



Designation: D 4734 – 9804

Standard Specification for Refined Benzene-545¹

This standard is issued under the fixed designation D 4734; 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 E 29.

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

¹ This specification 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.

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

2. Referenced Documents

2.1 *ASTM Standards:*²

- D 848 Test Method for Acid Wash Color of Industrial Aromatic Hydrocarbons
- D 852 Test Method for Solidification Point of Benzene
- D 1209 Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)
- D 1492 Test Method for Bromine Index of Aromatic Hydrocarbons by Coulometric Titration
- D 1685 Test Method for Traces of Thiophene in Benzene by Spectrophotometry
- D 3437 Practice for Sampling and Handling Liquid Cyclic Products
- ~~D 401745 Test Method for Water in Paints and Paint Materials by Karl Fisher Method~~
- ~~D 4045 Test Method for Sulfur in Petroleum Products by Hydrogenolysis and Rateometric Colorimetry~~
- D 4492 Test Method for Analysis of Benzene by Gas Chromatography
- D 4629 Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons by Syringe/Inlet Oxidative Combustion and Chemiluminescence Detection
- D 4735 Test Method for Determination of Trace Thiophene in Refined Benzene by Gas Chromatography
- D 5386 Test Method for Color of Liquids Using Tristimulus Colorimetry
- D 5776 Test Methods for Bromine Index of Aromatic Hydrocarbons by Electrometric Titration
- D 6069 Test Method for Trace Nitrogen in Aromatic Hydrocarbons by Oxidative Combustion and Reduced Pressure Chemiluminescence Detection
- D 6212 Test Method for Total Sulfur in Aromatic Compounds by Hydrogenolysis and Rateometric Colorimetry
- D 6304 Test Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives by Coulometric Karl Fischer Titration
- D 6313 Test Method for Total Sulfur in Aromatic Compounds by Hydrogenolysis and Sulfur Specific Difference Photometry
- D 6366 Test Method for Total Trace Nitrogen and Its Derivatives in Liquid Aromatic Hydrocarbons by Oxidative Combustion and Electrochemical Detection
- D 6428 Test Method for Total Sulfur in Liquid Hydrocarbons and Their Derivatives by Oxidative Combustion and Electrochemical Detection
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E 1064 Test Method for Water in Organic Liquids by Coulometric Karl Fischer Titration

2.2 *Other Document:*

OSHA Regulations, 29 CFR, paragraphs 1910.1000 and 1910.1200³

3. Properties

- 3.1 Benzene-545 shall conform to the following requirements:

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*, Vol 06.04, volume information, refer to the standard's Document Summary page on the ASTM website.

Annual Book

³ Available from U.S. Government Printing Office Superintendent of Documents, Vol 06-04: Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401.

Property	Specification	ASTM Test Method
<u>Property</u>	<u>Specification</u>	<u>ASTM Test Method</u>
Benzene, min, weight %	99.90	D 4492
Sulfur, max, mg/kg	4	D 4046
<u>Sulfur, max, mg/kg</u>	<u>1</u>	<u>D 4045 or</u> <u>D 6212 or</u> <u>D 6313 or</u> <u>D 6428</u>
Thiophene, max, mg/kg	0.6	D 1685 or D 4735
Toluene, max, weight%	0.05	D 4492
Nonaromatic hydrocarbons, max, weight %	0.10	D 4492
Nitrogen	(if needed)	D 4629
<u>Nitrogen</u>	<u>(if needed)</u>	<u>D 4629 or</u> <u>D 6069 or</u> <u>D 6366</u>
1,4 Dioxane	(if needed)	D 4492
Acid wash color, max	pass with 1	D 848
Bromine index, max	20	D 1492 or D 5776
Water	(if needed)	D 4017
<u>Water</u>	<u>(if needed)</u>	<u>D 6304 or</u> <u>E 1064</u>
Appearance	A	...
<u>Appearance</u>	<u>B</u>	<u>...</u>
Color, max, Pt-Co scale	20	D 1209 or D 5386
Solidification point, anhydrous basis, min, °C	5.45	D 852

^AWhere multiple analytical techniques are allowed the referee method will be mutually agreed by the parties involved.

^BClear liquid at 18.3 to 25.6°C.

4. Sampling

4.1 The material shall be sampled in accordance with Practice D 3437.

5. Keywords

5.1 benzene; benzene-545; purity

SUMMARY OF CHANGES

Committee D16 has identified the location of selected changes to this standard since the last issue (D 4734 – 98) that may impact the use of this standard.

(1) 2.1 – Added references for Test Methods D 6069, D 6212, D 6304, D 6313, D 6366, D 6428, and E 1064. Removed reference for Test Method D 4017.

(2) 3.1 – Removed Test Method D 4017 and replaced it with Test Methods D 6304 and E 1064.

(3) 3.1 – Added additional methods for sulfur and nitrogen that should be acceptable for this product.

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