

DEPARTMENT OF COMMERCE

BUREAU OF STANDARDS

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SUPPLEMENT TO CIRCULAR NO. 154

[Issued October 8, 1925]

ABRIDGED VOLUME CORRECTION TABLE FOR PETROLEUM OILS

[Approved by The American Petroleum Institute, The American Society for Testing Materials, The Bureau of Mines, and The Bureau of Standards. For complete table, see Table 2, Circular No. 154]

The table contained herein has been prepared to meet a demand from the oil industry for a short and convenient table for reducing oil volumes to the basis of 60° F. when extreme accuracy is not required. It is not intended to replace the more complete and accurate volume correction table contained in Circular No. 154, but rather to supplement it and especially to replace the various abridged tables and approximate correction factors heretofore employed in the oil industry. In case high accuracy is essential the complete table contained in Circular No. 154 should be used, especially if large volumes or wide temperature ranges are involved. To avoid possible confusion all contracts should state which table is to be used.

The abridged table is based on the same data as Table 2, Circular No. 154. The groups, coefficients of expansion, degrees A. P. I., and gravity ranges of the abridged table follow:

Group number	Coefficient of expansion at 60° F.	Corresponding degrees A. P. I.	Range of group (degrees A. P. I. at 60° F.)
I.....	0.0004	22	Up to 34.9.
II.....	.0005	44	35 to 50.9.
III.....	.0006	58	51 to 63.9.
IV.....	.0007	72	64 to 78.9.
V.....	.0008	86	79 to 88.9.
VI.....	.00085	91	89 and higher.

This table shows the volume occupied at 60° F. by a quantity of oil occupying unit volume at the indicated temperatures. For example, if at 60° F. the degrees A. P. I. of the oil is 28 (Group I), 1 gallon of this oil measured at 120° F. will have a volume of 0.9763 gallon at 60° F. The values given in the table are in the form of "multipliers"; that is, the volume of oil at the indicated temperature and degrees A. P. I. for each group, multiplied by the corresponding factor in the table, equals the volume at 60° F. For example, if the degrees A. P. I. of an oil at 60° F. equals 28 (Group I) and the volume at 120° F. equals 6,000 gallons, then the volume at 60° F. equals 6,000 × 0.9763, or 5,857.8 gallons.

Observed temperature in ° F.	Volume at 60° F. occupied by unit volume at indicated temperatures					
	Group I up to 34.9 degrees A. P. I. at 60° F.	Group II 35 to 50.9 degrees A. P. I. at 60° F.	Group III 51 to 63.9 degrees A. P. I. at 60° F.	Group IV 64 to 78.9 degrees A. P. I. at 60° F.	Group V 79 to 88.9 degrees A. P. I. at 60° F.	Group VI 89 and higher degrees A. P. I. at 60° F.
0	1.0242	1.0242	1.0361	1.0419	1.0476	1.0501
1	1.0238	1.0292	1.0355	1.0412	1.0468	1.0493
2	1.0234	1.0287	1.0349	1.0405	1.0460	1.0484
3	1.0230	1.0283	1.0343	1.0398	1.0453	1.0476
4	1.0226	1.0278	1.0337	1.0391	1.0445	1.0467
5	1.0222	1.0273	1.0331	1.0384	1.0437	1.0459
6	1.0218	1.0268	1.0325	1.0377	1.0429	1.0451
7	1.0214	1.0263	1.0319	1.0370	1.0421	1.0443
8	1.0210	1.0258	1.0313	1.0364	1.0414	1.0434
9	1.0206	1.0253	1.0307	1.0357	1.0406	1.0426
10	1.0202	1.0248	1.0301	1.0350	1.0398	1.0418
11	1.0198	1.0243	1.0295	1.0343	1.0390	1.0410
12	1.0194	1.0238	1.0289	1.0336	1.0382	1.0402
13	1.0189	1.0233	1.0283	1.0329	1.0375	1.0393
14	1.0185	1.0228	1.0277	1.0322	1.0367	1.0385
15	1.0181	1.0223	1.0271	1.0315	1.0359	1.0377
16	1.0177	1.0218	1.0265	1.0308	1.0351	1.0369
17	1.0173	1.0213	1.0259	1.0301	1.0343	1.0360
18	1.0169	1.0208	1.0253	1.0294	1.0335	1.0352
19	1.0165	1.0203	1.0247	1.0287	1.0327	1.0343
20	1.0161	1.0198	1.0241	1.0280	1.0319	1.0335
21	1.0157	1.0193	1.0235	1.0273	1.0311	1.0327
22	1.0153	1.0188	1.0229	1.0266	1.0303	1.0319
23	1.0148	1.0184	1.0223	1.0260	1.0295	1.0310
24	1.0144	1.0179	1.0217	1.0253	1.0288	1.0302
25	1.0140	1.0174	1.0211	1.0246	1.0280	1.0294
26	1.0136	1.0169	1.0205	1.0239	1.0272	1.0286
27	1.0132	1.0164	1.0199	1.0232	1.0264	1.0277
28	1.0128	1.0159	1.0193	1.0225	1.0256	1.0269
29	1.0124	1.0154	1.0187	1.0218	1.0248	1.0260
30	1.0120	1.0149	1.0181	1.0211	1.0240	1.0252
31	1.0116	1.0144	1.0175	1.0204	1.0232	1.0244
32	1.0112	1.0139	1.0169	1.0197	1.0224	1.0236
33	1.0108	1.0134	1.0163	1.0190	1.0216	1.0227
34	1.0104	1.0129	1.0157	1.0183	1.0208	1.0219
35	1.0100	1.0124	1.0151	1.0176	1.0200	1.0211
36	1.0096	1.0119	1.0145	1.0169	1.0192	1.0203
37	1.0092	1.0114	1.0139	1.0162	1.0184	1.0194
38	1.0088	1.0109	1.0133	1.0155	1.0176	1.0186
39	1.0084	1.0104	1.0127	1.0148	1.0168	1.0177
40	1.0080	1.0099	1.0121	1.0141	1.0160	1.0169
41	1.0076	1.0094	1.0115	1.0134	1.0152	1.0160
42	1.0072	1.0089	1.0109	1.0127	1.0144	1.0152
43	1.0068	1.0084	1.0103	1.0120	1.0136	1.0143
44	1.0064	1.0079	1.0097	1.0113	1.0128	1.0135
45	1.0060	1.0074	1.0091	1.0106	1.0120	1.0126
46	1.0056	1.0069	1.0085	1.0099	1.0112	1.0118
47	1.0052	1.0064	1.0079	1.0092	1.0104	1.0110
48	1.0048	1.0059	1.0072	1.0084	1.0096	1.0101
49	1.0044	1.0054	1.0066	1.0077	1.0088	1.0093
50	1.0040	1.0049	1.0060	1.0070	1.0080	1.0084
51	1.0036	1.0044	1.0054	1.0063	1.0072	1.0076
52	1.0032	1.0039	1.0048	1.0056	1.0064	1.0067
53	1.0028	1.0035	1.0042	1.0049	1.0056	1.0059
54	1.0024	1.0030	1.0036	1.0042	1.0048	1.0050
55	1.0020	1.0025	1.0030	1.0035	1.0040	1.0042
56	1.0016	1.0020	1.0024	1.0028	1.0032	1.0034
57	1.0012	1.0015	1.0018	1.0021	1.0024	1.0025
58	1.0008	1.0010	1.0012	1.0014	1.0016	1.0017
59	1.0004	1.0005	1.0006	1.0007	1.0008	1.0008
60	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
61	.9996	.9995	.9994	.9993	.9992	.9992
62	.9992	.9990	.9988	.9986	.9984	.9983
63	.9988	.9985	.9982	.9979	.9976	.9975
64	.9984	.9980	.9976	.9972	.9968	.9966

Observed temperature in ° F.	Volume at 60° F. occupied by unit volume at indicated temperatures						Observed temperature in ° F.	Volume at 60° F. occupied by unit volume at indicated temperatures	
	Group I up to 34.9 degrees A. P. I. at 60° F.	Group II 35 to 50.9 degrees A. P. I. at 60° F.	Group III 51 to 63.9 degrees A. P. I. at 60° F.	Group IV 64 to 78.9 degrees A. P. I. at 60° F.	Group V 79 to 88.9 degrees A. P. I. at 60° F.	Group VI 89 and higher degrees A. P. I. at 60° F.		Group I up to 34.9 degrees A. P. I. at 60° F.	Group II 35 to 50.9 degrees A. P. I. at 60° F.
65.....	0.9980	0.9975	0.9970	0.9965	0.9960	0.9958	130	0.9724	0.9652
66.....	.9976	.9970	.9964	.9958	.9952	.9949	131	.9720	.9647
67.....	.9972	.9965	.9957	.9951	.9944	.9941	132	.9716	.9642
68.....	.9968	.9961	.9951	.9943	.9935	.9932	133	.9713	.9637
69.....	.9964	.9956	.9945	.9936	.9927	.9924	134	.9709	.9632
70.....	.9960	.9951	.9939	.9929	.9919	.9915	135	.9705	.9627
71.....	.9956	.9946	.9933	.9922	.9911	.9907	136	.9701	.9622
72.....	.9952	.9941	.9927	.9915	.9903	.9898	137	.9697	.9617
73.....	.9948	.9935	.9921	.9908	.9895	.9890	138	.9694	.9613
74.....	.9944	.9930	.9915	.9901	.9887	.9881	139	.9690	.9608
75.....	.9940	.9925	.9909	.9894	.9879	.9873	140	.9686	.9603
76.....	.9936	.9920	.9903	.9887	.9871	.9864	141	.9682	.9598
77.....	.9932	.9915	.9897	.9880	.9863	.9856	142	.9678	.9593
78.....	.9929	.9911	.9891	.9872	.9854	.9847	143	.9675	.9588
79.....	.9925	.9906	.9885	.9865	.9846	.9839	144	.9671	.9583
80.....	.9921	.9901	.9879	.9858	.9838	.9830	145	.9667	.9578
81.....	.9917	.9896	.9873	.9851	.9830	.9821	146	.9663	.9573
82.....	.9913	.9891	.9867	.9844	.9822	.9813	147	.9659	.9568
83.....	.9909	.9886	.9860	.9837	.9814	.9804	148	.9655	.9563
84.....	.9905	.9881	.9854	.9830	.9806	.9796	149	.9651	.9558
85.....	.9901	.9876	.9848	.9823	.9798	.9787	150	.9647	.9553
86.....	.9897	.9871	.9842	.9816	.9790	.9779	151	.9643	.....
87.....	.9893	.9866	.9836	.9809	.9782	.9770	152	.9639	.....
88.....	.9889	.9861	.9830	.9802	.9773	.9762	153	.9636	.....
89.....	.9885	.9856	.9824	.9795	.9765	.9753	154	.9632	.....
90.....	.9881	.9851	.9818	.9788	.9757	.9745	155	.9628	.....
91.....	.9877	.9846	.9812	.....	.....	.....	156	.9624	.....
92.....	.9873	.9841	.9806	.....	.....	.....	157	.9620	.....
93.....	.9869	.9836	.9800	.....	.....	.....	158	.9616	.....
94.....	.9865	.9831	.9794	.....	.....	.....	159	.9612	.....
95.....	.9861	.9826	.9788	.....	.....	.....	160	.9608	.....
96.....	.9857	.9821	.9782	.....	.....	.....	161	.9604	.....
97.....	.9853	.9816	.9776	.....	.....	.....	162	.9601	.....
98.....	.9849	.9812	.9769	.....	.....	.....	163	.9597	.....
99.....	.9845	.9807	.9763	.....	.....	.....	164	.9594	.....
100.....	.9841	.9802	.9757	.....	.....	.....	165	.9590	.....
101.....	.9837	.9797	.9751	.....	.....	.....	166	.9586	.....
102.....	.9833	.9792	.9745	.....	.....	.....	167	.9582	.....
103.....	.9830	.9786	.9738	.....	.....	.....	168	.9578	.....
104.....	.9826	.9781	.9732	.....	.....	.....	169	.9574	.....
105.....	.9822	.9776	.9726	.....	.....	.....	170	.9570	.....
106.....	.9818	.9771	.9720	.....	.....	.....	171	.9566	.....
107.....	.9814	.9766	.9714	.....	.....	.....	172	.9562	.....
108.....	.9811	.9762	.9708	.....	.....	.....	173	.9559	.....
109.....	.9807	.9757	.9702	.....	.....	.....	174	.9555	.....
110.....	.9803	.9752	.9696	.....	.....	.....	175	.9551	.....
111.....	.9799	.9747	.9690	.....	.....	.....	176	.9547	.....
112.....	.9795	.9742	.9684	.....	.....	.....	177	.9543	.....
113.....	.9791	.9737	.9678	.....	.....	.....	178	.9540	.....
114.....	.9787	.9732	.9672	.....	.....	.....	179	.9536	.....
115.....	.9783	.9727	.9666	.....	.....	.....	180	.9532	.....
116.....	.9778	.9722	.9660	.....	.....	.....	181	.9528	.....
117.....	.9775	.9717	.9654	.....	.....	.....	182	.9524	.....
118.....	.9771	.9712	.9647	.....	.....	.....	183	.9521	.....
119.....	.9767	.9707	.9641	.....	.....	.....	184	.9517	.....
120.....	.9763	.9702	.9635	.....	.....	.....	185	.9513	.....
121.....	.9759	.9697	.9629	.....	.....	.....	186	.9509	.....
122.....	.9755	.9692	.9623	.....	.....	.....	187	.9505	.....
123.....	.9752	.9687	.9617	.....	.....	.....	188	.9502	.....
124.....	.9748	.9682	.9611	.....	.....	.....	189	.9498	.....
125.....	.9744	.9677	.9605	.....	.....	.....	190	.9494	.....
126.....	.9740	.9672	.....	.....	.....	.....	191	.9490	.....
127.....	.9736	.9667	.....	.....	.....	.....	192	.9487	.....
128.....	.9732	.9662	.....	.....	.....	.....	193	.9483	.....
129.....	.9728	.9657	.....	.....	.....	.....	194	.9480	.....
							195	.9476	.....

GROUP I (Extended)

Observed temperature in ° F.	Volume at 60° F. occupied by unit volume at indicated temperatures	Observed temperature in ° F.	Volume at 60° F. occupied by unit volume at indicated temperatures	Observed temperature in ° F.	Volume at 60° F. occupied by unit volume at indicated temperatures
195.....	0.9476	215.....	0.9401	235.....	0.9326
196.....	.9472	216.....	.9397	236.....	.9322
197.....	.9468	217.....	.9393	237.....	.9318
198.....	.9465	218.....	.9390	238.....	.9315
199.....	.9461	219.....	.9386	239.....	.9311
200.....	.9457	220.....	.9382	240.....	.9307
201.....	.9453	221.....	.9378	241.....	.9303
202.....	.9449	222.....	.9374	242.....	.9300
203.....	.9446	223.....	.9371	243.....	.9296
204.....	.9442	224.....	.9367	244.....	.9293
205.....	.9438	225.....	.9363	245.....	.9289
206.....	.9434	226.....	.9359	246.....	.9285
207.....	.9430	227.....	.9356	247.....	.9281
208.....	.9427	228.....	.9352	248.....	.9278
209.....	.9423	229.....	.9349	249.....	.9274
210.....	.9419	230.....	.9345	250.....	.9270
211.....	.9415	231.....	.9341	.....	.....
212.....	.9412	232.....	.9337	.....	.....
213.....	.9408	233.....	.9334	.....	.....
214.....	.9405	234.....	.9330	.....	.....

NOTE.—The above extension to the foregoing abridged table is based on the same data as Table 2, Circular No. 154. For temperatures above 203° F. the tabulated values of the volume at 60° F. are extrapolated from the experimental results obtained over the temperature range 32 to 203° F.

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