Designation: D2962 – 23

# Standard Practice for Calculating Volume-Temperature Correction For Coal-Tar Pitches[1]

This standard is issued under the fixed designation D2962; 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 This practice covers calculation of the amount of expansion or contraction of a volume of liquid coal-tar pitch due to a change of temperature.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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.*

## 2. Referenced Documents

2.1 *ASTM Standards:*[2]

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

D71 Test Method for Relative Density of Solid Pitch and Asphalt (Displacement Method)

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

## 3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this practice, refer to Terminology D4175.

## 4. Summary of Practice

4.1 Different pitches expand or contract at different rates which vary in relation to the relative density of the material. The corresponding values are listed in Table 1.

## 5. Significance and Use

5.1 Coal tar pitch is shipped or stored, or both, at various temperatures, consequently a means is required to correct volume to a specified temperature.

## 6. Procedure

6.1 Determine the relative density of the pitch at 60 °F/60 °F (15.6 °C/15.6 °C) in accordance with Test Methods D70 or D71, whichever is most suitable.

6.2 Find the coefficient of expansion per degree Celsius or Fahrenheit for the particular material from Table 1.

6.3 Multiply the coefficient by the number of degrees between the standard temperature and the actual temperature of the material as measured.

6.4 To the product of 6.3 add 1.000. The result is expansion factor *A*.

6.5 If the temperature of the material as measured is above the standard temperature, *divide* the measured volume by factor *A* (6.4). If the temperature of the material as measured is below the standard temperature, *multiply* the measured volume by factor *A* (6.4).

6.6 *Example*—A tank of pitch contains 95 000 gal at 350 °F (177 °C). Calculate the volume at 60 °F (15.6 °C) as follows: The relative density 60 °F/60 °F (15.6 °C/15.6 °C) according to Test Method D70 is 1.28.

From Table 1 the coefficient is $280 \times 10^{-6}$ per °F.

The temperature difference of 350 – 60 = 290 °.

$290 \times 280 \times 10^{-6} = 0.0812$

A = 1.0812

The corrected volume is 95,000/1.0812 = 87 865 gal at 60 °F (15.6 °C).

[1] This practice is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.02 on Hydrocarbon Measurement for Custody Transfer (Joint ASTM-API).

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[2] 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.

***A Summary of Changes section appears at the end of this standard**