



UL 343

STANDARD FOR SAFETY

Pumps for Oil-Burning Appliances

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



Documents
Document Sharing Hub

UL Standard for Safety for Pumps for Oil-Burning Appliances, UL 343

Ninth Edition, Dated December 17, 2008

Summary of Topics

This edition of UL 343 is being revised to reflect the first time ANSI approval of the Standard. No changes in the requirements are involved.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The revisions are substantially in accordance with Proposal(s) on this subject dated August 10, 2012.

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that have been revised and that have a future effective date are located after the Standard, and are preceded by a "SUPERSEDED REQUIREMENTS" notice.

No Text on This Page

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



Documents

Document Sharing Hub

DECEMBER 17, 2008
(Title Page Reprinted: June 12, 2013)



ANSI/UL 343-2013

1

UL 343

Standard for Pumps for Oil-Burning Appliances

First Edition – July, 1957
Second Edition – June, 1971
Third Edition – August, 1974
Fourth Edition – April, 1976
Fifth Edition – April, 1982
Sixth Edition – July, 1986
Seventh Edition – April, 1993
Eighth Edition – May, 1997

Ninth Edition

December 17, 2008

This ANSI/UL Standard for Safety consists of the Ninth Edition including revisions through June 12, 2013.

The most recent designation of ANSI/UL 343 as an American National Standard (ANSI) occurred on June 12, 2013. 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 © 2013 UNDERWRITERS LABORATORIES INC.

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



Documents
Document Sharing Hub

No Text on This Page

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



Documents

Document Sharing Hub

CONTENTS

INTRODUCTION

1 Scope	5
2 Components	5
3 Units of Measurement	5
4 Undated References	6
5 Glossary	6

CONSTRUCTION

6 Assembly	6
7 Materials	7
8 Strength of Parts	8
9 Bodies, Covers, and Heads	8
10 Shaft Seals and Stuffing Boxes	9
11 Springs	11
12 Diaphragms	11
13 Bases	12
14 Integral Tanks	12
15 Strainers	13
16 Floats	13
17 Control Application	14
18 Piping and Fittings	14

ELECTRICAL EQUIPMENT

19 General	14
20 Enclosures	15
21 Motors	16
22 Wiring Methods	18

PERFORMANCE

23 General	19
24 Deformation – Test No. 1	19
25 Operation of Pressure-Regulating and Nozzle Shutoff Valves Combined With a Pump Assembly – Test No. 2	20
26 Operation of Combination Pump and Compressor Assemblies – Test No. 3	21
27 Operation of Automatic Fuel Oil Pumps – Test No. 4	21
28 Vacuum and Capacity of Power-Operated Pumps – Test No. 5	23
29 Endurance – Test No. 6	24
30 Static-Pressure Leakage – Test No. 7	24
31 High-Pressure Leakage – Test No. 8	25
32 Hydrostatic-Pressure Strength – Test No. 9	25
33 10-Day Moist Ammonia-Air Stress Cracking Test	26

MANUFACTURING AND PRODUCTION TESTS

34 General	26
------------------	----

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

MARKING

35 General	27
------------------	----

Appendix A

Standards for Components.....	A1
-------------------------------	----



INTRODUCTION

1 Scope

1.1 These requirements cover pumps that are intended to be used as part of oil-burning appliances or installed in fuel-oil piping systems serving such equipment. Oil-burning appliance pumps may be either automatic or power-operated.

1.2 Requirements for the installation and use of oil-burning appliance pumps are included in the Standard for the Installation of Oil-Burning Equipment, NFPA 31.

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this standard shall comply with the requirements for that component. See Appendix A for a list of standards covering components used in the products covered by this standard.

2.2 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 standard.

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

2.4 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.

3 Units of Measurement

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

4 Undated References

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

5 Glossary

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

5.2 **AUTOMATIC PUMPS** – Assemblies that automatically pump oil from the supply tank and deliver this oil by gravity under a constant head to an oil-burning appliance and that have automatic means to prevent the abnormal discharge of oil. These pumps are intended for installation at least 1 foot (305 mm) above the top of the supply tank and are arranged to stop pumping automatically in case of total breakage of the oil-supply line between the pump and the appliance.

5.3 **DIFFERENTIAL PRESSURE** – The difference in pressure, measured at the discharge port, between the value obtained with the pump operating and after shutdown.

5.4 **NORMAL OPERATING PRESSURE** – The pressure at which the pump is normally operated on the appliance.

5.5 **POWER-OPERATED PUMPS** – Pumps for use in the assembly of power-operated oil burners or for use as oil-transfer pumps.

5.6 **RATED PRESSURE** – The minimum and maximum operating pressures recommended by the manufacturer of the pump.

5.7 **REGULATED PRESSURE** – The minimum and maximum operating pressures obtainable by adjustment of the pressure-regulating valve.

CONSTRUCTION

6 Assembly

6.1 An automatic pump shall include all the components necessary for its intended function.

6.2 The construction of a pump shall be such that parts can be reassembled after being dismantled to the extent needed for servicing.

6.3 Means shall be provided for the purpose of making any necessary field adjustment.

6.4 Screws or bolts used to attach a part that is detached for servicing of the pump shall be capable of holding the part upon the application of the torques specified in Table 6.1 after removal and replacement.

Table 6.1
Torque requirements for screws or bolts

American standard screw size,		Torque,		I.S.O. screw size,	Torque,	
No. or inch	(mm)	lb-in.	(N·m)	mm	N·m	(lb-in.)
—	—	—	—	4	1.6	(14)
No. 8	(4.2)	18	(2.0)	4.5	2.6	(23)
10	(4.8)	30	(3.4)	5	4.2	(37)
1/4 inch	(6.4)	100	(11.3)	6	8.7	(77)
—	—	—	—	7	15.0	(133)
5/16	(7.9)	200	(22.6)	8	23.5	(208)
—	—	—	—	9	33.6	(297)
3/8	(9.5)	350	(39.6)	10	45.2	(400)
7/16	(11.1)	575	(65.0)	12	81.0	(715)
1/2	(12.7)	850	(96.0)	14	128.0	(1130)
9/16	(14.3)	1200	(136.0)	—	—	—
5/8	(15.9)	1600	(181.0)	16	185.0	(1640)

6.5 The pump shall incorporate a provision for support that is independent of piping, tubing, or conduit that may be connected to the pump.

6.6 A brazing material used for joining liquid-confining parts of a pump shall have a melting point (solidus temperature) not less than 538°C (1000°F).

7 Materials

7.1 Liquid-confining and operating parts of a pump, other than an automatic pump, shall be made of material having a melting point (solidus temperature) of not less than 510°C (950°F) and a tensile strength not less than 10,000 psi (68.9 MPa) at 204°C (400°F).

7.2 A part in contact with the liquid to be handled by a pump shall be resistant to the action of the liquid.

7.3 A synthetic rubber part shall not show excessive volume change when considered on the basis of its intended function, following immersion for 70 hours at a temperature of 23 ±2°C (73.4 ±3.6°F) in No. 3 Swelling Oil. The change in volume is to be determined in accordance with the Standard Test Method for Rubber Property-Effect of Liquids, ASTM D471-79(1991).

7.4 A change in volume of not more than 25 percent swelling or 1 percent shrinkage is considered to comply with the requirement in 7.3.

7.5 A part made of synthetic rubber that may be affected by aging shall not crack or show visible evidence of deterioration following exposure for 96 hours to oxygen at a pressure of 300 psig (2070 kPa), and at a temperature of 70°C (158°F).

7.6 Other parts shall be resistant to atmospheric corrosion and attack by the liquid they may contact in service if corrosion of such parts may result in external leakage. A ferrous material of the thickness specified in Table 7.1 is considered adequate for the preceding when uncoated and when intended for use with the designated liquid.