UL 561

STANDARD FOR SAFETY

Floor-Finishing Machines

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER
REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

UL Standard for Safety for Floor-Finishing Machines, UL 561

Seventh Edition, Dated October 31, 2011

SUMMARY OF TOPICS

This reaffirmation of ANSI/UL 561 dated June 15, 2026 is issued to update the title page to reflect the most recent designation as a Reaffirmed American National Standard (ANS). No technical changes have been made.

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

The requirements are substantially in accordance with Proposal(s) on this subject dated April 24, 2026.

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 ULSE Inc. (ULSE).

ULSE 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 ULSE 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 ULSE or an authorized ULSE representative has been advised of the possibility of such damage. In no event shall ULSE'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 ULSE 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.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

No Text on This Page

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

OCTOBER 31, 2011
(Title Page Reprinted: June 15, 2026)



ANSI/UL 561-2021 (R2026)

UL 561

Standard for Floor-Finishing Machines

First Edition – July, 1974
Second Edition – September, 1979
Third Edition – April, 1987
Fourth Edition – May, 1993
Fifth Edition – May, 1997
Sixth Edition – April, 2007

Seventh Edition

October 31, 2011

This ANSI/UL Standard for Safety consists of the Seventh Edition including revisions through June 15, 2026.

The most recent designation of ANSI/UL 561 as a Reaffirmed American National Standard (ANS) occurred on June 15, 2026. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

The Department of Defense (DoD) has adopted UL 561 on March 11, 1991. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

Comments or proposals for revisions on any part of the Standard may be submitted to ULSE at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at https://csds.ul.com.

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

© 2026 ULSE Inc. All rights reserved.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

No Text on This Page

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

CONTENTS

INTRODUCTION

1 Scope 7
2 General 7
2.1 Terminology 7
2.2 Units of measurement 7
2.3 Undated references 7
3 Glossary 7
4 Components 9
4.1 General 9
4.2 Attachment Plugs, receptacles, connectors, and terminals 10
4.3 Boxes, conduits, and raceways 11
4.4 Capacitors and filters 11
4.5 Controls 11
4.6 Cords, cables, and internal wiring 14
4.7 Film-coated wire (magnet wire) 15
4.8 Gaskets and seals 15
4.9 Ground-fault, arc-fault, and leakage current detectors/interrupters 15
4.10 Heating elements and heaters 15
4.11 Insulation systems 15
4.12 Light sources and associated components 16
4.13 Marking and labeling systems 16
4.14 Motors and motor overload protection 16
4.15 Overcurrent protection 19
4.16 Polymeric materials and enclosures 19
4.17 Power supplies 19
4.18 Printed wiring boards 19
4.19 Pumps 20
4.20 Semiconductors and small electronic components 20
4.21 Supplemental insulation, insulating bushings, and assembly aids 21
4.22 Switches 21
4.23 Transformers 22
4.24 Valves (electrically operated) and solenoids 22

ALL APPLIANCES

CONSTRUCTION

5 Frame and Enclosure 22
6 Accessibility of Uninsulated Live Parts, Film-Coated Wire, and Moving Parts 23
7 Mechanical Assembly 28
8 Enclosure 29
8.1 General 29
9 Resistance to Corrosion 29
10 Supply Connections 29
11 Strain Relief 31
12 Bushings 31
13 Live Parts 32
14 Internal Wiring 33
15 Tabs Used in Electrical Quick-Connect Terminals 34
15.1 General 34
15.2 Material requirements 34
15.3 Dimensional requirements 34

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

16 Insulating Material 39
17 Motors and Motor Protection 40
18 Insulation Systems 40
19 Motor Circuit Overload Protection 40
20 Arc-Fault and Leakage Current Detectors/Interrupters 40
21 Switches and Controls 41
22 Controls – End Product Test Parameters 41
22.1 General 41
22.2 Auxiliary controls 41
22.3 Operating controls (regulating controls) 41
22.4 Protective controls (limiting controls) 43
22.5 Controls using a temperature sensing device 44
23 Capacitors 45
24 Lampholders 45
25 Receptacles 45
26 Spacings 46
27 Grounding 48
28 Reduction of Risk of Injury to Persons 48

PERFORMANCE

29 Leakage Current Test 49
30 Leakage Current Test After Humidity Conditioning 52
31 Starting Current Test 52
32 Input Test 52
33 Temperature Test 52
33.1 General 52
33.2 Maximum intended load 55
34 Dielectric Voltage-Withstand Test 56
35 Strain Relief Test 57
36 Push-Back Relief Test 57
37 Flooding Test 57
37.1 General 57
37.2 Component malfunction or breakdown 58
37.3 Wet pick-up 58
37.4 Wet scrubbing 58
37.5 Overflow 58
37.6 Polymeric water-handling components 58
37.7 Impact test for polymeric reservoirs 58
37.8 Temperature stability test for polymeric reservoirs 59
38 Cord Reel Flexing Test 59
39 Abnormal Operation Test 59
39.1 General 59
39.2 Locked rotor 60
39.3 Overcurrent 60
40 Abnormal Operation Test – Electronic Components Test 60
40.1 General 60
40.2 Electronic components 61
41 Overload Test 61
42 Permanence of Marking Test 62
42.1 General 62
42.2 Oven-aging test 62
42.3 Standard-atmosphere test 62

MANUFACTURING AND PRODUCTION TESTS

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

43 Production-Line Dielectric Voltage-Withstand Test 62
44 Production-Line Grounding Continuity Test 64

MARKINGS

45 General 64
46 Cord Tags 66

PACKING AND SHIPMENT

47 Safety Instructions 67

DOUBLE-INSULATED PRODUCTS

GENERAL

48 Scope 69
49 Glossary 69

CONSTRUCTION

50 Insulation 70
51 Enclosure 71
51.1 General 71
51.2 Accessibility of live parts 71
52 Supply Connections 71
53 Grounding 72
54 Internal Wiring 72
55 Capacitors 73
56 Brush Caps 73
57 Commutators and Armature End Turns 73
58 Switches 74
59 Brush Holders 74
60 Spacings 74

PERFORMANCE

61 Leakage Current Test 75
62 Insulation Resistance Test 75
63 Dielectric Voltage-Withstand Test 76
64 Resistance to Impact Test 77
65 Resistance to Heat Test 78
66 Overload Test 79
67 Armature Test 80

MANUFACTURING AND PRODUCTION TEST

68 Production-Line Dielectric Voltage-Withstand Test 80

MARKINGS

69 General 80

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

No Text on This Page

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

INTRODUCTION

1 Scope

1.1 These requirements cover electrically powered floor-finishing machines to be used in accordance with the National Electrical Code, NFPA 70. This product category includes the following: a floor polisher, floor scrubber, floor sander, floor scraper, tile remover, rug shampooer, rug and floor washer, and a similar machine for commercial use. A machine such as a sander and wet scrubber with vacuum attachments is also covered.

1.2 These requirements do not cover vacuum cleaning machines, permanently connected machines, or cord-connected machines that are intended to be fastened in place or located in a dedicated space. These requirements do not cover machines rated more than 600 volts, nor do they cover machines involving universal motors rated more than 250 volts. These requirements do not cover floor finishing machines for household use, which are covered in the Standard for Vacuum Cleaners, Blower Cleaners, and Household Floor Finishing Machines, UL 1017/CSA-C22.2 No. 243.

1.3 A machine that uses some other source of energy (such as gas or steam) in addition to electrical energy will be investigated under these requirements and under such additional requirements as applicable to the machine under consideration.

2 General

2.1 Terminology

2.1.1 In the following text, a requirement that applies to one type of equipment (polisher, scrubber, or the like) is identified by a specific reference in that requirement to the type of equipment involved. In the absence of such specific reference, or if the term product or machine is used, it is understood that the requirement applies to all types of equipment covered by the standard.

2.2 Units of measurement

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

2.2.2 Unless indicated otherwise, all voltage and current values mentioned in this standard are root mean square (rms).

2.3 Undated references

2.3.1 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.

3 Glossary

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

3.2 APPLIANCE COUPLER – A single-outlet, female contact device for attachment to a flexible cord as part of a detachable power-supply cord to be connected to an appliance inlet (motor attachment plug).

3.3 APPLIANCE INLET (MOTOR ATTACHMENT PLUG) – A male contact device mounted on an end product appliance to provide an integral blade configuration for the connection of an appliance coupler or cord connector.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

3.4 COMMERCIAL USE PRODUCT – A product not intended for use only in the home.

3.5 COMPONENT – A device or fabricated part of the appliance covered by the scope of a safety standard dedicated to the purpose. When incorporated in an appliance, equipment otherwise typically field installed (e.g. luminaire) is considered to be a component. Unless otherwise specified, materials that compose a device or fabricated part, such as thermoplastic or copper, are not considered components.

3.6 CONTROL, AUTOMATIC ACTION – A control in which at least one aspect is non-manual.

3.7 CONTROL, AUXILIARY – A device or assembly of devices that provides a functional utility, is not relied upon as an operational or protective control, and therefore is not relied upon for safety. For example, an efficiency control not relied upon to reduce the risk of electric shock, fire, or injury to persons during normal or abnormal operation of the end product is considered an auxiliary control.

3.8 CONTROL, MANUAL – A device that requires direct human interaction to activate or rest the control.

3.9 CONTROL, OPERATING – A device or assembly of devices, the operation of which starts or regulates the end product during normal operation. For example, a thermostat, the failure of which a thermal cutout/limiter or another layer of protection would reduce the risk of electric shock, fire, or injury to persons, is considered an operating control.

3.10 CONTROL, PROTECTIVE – A device or assembly of devices, the operation of which is intended to reduce the risk of electric shock, fire or injury to persons during normal and reasonably anticipated abnormal operation of the appliance. For example, a thermal cutout/limiter, or any other control/circuit relied upon for normal and abnormal conditions, is considered a protective control.

Note – During the evaluation of the protective control/circuit, the protective functions are verified under normal and single-fault conditions of the control.

3.11 CONTROL, TYPE 1 ACTION – The actuation of an automatic control for which the manufacturing deviation and the drift (tolerance before and after certain conditions) of its operating value, operating time, or operating sequence has not been declared and tested under this standard.

3.12 CONTROL, TYPE 2 ACTION – The actuation of an automatic control for which the manufacturing deviation and the drift (tolerance before and after certain conditions) of its operating value, operating time, or operating sequence have been declared and tested under this standard.

3.13 HAND-GUIDED PRODUCT – A portable product which during intended use is contacted by the hand of the user for purposes of electrical or physical control, but not for complete support.

3.14 HAND-SUPPORTED PRODUCT – A portable product that is completely supported by the user during the performance of its intended function. The hand of the user may also be used to exercise electrical or physical control of the operation of the product.

3.15 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.

3.16 LOW-VOLTAGE CIRCUIT – A circuit involving a peak open-circuit potential of not more than 42.4 volts supplied by a primary battery, by a Class 2 transformer, or by a combination of a transformer and a fixed impedance that, as a unit, complies with all performance requirements for a Class 2 transformer. 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 considered to be a low-voltage circuit.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

3.17 MEASUREMENT INDICATION UNIT (MIU) – The output voltage across the meter, in millivolts RMS, read from the measurement instrument in Figure 29.1, divided by 500 ohms. (The instrument indication is equal to the RMS value in milliamperes when the frequency is 60 Hz – sinusoidal current. The reading may not be a direct indication of the RMS or other common amplitude quantifier of leakage current when the leakage current is of a complex waveform or frequency other than 50 or 60 Hz).

4 Components

4.1 General

4.1.1 A component of a product covered by this standard shall:

a) Comply with the requirements for that component as indicated in 4.2 – 4.24;

b) Be used in accordance with its rating(s) established for the intended conditions of use;

c) Be used within its established use limitations or conditions of acceptability;

d) Additionally comply with the applicable requirements of this end product standard; and

e) Not contain mercury.

Note – 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.

Exception No. 1: A component of a product covered by this standard is not required to comply with a specific component requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product, or

b) Is superseded by a requirement in this end product standard,

c) Is separately investigated when forming part of another component, provided the component is used within its established ratings and limitations.

Exception No. 2: A component that complies with a UL component standard other than those specified in 4.2 – 4.24 is acceptable if:

a) The component also complies with the applicable component standard of 4.2 – 4.24; or

b) The component standard:

1) Is compatible with the ampacity and overcurrent protection requirements of the National Electrical Code, ANSI/NFPA 70, where applicable;

2) Considers long-term thermal properties of polymeric insulating materials in accordance with the Standard for Polymeric Materials – Long Term Property Evaluations, UL 746B, and

3) Any use limitations of the other component standard are identified and appropriately accommodated in the end use application. For example, a component used in a household application, but intended for industrial use and that complies with the relevant component standard may assume user expertise not common in household applications.

4.1.2 A component that is also intended to perform other functions, such as over current protection, ground-fault circuit-interruption, surge suppression, any other similar functions, or any combination

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.