



Designation: D4734 – 17

Standard Specification for Refined Benzene-545¹

This standard is issued under the fixed designation D4734; 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 specification covers benzene-545.

1.2 The following applies to all specified limits in this standard: for purposes of determining conformance with this standard, an observed value or a 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 in Practice E29.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 Consult current OSHA regulations, supplier’s Safety Data Sheets, and local regulations for all materials used in this specification.

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.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D848 Test Method for Acid Wash Color of Industrial Aromatic Hydrocarbons

D852 Test Method for Solidification Point of Benzene

D1492 Test Method for Bromine Index of Aromatic Hydrocarbons by Coulometric Titration

D1685 Test Method for Traces of Thiophene in Benzene by

Spectrophotometry (Withdrawn 2009)³

D3437 Practice for Sampling and Handling Liquid Cyclic Products

D4492 Test Method for Analysis of Benzene by Gas Chromatography

D4735 Test Method for Determination of Trace Thiophene in Refined Benzene by Gas Chromatography

D5386 Test Method for Color of Liquids Using Tristimulus Colorimetry

D5776 Test Method for Bromine Index of Aromatic Hydrocarbons by Electrometric Titration

D6304 Test Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives by Coulometric Karl Fischer Titration

D6875 Test Method for Solidification Point of Industrial Organic Chemicals by Thermistor

D7011 Test Method for Determination of Trace Thiophene in Refined Benzene by Gas Chromatography and Sulfur Selective Detection

D7183 Test Method for Determination of Total Sulfur in Aromatic Hydrocarbons and Related Chemicals by Ultraviolet Fluorescence

D7184 Test Method for Ultra Low Nitrogen in Aromatic Hydrocarbons by Oxidative Combustion and Reduced Pressure Chemiluminescence Detection

D7360 Test Method for Analysis of Benzene by Gas Chromatography with External Calibration

D7375 Test Method for Trace Quantities of Water in Aromatic Hydrocarbons and Their Mixtures by Coulometric Karl Fischer Titration (Withdrawn 2017)³

D7504 Test Method for Trace Impurities in Monocyclic Aromatic Hydrocarbons by Gas Chromatography and Effective Carbon Number

D8005 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

¹ This specification is under the jurisdiction of ASTM Committee D16 on Aromatic, Industrial, Specialty and Related Chemicals and is the direct responsibility of Subcommittee D16.01 on Benzene, Toluene, Xylenes, Cyclohexane and Their Derivatives.

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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.

³ The last approved version of this historical standard is referenced on www.astm.org.

E1064 Test Method for Water in Organic Liquids by Coulometric Karl Fischer Titration

E2680 Test Method for Appearance of Clear, Transparent Liquids (Visual Inspection Procedure)

2.2 *Other Document:*

OSHA Regulations, 29 CFR paragraphs 1910.1000 and 1910.1200⁴

3. Properties

3.1 Benzene-545 shall conform to the following requirements:

Property	Specification	ASTM Test Method ⁴
Benzene, min, weight %	99.90	D4492 or D7360 or D7504 or D7183
Sulfur, max, mg/kg	1.0	D7183
Thiophene, max, mg/kg	0.6	D1685, D4735, or D7011
Toluene, max, weight%	0.05	D4492 or D7360 or D7504
Nonaromatic hydrocarbons, max, weight %	0.10	D4492 or D7360 or D7504
Acid wash color, max	pass with 1	D848
Bromine index, max	20	D1492 or D5776

⁴ Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, <http://www.access.gpo.gov>.

Appearance, free of haze, particulates or suspended matter particles	pass	E2680
Color, max, Pt–Co scale	20	D5386 or D8005
Solidification point, anhydrous basis, min, °C	5.45	D852 or D6875

⁴ If more than one method is listed, the producer and user should agree on the referee method.

3.2 See Section 5 for non-mandatory supplementary requirements.

4. Sampling

4.1 The material shall be sampled in accordance with Practice D3437.

5. Supplementary Requirements (Non-mandatory)

5.1 The following supplementary requirements shall apply when agreed upon by the supplier and purchaser:

Property	ASTM Test Methods ⁴
Nitrogen, max, mg/kg	D7184
1,4 Dioxane	D4492
Water	D6304 or E1064 or D7375

⁴ If more than one method is listed, the producer and user should agree on the referee method.

6. Keywords

6.1 benzene; benzene-545; purity

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