

DEPARTMENT OF COMMERCE
BUREAU OF STANDARDS
WASHINGTON

Letter
Circular
LC 89

March 12, 1923

CONVERSION TABLES
for
PETROLEUM OILS

Degrees A.P.I. Corresponding to
Specific Gravity at 60°/60°F

Specific Gravity at 60°/60°F
Corresponding to Degrees A.P.I.
and

Degrees A.P.I. Corresponding to Degrees Baume

INTRODUCTION

Through an unfortunate circumstance, as outlined in Bureau of Standards Circular No. 59, "United States Standard Baume Scale," there have been in use in the petroleum industry two arbitrary scales for hydrometers; one based on the modulus 140 and the other on the modulus 141.5. This has led to much confusion and uncertainty.

In order to clarify the situation and put the oil industry on a definite basis, the following action has been taken as outlined in Bureau of Standards Circular No. 16, "Testing of Hydrometers."

"In order to avoid confusion and misunderstanding the American Petroleum Institute, the Bureau of Mines, and the Bureau of Standards have agreed that a scale based on the modulus 141.5 shall be used in the United States petroleum industry and shall be known as the A. P. I. scale.

"The formula for converting specific gravity to A.P.I. is as follows:

$$\text{"Degrees A. P. I.} = \frac{141.5}{\text{Sp.Gr. } 60^{\circ}/60^{\circ}\text{F}} - 131.5$$

"The United States Baume scale based on the modulus 140 will continue to be used for other liquids lighter than water."

It is proposed to include in the revised edition of Bureau of Standards Circular No. 19, "Standard Density and Volumetric Tables," which is in process of preparation, tables based on the modulus 141.5.

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Specific Gravity Corresponding to degrees A.P.I. at 60°/60°F ($\frac{15.56}{15.56} C$)

(Calculated from the formula degrees specific gravity = $\frac{141.5}{131.5 + \text{Degrees A.P.I.}}$)

Degrees A.P.I.	Tenths of Degrees									
	0	1	2	3	4	5	6	7	8	9
10	1.0000	.9993	.9986	.9979	.9972	.9965	.9958	.9951	.9944	.9937
11	.9930	.9923	.9916	.9909	.9902	.9895	.9888	.9881	.9874	.9868
12	.9861	.9854	.9847	.9840	.9833	.9826	.9820	.9813	.9806	.9799
13	.9792	.9786	.9779	.9772	.9765	.9759	.9752	.9745	.9738	.9732
14	.9725	.9718	.9712	.9705	.9698	.9692	.9685	.9679	.9672	.9665
15	.9659	.9652	.9646	.9639	.9632	.9626	.9619	.9613	.9606	.9600
16	.9593	.9587	.9580	.9574	.9567	.9561	.9554	.9548	.9541	.9535
17	.9529	.9522	.9516	.9509	.9503	.9497	.9490	.9484	.9478	.9471
18	.9465	.9459	.9452	.9446	.9440	.9433	.9427	.9421	.9415	.9408
19	.9402	.9396	.9390	.9383	.9377	.9371	.9365	.9358	.9352	.9346
20	.9340	.9334	.9328	.9321	.9315	.9309	.9303	.9297	.9291	.9285
21	.9279	.9273	.9267	.9260	.9254	.9248	.9242	.9236	.9230	.9224
22	.9218	.9212	.9206	.9200	.9194	.9188	.9182	.9176	.9170	.9165
23	.9159	.9153	.9147	.9141	.9135	.9129	.9123	.9117	.9111	.9106
24	.9100	.9094	.9088	.9082	.9076	.9071	.9065	.9059	.9053	.9047
25	.9042	.9036	.9030	.9024	.9018	.9013	.9007	.9001	.8996	.8990
26	.8984	.8978	.8973	.8967	.8961	.8956	.8950	.8944	.8939	.8933
27	.8927	.8922	.8916	.8911	.8905	.8899	.8894	.8888	.8883	.8877
28	.8871	.8866	.8860	.8855	.8849	.8844	.8838	.8833	.8827	.8822
29	.8816	.8811	.8805	.8800	.8794	.8789	.8783	.8778	.8772	.8767
30	.8762	.8756	.8751	.8745	.8740	.8735	.8729	.8724	.8718	.8713
31	.8708	.8702	.8697	.8692	.8686	.8681	.8676	.8670	.8665	.8660
32	.8654	.8649	.8644	.8639	.8633	.8628	.8623	.8618	.8612	.8607
33	.8602	.8597	.8591	.8586	.8581	.8576	.8571	.8565	.8560	.8555
34	.8550	.8545	.8540	.8534	.8529	.8524	.8519	.8514	.8509	.8504
35	.8498	.8493	.8488	.8483	.8478	.8473	.8468	.8463	.8458	.8453
36	.8448	.8443	.8438	.8433	.8428	.8423	.8418	.8412	.8408	.8403
37	.8398	.8393	.8388	.8383	.8378	.8373	.8368	.8363	.8358	.8353
38	.8348	.8343	.8338	.8333	.8328	.8324	.8319	.8314	.8309	.8304
39	.8299	.8294	.8289	.8285	.8280	.8275	.8270	.8265	.8260	.8256
40	.8251	.8246	.8241	.8236	.8232	.8227	.8222	.8217	.8212	.8208
41	.8203	.8198	.8193	.8189	.8184	.8178	.8174	.8170	.8165	.8160
42	.8155	.8151	.8146	.8142	.8137	.8132	.8128	.8123	.8118	.8114
43	.8109	.8104	.8100	.8095	.8090	.8086	.8081	.8076	.8072	.8067
44	.8063	.8058	.8054	.8049	.8044	.8040	.8035	.8031	.8026	.8022
45	.8017	.8012	.8008	.8003	.7999	.7994	.7990	.7985	.7981	.7976
46	.7972	.7967	.7963	.7958	.7954	.7949	.7945	.7941	.7936	.7932
47	.7927	.7923	.7918	.7914	.7909	.7905	.7901	.7896	.7892	.7887
48	.7883	.7879	.7874	.7870	.7865	.7861	.7857	.7852	.7848	.7844
49	.7839	.7835	.7831	.7826	.7822	.7818	.7813	.7809	.7805	.7800

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Degrees A.P.I. (modulus 141.5) Corresponding to Degrees Baume (modulus 140)

Degrees Baume (modulus 140)	Tenths of Degrees Baume									
	0	1	2	3	4	5	6	7	8	9
10	10.00	10.10	10.20	10.30	10.40	10.51	10.61	10.71	10.81	10.91
11	11.01	11.11	11.21	11.31	11.42	11.52	11.62	11.72	11.82	11.92
12	12.02	12.12	12.22	12.32	12.43	12.53	12.63	12.73	12.83	12.93
13	13.03	13.13	13.23	13.34	13.44	13.54	13.64	13.74	13.84	13.94
14	14.04	14.14	14.24	14.35	14.45	14.55	14.65	14.75	14.85	14.95
15	15.05	15.15	15.26	15.36	15.46	15.56	15.66	15.76	15.86	15.96
16	16.06	16.17	16.27	16.37	16.47	16.57	16.67	16.77	16.87	16.97
17	17.08	17.18	17.28	17.38	17.48	17.58	17.68	17.78	17.88	17.98
18	18.09	18.19	18.29	18.39	18.49	18.59	18.69	18.79	18.89	19.00
19	19.10	19.20	19.30	19.40	19.50	19.60	19.70	19.80	19.90	20.01
20	20.11	20.21	20.31	20.41	20.51	20.61	20.71	20.81	20.92	21.02
21	21.12	21.22	21.32	21.42	21.52	21.62	21.72	21.83	21.93	22.03
22	22.13	22.23	22.33	22.43	22.53	22.63	22.74	22.84	22.94	23.04
23	23.14	23.24	23.34	23.44	23.54	23.64	23.75	23.85	23.95	24.05
24	24.15	24.25	24.35	24.45	24.55	24.66	24.76	24.86	24.96	25.06
25	25.16	25.26	25.36	25.46	25.56	25.67	25.77	25.87	25.97	26.07
26	26.17	26.27	26.37	26.47	26.58	26.68	26.78	26.88	26.98	27.08
27	27.18	27.28	27.38	27.49	27.59	27.69	27.79	27.89	27.99	28.09
28	28.19	28.29	28.40	28.50	28.60	28.70	28.80	28.90	29.00	29.10
29	29.20	29.30	29.41	29.51	29.61	29.71	29.81	29.91	30.01	30.11
30	30.21	30.32	30.42	30.52	30.62	30.72	30.82	30.92	31.02	31.12
31	31.22	31.33	31.43	31.53	31.63	31.73	31.83	31.93	32.03	32.13
32	32.24	32.34	32.44	32.54	32.64	32.74	32.84	32.94	33.04	33.15
33	33.25	33.35	33.45	33.55	33.65	33.75	33.85	33.95	34.06	34.16
34	34.26	34.36	34.46	34.56	34.66	34.76	34.86	34.96	35.07	35.17
35	35.27	35.37	35.47	35.57	35.67	35.77	35.87	35.98	36.08	36.18
36	36.28	36.38	36.48	36.58	36.68	36.78	36.88	36.99	37.09	37.19
37	37.29	37.39	37.49	37.59	37.69	37.79	37.90	38.00	38.10	38.20
38	38.30	38.40	38.50	38.60	38.70	38.81	38.91	39.01	39.11	39.21
39	39.31	39.41	39.51	39.61	39.72	39.82	39.92	40.02	40.12	40.22
40	40.32	40.42	40.52	40.62	40.73	40.83	40.93	41.03	41.13	41.23
41	41.33	41.43	41.53	41.64	41.74	41.84	41.94	42.04	42.14	42.24
42	42.34	42.44	42.54	42.65	42.75	42.85	42.95	43.05	43.15	43.25
43	43.35	43.45	43.56	43.66	43.76	43.86	43.96	44.06	44.16	44.26
44	44.36	44.47	44.57	44.67	44.77	44.87	44.97	45.07	45.17	45.27
45	45.38	45.48	45.58	45.68	45.78	45.88	45.98	46.08	46.18	46.28
46	46.39	46.49	46.59	46.69	46.79	46.89	46.99	47.09	47.19	47.30
47	47.40	47.50	47.60	47.70	47.80	47.90	48.00	48.10	48.20	48.31
48	48.41	48.51	48.61	48.71	48.81	48.91	49.01	49.11	49.22	49.32
49	49.42	49.52	49.62	49.72	49.82	49.92	50.02	50.13	50.23	50.33
50	50.43	50.53	50.63	50.73	50.83	50.93	51.04	51.14	51.24	51.34
51	51.44	51.54	51.64	51.74	51.84	51.94	52.05	52.15	52.25	52.35
52	52.45	52.55	52.65	52.75	52.85	52.96	53.06	53.16	53.26	53.36
53	53.46	53.56	53.66	53.76	53.86	53.97	54.07	54.17	54.27	54.37
54	54.47	54.57	54.67	54.77	54.88	54.98	55.08	55.18	55.28	55.38





