UL 79B

STANDARD FOR SAFETY

Power-Operated Pumps for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations up to 20 Percent (B20), Kerosene, and Fuel Oil

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

UL Standard for Safety for Power-Operated Pumps for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations up to 20 Percent (B20), Kerosene, and Fuel Oil, UL 79B

First Edition, Dated February 11, 2015

Summary of Topics

This first edition of the Standard for Power-Operated Pumps for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations up to 20 Percent (B20), Kerosene, and Fuel Oil, ANSI/UL 79B, covers electrically-, hydraulically-, or pneumatically-driven power-operated pumps for use with petroleum products.

The requirements are substantially in accordance with Proposal(s) on this subject dated October 17, 2014.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical photocopying, recording, or otherwise without prior permission of UL.

UL provides this Standard ″as is″ without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any purpose.

In no event will UL be liable for any special, incidental, consequential, indirect or similar damages, including loss of profits, lost savings, loss of data, or any other damages arising out of the use of or the inability to use this Standard, even if UL or an authorized UL representative has been advised of the possibility of such damage. In no event shall UL's liability for any damage ever exceed the price paid for this Standard, regardless of the form of the claim.

Users of the electronic versions of UL's Standards for Safety agree to defend, indemnify, and hold UL harmless from and against any loss, expense, liability, damage, claim, or judgment (including reasonable attorney's fees) resulting from any error or deviation introduced while purchaser is storing an electronic Standard on the purchaser's computer system.

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.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

No Text on This Page

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

February 11, 2015

ANSI/UL 79B-2015

UL 79B

Standard for Power-Operated Pumps for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations up to 20 Percent (B20), Kerosene, and Fuel Oil

Prior to the first edition, the requirements for the products covered by this standard were included in the Outline of Investigation for Power-Operated Pumps for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends with Nominal Biodiesel Concentrations up to 20 Percent (B20), Kerosene, and Fuel Oil, UL 79B.

First Edition

February 11, 2015

This ANSI/UL Standard for Safety consists of the First Edition.

The most recent designation of ANSI/UL 79B as an American National Standard (ANSI) occurred on February 11, 2015. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, or effective date information.

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.

UL's Standards for Safety are copyrighted by UL. Neither a printed nor electronic copy of a Standard should be altered in any way. All of UL's Standards and all copyrights, ownerships, and rights regarding those Standards shall remain the sole and exclusive property of UL.

COPYRIGHT © 2015 UNDERWRITERS LABORATORIES INC.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

No Text on This Page

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

CONTENTS

INTRODUCTION

1 Scope 6
2 General 7
2.1 Components 7
2.2 Units of measurement 8
2.3 Undated references 8
3 Glossary 8

CONSTRUCTION

4 Assembly 9
5 Materials 10
5.1 Metallic materials 10
5.2 Nonmetallic materials 11
5.3 Materials – system level 14
5.4 Casting impregnation materials 14
5.5 Internal parts 14
6 Bodies, Covers, and Heads 14
7 Drive-Shaft Seals 15
8 Diaphragms 15
9 Springs 15
10 Floats 16
11 Air Separators 16
12 Strainers 16
13 Outlet Pressure Regulation 17
14 Pressure Relief 18
15 Mounting and Base 18
16 Guards 18
17 Piping and Fittings 19
18 Hose Nozzle Valve, Hose, and Coupling 20
19 Conduit Seals 21
20 Electrical Equipment 22
21 Supply Connections 24
22 Current-Carrying Parts 26
23 Insulating Material 26
24 Internal Wiring 28
24.1 Mechanical protection 28
24.2 Types of wire 28
24.3 Splices and connections 29
25 Separation of Circuits 31
26 Capacitors 31
27 Grounding 32
27.1 General 32
27.2 Grounding identification 33
28 Motors 34
28.1 Construction 34
28.2 Overload protection 34
28.3 Brushes and brush holders 35
29 Overload- or Thermal-Protective Devices 36

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL
Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

30 Switches and Controls 36
31 Spacings 37

PROTECTION OF PERSONNEL

32 General 39
33 Sharp Edges 39
34 Enclosures and Guards 40
35 Materials 43
36 Surface Temperatures 43
37 Locking Mechanism 44
38 Control Application 44
39 Secondary Circuits 44
39.1 General 44
39.2 Protection of wiring 45

PERFORMANCE

40 General 45
41 Long Term Exposure Test 46
41.1 General 46
41.2 Samples 47
41.3 Method 47
41.4 Results 48
42 High Pressure Leakage Test 48
43 Endurance Test – Pumps 50
44 Hydrostatic Strength Test 50
45 Retention Test for Screws and Bolts 51
46 Deformation Test 51
47 Leakage of Wire Seal Test 52
48 Endurance Test for Air Separators 53
49 Blocked Outlet Test 53
50 Pressure Relief Test 53
51 Float Buoyancy Test 53
52 Dimensional Stability of Floats Test 54
53 Weight Change of Floats Test 54
54 Float Crushing Test 55
55 10-Day Moist Ammonia-Air Stress Cracking Test 56
56 Tests on Sealing Compounds 56
57 Metallic Coating Thickness Test 57
58 Starting Current Test 59
59 Input Test 59
60 Temperature Test 59
60.1 General 59
60.2 Maximum normal load 63
61 Dielectric Voltage-Withstand Test 63
62 Grounding Continuity Test 64
63 Rain Test 65
64 Submersion Test 68
65 Conductor Secureness Test 68
66 Insulation Resistance Test 68
67 Leakage Current Test 71
68 Pneumatic Parts – Pressure Distortion Test 73

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL
Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015
Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

69 Pneumatic Parts – Endurance 74
70 Pneumatic Parts – Impact Test 74

MANUFACTURING AND PRODUCTION

71 General 74

INSTRUCTIONS

72 General 76

RATING

73 Details 77

MARKING

74 General 77
75 Cautionary Markings 79
76 Permanence of Marking 80

SUPPLEMENT SA - Test Fluids

SA.1 Representative aggressive combustible test fuel mixtures SA1

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

INTRODUCTION

1 Scope

1.1 These requirements cover products described in 1.2 when used with one or more of the fuels described in 1.3.

1.2 These requirements cover electrically-, hydraulically-, or pneumatically-driven power-operated pumps for use with petroleum products in the following applications:

a) Self-contained dispensing devices and submerged pumps used in storage tanks that provide the fuel to remote control dispensing devices. They are intended for operation at discharge pressures of 50 pounds per square inch (psig) (345 kPa), or the marked maximum discharge pressure rating, when less, with the ambient and liquid temperature within the range of minus 29°C (minus 20°F) – 52°C (125°F).

b) Dispensing systems to transfer the fuel from a tank or container to a vehicle or another container. They are intended for operation at the marked maximum discharge pressure, or less, with the ambient and liquid temperature within the range of minus 29°C (minus 20°F) – 52°C (125°F).

c) Vapor recovery applications for dispensing devices. They are intended to operate under a vacuum at the inlet and a maximum discharge pressure of 50 psig (345 kPa), or marked discharge pressure, whichever is less.

1.3 Pumps covered by these requirements are intended for use with one or more of the following:

a) Diesel Fuel and diesel/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 Kerosine, ANSI/ASTM D3699.

e) Fuel Oil (Heating Oil) formulated in accordance with the Standard Specification for Fuel Oils, ASTM D396.

1.4 Requirements for the installation and use of these products are included in the Flammable and Combustible Liquids Code, ANSI/NFPA 30; the Motor Fuel Dispensing Facilities and Repair Garages Code, ANSI/NFPA 30A; and the National Electrical Code, ANSI/NFPA 70.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL
Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015
Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

1.5 These requirements do not cover:

a) Oil burner pumps, which are evaluated under the Standard for Pumps for Oil-Burning Appliances, UL 343.

b) Pumps for engine-powered automotive equipment.

c) Pumps for marine use which are evaluated under the Standard for Mechanically and Electrically Operated Fuel Pumps for Marine Use, UL 1130.

d) Pumps for use in chemical, petrochemical, or petroleum processing plants; utility power plants; petroleum production facilities; pipeline pump stations; pipeline or marine terminals; or bulk plant distribution and related facilities.

e) Pumps used in mobile applications, such as on tank trucks, portable tanks, or portable containers mounted on vehicles.

f) Pumps rated more than 600 volts.

g) Pump assemblies also provided with a flammable liquid meter or electrically-operated shutoff valve, which are evaluated in accordance with the Standard for Power-Operated Dispensing Devices for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent (E0 – E85), UL 87A.

h) Pumps intended for use with gasoline and gasoline/ethanol blends which are evaluated in accordance with the Standard for Power Operated Pumps for Gasoline and Gasoline/Ethanol Blends with Nominal Ethanol Concentrations up to 85 Percent (E0 – E85), UL 79A.

1.6 The pump assembly may be constructed such that it provides for the installation and use of a hose and hose nozzle valve.

2 General

2.1 Components

2.1.1 Except as indicated in 2.1.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.1.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this .

2.1.3 A component shall be used in accordance with its rating established for the intended conditions of use.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

2.1.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

2.1.5 Electrical components, including motors and wiring, when incorporated by a manufacturer in an assembly with a pump, and including the means provided in the pump assembly for electrical connections, shall comply with the requirements for equipment for use in hazardous locations, Class I, Group D, National Electrical Code, ANSI/NFPA 70, Articles 500 and 501.

2.2 Units of measurement

2.2.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

2.3 Undated references

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

3 Glossary

3.1 For the purpose of this standard, the following definitions apply.

3.2 DIESEL/BIODIESEL BLENDS – Blended fuels composed of a diesel component and a biodiesel component. The numerical value corresponding to the biodiesel component determines the blend rating (such as B20 for 20% biodiesel and 80% diesel).

3.3 HAZARDOUS LOCATIONS – Locations in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixture.

3.4 INTRINSICALLY SAFE CIRCUIT – A circuit incapable of releasing sufficient electrical energy under normal or abnormal conditions to cause ignition of a specific hazardous atmospheric mixture. Abnormal conditions include unintentional damage to any part of the equipment or wiring, insulation or other malfunction of electrical components, application of overvoltage, adjustment and maintenance operations, and other similar conditions.

3.5 LINE-VOLTAGE CIRCUIT – A circuit involving a potential of not more than 600 volts and having circuit characteristics in excess of those of a low-voltage circuit.

3.6 LOW-VOLTAGE CIRCUIT – A circuit involving a peak open-circuit potential of not more than 42.2 volts supplied by:

a) A battery;

b) A Class 2 transformer; or

c) A combination of a transformer and a fixed impedance that, as a unit, complies with the performance requirements for Class 2 transformers in accordance with the Standard for Standard for Low Voltage Transformers – Part 1: General Requirements, UL 5085-1 and the Standard for Low Voltage Transformers – Part 3: Class 2 and Class 3 Transformers, UL 5085-3.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

A circuit derived from a line-voltage circuit by connecting a resistance in series with the supply circuit as a means of limiting the voltage and current is not a low-voltage circuit.

3.7 RAINPROOF ENCLOSURE – An enclosure that prevents the entrance of a beating rain to the extent that there is no wetting of electrical parts and no water enters a compartment housing field installed wiring.

3.8 SEALS, 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.

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

CONSTRUCTION

4 Assembly

4.1 The construction of a pump shall be such that parts can be assembled in the intended manner after being dismantled to the extent needed for replacement of parts or for other maintenance or servicing.

4.2 When a pump requires the use of special pipe flanges, gaskets, bolts, or other special fittings or parts for making connections, such parts shall be furnished as part of the pump assembly.

4.3 A product shall be formed and assembled so that it has the strength and rigidity required to resist the abuses to which it is subjected without resulting in the risk of fire, electric shock, or injury to persons due to total or partial collapse with:

a) Resulting reduction of spacings;

b) Loosening or displacement of parts; or

c) Other defects.

4.4 A pump-motor assembly to be shipped from the manufacturer disassembled shall be provided with the marking described in 74.9.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

5 Materials

5.1 Metallic materials

5.1.1 General

5.1.1.1 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 41.

5.1.1.2 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, 5.1.2.

5.1.1.3 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.

5.1.1.4 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.

5.1.2 Atmospheric corrosion

5.1.2.1 Metallic materials used for fluid confining parts shall be resistant to atmospheric corrosion. In addition, metallic materials that are required to operate to address safety (e.g. thermal links on shear valves) shall be resistant to atmospheric corrosion. Ferrous materials of the thickness specified in the following items are acceptable for the preceding when uncoated:

a) A casting having a wall thickness of not less than 1/4 inch (6.4 mm) if shown by production test to be free of leakage;

b) Standard pipe and fittings conforming to the Standard for Welded and Seamless Wrought Steel Pipe, ANSI/ASME B36.10M; and

c) Fabricated sheet steel parts having a minimum wall thickness of 0.093 inch (2.36 mm).

5.1.2.2 A protective coating shall provide resistance against atmospheric corrosion to a degree not less than that provided by the protective coatings specified in 5.1.2.3.

5.1.2.3 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 5.1.2.1 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.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL
Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015
Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

5.1.2.4 A metallic material other than as described in 5.1.2.1 – 5.1.2.3 shall be painted or protected in a manner that has been determined to be equivalent.

5.2 Nonmetallic materials

5.2.1 General

5.2.1.1 A nonmetallic 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.

5.2.1.2 Gaskets or seals shall be designated as dynamic and/or static seals. See 3.8 and 3.9 respectively. If the type of seal cannot be determined, then the material shall be treated as both a static and a dynamic seal.

5.2.1.3 Gaskets and seals shall comply with the requirements as d in Nonmetallic materials – material level, 5.2.2 and Materials – system level, 5.3.

5.2.1.4 Nonmetallic materials in contact with the fuels anticipated by these requirements shall not be constructed of the following:

a) Polysulfide rubber;

b) Ethylene propylene diene monomer (EPDM) rubber;

c) Methyl-Methacrylate;

d) Polyvinyl Chloride (PVC);

e) Nylon 6/6; or

f) Polyurethane.

5.2.1.5 The reliability of a nonmetallic, pneumatic pressure confining part shall be determined for each application. Among the factors to be taken into consideration with the reliability of a nonmetallic material are:

a) Mechanical strength;

b) Resistance to impact;

c) Resistance to distortion and creeping at temperature and pressures to which the material is subjected under conditions of intended use; and

d) Dimensional stability.

Compliance with this requirement is determined by the tests of Sections 52, 68, 69, and 70.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

5.2.2 Nonmetallic materials – material level

5.2.2.1 Static seals

5.2.2.1.1 Static seals shall be evaluated in accordance with the Standard for Gaskets and Seals, UL 157, modified as indicated in 5.2.2.1.2 – 5.2.2.1.4. If a specific material complies with these requirements, the material can be considered to be qualified for system testing.

5.2.2.1.2 A static seal shall be constructed of a material that is acceptable in accordance with the scope of Standard for Gaskets and Seals, UL 157.

5.2.2.1.3 Static seals shall be subjected to the Volume Change and Extraction Test in accordance with the Standard for Gaskets and Seals, UL 157, except for the following modifications:

a) The test duration shall be 1000 hours;

b) The applicable test fluids shall be as described in Supplement SA; and

c) For all materials, the average volume change shall not exceed 40% swell (increase in volume) or 1% shrinkage (decrease in volume). In addition, the weight loss shall not exceed 10%. For coated fabrics, alternate limits can be used with the average volume change not exceeding 60% swell or 5% shrinkage, and the weight loss shall not exceed 20%. There shall be no visual evidence of cracking or other degradation as a result of the exposure for any material including coated fabrics.

5.2.2.1.4 Static seals shall be subjected to the Compression Set Test in accordance with the Standard for Gaskets and Seals, UL 157, except for the following modifications:

a) The test duration shall be 1000 hours.

b) The samples shall be immersed, at room temperature, in the test fluids (see item c) while compressed for the entire test duration. No oven conditioning is required.

c) The applicable test fluids shall be as described in Supplement SA.

d) The recovery period shall consist of removing the sample from the compression device and immersing it in the applicable test fluid for 30 minutes at room temperature. The sample shall not be allowed to dry out due to exposure to air. The 30-minute immersion should use the same fluid as the test fluid for each sample.

e) For all materials, the average compressions set is calculated and shall not exceed 35 percent. For coated fabrics, alternate limits can be used with the average compression set not exceeding 70%.

Exception: This requirement does not apply to composite gasket materials as defined in accordance with the Standard for Gaskets and Seals, UL 157.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

5.2.2.2 Dynamic seals

5.2.2.2.1 Dynamic seals shall be evaluated in accordance with the Standard for Gaskets and Seals, UL 157, modified as indicated in 5.2.2.2.2 – 5.2.2.2.4. If a specific material complies with these requirements, the material can be considered to be qualified for system testing.

5.2.2.2.2 A dynamic seal shall be constructed of a material that is acceptable in accordance with the scope of the Standard for Gaskets and Seals, UL 157.

5.2.2.2.3 Dynamic seals shall be subjected to the Volume Change and Extraction Test in accordance with the Standard for Gaskets and Seals, UL 157, except for the following modifications:

a) The test duration shall be 1000 hours;

b) The applicable test fluids shall be as described in Supplement SA; and

c) For all materials, the average volume change for a gasket or seal material shall not exceed 40% swell (increase in volume) or 1% shrinkage (decrease in volume). In addition, the weight loss shall not exceed 10%. For coated fabrics, alternate limits can be used with the average volume change not exceeding 60% swell or 5% shrinkage, and the weight loss shall not exceed 20%. There shall be no visual evidence of cracking or other degradation as a result of the exposure for any material including coated fabrics.

5.2.2.2.4 Dynamic seals shall be subjected to the Tensile Strength and Elongation Test in accordance with the Standard for Gaskets and Seals, UL 157, except for the following modifications:

a) The test duration shall be 1000 hours;

b) The applicable test fluids shall be as described in Supplement SA; and

c) For all materials, the average tensile strength and the average elongation of materials shall not be less than 60 percent of the as-received values. For coated fabrics, alternate limits can be used with the average tensile strength and the average elongation not less than 30% of the as-received values.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

5.3 Materials – system level

5.3.1 For all materials, gaskets and seals that have been shown to comply with the applicable requirements for static seals in the Standard for Gaskets and Seals, UL 157, or with the requirements under material level tests shall be subjected to the system level tests for the applicable component after the Long Term Exposure Test, Section 41. Static seals shall be provided in accordance with 41.2.4.

5.4 Casting impregnation materials

5.4.1 Material level

5.4.1.1 Casting impregnation materials shall be evaluated at the material level in accordance with the requirements in the of Investigation for 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.

5.4.2 System level

5.4.2.1 The casting impregnation material, applied as intended to a casting, shall comply with the Long Term Exposure Test, Section 41. The casting shall not show indications of porosity leakage at any point during or after this test.

5.5 Internal parts

5.5.1 Nonmetallic parts located internally to a fluid confining part, degradation of which would not directly result in leakage, are not required to comply with Nonmetallic materials, 5.2. The part shall be tested in accordance with 5.5.2.

5.5.2 Internal nonmetallic parts shall be tested during the Long Term Exposure Test, Section 41. During this test, the part shall not degrade to the extent that visible particles can be observed in the drained fluid.

6 Bodies, Covers, and Heads

6.1 A pump body assembly shall withstand the Deformation Test, High Pressure Leakage Test, and Hydrostatic Strength Test requirements specified in 46, 42, and 44, respectively. These requirements do not apply to body sections of submersible type pumps intended to be immersed in the liquid.

6.2 Plugs and other parts, other than cap screws and bolts threaded into noncorrosion-resistant ferrous parts of the pump, shall be of corrosion-resistant metal or provided with a protective coating when they are required to be removed for adjustment, repair, or other care of the pump.

6.3 A plug, cap, or other part threaded into or on the pump body shall engage with at least four full threads.

6.4 A bolt or a screw hole shall not extend through the outer walls of a pump body into a liquid-handling section.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

7 Drive-Shaft Seals

7.1 A stuffing box or a seal shall comply with the requirements specified in the Endurance Test – Pumps, Section 43.

7.2 An adjustable stuffing box, when guarded or not accessible, or when clearly visible to the operator, shall be provided with a spring-loaded follower gland or the equivalent.

7.3 An automatic spring take-up for a gland shall employ a spring made of corrosion resistant material or coated to retard corrosion.

7.4 The physical characteristics of a take-up spring shall be such that it advances the gland through not less than one-half its possible travel from its initial setting with the spring compressed.

7.5 The stuffing-box recess shall be such that packing material does not come into contact with screw threads.

8 Diaphragms

8.1 A metal part coming in contact with a diaphragm shall have no sharp edges, burrs, projections, and surfaces that are capable of chafing or abrading the diaphragm.

8.2 A pump, in which a flexible diaphragm, bellows, or similar construction constitutes the only fluid seal, shall be constructed such that the atmospheric side of the diaphragm or bellows is enclosed in a casing construction to reduce external leakage in the event of a diaphragm or bellows rupture, or shall have provisions for connection of a vent pipe or tubing intended to be routed to the outdoors or other location determined to be equivalent. See 74.8.

9 Springs

9.1 An operating spring shall be guided and arranged to reduce binding, buckling, or other interference with its free movement. When required, ends of a spring shall be closed and squared.

9.2 A spring employed in a pump to reduce the risk of leakage, shall:

a) Be protected against abrasion and corrosion and

b) Demonstrate no loss in strength following subjection to a compression force of three times that exerted by the spring in any position of its intended function.

9.3 In reference to 9.2(a), springs that are exposed to the fuels anticipated by these requirements shall comply with the applicable material requirements from Materials, Section 5. Springs not exposed to fuels, but exposed to the environment, shall comply with the atmospheric corrosion requirements in 5.1.2.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

10 Floats

10.1 A float constructed to actuate a mechanism shall have a buoyancy not less than 50 percent greater than that required to operate the mechanism. See the Float Buoyancy Test, Section 51.

10.2 A hollow float shall withstand an external crushing pressure of not less than 35 psig (240 kPa). See the Float Crushing Test, Section 54.

10.3 A cork float shall be provided with a coating that is resistant to the action of the liquid with which it is in contact. Compliance of the coating is verified by the Long term Exposure Test, Section 41.

10.4 A float shall be secured to its corresponding lever, rod, or other part of the mechanism by a method that prevents the float from becoming detached under its intended conditions of operation.

10.5 A float constructed of nonmetallic materials shall comply with the requirements of the

a) Float Buoyancy Test, Section 51;

b) Dimensional Stability of Floats Test, Section 52; and

c) Weight Change of Floats Test, Section 53.

11 Air Separators

11.1 Air separators that are provided as an integral part of a pump assembly shall be provided with floats that comply with the requirements of Floats, Section 10.

11.2 The valve mechanism operated by the float shall be subjected to the Endurance Test for Air Separators, Section 48. When the valve mechanism closes a vent to atmosphere, it shall also be subjected to the High Pressure Leakage Test, Section 42.

12 Strainers

12.1 A strainer integral with or provided as part of a pump assembly shall comply with the applicable requirements in the of Investigation for Strainers for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends With Nominal Biodiesel Concentrations Up To 20 Percent (B20), Kerosene, and Fuel Oil, UL 331A. The additional requirements of 12.2 – 12.6 apply.

12.2 A strainer shall enable the removal of foreign matter (sediment or dirt) without depositing the foreign matter in the outlet side of the strainer when the screen or filter element is removed for cleaning.

12.3 A strainer shall be installed and located so that removal and replacement of the strainer element is accomplished without breaking liquid lines or disturbing any part of the pump assembly. The location shall provide for the collection and removal of any spillage.

12.4 When provided, a drain opening shall be closed by a pipe plug not smaller than 1/4 inch pipe size (ANSI B36.10M). A pet cock or valve shall not be provided for drainage purposes. The materials shall comply with Materials, Section 5.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

12.5 The force necessary to open a strainer shall not permanently distort the assembly or piping to which the strainer is attached.

12.6 Filter elements do not need to be evaluated for fluid compatibility.

13 Outlet Pressure Regulation

13.1 A pump assembly for use with or in dispensing devices intended to dispense the fuels anticipated by this shall incorporate means for the prevention of or the relief of pressures developed by the pump in excess of the maximum discharge pressure of 50 psig (345 kPa) or the marked maximum discharge pressure rating, whichever is less. See Blocked Outlet Test, Section 49.

13.2 To comply with the requirements in 13.1, a pump assembly may be equipped with:

a) A bypass valve connected between the discharge and suction ports;

b) A relief valve arranged to be connected between the discharge side and the supply tank through a separate return line. When the relief valve is not provided as part of the pump, it shall be marked as indicated in 74.6;

c) A means to effect an automatic reduction in volumetric capacity upon an increase in pressure at the outlet; or

d) An energy input incapable, because of power or speed, of developing a discharge pressure in excess of the maximum discharge pressure.

13.3 After the valve or other means for pressure regulation has been adjusted in accordance with the requirements in 13.1, it shall:

a) Be capable of being sealed to discourage tampering;

b) Be located within the pump body and require tools for access; or

c) Be constructed so that the maximum adjustment obtainable does not result in a pressure in excess of the maximum discharge pressure under maximum output conditions.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

14 Pressure Relief

14.1 A pump for use with or in dispensing devices intended to dispense the fuels anticipated by this shall incorporate means for the relief of pressures developed by thermal expansion of the fluid in excess of the maximum discharge pressure of 50 psig (345 kPa), or in excess of the marked maximum discharge pressure, whichever is less. Thermal expansion pressure shall anticipate a temperature rise of 28°C (50°F) in an ambient temperature of 24°C (75°F). See the Pressure Relief Test, Section 50.

14.2 To comply with the requirements in 14.1, a pump assembly may be equipped with:

a) A bypass valve connected between the discharge and suction ports and

b) A relief valve arranged to be connected between the discharge side and the supply tank through a separate return line. When the relief valve is not provided as part of the pump, it shall be marked as indicated in 74.6.

14.3 After the valve or other means for pressure relief has been adjusted in accordance with the requirements in 14.1, it shall be:

a) Capable of being sealed to discourage tampering;

b) Located within the pump body and require the use of tools for access;, or

c) Constructed so that the maximum adjustment obtainable does not result in a pressure in excess of the maximum discharge pressure.

15 Mounting and Base

15.1 A pump shall be provided with supporting and mounting means independent of liquid-handling pipe connections. A mounting arrangement shall permit anchoring of the pump by bolts or cap screws.

15.2 When a base is furnished as part of a pump assembly, it shall be arranged to permit attachment and alignment of mounted parts and for anchoring to a mounting surface by cap screws or bolts.

16 Guards

16.1 A gear, belt, pulley, or other rotating part shall be enclosed in a metal guard or the pump assembly shall be furnished with an enclosure.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

17 Piping and Fittings

17.1 Pipe threads shall be in accordance with the Standard for Pipe Threads, General Purpose (Inch) ANSI/ASME B1.20.1.

17.2 Flanges of flange-type pumps shall comply with the appropriate American National Standard for pipe flanges and flanged fittings covering the material from which they are made, or such flanges and flanged fittings shall comply with all of the following tests as complete assemblies forming part of the pump:

a) High Pressure Leakage Test, Section 42;

b) Hydrostatic Strength Test, Section 44;

c) Retention Test for Screws and Bolts, Section 45;

d) Deformation Test, Section 46; and

e) 10-Day Moist Ammonia-Air Stress Cracking Test, Section 55.

17.3 An opening threaded for attachment to pipe shall be constructed so that a pipe threaded two threads beyond standard construction (for the size in question) is capable of being threaded into the opening without distorting any part of the fitting.

17.4 A male thread for attachment to pipe fittings shall have no shoulder within the distance specified in Table 17.1, from the beginning of the thread, including any chamfer, nor shall any shoulder prevent an additional turn being made within this distance as determined by assembling the part into a fitting within a tolerance of plus or minus one thread.

Table 17.1
Minimum shoulder distance from beginning of thread

Pipe size, ANSI B36.10M, nominal inches	Shoulder distance,	
	inches	(mm)
1/8	3/8	9.5
1/4, 3/8	9/16	14.3
1/2, 3/4	3/4	19.1
1	15/16	23.8
1-1/4	31/32	24.6
1-1/2	1	25.4
2	1-1/32	26.2
1-1/2	1-33/64	38.5
3	1-37/64	40.1

17.5 A threaded pipe connection shall be made with litharge and glycerine cement, shellac, shellac and inert powder filler, or a suitable pipe-joint sealing compound that is not alcohol based.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL
Documents
Document Sharing Hub
Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015
Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

17.6 ASTM Schedule 40 metallic pipe shall be used, and the metallic materials shall comply with Materials, Section 5. A union, when used, shall be of the ground-joint type or a part that has been determined to be equivalent.

17.7 Tubing may be used where it is protected by its location in the pump assembly or by its intended installation location. Tubing and tube fittings shall be metallic and all metallic materials shall comply with Materials, Section 5.

17.8 Tubing shall have a minimum wall thickness in accordance with Table 17.2 in any configuration that is used.

Table 17.2
Wall thickness for tubing

Outside diameter,		Minimum wall thickness,	
inch	(mm)	inch[a]	(mm)[a]
1/8	3.17	0.028	0.71
1/4	6.35	0.028	0.71
5/16	7.94	0.028	0.71
3/8	9.53	0.028	0.71
1/2	12.7	0.0315	0.80

[a] Nominal wall thickness of tubing is required to be greater than the thickness indicated to maintain the minimum wall thickness.

18 Hose Nozzle Valve, Hose, and Coupling

18.1 A pump assembly for use with service-station type hose-nozzle valves may be furnished without a hose-nozzle valve when the assembly is marked as specified in 74.4. If the hose nozzle valve is provided, the hose nozzle valve shall be in accordance with the of Investigation for Hose Nozzle Valves for Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends With Nominal Biodiesel Concentrations Up To 20 Percent (B20), Kerosene, and Fuel Oil, UL 2586B.

18.2 When a hose assembly, consisting of hose and couplings, is supplied with the pump assembly, it shall comply with the of Investigation for Hose and Hose Assemblies for Dispensing Diesel Fuel, Biodiesel Fuel, Diesel/Biodiesel Blends With Nominal Biodiesel Concentrations Up To 20 Percent (B20), Kerosene, and Fuel Oil, UL 330A.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL
Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

19 Conduit Seals

19.1 A factory-installed conduit seal incorporated as part of the product shall comply with the requirements of the High Pressure Leakage Test, Section 42; the Leakage of Wire Seal Test, Section 47; and the Hydrostatic Strength Test, Section 44.

19.2 When a conduit seal is incorporated with the product, the wires or conductors shall be securely held and tightly sealed where they pass into the enclosure. When a sealing compound or cement is used it shall:

a) Provide a tight fit;

b) Neither soften nor crack under service conditions;

c) Be resistant to the solvent action of the liquids and vapors to which it is capable of being exposed – see the Tests on Sealing Compounds, Section 56;

d) Be resistant to moisture and aging; and

e) Have a depth equal to the inside diameter of the conduit or 5/8 inch (15.9 mm), whichever is greater.

The sealing compound used in a conduit seal shall not flow or creep at the operating temperature of the device. Sealing compounds that soften with the application of heat shall have a softening point of not less than 94°C (200°F) when used adjacent to motors having Class A (Class 105) insulation and not less than 113°C (236°F) when used adjacent to motors having Class B (Class 130) insulation. The softening point is to be determined in accordance with the Standard Test Method for Softening Point by Ring-and-Ball Apparatus, ASTM E28.

19.3 When a nipple is used to retain the sealing compound for lead wires, the depth of the seal shall not be less than the internal diameter of the nipple or 5/8 inch (15.9 mm), whichever is greater. Depending on the compound, the size of the lead wires, and the construction of the sealing well, a greater depth of sealing compound shall be used as required to form a tight seal. Means shall be provided in the nipple to anchor the sealing compound.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL

Documents
Document Sharing Hub

Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015

Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT

20 Electrical Equipment

20.1 Electrical conduit to be immersed in the liquid to be handled shall be of the rigid, seamless, metallic type or other material that has been determined to be equivalent.

20.2 Electrical equipment and wiring shall be arranged so that the liquid does not drip or drain on them during the intended care and usage of the pump assembly.

20.3 Wiring shall be in threaded rigid metal conduit, threaded steel intermediate metal conduit, or Type MI cable with termination fittings that comply with the requirements for Class I, Group D equipment for use in hazardous locations specified in the National Electrical Code, ANSI/NFPA 70. All boxes, fittings, and joints shall be threaded for connection to conduit or cable terminations in compliance with the requirements in Class I, Group D equipment for use in hazardous locations. At least five full threads shall engage in each threaded joint.

Exception: The housing may be considered the electrical enclosure for intrinsically safe circuit wiring.

20.4 One end of a wireway between two parts that are factory-attached to an assembly may be secured to one of the parts by means of straight threads and, where necessary for security, with a locknut when the other end of the wireway is secured to the other part by tapered threads.

20.5 A compartment enclosing a switch or other part that is capable of producing arcs shall be sealed from any adjacent compartment in which field connections are to be made.

20.6 The ends of all conduit lengths, including nipples, shall be chamfered after threading to remove burrs or sharp edges.

20.7 For a vapor-tight fit, the sheath of shielded or multiconductor cables shall be split to enable the seal materials to be poured around the individual conductors.

Exception: Shielded or multiconductor cables that are evaluated in accordance with the Leakage of Wire Seal Test, Section 47, for the cable are not required to be split.

20.8 A terminal box threaded to conduit enclosing wiring sealed against the entry of water, petroleum products, or vapor shall not be subject to turning or require removal to accommodate replacement or extraction of parts for maintenance, servicing, or to facilitate the connection of field-installed piping or conduit.

20.9 Upper ends of conduit subject to immersion or to entry of water, liquids, or vapors shall be sealed in the area between the conduit inside diameter and the enclosed wiring. Sealing shall be by means of litharge and glycerine, or with a nonmetallic material which has been successfully evaluated for use in this application. See Tests on Sealing Compounds, Section 56.

20.10 Threaded joints for conduit shall provide for five full-thread engagement. Threads subject to turning during installation or use shall be coated with litharge and glycerine. Threads not subject to turning during installation or use and subject to immersion in the fluids anticipated by these requirements shall be coated with litharge and glycerine or a suitable pipe-joint sealing compound that is not alcohol based. Threaded joints in a coupling used to join lengths of conduit immersed in petroleum products shall be prevented from turning by leak-tight welding or brazing at the conduit and outside surfaces of couplings or by coating all threads with litharge and glycerine.

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM UL
Documents
Document Sharing Hub
Copyright UL
Provided by IHS under license with UL
No reproduction or networking permitted without license from IHS
Full document details: UL 79B 2015
Licensee=North Carolina State Univ/5618801100
Not for Resale, 10/17/2015 13:04:53 MDT