



Designation: D4311/D4311M – 21

Standard Practice for Determining Asphalt Volume Correction to a Base Temperature¹

This standard is issued under the fixed designation D4311/D4311M; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This practice provides tables of volume correction factors which may be used to convert volumes of asphalt measured at different temperatures to a volume at a standard base temperature. These tables are applicable to all types of asphalts except emulsified asphalts.

1.2 This practice provides tables to convert asphalt volumes to 15 °C [60 °F] from volumes measured at any temperature from –25 to +275 °C [0 to 500 °F].

1.3 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with the standard.

NOTE 1—Correction factors in Table 1 and Table 2 are for use in place of correction factors provided in Guide D1250, which do not address requirements for asphalt specifications.²

1.4 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This practice is under the jurisdiction of ASTM Committee D04 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.40 on Asphalt Specifications.

Current edition approved Dec. 15, 2021. Published January 2022. Originally approved in 1983. Last previous edition approved in 2015 as D4311/D4311M – 15. DOI: 10.1520/D4311_D4311M-21.

² Factors originally published for Groups 0 and 1 oils in Tables 7, 25, and 55 in D1250 – 52 T. Last previous edition D1250 – 04.

2. Referenced Documents

2.1 ASTM Standards:³

D70/D70M Test Method for Specific Gravity and Density of Semi-Solid Asphalt Binder (Pycnometer Method)

D1250 Guide for the Use of the Joint API and ASTM Adjunct for Temperature and Pressure Volume Correction Factors for Generalized Crude Oils, Refined Products, and Lubricating Oils: API MPMS Chapter 11.1

D3142/D3142M Test Method for Specific Gravity, API Gravity, or Density of Cutback Asphalts by Hydrometer Method

D3289 Test Method for Density of Semi-Solid and Solid Asphalt Materials (Nickel Crucible Method)

3. Significance and Use

3.1 Asphalts change in volume with change in temperature. They are loaded or transferred at widely varying temperatures. Volume correction factors are used to adjust bulk volumes measured at those temperatures to corresponding volumes at a base temperature of 15 °C or [60 °F] for the purposes of custody transfer and accounting operations.

3.2 Correction factors as provided in this practice have proven to be sufficiently accurate for the intended purposes.

3.3 Coefficients of expansion used for development of data in this practice are as follows:

Table	Column A	Column B
1	0.00035	0.00040
2	0.00063	0.00072

4. Procedure

4.1 Volume correction factors are provided for volume adjustments to 15 °C in Table 1 and [60 °F] in Table 2. The tables are entered with asphalt temperature at which bulk volume is measured.

4.2 The tables provide two sets of factors in columns labeled A and B. The selection of the appropriate column, A or B, is defined by table footnotes. The selection is based on

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.