



UL 330B

STANDARD FOR SAFETY

Hose and Hose Assemblies for Use With
Dispensing Devices Dispensing Diesel Fuel,
Biodiesel Fuel, Diesel/Biodiesel Blends With
Nominal Biodiesel Concentrations Up To 20
Percent (B20), Kerosene, and Fuel Oil



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UL Standard for Safety for Hose and Hose Assemblies for Use With Dispensing Devices Dispensing Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends With Nominal Biodiesel Concentrations Up To 20 Percent (B20), Kerosene, and Fuel Oil, UL 330B

First Edition, Dated December 18, 2015

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The following Standard has been published:

1. Standard for Safety for Hose and Hose Assemblies for Use With Dispensing Devices Dispensing Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends With Nominal Biodiesel Concentrations Up To 20 Percent (B20), Kerosene, and Fuel Oil, UL 330B

The new requirements are substantially in accordance with Proposal(s) on this subject dated July 10, 2015.

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The requirements in this Standard are now in effect, except for those paragraphs, sections, tables, figures, and/or other elements of the Standard having future effective dates as indicated in the note following the affected item. The prior text for requirements that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

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December 18, 2015



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1

UL 330B

Standard for Hose and Hose Assemblies for Use With Dispensing Devices Dispensing Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends With Nominal Biodiesel Concentrations Up To 20 Percent (B20), Kerosene, and Fuel Oil

First Edition

December 18, 2015

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Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at <http://csds.ul.com>.

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CONTENTS

INTRODUCTION

1 Scope	6
2 General	7
2.1 Units of Measurement	7
2.2 Undated References	7
3 Glossary	7

CONSTRUCTION

4 Tube and Cover	8
5 Thickness of Cover	8
6 Internal Diameter	9
7 Reinforcement	9
8 Electrical Bonding	9
9 Couplings	9
10 Materials	10
10.1 Metallic materials	10
10.2 Nonmetallic materials	11

PERFORMANCE

11 General	14
12 Repeating Bending Test (Empty)	15
12.1 General	15
12.2 Sample	15
12.3 Apparatus	15
12.4 Method	15
13 Hydrostatic Strength Test	17
13.1 General	17
13.2 Sample	17
13.3 Apparatus	17
13.4 Method	17
14 Repeated Bending Test (Filled)	18
14.1 General	18
14.2 Sample	18
14.3 Apparatus	18
14.4 Method	19
15 Permeation Test (For Low Permeation Hose)	19
15.1 General	19
15.2 Test equipment	19
15.3 General test procedure and instructions	20
15.4 Samples	21
15.5 Pretest procedure	21
15.6 Preconditioning procedure	22
15.7 Permeation test procedure	22
15.8 Steady state criteria	23
16 Electrical Resistance Tests for Hose Having Nonmetallic Electrically Conductive Materials ..	24
16.1 General	24
16.2 Samples	24

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16.3 Apparatus	24
16.4 Method	24
17 Leakage and Electrical Continuity Test	25
17.1 General	25
17.2 Sample	25
17.3 Apparatus	25
17.4 Method	25
18 Swivel Joint Operation Test	26
18.1 General	26
19 Pull Test	26
19.1 General	26
19.2 Sample	26
19.3 Equipment	26
19.4 Method	26
20 Adhesion Test	27
20.1 General	27
20.2 Sample	27
20.3 Apparatus	27
20.4 Method	27
21 Deformation Test	28
22 Kink Test	28
23 Tensile Strength and Elongation Tests for Hose Components	28
23.1 General	28
23.2 Samples	29
23.3 Apparatus	29
23.4 Method	29
24 Accelerated Air Oven Aging Test for Hose Components	30
24.1 General	30
24.2 Samples	30
24.3 Apparatus	30
24.4 Method	31
25 Ozone Exposure Test	31
25.1 General	31
25.2 Samples	31
25.3 Apparatus	31
25.4 Method	31
26 Immersion Tests for Hose Components	32
26.1 Tensile strength and ultimate elongation	32
26.2 Volume change	33
27 Low Temperature Test	34
27.1 General	34
27.2 Sample	34
27.3 Apparatus	34
27.4 Method	34
28 Long Term Exposure Test for Hose and Hose Assemblies	35
28.1 General	35
28.2 Samples	35
28.3 Method	36
29 Bending Test for Hose Assemblies with Internal Spring	36

MANUFACTURING AND PRODUCTION TESTS

30 General	37
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MARKING

31 Details	37
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SUPPLEMENT SA - TEST FLUIDS

SA.1 Representative Aggressive Combustible Test Fuel Mixtures	SA1
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INTRODUCTION

1 Scope

1.1 These requirements cover hose and hose assemblies for use on dispensing devices for fuels. A flammable liquid hose assembly consists of flexible hose and fittings suitable for attachment to fuel dispensing equipment. Fuels, as defined by these requirements, include one or more of the fuels described in 1.2.

1.2 Hose and hose assemblies covered by these requirements are intended for use with one or more of the following fuels:

- a) Diesel fuel and diesel fuel/biodiesel blends with nominal biodiesel concentrations up to 5 percent (B0 – B5) formulated in accordance with the Standard Specification for Diesel Fuel Oils, ASTM D975.
- b) Diesel/biodiesel blends with nominal biodiesel concentrations from 5 percent up to 20 percent (B6 – B20) formulated in accordance with the Standard Specification for Diesel Fuel Oil, Biodiesel Blends (B6 – B20), ASTM D7467.
- c) Biodiesel (B99.9/B100) formulated in accordance with the Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels, ASTM D6751.
- d) Kerosene formulated in accordance with the Standard Specification for Kerosene, ASTM D3699.
- e) Fuel Oil (heating oil) formulated in accordance with the Standard Specification for Fuel Oils, ASTM D396.

1.3 Hose assemblies are intended for use in accordance with the Code for Motor Fuel Dispensing Facilities and Repair Garages, NFPA 30A.

1.4 These requirements cover hose and hose assemblies (hose with couplings attached) in sizes up to and including 1-1/2 inches (38.1 mm).

1.5 Hose for conveying liquid fuel is intended for use at a maximum working pressure of 50 psig (345 kPa).

1.6 These requirements cover hose and hose assemblies for use at temperatures down to minus 40°C (minus 40°F) or optionally down to minus 54°C (minus 65°F).

1.7 These requirements do not cover hose or hose assemblies, intended for use in automotive vehicles or in confined areas, except for locations inside the housings of dispensing devices complying with the Outline for Power-Operated Dispensing Devices for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations Up to 20 Percent (B20), Kerosene, and Fuel Oil, UL 87B.

1.8 These requirements do not cover hoses or hose assemblies for use with any other fuel other than as described in 1.2.

2 General

2.1 Units of Measurement

2.1.1 When a value for measurement is followed by a value in other units in parentheses, the first stated value is the requirement.

2.2 Undated References

2.2.1 Any undated reference to a code or standard appearing in the requirements of this Outline shall be interpreted as referring to the latest edition of that code or standard.

3 Glossary

3.1 For the purposes of this outline, the following definitions apply.

3.2 DISPENSING DEVICE – A product consisting of various components that is used to control and meter the flow of liquid from an upstream storage device.

3.3 PERMEATION SURFACE AREA – The length of the hose as determined in 15.5.4 multiplied by the inner circumference of the hose, expressed in square meters. For vacuum-assist vapor recovery hose, the length of the hose is multiplied by the inner circumference of the outer hose. For balance vapor recovery hose, the length of the hose is multiplied by the average inner circumference of the outer hose.

3.4 REINFORCEMENT – Natural or synthetic fibers or fabric, or metallic wire that is wrapped, braided or spiral wound in one or more layers over the tube, intended to provide longitudinal and transverse (hoop) strength to the hose.

3.5 SEAL, DYNAMIC – A seal that is subject to mechanical movement or other applied forces that result in movement or flexing of the seal under normal use conditions.

3.6 SEAL, STATIC – A seal that is not subject to mechanical movement or other applied forces other than compressing forces that are applied during installation and maintained during normal use conditions.

CONSTRUCTION

4 Tube and Cover

4.1 The tube shall be made from a material resistant to the fuels anticipated by these requirements.

4.2 The cover shall be made from a material resistant to the fuels anticipated by these requirements and ozone.

4.3 The tube and cover shall be of uniform thickness, and free from pitting, blisters, or other imperfections. This requirement is not intended to exclude the use of a corrugated cover.

5 Thickness of Cover

5.1 The thickness of the cover shall not be less than 0.047 inch (1.19 mm) when measured in accordance with 5.2 – 5.6.

5.2 For removing irregularities in samples, the buffing machine or skiving machine outlined in the Standard Practice for Rubber – Preparation of Product Pieces for Test Purposes from Products, ASTM D3183, is to be used.

5.3 The abrasive wheel of the buffing machine is to be No. 30 – 60 grit and the diameter and rotary velocity of the wheel are to be such that it will have a peripheral speed of 4000 ± 700 feet per minute (20.3 ± 3.6 m/s). The machine is to be provided with a slow feed so that very little compound can be removed at one cut to avoid overheating of the specimen.

5.4 A dial micrometer graduated to 0.001 inch (0.03 mm) that exerts a load of 2.82 – 3.00 ounces (80 – 85 grams) by means of a weight is to be used to measure thickness. The load is to be applied through a flat contact foot 0.25 ± 0.01 inch (6.4 ± 0.3 mm) in diameter.

5.5 To determine the thickness of the tube and cover, a strip, 6 – 8 inches (152.4 – 203.2 mm) long and 1 inch (25.4 mm) wide, or as close to 1 inch (25.4 mm) as possible from small diameter hose, is to be cut longitudinally from the hose, and the part separated from the plies. When the thickness of the part is not uniform around the circumference of the hose, the strip is to be cut from the thinnest portion of the sample.

5.6 The strip specimen is to be buffed or skived to remove the impressions left by the fabric or braid or other surface irregularities, using the equipment described in 5.2 and 5.3. A series of five thickness measurements are to be taken within the area from which the impressions have been removed, and the maximum reading obtained is to be taken as the thickness of the part.

6 Internal Diameter

6.1 The internal diameter of a hose shall be equal to the nominal diameter $\pm 1/32$ inch (0.8 mm) for sizes up to and including $3/4$ inch (19.0 mm) and $\pm 1/16$ inch (1.6 mm) for larger sizes.

6.2 A tapered plug gauge of wood or metal having a taper of $3/8$ inch per foot (31.3 mm/m), marked to indicate variations of $1/64$ inch (0.4 mm) in diameter, or a set of wood or metal plug gauges, straight or ball type, in increments no greater than 0.01 inches (0.25 mm) for hoses in sizes 1 inch (25.4 mm) and less and 0.02 inches (0.51 mm) for hoses in sizes greater than 1 inch (25.4 mm), shall be used for measuring the internal diameter. An expanding ball gauge, and a micrometer or other equivalent means to accurately measure the expanded ball, are required in some cases.

6.3 The end of the hose is to be cut square. When a tapered plug gauge is used, the plug gauge is to be inserted in the hose sample until a close fit is obtained without forcing. The diameter of the gauge at the end of the sample, to the nearest $1/64$ inch (0.4 mm), is to be recorded as the internal diameter of the hose. When a set of straight or ball-type plug gauges is used, the diameter of the gauge, which when inserted in the hose sample gives a close fit without forcing, is to be recorded as the internal diameter of the hose. When the end of a wire-braided hose is constricted or flared, the inside diameter is to be measured 1 inch (25.4 mm) from the end to be representative of the inside diameter by means of an expanding ball gauge.

7 Reinforcement

7.1 Reinforcement, if present, shall be evenly and firmly applied over the tube of hose conveying liquid fuel.

8 Electrical Bonding

8.1 Hose and hose assemblies shall be constructed so as to provide an electrically conductive and bonding path between the couplings at each end of the length in order to dissipate static electricity.

9 Couplings

9.1 Couplings provided on hose assemblies shall be made from metals and shall be constructed with a section for tightening with tools. See Materials, Section 10.

9.2 The coupling provided on single-line hose assemblies shall have male pipe threads complying with the Standard for Pipe Threads, General Purpose (Inch), ASME B1.20.1.

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10 Materials

10.1 Metallic materials

10.1.1 General

10.1.1.1 A metallic part in contact with the fuels anticipated by these requirements shall be resistant to the action of the fuel if degradation of the material will result in leakage of the fuel or if it will impair the function of the device. See the Long Term Exposure Test, Section, 27.

10.1.1.2 The exposed surfaces of metallic parts shall be resistant to atmospheric corrosion if this corrosion will lead to leakage of the fluid or if it will impair the function of the device. The material shall comply with the requirements in Atmospheric corrosion, 10.1.2.

10.1.1.3 Metallic parts in contact with the fuels anticipated by these requirements shall not be constructed of lead, or materials that are substantially lead. In addition, no coatings or platings containing lead shall be used, such as terne-plated steel.

10.1.1.4 With reference to the above requirements, metallic parts include metallic materials used to form fluid confining parts as well as metallic coatings or plating that may be applied to a base material.

10.1.2 Atmospheric corrosion

10.1.2.1 Metallic materials used for fluid confining parts shall be resistant to atmospheric corrosion. Standard pipe and fittings conforming to the Standard for Welded and Seamless Wrought Steel Pipe, ASME B36.10M are acceptable when uncoated.

10.1.2.2 A protective coating shall provide resistance against atmospheric corrosion to a degree not less than that provided by the protective coatings specified in 10.1.2.3.

10.1.2.3 Cadmium plating shall not be less than 0.0003 inch (0.008 mm) thick, and zinc plating shall not be less than 0.0005 inch (0.013 mm) thick, except on parts where threads constitute the major portion of the area in which case the cadmium or zinc plating shall not be less than 0.00015 inch (0.0038 mm) thick. Metallic parts are considered to comply with 10.1.2.1 when they are protected against atmospheric corrosion by:

- a) Hot dipped, mill galvanized sheet steel complying with the coating designation G90 in Table I of the Specification for Sheet Steel, Zinc Coated (Galvanized) or Zinc-Iron-Alloy Coated (Galvannealed) by the Hot Dip Process, ASTM A653/A653M; or
- b) Coatings which have been determined to be equivalent to G90 under the requirements of the Standard for Organic Coatings for Steel Enclosures for Outdoor Use Electrical Equipment, UL 1332.

10.1.2.4 A metallic material other than as described in 10.1.2.1 – 10.1.2.3 shall be painted or protected in a manner that has been determined to be equivalent.