Designation: D 347 – 04

Standard Tables for Volume and Specific Gravity Correction for Creosote, Creosote-Coal Tar Solution, and Coal Tar[1, 2]

This standard is issued under the fixed designation D 347; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 These tables have been prepared by the National Institute of Standards and Technology to meet a demand from the wood preserving industry for convenient tables for reducing creosote volumes to the basis of 100°F and of 38°C and for reducing specific gravity observations to the same temperature. Tables 1-4 give in parallel columns corrections factors for creosote, for mixtures of creosote and coal tar (up to 50 % tar) designated as solution, and for coal tar. They are based on density determinations made on a selected range of domestic coke-oven tars.

1.2 Tables 1 and 2 show the volume occupied at 100°F by a quantity of oil occupying a unit volume at the indicated temperature; for example, 1 gal of creosote measured at 120°F will have a volume of 0.9921 gal at 100°F; thus, if the volume of creosote at 120°F equals 10 000 gal, then the volume at 100°F equals 10 000 times 0.9921 or 9921 gal. Likewise, Table 3 provides similar information, but is based upon the volume of oil at 38°C and correction factors are based on intervals of 1°C.

1.3 Tables 1 and 2 give corrections for observed specific gravity, which are simply made by adding them to the observed values for temperatures above 100°F and subtracting them for temperatures below 100°F. Table 4 provides corrections that are based upon the volume of oil at 38°C and are based on intervals of 1°C. Furthermore, since the corrections for temperatures below 38°C are listed as negative numbers, it is necessary to add the correction, whether positive or negative, to the observed value in order to obtain the corrected value.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Keywords

2.1 coal tar; creosote; specific gravity; volume

[1] These tables are under the jurisdiction of ASTM Committee D07 on Wood and are the direct responsibility of Subcommittee D07.06 on Treatments for Wood Products.

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[2] These tables have been adopted as standard by the American Wood Preservers' Association and by the American Railway Engineering Association; they are the outcome of a Joint Conference Committee representing these associations and ASTM.

TABLE 1 Volume Correction Table for Creosote, Creosote-Coal Tar Solution (up to 50 % Tar), and Coal Tar (Coke-Oven Tars)

NOTE—The observed volume is to be multiplied by the factor corresponding to the observed temperature.

Observed Temperature, °F	Volume at 100°F Occupied by Unit Volume at Indicated Temperature			Observed Temperature,° F	Volume at 100°F Occupied by Unit Volume at Indicated Temperature			Observed Temperature,° F	Volume at 100°F Occupied by Unit Volume at Indicated Temperature		
	Creosote	Solution	Coal Tar		Creosote	Solution	Coal Tar		Creosote	Solution	Coal Tar
220	0.9526	0.9542	0.9594	180	0.9684	0.9696	0.9732	140	0.9842	0.9850	0.9867
219	0.9530	0.9546	0.9597	179	0.9687	0.9700	0.9735	139	0.9846	0.9853	0.9870
218	0.9534	0.9550	0.9600	178	0.9691	0.9704	0.9739	138	0.9850	0.9857	0.9874
217	0.9538	0.9554	0.9604	177	0.9695	0.9708	0.9742	137	0.9853	0.9861	0.9877
216	0.9542	0.9557	0.9607	176	0.9699	0.9712	0.9745	136	0.9857	0.9865	0.9880
215	0.9546	0.9561	0.9611	175	0.9703	0.9715	0.9749	135	0.9861	0.9868	0.9884
214	0.9550	0.9565	0.9614	174	0.9707	0.9719	0.9752	134	0.9865	0.9872	0.9887
213	0.9554	0.9569	0.9618	173	0.9711	0.9723	0.9756	133	0.9869	0.9876	0.9890
212	0.9558	0.9573	0.9621	172	0.9715	0.9727	0.9759	132	0.9873	0.9880	0.9894
211	0.9561	0.9577	0.9625	171	0.9719	0.9731	0.9762	131	0.9877	0.9884	0.9897
210	0.9565	0.9581	0.9628	170	0.9723	0.9735	0.9766	130	0.9881	0.9887	0.9900
209	0.9569	0.9584	0.9632	169	0.9727	0.9738	0.9769	129	0.9885	0.9891	0.9904
208	0.9573	0.9588	0.9635	168	0.9731	0.9742	0.9772	128	0.9889	0.9895	0.9907
207	0.9577	0.9592	0.9639	167	0.9735	0.9746	0.9776	127	0.9893	0.9899	0.9910
206	0.9581	0.9596	0.9642	166	0.9739	0.9750	0.9779	126	0.9897	0.9902	0.9914
205	0.9585	0.9600	0.9646	165	0.9743	0.9754	0.9783	125	0.9901	0.9906	0.9917
204	0.9589	0.9604	0.9649	164	0.9747	0.9758	0.9786	124	0.9905	0.9910	0.9920
203	0.9593	0.9608	0.9652	163	0.9751	0.9762	0.9789	123	0.9909	0.9914	0.9924
202	0.9597	0.9611	0.9656	162	0.9754	0.9765	0.9793	122	0.9913	0.9917	0.9927
201	0.9601	0.9615	0.9659	161	0.9758	0.9769	0.9796	121	0.9917	0.9921	0.9930
200	0.9605	0.9619	0.9663	160	0.9762	0.9773	0.9800	120	0.9921	0.9925	0.9934
199	0.9609	0.9623	0.9666	159	0.9766	0.9777	0.9803	119	0.9925	0.9929	0.9937
198	0.9612	0.9627	0.9670	158	0.9770	0.9781	0.9806	118	0.9929	0.9932	0.9940
197	0.9616	0.9631	0.9673	157	0.9774	0.9785	0.9810	117	0.9932	0.9936	0.9944
196	0.9620	0.9634	0.9677	156	0.9778	0.9788	0.9813	116	0.9936	0.9940	0.9947
195	0.9624	0.9638	0.9680	155	0.9782	0.9792	0.9816	115	0.9940	0.9944	0.9950
194	0.9628	0.9642	0.9684	154	0.9786	0.9796	0.9820	114	0.9944	0.9948	0.9954
193	0.9632	0.9646	0.9687	153	0.9790	0.9800	0.9823	113	0.9948	0.9951	0.9957
192	0.9636	0.9650	0.9690	152	0.9794	0.9804	0.9827	112	0.9952	0.9955	0.9960
191	0.9640	0.9654	0.9694	151	0.9789	0.9808	0.9830	111	0.9956	0.9959	0.9964
190	0.9644	0.9658	0.9697	150	0.9802	0.9811	0.9833	110	0.9960	0.9962	0.9967
189	0.9648	0.9662	0.9701	149	0.9806	0.9815	0.9837	109	0.9964	0.9966	0.9970
188	0.9652	0.9665	0.9704	148	0.9810	0.9819	0.9840	108	0.9968	0.9970	0.9974
187	0.9656	0.9669	0.9708	147	0.9814	0.9823	0.9844	107	0.9972	0.9974	0.9977
186	0.9660	0.9673	0.9711	146	0.9818	0.9827	0.9847	106	0.9976	0.9978	0.9980
185	0.9664	0.9677	0.9714	145	0.9822	0.9830	0.9850	105	0.9980	0.9981	0.9983
184	0.9668	0.9681	0.9718	144	0.9826	0.9834	0.9854	104	0.9984	0.9985	0.9987
183	0.9672	0.9685	0.9721	143	0.9830	0.9838	0.9857	103	0.9988	0.9989	0.9990
182	0.9676	0.9688	0.9725	142	0.9834	0.9842	0.9860	102	0.9992	0.9992	0.9993
181	0.9680	0.9692	0.9728	141	0.9838	0.9846	0.9864	101	0.9996	0.9996	0.9997
								100	1.0000	1.0000	1.0000

The portion of the table below should not be used unless the oil is entirely free from crystals[A]

Observed Temperature, °F	Volume at 100°F Occupied by Unit Volume at Indicated Temperature			Observed Temperature,° F	Volume at 100°F Occupied by Unit Volume at Indicated Temperature			Observed Temperature,° F	Volume at 100° Occupied by Unit Volume at Indicated Temperature		
	Creosote	Solution	Coal Tar		Creosote	Solution	Coal Tar		Creosote	Solution	Coal Tar
99	1.0004	1.0004	1.0003	84	1.0063	1.0062	1.0053	69	1.0122	1.0116	1.0103
98	1.0008	1.0008	1.0007	83	1.0067	1.0066	1.0056	68	1.0126	1.0120	1.0106
97	1.0012	1.0011	1.0010	82	1.0071	1.0070	1.0060	67	1.0130	1.0124	1.0109
96	1.0016	1.0015	1.0013	81	1.0075	1.0074	1.0063	66	1.0134	1.0127	1.0112
95	1.0020	1.0019	1.0017	80	1.0079	1.0078	1.0066	65	1.0138	1.0131	1.0116
94	1.0024	1.0022	1.0020	79	1.0083	1.0079	1.0070	64	1.0142	1.0135	1.0119
93	1.0028	1.0026	1.0023	78	1.0087	1.0082	1.0073	63	1.0146	1.0138	1.0122