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Standard Specification for Vapor-Degreasing Solvents Based on *normal*-Propyl Bromide and Technical Grade *normal*-Propyl Bromide¹

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1. Scope

1.1 This standard covers solvents based on stabilized *normal*-propyl bromide (*n*PB) for use in vapor degreasing. The standard also includes a separate specification for technical-grade *n*-propyl bromide.

1.2 Blends and azeotropic mixtures of stabilized *n*PB for vapor-degreasing shall be blended from *n*PB meeting the specification for technical-grade *n*PB.

NOTE 1—Guide D3844, Practice D4276, and MNL2² provide additional important information on vapor degreasing and solvent properties.

1.3 *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:³

- D1078 Test Method for Distillation Range of Volatile Organic Liquids
- D2108 Test Method for Color of Halogenated Organic Solvents and Their Admixtures (Platinum-Cobalt Scale)
- D2109 Test Methods for Nonvolatile Matter in Halogenated Organic Solvents and Their Admixtures
- D2111 Test Methods for Specific Gravity and Density of Halogenated Organic Solvents and Their Admixtures
- D2251 Test Method for Metal Corrosion by Halogenated Organic Solvents and Their Admixtures
- D2942 Test Method for Total Acid Acceptance of Halogenated Organic Solvents (Nonreflux Methods)

¹ This specification is under the jurisdiction of ASTM Committee D26 on Halogenated Organic Solvents and Fire Extinguishing Agents and is the direct responsibility of Subcommittee D26.02 on Vapor Degreasing.

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² *Manual on Vapor Degreasing, MNL2*, Third Edition, ASTM.

³ 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.

- D2989 Test Method for Acidity-Alkalinity of Halogenated Organic Solvents and Their Admixtures
- D3401 Test Methods for Water in Halogenated Organic Solvents and Their Admixtures
- D3741 Test Methods for Appearance of Admixtures Containing Halogenated Organic Solvents
- D3844 Guide for Labeling Chlorinated Hydrocarbon Solvent Containers (Withdrawn 2013)⁴
- D4276 Practice for Confined Area Entry
- D4755 Test Method for Free Halogens in Halogenated Organic Solvents and Their Admixtures
- 2.2 U.S. Government Documents:⁵
 - 29 CFR 1919.1200 Department of Labor, OSHA Regulations on Hazard Communications
 - 49 CFR 100 to 199 Department of Transportation Hazardous Materials Regulations

3. Properties

3.1 Vapor-degreasing solvents based on stabilized *normal*-propyl bromide shall conform to the requirements prescribed in Table 1. The metal corrosion tests described in Test Method D2251 (test at reflux temperature only) shall be performed with aluminum (Al 1100). It is recommended, but not a requirement of this specification, that this test also be carried out by the end user on all metal alloys expected to contact the solvent during the intended storage and use.

3.2 Blends and azeotropic mixtures of stabilized *n*PB with other materials for use in vapor degreasing shall be prepared from technical-grade *n*PB which conforms to the requirements prescribed in Table 2.

4. Packaging

4.1 Industrial or commercial quantities shall be packaged and labeled in accordance with DOT regulations as found in 49 CFR 100 to 199 and state and local regulations, and with OSHA Regulations found in 29 CFR 1910.1200.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

⁵ The *Code of Federal Regulations* may be obtained from U.S. Government Publishing Office (GPO), 732 N. Capitol Street, NW, Washington, DC 20401, <http://www.gpo.gov>.

TABLE 1 Properties of Vapor-Degreasing Solvents Based on Stabilized *n*-Propyl Bromide

Property	Specification	Test Method
Boiling point, °C, min	65–75	D1078
Acidity (as HCl), weight %, max	0.0010	D2989
Water, weight %, max	0.0150	D3401
Appearance	clear and free from suspended matter	D3741
Color, APHA, max	15	D2108
Free halogen	passes test	D4755
Nonvolatile residue, weight %, max	0.0010	D2109
Acid acceptance (as NaOH), weight %, min	0.15	D2942
Aluminum corrosion at reflux	no evidence of tarnish or corrosion when compared with a similar untested strip	D2251
<i>normal</i> -propyl bromide content, weight %, min	90	GC
<i>iso</i> -propyl bromide content, weight %, max	0.05	GC

TABLE 2 Properties of Technical-Grade *n*-Propyl Bromide

Property	Specification	Test Method
Specific gravity, 25/25 °C	1.34–1.35	D2111
Boiling point, °C	70–71	D1078
Acidity (as HCl), weight %, max	0.0010	D2989
Water, weight %, max	0.0100	D3401
Appearance	clear and free from suspended matter	D3741
Color, APHA, max	15	D2108
Free halogen	passes test	D4755
Nonvolatile residue, weight %, max	0.0010	D2109
<i>normal</i> -propyl bromide content, weight %, min	99.5	GC
<i>iso</i> -propyl bromide content, weight %, max	0.05	GC

5. Keywords

5.1 1-bromopropane; *normal*-propyl bromide; vapor-degreasing solvent

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