1.2411
18	1.1491	1.1571	1.1650	1.1730	1.1810	1.1890	1.1970	1.2049	1.2129	1.2209	1.2289	1.2369
19	1.1451	1.1531	1.1611	1.1690	1.1770	1.1849	1.1929	1.2008	1.2088	1.2167	1.2247	1.2326
20	1.1412	1.1492	1.1571	1.1650	1.1729	1.1809	1.1888	1.1967	1.2046	1.2126	1.2205	1.2284
21	1.1373	1.1452	1.1531	1.1610	1.1689	1.1768	1.1847	1.1926	1.2005	1.2084	1.2163	1.2242
22	1.1335	1.1414	1.1492	1.1571	1.1650	1.1728	1.1807	1.1886	1.1965	1.2043	1.2122	1.2201
23	1.1296	1.1375	1.1453	1.1532	1.1610	1.1689	1.1767	1.1845	1.1924	1.2002	1.2081	1.2159
24	1.1258	1.1337	1.1415	1.1493	1.1571	1.1649	1.1727	1.1806	1.1884	1.1962	1.2040	1.2118
25	1.1220	1.1298	1.1376	1.1454	1.1532	1.1610	1.1688	1.1766	1.1844	1.1922	1.2000	1.2078
26	1.1183	1.1261	1.1338	1.1416	1.1494	1.1571	1.1649	1.1727	1.1804	1.1882	1.1959	1.2037
27	1.1146	1.1223	1.1300	1.1378	1.1455	1.1533	1.1610	1.1687	1.1765	1.1842	1.1920	1.1997
28	1.1108	1.1186	1.1263	1.1340	1.1417	1.1494	1.1571	1.1648	1.1726	1.1803	1.1880	1.1957
29	1.1072	1.1149	1.1225	1.1302	1.1379	1.1456	1.1533	1.1610	1.1687	1.1764	1.1840	1.1917
30	1.1035	1.1112	1.1188	1.1265	1.1342	1.1418	1.1495	1.1571	1.1648	1.1725	1.1801	1.1878
31	1.0999	1.1075	1.1151	1.1228	1.1304	1.1381	1.1457	1.1533	1.1610	1.1686	1.1762	1.1839

TABLE 18.—Buoyancy Constants (mg/cm³)

[Difference in milligrams between the mass and the apparent weight of 1 cubic centimeter of water weighed with brass weights (d=8.4) in air at various temperatures and barometer readings (unreduced). A humidity of 50 per cent saturation is assumed. To find the weight of 1 cubic centimeter of air under the conditions assumed in this table, multiply the buoyancy constant by 1.135 (42.37)]

Observed Pressure in Millimeters	Pressure	Temperature in Degrees Centigrade			
		15	20	25	30
	720	1.017	0.998	0.979	0.960
	725	1.024	1.004	0.985	0.967
	730	1.031	1.011	0.992	0.973
	735	1.038	1.018	0.999	0.980
	740	1.045	1.025	1.006	0.987
	745	1.052	1.032	1.013	0.994
	750	1.059	1.039	1.020	1.000
	755	1.067	1.046	1.027	1.007
	760	1.074	1.053	1.034	1.014
	765	1.081	1.060	1.040	1.020
	770	1.088	1.067	1.047	1.027
	775	1.095	1.074	1.054	1.034
	780	1.102	1.081	1.061	1.041

TABLE 19.—Apparent Weight (in Grams) of Water in Air

[This table gives the apparent weight, for temperatures between 15° and 30° C, humidity 50 per cent, unreduced barometer reading 76 cm of certain volumes of water weighed with brass weights. This table is based on the data given in Tables 1 and 15, and may be conveniently employed to determine definite volumes of water for calibrating instruments. The table assumes the air to be at the same temperature as the water]

Temp. in Degrees C	2000 cc	1000 cc	500 cc	400 cc	300 cc	250 cc	150 cc
15	1996.11	998.05	499.03	399.22	299.42	249.51	149.71
16	1995.80	997.90	498.95	399.16	299.37	249.48	149.68
17	1995.48	997.74	498.87	399.10	299.32	249.43	149.66
18	1995.13	997.56	498.78	399.03	299.27	249.39	149.63
19	1994.76	997.38	498.69	398.95	299.21	249.34	149.61
20	1994.36	997.18	498.59	398.87	299.15	249.30	149.58
21	1993.95	996.97	498.49	398.79	299.09	249.24	149.55
22	1993.51	996.76	498.38	398.70	299.03	249.19	149.51
23	1993.06	996.53	498.26	398.61	298.96	249.13	149.48
24	1992.58	996.29	498.15	398.52	298.89	249.07	149.44
25	1992.09	996.04	498.02	398.42	298.81	249.01	149.41
26	1991.57	995.79	497.89	398.31	298.74	248.95	149.37
27	1991.04	995.52	497.76	398.21	298.66	248.88	149.33
28	1990.49	995.24	497.62	398.10	298.57	248.81	149.29
29	1989.92	994.96	497.48	397.98	298.49	248.74	149.24
30	1989.33	994.66	497.33	397.87	298.40	248.67	149.20

TABLE 20.—Temperature Correction for Glass Volumetric Apparatus

[This table gives the correction to be added to actual capacity (determined at certain temperatures) to give the capacity at the standard temperature, 20° C. Conversely, by subtracting the corrections from the indicated capacity of an instrument standard at 20° C the corresponding capacity at other temperatures is obtained. The table assumes for the cubical coefficient of expansion of glass 0.000025 per degree centigrade. The coefficients of expansion of glasses used for volumetric instruments vary from 0.000023 to 0.000028]

Temp. in Degrees C	2000 cc	1000 cc	500 cc	400 cc	300 cc	250 cc
15	+0.25	+0.12	+0.06	+0.05	+0.04	+0.031
16	+ .20	+ .10	+ .05	+ .04	+ .03	+ .025
17	+ .15	+ .08	+ .04	+ .03	+ .02	+ .019
18	+ .10	+ .05	+ .02	+ .02	+ .02	+ .012
19	+ .05	+ .02	+ .01	+ .01	+ .01	+ .006
21	-0.05	-0.02	-0.01	-0.01	-0.01	-0.006
22	- .10	- .05	- .02	- .02	- .02	- .012
23	- .15	- .08	- .04	- .03	- .02	- .019
24	- .20	- .10	- .05	- .04	- .03	- .025
25	- .25	- .12	- .06	- .05	- .04	- .031
26	-0.30	-0.15	-0.08	-0.06	-0.04	-0.038
27	- .35	- .18	- .09	- .07	- .05	- .044
28	- .40	- .20	- .10	- .08	- .06	- .050
29	- .45	- .22	- .11	- .09	- .07	- .056
30	- .50	- .25	- .12	- .10	- .08	- .062

**TABLES OF CORRECTIONS FOR DETERMINING THE TRUE CAPACITIES OF GLASS
VESSELS FROM THE WEIGHT OF WATER IN AIR**

Tables 21 to 33 are intended for the calculation of capacities of glass vessels of common sizes from the weight (in air) of the water contained or delivered. They give for each nominal capacity and observed temperature the amounts to be added to the apparent weight (in air against brass weights) of the water contained in or delivered by a glass vessel to give the capacity in cubic centimeters at 20° C. They are calculated on the following data assumed as approximating ordinary conditions:

Observed barometric pressure.....	76 cm
Relative humidity.....	50 per cent
Coefficient of expansion of glass.....	0.000025 per deg. C

EXAMPLE OF USE OF TABLE

Determination of capacity of glass measuring flask marked "To contain 250 cc at 20° C."

Apparent weight of water at the observed temperature 22°3 C.....	249.198g
From Table 21, correction.....	0.813

Actual capacity at 20°..... 250.011 cc

TABLE 21.—Indicated Capacity 250 cc

[Amounts to be added to apparent weight of water in grams to obtain actual capacity in cubic centimeters at 20° C]

Temp. in Deg. C	Tenths of Degrees									
	0	1	2	3	4	5	6	7	8	9
15	0.518	0.521	0.524	0.528	0.530	0.534	0.537	0.540	0.543	0.546
16	.550	.554	.556	.560	.563	.567	.570	.574	.578	.581
17	.584	.588	.592	.596	.599	.603	.606	.610	.614	.618
18	.622	.626	.630	.633	.638	.642	.646	.649	.654	.658
19	.662	.666	.670	.674	.679	.683	.687	.692	.696	.700
20	.705	.709	.714	.718	.722	.727	.732	.736	.741	.746
21	.750	.754	.760	.764	.769	.774	.778	.784	.788	.793
22	.798	.804	.808	.813	.818	.824	.828	.834	.839	.844
23	.849	.854	.860	.865	.870	.875	.881	.886	.892	.897
24	.902	.908	.913	.919	.924	.930	.936	.941	.947	.952
25	.958	.964	.969	.975	.981	.986	.993	.998	1.004	1.010
26	1.016	1.022	1.028	1.034	1.040	1.046	1.052	1.058	1.064	1.070
27	1.076	1.082	1.089	1.095	1.101	1.108	1.114	1.120	1.126	1.132
28	1.139	1.146	1.152	1.158	1.165	1.172	1.178	1.184	1.191	1.198
29	1.204	1.211	1.218							

TABLES OF CORRECTIONS FOR DETERMINING THE TRUE CAPACITIES OF GLASS VESSELS FROM THE WEIGHT OF WATER IN AIR—Continued

[Amounts to be added to apparent weight of water in grams to obtain actual capacity in cubic centimeters at 20° C]

TABLE 22.—Indicated Capacity 200 cc

Temp. in Deg. C	Tenths of Degrees									
	0	1	2	3	4	5	6	7	8	9
15	0.414	0.417	0.419	0.422	0.424	0.427	0.430	0.432	0.435	0.437
16	.440	.443	.445	.448	.451	.454	.456	.459	.462	.465
17	.468	.470	.473	.477	.479	.482	.485	.488	.491	.494
18	.497	.501	.504	.507	.510	.513	.516	.519	.523	.526
19	.529	.533	.536	.540	.543	.546	.550	.553	.557	.560
20	.564	.567	.571	.574	.578	.582	.585	.589	.593	.596
21	.600	.604	.608	.612	.615	.619	.623	.627	.631	.635
22	.639	.643	.647	.650	.655	.659	.663	.667	.671	.675
23	.679	.683	.688	.692	.696	.700	.705	.709	.713	.717
24	.722	.726	.731	.735	.739	.744	.748	.753	.757	.762
25	.766	.771	.775	.780	.785	.789	.794	.799	.803	.808
26	.813	.818	.822	.827	.832	.837	.842	.846	.851	.856
27	.861	.866	.871	.876	.881	.886	.891	.896	.901	.906
28	.911	.917	.922	.927	.932	.937	.942	.947	.953	.958
29	.963	.969	.974							

TABLE 23.—Indicated Capacity 150 cc

15	0.311	0.313	0.314	0.316	0.318	0.320	0.322	0.324	0.326	0.328
16	.330	.332	.334	.336	.338	.340	.342	.344	.346	.349
17	.351	.353	.355	.357	.359	.362	.364	.366	.368	.371
18	.373	.375	.378	.380	.383	.385	.387	.390	.392	.395
19	.397	.400	.402	.405	.408	.410	.412	.415	.418	.420
20	.423	.425	.428	.431	.433	.436	.439	.442	.445	.448
21	.450	.453	.456	.459	.461	.464	.467	.470	.473	.476
22	.479	.483	.485	.488	.491	.494	.497	.500	.503	.506
23	.509	.512	.516	.519	.522	.525	.529	.532	.535	.538
24	.541	.545	.548	.551	.554	.558	.562	.565	.568	.571
25	.575	.578	.581	.585	.588	.592	.596	.599	.602	.606
26	.610	.613	.617	.620	.624	.628	.631	.635	.638	.642
27	.645	.649	.653	.657	.661	.664	.668	.672	.676	.680
28	.684	.688	.691	.695	.699	.703	.707	.711	.715	.719
29	.722	.726	.730							

TABLE 24.—Indicated Capacity 100 cc

15	0.207	0.208	0.210	0.211	0.212	0.213	0.215	0.216	0.217	0.219
16	.220	.221	.223	.224	.225	.227	.228	.230	.231	.232
17	.234	.235	.237	.238	.240	.241	.243	.244	.246	.247
18	.249	.250	.252	.253	.255	.257	.258	.260	.261	.263
19	.265	.266	.268	.270	.272	.273	.275	.277	.278	.280
20	.282	.284	.285	.287	.289	.291	.293	.294	.296	.298
21	.300	.302	.304	.306	.308	.310	.311	.314	.315	.317
22	.319	.321	.323	.325	.327	.329	.331	.333	.336	.338
23	.340	.342	.344	.346	.348	.350	.352	.354	.357	.359
24	.361	.363	.365	.368	.370	.372	.374	.376	.379	.381
25	.383	.386	.388	.390	.392	.395	.397	.399	.402	.404
26	.406	.409	.411	.414	.416	.418	.421	.423	.426	.428
27	.431	.433	.436	.438	.440	.443	.446	.448	.451	.453
28	.456	.458	.461	.463	.466	.469	.471	.474	.476	.479
29	.482	.484	.487							

TABLES OF CORRECTIONS FOR DETERMINING THE TRUE CAPACITIES OF GLASS
VESSELS FROM THE WEIGHT OF WATER IN AIR—Continued

[Amounts to be added to apparent weight of water in grams to obtain actual capacity in cubic centimeters at 20° C]

TABLE 25.—Indicated Capacity 90 cc

Temp. in Deg. C	Tenths of Degrees									
	0	1	2	3	4	5	6	7	8	9
15	0.186	0.188	0.189	0.190	0.191	0.192	0.193	0.194	0.196	0.197
16	.198	.199	.200	.202	.203	.204	.205	.207	.208	.209
17	.210	.212	.213	.214	.216	.217	.218	.220	.221	.222
18	.224	.225	.227	.228	.230	.231	.232	.234	.235	.237
19	.238	.240	.241	.243	.244	.246	.247	.249	.251	.252
20	.254	.255	.257	.258	.260	.262	.263	.265	.267	.268
21	.270	.272	.273	.275	.277	.278	.280	.282	.284	.286
22	.287	.289	.291	.293	.295	.296	.298	.300	.302	.304
23	.306	.308	.309	.311	.313	.315	.317	.319	.321	.323
24	.325	.327	.329	.331	.333	.335	.337	.339	.341	.343
25	.345	.347	.349	.351	.353	.355	.357	.359	.362	.364
26	.366	.368	.370	.372	.374	.377	.379	.381	.383	.385
27	.388	.390	.392	.394	.396	.399	.401	.403	.406	.408
28	.410	.412	.415	.417	.419	.422	.424	.426	.429	.431
29	.434	.436	.438							

TABLE 26.—Indicated Capacity 80 cc

15	0.166	0.167	0.168	0.169	0.170	0.171	0.172	0.173	0.174	0.175
16	.176	.177	.178	.179	.180	.181	.183	.184	.185	.186
17	.187	.188	.189	.191	.192	.193	.194	.195	.196	.198
18	.199	.200	.201	.203	.204	.205	.206	.208	.209	.210
19	.212	.213	.214	.216	.217	.218	.220	.221	.223	.224
20	.226	.227	.228	.230	.231	.233	.234	.236	.237	.239
21	.240	.241	.243	.245	.246	.248	.249	.251	.252	.254
22	.255	.257	.259	.260	.262	.264	.265	.267	.268	.270
23	.272	.273	.275	.277	.278	.280	.282	.284	.285	.287
24	.289	.290	.292	.294	.296	.298	.299	.301	.303	.305
25	.306	.308	.310	.312	.314	.316	.318	.320	.321	.323
26	.325	.327	.329	.331	.333	.335	.337	.339	.341	.342
27	.344	.346	.348	.350	.352	.354	.356	.358	.360	.362
28	.365	.367	.369	.371	.373	.375	.377	.379	.381	.383
29	.385	.387	.390							

TABLE 27.—Indicated Capacity 70 cc

15	0.145	0.146	0.147	0.148	0.148	0.149	0.150	0.151	0.152	0.153
16	.154	.155	.156	.157	.158	.159	.160	.161	.162	.163
17	.164	.165	.166	.167	.168	.169	.170	.171	.172	.173
18	.174	.175	.176	.177	.178	.180	.181	.182	.183	.184
19	.185	.186	.188	.189	.190	.191	.192	.194	.195	.196
20	.197	.199	.200	.201	.202	.204	.205	.206	.207	.209
21	.210	.211	.213	.214	.216	.217	.218	.220	.221	.222
22	.224	.225	.226	.228	.229	.230	.232	.233	.235	.236
23	.238	.239	.241	.242	.244	.245	.247	.248	.250	.251
24	.253	.254	.256	.257	.259	.260	.262	.263	.265	.267
25	.268	.270	.271	.273	.274	.276	.278	.280	.281	.283
26	.284	.286	.288	.289	.291	.293	.294	.296	.298	.299
27	.301	.303	.305	.307	.308	.310	.312	.314	.315	.317
28	.319	.321	.323	.324	.326	.328	.330	.332	.333	.335
29	.337	.339	.341							

TABLES OF CORRECTIONS FOR DETERMINING THE TRUE CAPACITIES OF GLASS VESSELS FROM THE WEIGHT OF WATER IN AIR—Continued

[Amounts to be added to apparent weight of water in grams to obtain actual capacity in cubic centimeters at 20° C]

TABLE 28.—Indicated Capacity 60 cc

Temp. in Deg. C	Tenths of Degrees									
	0	1	2	3	4	5	6	7	8	9
15	0.124	0.125	0.126	0.127	0.127	0.128	0.129	0.130	0.130	0.131
16	.132	.133	.134	.134	.135	.136	.137	.138	.139	.140
17	.140	.141	.142	.143	.144	.145	.145	.147	.147	.148
18	.150	.150	.151	.152	.153	.154	.155	.156	.157	.158
19	.159	.160	.161	.162	.163	.164	.165	.166	.167	.168
20	.169	.170	.171	.172	.173	.175	.176	.177	.178	.179
21	.180	.181	.182	.183	.185	.186	.187	.188	.189	.190
22	.192	.193	.194	.195	.196	.198	.199	.200	.201	.202
23	.204	.205	.206	.208	.209	.210	.211	.213	.214	.215
24	.216	.218	.219	.220	.222	.223	.225	.226	.227	.228
25	.230	.231	.232	.234	.235	.237	.238	.240	.241	.242
26	.244	.245	.247	.248	.250	.251	.253	.254	.255	.257
27	.258	.260	.261	.263	.264	.266	.267	.269	.270	.272
28	.273	.275	.276	.278	.280	.281	.283	.284	.286	.288
29	.289	.291	.292							

TABLE 29.—Indicated Capacity 50 cc

15	0.104	0.104	0.105	0.106	0.106	0.107	0.107	0.108	0.109	0.109
16	.110	.111	.111	.112	.113	.113	.114	.115	.116	.116
17	.117	.118	.118	.119	.120	.121	.121	.122	.123	.124
18	.124	.125	.126	.127	.128	.128	.129	.130	.131	.132
19	.132	.133	.134	.135	.136	.137	.137	.138	.139	.140
20	.141	.142	.143	.144	.144	.145	.146	.147	.148	.149
21	.150	.151	.152	.153	.154	.155	.156	.157	.158	.159
22	.160	.161	.162	.163	.164	.165	.166	.167	.168	.169
23	.170	.171	.172	.173	.174	.175	.176	.177	.178	.179
24	.180	.182	.183	.184	.185	.186	.187	.188	.189	.190
25	.192	.193	.194	.195	.196	.197	.199	.200	.201	.202
26	.203	.204	.206	.207	.208	.209	.210	.212	.213	.214
27	.215	.216	.218	.219	.220	.222	.223	.224	.225	.226
28	.228	.229	.230	.232	.233	.234	.236	.237	.238	.240
29	.241	.242	.244							

TABLE 30.—Indicated Capacity 45 cc

15	0.093	0.094	0.094	0.095	0.095	0.096	0.097	0.097	0.098	0.098
16	.099	.100	.100	.101	.101	.102	.103	.103	.104	.105
17	.105	.106	.107	.107	.108	.108	.109	.110	.111	.111
18	.112	.113	.113	.114	.115	.115	.116	.117	.118	.118
19	.119	.120	.121	.121	.122	.123	.124	.124	.125	.126
20	.127	.128	.128	.129	.130	.131	.132	.132	.133	.134
21	.135	.136	.137	.138	.138	.139	.140	.141	.142	.143
22	.144	.145	.145	.146	.147	.148	.149	.150	.151	.152
23	.153	.154	.155	.156	.157	.158	.159	.160	.160	.161
24	.162	.163	.164	.165	.166	.167	.168	.169	.170	.171
25	.172	.173	.174	.176	.177	.178	.179	.180	.181	.182
26	.183	.184	.185	.186	.187	.188	.189	.190	.192	.193
27	.194	.195	.196	.197	.198	.199	.201	.202	.203	.204
28	.205	.206	.207	.209	.210	.211	.212	.213	.214	.216
29	.217	.218	.219							

TABLES OF CORRECTIONS FOR DETERMINING THE TRUE CAPACITIES OF
GLASS VESSELS FROM THE WEIGHT OF WATER IN AIR—Continued

[Amounts to be added to apparent weight of water in grams to obtain actual capacity in cubic centimeters at 20° C]

TABLE 31.—Indicated Capacity 40 cc

Temp. in Deg. C	Tenths of Degrees									
	0	1	2	3	4	5	6	7	8	9
15	0.083	0.083	0.084	0.084	0.085	0.085	0.086	0.086	0.087	0.087
16	.088	.089	.089	.090	.090	.091	.091	.092	.092	.093
17	.094	.094	.095	.095	.096	.096	.097	.098	.098	.099
18	.099	.100	.101	.101	.102	.102	.103	.104	.105	.105
19	.106	.107	.107	.108	.109	.109	.110	.111	.111	.112
20	.113	.113	.114	.115	.116	.116	.117	.118	.119	.119
21	.120	.121	.122	.122	.123	.124	.125	.125	.126	.127
22	.128	.129	.129	.130	.131	.132	.133	.133	.134	.135
23	.136	.137	.138	.138	.139	.140	.141	.142	.143	.143
24	.144	.145	.146	.147	.148	.149	.150	.151	.151	.152
25	.153	.154	.155	.156	.157	.158	.159	.160	.161	.162
26	.163	.164	.164	.165	.166	.167	.168	.169	.170	.171
27	.172	.173	.174	.175	.176	.177	.178	.179	.180	.181
28	.182	.183	.184	.185	.186	.187	.188	.189	.191	.192
29	.193	.194	.195							

TABLE 32.—Indicated Capacity 35 cc

15	0.073	0.073	0.073	0.074	0.074	0.075	0.075	0.076	0.076	0.076
16	.077	.078	.078	.078	.079	.079	.080	.080	.081	.081
17	.082	.082	.083	.083	.084	.084	.085	.085	.086	.086
18	.087	.088	.088	.089	.089	.090	.090	.091	.091	.092
19	.092	.093	.094	.094	.095	.096	.096	.097	.097	.098
20	.099	.099	.100	.100	.101	.102	.102	.103	.104	.104
21	.105	.106	.106	.107	.108	.108	.109	.110	.110	.111
22	.112	.113	.113	.114	.115	.115	.116	.117	.117	.118
23	.119	.120	.120	.121	.122	.122	.123	.124	.125	.126
24	.126	.127	.128	.129	.129	.130	.131	.132	.133	.133
25	.134	.135	.136	.137	.137	.138	.139	.140	.141	.141
26	.142	.143	.144	.145	.146	.146	.147	.148	.149	.150
27	.151	.152	.152	.153	.154	.155	.156	.157	.158	.159
28	.159	.160	.161	.162	.163	.164	.165	.166	.167	.168
29	.169	.170	.170							

TABLE 33.—Indicated Capacity 30 cc

15	0.062	0.063	0.063	0.063	0.064	0.064	0.064	0.065	0.065	0.066
16	.066	.066	.067	.067	.068	.068	.068	.069	.069	.070
17	.070	.071	.071	.071	.072	.072	.073	.073	.074	.074
18	.075	.075	.076	.076	.077	.077	.077	.078	.078	.079
19	.079	.080	.080	.081	.081	.082	.082	.083	.084	.084
20	.085	.085	.086	.086	.087	.087	.088	.088	.089	.089
21	.090	.091	.091	.092	.092	.093	.093	.094	.094	.095
22	.096	.096	.097	.098	.098	.099	.099	.100	.101	.101
23	.102	.103	.103	.104	.104	.105	.106	.106	.107	.108
24	.108	.109	.110	.110	.111	.112	.112	.113	.114	.114
25	.115	.116	.116	.117	.118	.118	.119	.120	.121	.121
26	.122	.123	.123	.124	.125	.126	.126	.127	.128	.128
27	.129	.130	.131	.131	.132	.133	.134	.134	.135	.136
28	.137	.137	.138	.139	.140	.141	.141	.142	.143	.144
29	.145	.145	.146							

TABLE 34.—Density of Water at Temperatures from 0° to 102° C¹

Temp., Deg. C	Density	Temp., Deg. C	Density	Temp., Deg. C	Density
0	0.99987	35	0.99406	70	0.97781
1	.99993	36	.99371	71	.97723
2	.99997	37	.99336	72	.97666
3	.99999	38	.99299	73	.97607
4	1.00000	39	.99262	74	.97548
5	.99999	40	.99224	75	.97489
6	.99997	41	.99186	76	.97428
7	.99993	42	.99147	77	.97368
8	.99988	43	.99107	78	.97307
9	.99981	44	.99066	79	.97245
10	.99973	45	.99024	80	.97183
11	.99963	46	.98982	81	.97120
12	.99952	47	.98940	82	.97057
13	.99940	48	.98896	83	.96994
14	.99927	49	.98852	84	.96930
15	.99913	50	.98807	85	.96865
16	.99897	51	.98762	86	.96800
17	.99880	52	.98715	87	.96734
18	.99862	53	.98669	88	.96668
19	.99843	54	.98621	89	.96601
20	.99823	55	.98573	90	.96534
21	.99802	56	.98524	91	.96467
22	.99780	57	.98478	92	.96399
23	.99756	58	.98425	93	.96330
24	.99732	59	.98375	94	.96261
25	.99707	60	.98324	95	.96192
26	.99681	61	.98272	96	.96122
27	.99654	62	.98220	97	.96051
28	.99626	63	.98167	98	.95981
29	.99597	64	.98113	99	.95909
30	.99567	65	.98059	100	.95838
31	.99537	66	.98005	101	.95765
32	.99505	67	.97950	102	.95693
33	.99473	68	.97894		
34	.99440	69	.97838		
35	.99406	70	.97781		

¹According to M. Thiesen, Physikalisch-Technische Reichsanstalt (Wiss. Abh., 4, No. 1, 1904).



