



Petroleum and Petrochemical Bulletin

**U.S. Application of API MPMS Chapter 11.3.3
Ethanol Density and Volume Correction Factors**

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In late 2011, API MPMS Chapter 11.3.3, *Miscellaneous Hydrocarbon Product Properties – Ethanol Density and Volume Correction Factors* was published.

The standard includes implementation procedures for both pure (99+%) and denatured ethanol, providing alpha coefficients as follows.

For volume or density correction from observed temperature to 60 °F, the implementation procedure given in API MPMS Ch. 11.1-2004 shall be used. Pure and Denatured fuel grade ethanol's are considered "special applications" (formerly known as Table 6C or Table 54C) with an alpha coefficient of 0.000599/°F or 0.001078/°C for Pure Ethanol and 0.000603/°F or 0.001085/°C for Denatured Ethanol.

Note 1: The alpha coefficient given for pure ethanol closely approximates to the figure used by many international shippers; 0.00108/°C and the OIML tables, 0.00109/°C

Note 2: Denatured Ethanol includes only ethanol denatured with gasoline at between 2% and 5% by volume.

The standard also notes *"However, if occasional table differences of 0.001% (1 in 100,000 volume units) are acceptable to all parties, commodity group Refined Products (formerly known as Table 6B) with an API gravity of 50.47 (pure) and 50.61 (denatured) may be used in lieu of the 6C table"*.

This alternate method using Table 6B is not recommended by IFIA member companies as the API gravity must be entered, calculated and reported to (2) decimal places which is considered impractical.

The standard does not allow for, or recommend, an implementation period and IFIA members therefore intend to implement the new ethanol volume correction factors (VCF's) with immediate effect.

Revisions/Reaffirmations

Rev. 0 Dec 2011
Reaffirmed May 2012

IFIA members consider immediate implementation to be in accordance with the requirements of 19CFR 151.13; applicable to USA custody transfers controlled by US Customs and Border Protection (CBP). This applies to all vessel and barge shipments, including imports and exports involving discharges into and loadings from storage tank facilities, refineries and admissions to and transfers to or from foreign trade zones.

These tables should not be confused with Gauging Manual Table 7 (27 CFR 30.67) used by the Alcohol and Tobacco Tax and Trade Bureau (TTB), which applies to “spirituous liquors” (drinking alcohol). This old table (1913) is of limited utility as it covers 18 °F to 100 °F in 2 °F increments and provides three decimal VCF’s.
(http://www.ttb.gov/foia/gauging_manual_toc.shtml#27:1.0.1.1.25.5.507.7).

For the measurement of the quantity of non-denatured or denatured bulk fuel use ethanol for CBP purposes whose purity and other specifications fall outside the scope of the API-MPMS Chapter 11.3.3 standard, the ASTM D1250 standard shall be used. Ethanol of these other purities shall be considered to be a “special application” within the ASTM D1250 standard.

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