



## Standard Test Method for Calculation of Volume and Weight of Industrial Aromatic Hydrocarbons<sup>1</sup>

This standard is issued under the fixed designation D 1555; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope

1.1 These tables are for use in calculating the weight and volume of benzene, toluene, mixed xylenes, styrene, ortho-xylene, meta-xylene, para-xylene, cumene, ethylbenzene, 300 to 350°F aromatic hydrocarbons, 350° to 400°F aromatic hydrocarbons and cyclohexane. A method is given for calculating the volume at 60°F from an observed volume at  $t^\circ\text{F}$ . Table 1 lists the density in pounds per gallon at 60°F for high purity chemicals.

1.2 A procedure for the calculation of density in pounds per gallon at 60°F of materials of lower purity is provided.

NOTE 1—The purchaser and the seller should agree on a reasonable policy in regard to rounding of final numbers in all computations. Rounding the final weight or volume to not more than five significant digits is, in most cases, consistent with the experimental reliability of the data.

NOTE 2—An alternative method is Test Method D 4052.

1.3 The following applies to all specified limits in this test method: for purposes of determining conformance with this test method, an observed value or calculated value shall be rounded off “to the nearest unit” in the last right-hand digit used in expressing the specification limit, in accordance with the rounding-off method of Practice E 29.

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. Referenced Documents

#### 2.1 ASTM Standards:

D 941 Test Method for Density and Relative Density (Specific Gravity) of Liquids by Lipkin Bicapillary Pycnometer<sup>2</sup>

D 1217 Test Method for Density and Relative Density (Specific Gravity) of Liquids by Bingham Pycnometer<sup>2</sup>

<sup>1</sup> This method is under the jurisdiction of ASTM Committee D16 on Aromatic Hydrocarbons and Related Chemicals and is the direct responsibility of Subcommittee D16.01 on Benzene, Toluene, Xylenes, Cyclohexane, and Their Derivatives.

Current edition approved Sept. 15, 1995. Published November 1995. Originally published as D 1555 – 57. Last previous edition D 1555 – 92.

<sup>2</sup> *Annual Book of ASTM Standards*, Vol 05.01.

TABLE 1 Relative Density and Density Data

| Product          | Relative Density<br>60°F/60°F | Density in Air at 60°F lb<br>per U.S. Gallon |
|------------------|-------------------------------|----------------------------------------------|
| Benzene          | 0.8844                        | 7.365                                        |
| Cumene           | 0.8663                        | 7.214                                        |
| Cyclohexane      | 0.7834                        | 6.522                                        |
| Ethylbenzene     | 0.8718                        | 7.259                                        |
| <i>m</i> -Xylene | 0.8687                        | 7.234                                        |
| <i>o</i> -Xylene | 0.8848                        | 7.367                                        |
| <i>p</i> -Xylene | 0.8657                        | 7.209                                        |
| Styrene          | 0.9110                        | 7.586                                        |
| Toluene          | 0.8718                        | 7.260                                        |

D 1250 Guide for Petroleum Measurement Tables<sup>2</sup>

D 3505 Test Method for Density or Relative Density of Pure Liquid Chemicals<sup>3</sup>

D 4052 Test Method for Density and Relative Density of Liquids by Digital Density Meter<sup>4</sup>

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications<sup>5</sup>

#### 2.2 Other Document:

American Petroleum Institute Research Project 44<sup>6</sup>

### 3. Significance and Use

3.1 This test method is suitable for use in calculating weights and volumes of products outlined in Section 1. The information gained from this method can be used for determining quantities of stated aromatic hydrocarbons in tanks, shipping containers, etc.

### 4. Basic Data

4.1 All calculations are derived from densities furnished by the American Petroleum Institute Research Project 44. The tables are based on data for compounds of the highest purity, but can be used for materials in the range indicated in Table 2.

4.2 The basic data and conversion factors used are given in

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 06.04.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 05.02.

<sup>5</sup> *Annual Book of ASTM Standards*, Vol 14.02.

<sup>6</sup> “Selected Values of Properties of Hydrocarbons and Related Compounds,” prepared by American Petroleum Institute Research Project 44 at the Chemical Thermodynamic Center, Department of Chemistry, Agriculture and Mechanical College Station, TX.