



**CSA  
Group**

**C22.2 No. 112-18**

## **Electric clothes dryers**

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# Revision History

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Update No. 1 — September 2019	Revision symbol (in margin)
Cover, copyright page, Preface, Clauses 28.1.4 a), SB13.3.2, and SB13.3.4, and Table 11  <ul style="list-style-type: none"><li>• Update your copy by inserting these revised pages.</li><li>• Keep the pages you remove for reference.</li></ul>	

Standard for Safety for Electric Clothes Dryers

11th Edition, Dated April 6, 2018

**Summary of Topics**

***This revision dated September 20, 2019 is being issued to incorporate several miscellaneous corrections.***

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CSA Group  
CSA C22.2 No. 112-18  
Eleventh Edition



Underwriters Laboratories Inc.  
UL 2158  
Fifth Edition

## Electric Clothes Dryers

April 6, 2018

(Title Page Reprinted: September 20, 2019)



ANSI/UL 2158-2019

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## PREFACE

This is the harmonized CSA Group and UL Standard for Electric Clothes Dryers. It is the eleventh edition of CSA C22.2 No. 112 and the fifth edition of UL 2158. This edition of CSA C22.2 No. 112 supersedes the previous edition published in 2015. This edition of UL 2158 supersedes the previous edition published in 2015. This harmonized standard has been jointly revised on September 20, 2019. For this purpose, CSA Group and UL are issuing revision pages dated September 20, 2019.

This harmonized Standard was prepared by CSA Group and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Committee for Laundry Standards and the Association of Home Appliance Manufacturers (AHAM) are gratefully acknowledged.

This Standard is considered suitable for conformity assessment within the stated scope of the Standard.

This Standard was reviewed by the CSA Subcommittee on Clothes-Drying Machines, under the jurisdiction of the CSA Technical Committee on Consumer and Commercial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

### Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

**Note:** Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

### Level of Harmonization

This Standard is published as an identical standard for CSA Group and UL.

An identical standard is a standard that is exactly the same in technical content except for national differences resulting from conflicts in codes and governmental regulations. Presentation is word for word except for editorial changes.

### Reasons for Differences From IEC

This standard provides requirements for electric clothes dryers for use in accordance with the electrical installation codes of Canada and the United States. This standard does not employ any IEC standard for base requirements.

### Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

b) be located so, or of such material that, it will not be adversely affected by arcing.

Fibre not less than 0.4 mm thick may be used in conjunction with an air spacing of not less than 50 percent of the spacing required for air alone.

## 26.2 Alternate spacings – clearances and creepage distances

26.2.1 As an alternative to the specified spacing requirements of Clause 26.1, the spacing requirements in CSA C22.2 No. 0.2 and UL 840 may be used. The spacing requirements in CSA C22.2 No. 0.2 and UL 840 shall not be used for spacings:

- a) between field wiring terminals; or
- b) between uninsulated current-carrying parts and a metal enclosure.

26.2.2 Appliances shall be considered overvoltage category 2 as specified in CSA C22.2 No. 0.2 and UL 840.

26.2.3 Printed wiring boards constructed of Types XXXP, XXXPC, G-10, FR-2, FR-3, FR-4, FR-5, CEM-1, CEM-3, GPO-2, or GPO-3 industrial laminates in accordance with UL 746E shall be considered to have a minimum comparative tracking index of 100 as specified in accordance with CAN/CSA C22.2 No. 0.17 and UL 746A.

26.2.4 The internal microenvironment of the enclosure shall be considered pollution degree 2 as specified in CSA C22.2 No. 0.2 and UL 840 unless steps have been taken to achieve pollution degree 1 at a creepage distance by encapsulation or hermetic sealing; for printed wiring boards, coatings may be used to achieve pollution degree 1 provided that the coating satisfies the performance criteria specified in CSA C22.2 No. 0.2 and UL 840 and is used within the approved thickness.

**Note 1: Pollution degree 2 is considered an environment where normally only nonconductive pollution occurs except occasionally a temporary conductivity caused by condensation is to be expected.**

**Note 2: Pollution degree 1 is considered an environment where no pollution or only dry, nonconductive pollution occurs. The pollution has no influence.**

26.2.5 In order to evaluate clearances where the levels of overvoltage are controlled, control of overvoltage shall be achieved by providing an overvoltage device or system as an integral part of the appliance. The appliance shall be evaluated for the rated impulse withstand voltage specified in CSA C22.2 No. 0.2 and UL 840.

26.2.6 A device having exposed Class 2 outputs that:

- a) can be contacted during normal operation or user servicing; and
- b) has clearances between the Class 2 circuit and an overvoltage-protected line-voltage circuit that have been evaluated in accordance with Clearance B requirements in CSA C22.2 No. 0.2 and UL 840;

shall be provided with a mechanism to indicate the malfunction of the overvoltage-protective device or system.

## 27 Resistance to Rusting and Corrosion

27.1 Iron and steel parts shall be provided with a means to reduce the likelihood of corrosion, such as enameling, galvanizing, plating, or other equivalent means, if the corrosion of such unprotected parts would be likely to result in a risk of fire, electric shock, or injury to persons.

### Notes:

1) In certain instances in which the oxidation of iron or steel resulting from the exposure of the metal to air and moisture is not likely to be appreciable and the thickness of metal and temperature are also factors, surfaces of sheet-steel and cast-iron parts within an enclosure might not be required to be protected against corrosion.

2) Bearings, laminations, or minor parts of iron or steel, such as washers, screws, or the like, need not be protected against corrosion.

27.2 If deterioration or breakage of a liquid container provided as a part of an appliance would result in a risk of fire, electric shock, or injury to persons, the container shall be of a material that is resistant to corrosion by the liquid intended to be contained.

## 28 Polymeric Materials

### 28.1 General

28.1.1 The requirements of Clause 28 apply to polymeric materials, including thermoset materials, used as enclosures, functional polymeric parts, decorative parts, nonfunctional polymeric parts or liquid containers.

28.1.2 Some tests may be eliminated or modified if specimen testing as part of a previous test program indicates that the polymeric material is acceptable for the properties being investigated.

28.1.3 Table 10 specifies the tests applicable to polymeric parts. Table 11 specifies what tests shall be conducted on each part, dependent on its use.

28.1.4 Polymeric material employed to support a live part, in direct contact with an uninsulated live part, or in the vicinity of an uninsulated live part as noted below shall be rated for use at the operating temperature involved and shall have the following material properties determined in accordance with CAN/CSA-C22.2 No. 0.17 and UL 746C:

a) volume resistivity of at least  $50 \times 10^6$  ohm-cm:

1) This volume resistivity requirement is applicable to polymeric materials that serve as insulation between uninsulated live parts of opposite polarity, or between uninsulated live parts and dead metal parts that may be grounded in service or any surface exposed to user contact.

2) In lieu of volume resistivity requirement the leakage current test of Clause 10 may be conducted to determine compliance.

b) comparative tracking index (CTI) of at least 175 volts (PLC 3 – see note (a) of Table 12) for a moderately contaminate environment. This CTI requirement is applicable when the polymeric material surface is:

**Table 11**  
**Tests on a polymeric part**  
 (See Clause 28.1.3.)

Group <sup>a</sup>	Description	Applicable test number <sup>b</sup>
1	A decorative or nonfunctional part	2, 12 <sup>c,d</sup>
2	A functional polymeric part subjected to a temperature of not more than 65°C and not subjected to impact	1, 2, 12 <sup>c,d</sup> , 14
3	A functional polymeric part subjected to a temperature of not more than 65°C and subjected to impact	1, 2, 4, 5 <sup>e</sup> , 6 <sup>e</sup> , 12 <sup>c,d</sup> , 14
4	A functional polymeric part subjected to a temperature of more than 65°C and not subjected to impact	1, 2, 10 <sup>h</sup> , 12 <sup>c,d</sup> , 14
5	A functional polymeric part subjected to a temperature of more than 65°C and subjected to impact	1, 2, 4, 5 <sup>e</sup> , 6 <sup>e</sup> , 10 <sup>h</sup> , 12 <sup>c,d</sup> , 14
6	A part serving as an enclosure or supplementary enclosure and subjected to a temperature of not more than 65°C	1, 3 <sup>f</sup> , 4, 5 <sup>e</sup> , 6 <sup>e</sup> , 8 <sup>c</sup> , 9, 12 <sup>c,d</sup> , 13
7	A part serving as an enclosure or supplementary enclosure and subjected to a temperature of more than 65°C	1, 3 <sup>f</sup> , 4, 5 <sup>e</sup> , 6 <sup>e</sup> , 8 <sup>c</sup> , 9, 10 <sup>h</sup> , 12 <sup>c,d</sup> , 13
8	A part spaced less than the distances specified in Clause 28.1.4 (b) and (c) <sup>j</sup>	11, 15 <sup>g</sup>
9	A part located in the air stream	2 <sup>j</sup>

<sup>a</sup> If a polymeric part falls into more than one test group, separate samples shall be subjected to the tests required for each group.

<sup>b</sup> These requirements do not fully cover a plated plastic part if loss of bond strength between the plastic substrate and the metal coating can result in a reduction of electrical spacings, reduction in mechanical strength, or reduction in resistance to flammability. A plated plastic part shall be the subject of a separate investigation.

<sup>c</sup> These tests do not apply to an appliance readily movable from one place to another.

<sup>d</sup> This test shall be conducted only on an external part having a dimension greater than 1.83 m or a projected surface area greater than 0.93 m<sup>2</sup>.

<sup>e</sup> This test may be waived for a console.

<sup>f</sup> An enclosure provided with a liner of vulcanized fibre, metal foil, or other material intended to reduce the flammability of the enclosure shall be tested with the liner in place, and the flame shall be applied to the liner.

<sup>g</sup> Additional consideration shall be given to an appliance protected by an overcurrent device rated more than 30 A.

<sup>h</sup> Material used within its temperature index based on historical data or a long-term thermal aging program need not be subjected to Test No. 10.

<sup>i</sup> This test does not apply to a dryer drum seal or door gasket.

<sup>j</sup> See also Clause 28.1.4.

**Table 12**  
**Material property**

(See Clause 28.1.4.)

Material property (units)	Flame rating of material			
	V-0	V-1	V-2	HB
HAI (arcs) (PLC) <sup>a</sup>	≥ 15 (3)	≥ 30 (2)	≥ 30 (2)	≥ 60 (1)
HWI (seconds) (PLC) <sup>a</sup>	≥ 7 (4)	≥ 15 (3)	≥ 30 (2)	≥ 30 (2)

<sup>a</sup> PLC is the performance level category in accordance with UL 746A.

**Table 13**  
**Temperatures for oven conditioning**

(See Clause 28.11.2.)

Maximum operating temperature of polymeric enclosure part, °C	Oven temperature, °C
> 65 ° 75	85
> 75 ° 85	95
> 85 ° 95	105
> 95	<sup>a</sup>

<sup>a</sup> A polymeric part subjected to a temperature higher than 95°C shall have a temperature index, based on historical data or a long-term thermal-aging program, that indicates its acceptability for use at the temperature involved. This part shall be the subject of a separate investigation.

**Table 14**  
**Production line test conditions**

(See Clauses 29.3.2 and 29.3.5.)

Appliance rating, V	Condition A			Condition B		
	Potential, V		Time, s	Potential, V		Time, s
	AC	DC		AC	DC	
≤ 250	1 000	1 400	60	1200	1 700	1
> 250 ≤ 600	1 000 + 2V	1 400 + 2.8V	60	1 200 + 2.4V	1 700 + 3.4V	1

V = maximum marked voltage.

### **SB13.3 Test results determined by overcurrent protection operation**

SB13.3.1 If compliance with these requirements under any of the fault conditions depends on the operation of an overcurrent device incorporated within the electronic control, the fuse and/or circuit breaker shall comply with the requirements for that component.

SB13.3.2 If safety of the appliance depends upon the operation of a miniature fuse-link complying with IEC 60127-1 – Miniature Fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links, during any of the fault conditions specified in Clause SB15.1.11, the test shall be repeated but with the miniature fuse-link replaced by an ammeter. If the current measured:

a) Does not exceed 2.1 times the rated current of the fuse-link, the circuit is not considered to be adequately protected and the test is carried out with the fuse-link short-circuited;

b) Is at least 2.75 times the rated current of the fuse-link, the circuit is considered to be adequately protected; and

c) Is between 2.1 times and 2.75 times the rated current of the fuse-link, the fuse link is short-circuited and the test is carried out:

1) for the relevant period or for 30 minutes, whichever is the shorter, for quick acting fuses; and

2) for the relevant period or for 2 minutes, whichever is the shorter, for time lag fuses.

SB13.3.3 In case of doubt, the maximum resistance of the fuse-link shall be taken into account when determining the current.

SB13.3.4 The verification whether the fuse-link acts as a protective device is based on the fusing characteristics specified in IEC 60127-1, which also gives the information necessary to calculate the maximum resistance of the fuse-link.

## **SB14 Low-Power Circuits**

### **SB14.1 Low-power circuit determination**

SB14.1.1 The appliance shall be supplied at rated voltage, and a variable resistor, adjusted to its maximum resistance, shall be connected between the point to be investigated and the opposite pole of the supply source. The resistance shall then be decreased until the power consumed by the resistor reaches a maximum. Points closest to the supply source at which the maximum power delivered to this resistor does not exceed 15 W at the end of 5 seconds are called low-power points. The part of the circuit farther from the supply source than a low-power point is considered to be a low-power circuit. See Figure SB14.1.

SB14.1.2 The measurements shall be made from only one pole of the supply source, preferably the one that gives the fewest low-power points.

SB14.1.3 When determining the low-power points, measurements shall start with points close to the supply source.

SB14.1.4 The power delivered to the variable resistor shall be measured by a wattmeter.

SB14.1.5 If power is interrupted to parts of circuits by intentionally weak parts, the test shall be repeated two more times to confirm a consistent result.

SB14.1.6 If a regulating or other type of circuit is located between the points being measured and the power supply, the component faults of Abnormal Operation and Fault Tests, Clause SB15, shall not cause the limit of Clause SB14.1.1 to be exceeded.

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## PREFACE

This is the harmonized CSA Group and UL Standard for Electric Clothes Dryers. It is the eleventh edition of CSA C22.2 No. 112 and the fifth edition of UL 2158. This edition of CSA C22.2 No. 112 supersedes the previous edition published in 2015. This edition of UL 2158 supersedes the previous edition published in 2015.

This harmonized Standard was prepared by CSA Group and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Committee for Laundry Standards and the Association of Home Appliance Manufacturers (AHAM) are gratefully acknowledged.

This Standard is considered suitable for conformity assessment within the stated scope of the Standard.

This Standard was reviewed by the CSA Subcommittee on Clothes-Drying Machines, under the jurisdiction of the CSA Technical Committee on Consumer and Commercial Products and the CSA Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the CSA Technical Committee.

This standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

### Application of Standard

Where reference is made to a specific number of samples to be tested, the specified number is to be considered a minimum quantity.

**Note:** Although the intended primary application of this standard is stated in its scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

### Level of Harmonization

This Standard is published as an identical standard for CSA Group and UL.

An identical standard is a standard that is exactly the same in technical content except for national differences resulting from conflicts in codes and governmental regulations. Presentation is word for word except for editorial changes.

### Reasons for Differences From IEC

This standard provides requirements for electric clothes dryers for use in accordance with the electrical installation codes of Canada and the United States. This standard does not employ any IEC standard for base requirements.

### Interpretations

The interpretation by the standards development organization of an identical or equivalent standard is based on the literal text to determine compliance with the standard in accordance with the procedural rules of the standards development organization. If more than one interpretation of the literal text has been identified, a revision is to be proposed as soon as possible to each of the standards development organizations to more accurately reflect the intent.

# Electric Clothes Dryers

## 1 Scope

1.1 This Standard applies to electric clothes dryers intended to be used in nonhazardous locations in accordance with the *Canadian Electrical Code*, Part I (CE Code, Part I) and the (U.S.) *National Electrical Code* (NEC), on circuits having a nominal voltage not exceeding 600 V.

**Note:** Wherever practical, for convenience, the term "appliance" has been used in lieu of "clothes dryer" or "machine".

1.2 This Standard applies to both cord-connected and permanently connected appliances. The appliances covered by this Standard are intended for use by the general public not specifically trained in the use of the appliance, regardless of the mode by which its operation is initiated. They are for use in households and for commercial purposes, including appliances provided with coin-, ticket-, or card-operated mechanisms, laundry centers and combination washer-dryers. This Standard applies to tumbling clothes dryers and non-tumbling clothes dryers, such as drying cabinets, as well as both vented clothes dryers and non-vented clothes dryers, such as condensation-type and heat pump clothes dryers.

1.3 This Standard does not apply to industrial and institutional type appliances. Industrial or institutional appliances are covered under the scope of *Electric Commercial Clothes-Drying Equipment*, UL 1240.

**Note:** Industrial and institutional type appliances are not intended for use by the general public, but only by trained or supervised personnel.

## 2 Normative References

2.1 Products covered by this Standard shall comply with the referenced installation codes and standards noted in this clause.

2.2 Where reference is made to any Standards, such reference shall be considered to refer to the latest editions and revisions thereto available at the time of printing unless otherwise specified.

### CSA Group Standards

B64.1.1-11 (R2016)  
*Atmospheric Vacuum Breakers (AVB)*

C22.1-15  
*Canadian Electrical Code, Part I*

CAN/CSA-C22.2 No. 0-10 (R2015)  
*General Requirements – Canadian Electrical Code, Part II*

C22.2 No. 0.1-M1985 (R2013)  
*General Requirements for Double-Insulated Equipment*

C22.2 No. 0.2-16  
*Insulation Coordination*

CAN/CSA-C22.2 No. 0.4-17  
*Bonding of Electrical Equipment*