



UL 2158

STANDARD FOR SAFETY

Electric Clothes Dryers

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UL Standard for Safety for Electric Clothes Dryers, UL 2158

Sixth Edition, Dated July 30, 2021

Summary of Topics

This revision of ANSI/UL 2158 dated December 15, 2023 includes a correction to the formula in [10.1.6.2](#). No other changes have been made to the standard.

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.

This correction is in accordance with the Proposal(s) dated October 16, 2020 and April 16, 2021.

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CSA Group
CSA C22.2 No. 112:21
Twelfth Edition

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ULSE Inc.
UL 2158
Sixth Edition

Electric Clothes Dryers

July 30, 2021

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ANSI/UL 2158-2021

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This Standard is subject to review within five years from the date of publication, and suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line: Standard designation (number); relevant clause, table, and/or figure number; wording of the proposed change; and rationale for the change.

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This ANSI/UL Standard for Safety consists of the Sixth Edition including revisions through December 15, 2023.

The most recent designation of ANSI/UL 2158 as an American National Standard (ANSI) occurred on July 30, 2021. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page (front and back), or the Preface.

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PREFACE

This is the harmonized CSA Group and ULSE Standard for Electric Clothes Dryers. It is the twelfth edition of CSA C22.2 No. 112 and the sixth edition of UL 2158. This edition of CSA C22.2 No. 112 supersedes the previous edition published in 2018. This edition of UL 2158 supersedes the previous edition published in 2018. This harmonized standard has been jointly revised on December 15, 2023. For this purpose, CSA Group and ULSE are issuing revision pages dated December 15, 2023.

This harmonized Standard was prepared by CSA Group and ULSE Inc. (ULSE). 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 ULSE.

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.

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Electric Clothes Dryers

1 Scope

1.1 This Standard applies to electric clothes dryers intended to be used in nonhazardous locations in accordance with CSA C22.1, *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.

1.3 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. Additional requirements for heat pump clothes dryers are given in Supplement [SD](#).

1.4 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

C22.1-21
Canadian Electrical Code, Part I

C22.2 No. 0:20
General Requirements – Canadian Electrical Code, Part II

C22.2 No. 0.1:19
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

C22.2 No. 0.5-16

Threaded Conduit Entries

C22.2 No. 0.8:19

Safety Functions Incorporating Electronic Technology

C22.2 No. 0.15-15 (R2020)

Adhesive Labels

CAN/CSA-C22.2 No. 0.17-00 (R2018)

Evaluation of Properties of Polymeric Materials

C22.2 No. 8-13 (R2018)

Electromagnetic Interference (EMI) Filters

C22.2 No. 250.4:20

Portable Luminaires

C22.2 No. 14-18

Industrial Control Equipment

C22.2 No. 18.1-13 (R2018)

Metallic Outlet Boxes

C22.2 No. 18.2-06 (R2016)

Nonmetallic Outlet Boxes

C22.2 No. 18.3-12 (R2017)

Conduit, Tubing, and Cable Fittings

C22.2 No. 18.5-13 (R2018)

Positioning Devices

C22.2 No. 21-18

Cord Sets and Power-Supply Cords

C22.2 No. 24-15 (R2019)

Temperature-Indicating and -Regulating Equipment

C22.2 No. 38-18

Thermoset-Insulated Wires and Cables

C22.2 No. 39-13 (R2017)

Fuseholder Assemblies

C22.2 No. 42-10 (R2020)

General Use Receptacles, Attachment Plugs, and Similar Wiring Devices

C22.2 No. 42.1-13 (R2017)

Cover Plates for Flush-Mounted Wiring Devices

C22.2 No. 43-17

Lampholders

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CAN/CSA-C22.2 No. 49-18
Flexible Cords and Cables

C22.2 No. 55-15 (R2020)
Special Use Switches

CAN/C22.2 No. 65-18
Wire Connectors

C22.2 No. 66.1-06 (R2015)
Low-voltage Transformers – Part 1: General Requirements

C22.2 No. 66.2-06 (R2015)
Low-voltage Transformers – Part 2: General Purpose Transformers

C22.2 No. 66.3-06 (R2015)
Low-voltage Transformers – Part 3: Class 2 and Class 3 Transformers

C22.2 No. 72-10 (R2019)
Heater Elements

C22.2 No. 74-16
Equipment for Use With Electric Discharge Lamps

C22.2 No. 75-17
Thermoplastic Insulated Wires and Cables

C22.2 No. 77-14 (R2019)
Motors with Inherent Overheating Protection

C22.2 No. 94.1-15
Enclosures for Electrical Equipment, Non-Environmental Considerations

C22.2 No. 100-14 (R2019)
Motors and Generators

C22.2 No. 108-14 (R2019)
Liquid Pumps

C22.2 No. 111-18
General-Use Snap Switches

C22.2 No. 127-18
Equipment and Lead Wires

C22.2 No. 139:19
Electrically Operated Valves

C22.2 No. 140.2-96 (R2016)
Hermetic Refrigerant Motor-Compressors

C22.2 No. 153-14 (R2019)
Electrical Quick-Connect Terminals

C22.2 No. 156-M1987 (R2018)
Solid-State Speed Controls

C22.2 No. 158-10 (R2019)
Terminal Blocks

C22.2 No. 169-18
Electric Clothes Washing Machines and Extractors

C22.2 No. 177-13 (R2018)
Clock-Operated Switches

C22.2 No. 182.3-16
Special Use Attachment Plugs, Receptacles and Connectors

C22.2 No. 188-18
Splicing Wire Connectors

C22.2 No. 190-14 (R2019)
Capacitors for Power Factor Correction

C22.2 No. 197-M1983 (R2018)
PVC Insulating Tape

CAN/CSA-C22.2 No. 198.1-06 (R2015)
Extruded Insulating Tubing

CAN/CSA-C22.2 No. 198.3-05 (R2019)
Coated Electrical Sleeving

C22.2 No. 210-15
Appliance Wiring Material Products

C22.2 No. 223-15
Power Supplies with Extra-Low-Voltage Class 2 Outputs

C22.2 No. 235-04 (R2017)
Supplementary Protectors

C22.2 No. 236-15
Heating and Cooling Equipment

C22.2 No. 248.1-11 (R2016)
Low-voltage fuses – Part 1: General Requirements

C22.2 No. 250.13:20
Light Emitting Diode (LED) Equipment for Lighting Applications

C22.2 No. 2459-08 (R2017)
Insulated Multi-Pole Splicing Wire Connectors

C22.2 No. 2556-15
Wire and Cable Test Methods

CAN/CSA-C22.2 No. 4248.1-17
Fuseholders – Part 1: General Requirements

CAN/CSA-C22.2 No. 60335-1:16
Safety of Household and Similar Appliances – Part 1: General Requirements

CAN/CSA-C22.2 No. 60335-2-34:17
Safety of Household and Similar Electrical Appliances – Part 2-34: Particular Requirements for Motor-compressors

CAN/CSA-C22.2 No. 60065:16
Audio, Video and Similar Electronic Apparatus – Safety Requirements

CAN/CSA-C22.2 No. 60950-1-07 (R2016)
Information Technology Equipment Safety Part 1: General Requirements

CAN/CSA-C22.2 No. 61058-1:17
Switches for appliances – Part 1: General requirements

CAN/CSA-C361-16
Energy Performance and Drum Volume of Household Electric Clothes Dryers

CAN/CSA-E60384-14:14 (R2018)
Fixed Capacitors for Use in Electronic Equipment – Part 14: Sectional Specification – Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains

CAN/CSA-E60384-1:14 (R2018)
Fixed Capacitors for Use in Electronic Equipment – Part 1: Generic Specification

CAN/CSA-E60730-1:15
Automatic Electrical Controls – Part 1: General Requirements

CAN/CSA-E730-2-7-94 (R2018)
Automatic Electrical Controls for Household and Similar Use – Part 2: Particular Requirements for Timers and Time Switches

CAN/CSA-E60730-2-8-17
Automatic Electrical Controls for Household and Similar Use – Part 2-8: Particular Requirements for Electrically Operated Water Valves, Including Mechanical Requirements

CAN/CSA-E60730-2-9:18
Automatic Electrical Controls for Household and Similar Use – Part 2-9: Particular Requirements for Temperature Sensing Controls

CSA Component Acceptance Notice 5A
Announcement of Extension of the Component Acceptance Service for Optocouplers and Related Devices

CSA C22.2 No. 62368-1:19
Audio/video, information and communication technology equipment – Part 1: Safety requirements – Third Edition

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

UL Standards

UL 20

General-Use Snap Switches

UL 44

Thermoset-Insulated Wires and Cables

UL 62

Flexible Cords and Cables

UL 66

Fixture Wire

UL 83

Thermoplastic-Insulated Wires and Cables

UL 94

Tests for Flammability of Plastic Materials for Parts in Devices and Appliances

UL 157

Gaskets and Seals

UL 224

Extruded Insulating Tubing

UL 244A

Solid-State Controls for Appliances

UL 248-1

Low-Voltage Fuses – Part 1: General Requirements

UL 310

Electrical Quick-Connect Terminals

UL 429

Standard for Electrically Operated Valves

UL 496

Lampholders

UL 498

Standard for Attachment Plugs and Receptacles

UL 499

Standard for Electric Heating Appliances

UL 508

Industrial Control Equipment

UL 510

Polyvinyl Chloride, Polyethylene and Rubber Insulating Tape

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UL 514A
Metallic Outlet Boxes

UL 514B
Conduit, Tubing, and Cable Fittings

UL 514C
Standard for Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers

UL 514D
Cover Plates for Flush-Mounted Wiring Devices

UL 635
Standard for Insulating Bushings

UL 723
Tests for Surface Burning Characteristics of Building Materials

UL 746A
Polymeric Materials – Short Term Property Evaluations

UL 746B
Standard for Polymeric Materials – Long Term Property Evaluations

UL 746C
Polymeric Materials – Use in Electrical Equipment Evaluations

UL 746E
Polymeric Materials – Industrial Laminates, Filament Wound Tubing, Vulcanized Fibre, and Materials Used in Printed Wiring Boards

UL 796
Printed-Wiring Boards

UL 758
Standard for Appliance Wiring Material

UL 778
Standard for Motor-Operated Water Pumps

UL 810
Capacitors

UL 817
Standard for Cord Sets and Power-Supply Cords

UL 840
Insulation Coordination Including Clearances and Creepage Distances for Electrical Equipment

UL 873
Temperature-Indicating and -Regulating Equipment

UL 917

Clock-Operated Switches

UL 935

Standard for Fluorescent-Lamp Ballasts

UL 969

Marking and Labeling Systems

UL 991

Tests for Safety-Related Controls Employing Solid-State Devices

UL 1004-1

Rotating Electrical Machines – General Requirements

UL 1004-2

Impedance Protected Motors

UL 1004-3

Thermally Protected Motors

UL 1004-7

Electronically Protected Motors

UL 1012

Standard for Power Units Other Than Class 2

UL 1029

Standard for High-Intensity-Discharge Lamp Ballasts

UL 1030

Standard for Sheathed Heating Elements

UL 1054

Special-Use Switches

UL 1059

Standard for Terminal Blocks

UL 1077

Standard for Supplementary Protectors for Use in Electrical Equipment

UL 1097

Double Insulation Systems for Use in Electrical Equipment

UL 1310

Class 2 Power Units

UL 1434

Thermistor-Type Devices

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UL 1411
Standard for Transformers and Motor Transformers for Use in Audio-, Radio-, and Television-Type Appliances

UL 1441
Coated Electrical Sleeving

UL 1446
Standard for Systems of Insulating Materials – General

UL 1565
Positioning Devices

UL 1577
Optical Isolators

UL 1581
Reference Standard for Electrical Wires, Cables, and Flexible Cords

UL 1694
Tests for Flammability of Small Polymeric Component Materials

UL 1977
Standard for Component Connectors for Use in Data, Signal, Control and Power Applications

UL 1995
Heating and Cooling Equipment

UL 1998
Software in Programmable Components

UL 2157
Electric Clothes Washing Machines and Extractors

UL 2158A
Clothes Dryer Transition Duct

UL 2353
Standard for Safety for Single- and Multi-Layer Insulated Winding Wire

UL 2459
Insulated Multi-Pole Splicing Wire Connectors

UL 4200A
Standard for Safety for Products Incorporating Button or Coin Cell Batteries of Lithium Technologies

UL 4248-1
Fuseholders – Part 1: General Requirements

UL 5085-1
Low-Voltage Transformers – Part 1: General Requirements

UL 5085-2

Low-Voltage Transformers – Part 2: General Purpose Transformers

UL 5085-3

Low-Voltage Transformers – Part 3: Class 2 and Class 3 Transformers

UL 8750

Standard for Light Emitting Diode (LED) Equipment for Use in Lighting Products

UL 60065

Audio, Video and Similar Electronic Apparatus – Safety Requirements

UL 60335-1

Safety of Household and Similar Appliances – Part 1: General Requirements

UL 60335-2-34

Safety of Household and Similar Electrical Appliances, Part 2-34: Particular Requirements for Motor-Compressors

UL 60384-14

Safety Requirements for Fixed Capacitors for Use in Electronic Equipment – Part 14: Sectional Specification: Fixed Capacitors for Electromagnetic Interference Suppression and Connection to the Supply Mains

UL 60691

Thermal-Links – Requirements and Application Guide

UL 60730-1

Automatic Electrical Controls for Household and Similar Use; Part 1: General Requirements

UL 60730-2-7

Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Timers and Time Switches

UL 60730-2-8

Standard for Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Electrically Operated Water Valves, Including Mechanical Requirements

UL 60730-2-9

Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Temperature Sensing Controls

UL 60950-1

Information Technology Equipment – Safety – Part 1: General Requirements

UL 60939-1

Passive Filter Units for Electromagnetic Interference Suppression – Part 3: Passive Filter Units for Which Safety Tests are Appropriate

UL 61058-1

Switches for Appliances – Part 1: General Requirements

UL 61800-5-1

Adjustable Speed Electrical Power Drive Systems – Part 5-1: Safety Requirements – Electrical, Thermal and Energy

UL 62368-1

Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements

ASSE (American Society of Sanitary Engineering) Standards

ASSE 1001

Performance Requirements for Atmospheric Type Vacuum Breakers

ASTM International Standards

ASTM B344

Standard Specification for Drawn or Rolled Nickel-Chromium and Nickel-Chromium-Iron Alloys for Electrical Heating Elements

ASTM E230/E230M

Standard Specification and Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples

ASTM B603

Standard Specification for Drawn or Rolled Iron-Chromium-Aluminum Alloys for Electrical Heating Elements

ASTM D5025

Standard Specification for Laboratory Burner Used for Small-Scale Burning Tests on Plastic Materials

Government of USA

Code of Federal Regulations, Title 10, Part 430, as amended from time to time (referenced as 10 CFR 430)

Appendix D to Subpart B of Part 430, Uniform Test Method for Measuring the Energy Consumption of Clothes Dryers

IEC (International Electrotechnical Commission) Standards

IEC 60127-1:2015

Miniature Fuses – Part 1: Definitions for Miniature Fuses and General Requirements for Miniature Fuse-links

IEC 60695-2-11

Fire Hazard Testing – Part 2-11: Glowing/Hot-Wire Based Test Methods – Glow-Wire Flammability Test Method for End-Products

IEC 60695-2-13

Fire Hazard Testing – Part 2-13: Glowing/Hot-Wire Based Test Methods – Glow Wire Ignitability Test Method for Materials

IEC 60695-11-10

Fire Hazard Testing – Part 11-10: Test Flames – 50 W Horizontal and Vertical Flame Test Methods

IEC 61000-4-2-08

Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test

IEC 61000-4-3-10

Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test

IEC 61000-4-4-12

Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test

IEC 61000-4-5-14

Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test

IEC 61000-4-6-15

Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields

IEC 61000-4-11-10

Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests

IEC 61000-4-13-09

Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests

NFPA (National Fire Protection Association) Standards

NFPA 70

National Electrical Code

ULC (Underwriters Laboratories of Canada) Standards

CAN/ULC-S102-10

Test for Surface Burning Characteristics of Building Materials and Assemblies

3 Definitions

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

3.2 APPLIANCE, CORD-CONNECTED – an appliance that is connected to the electrical supply by a cord set or by a power-supply cord terminating in an acceptable attachment plug.

3.3 APPLIANCE, HOUSEHOLD TYPE – an appliance commonly used in, but not restricted to, a single-family dwelling.

3.4 APPLIANCE, PERMANENTLY CONNECTED – an appliance that is connected to the electrical supply by means other than a supply cord and an attachment plug.

3.5 APPLIANCE, RECESSED – an appliance intended to be:

- a) supported by the floor; and
- b) located immediately adjacent to a wall in the rear or located immediately adjacent to a wall, a cabinet, or another appliance on each side.

If the construction permits, a countertop can cover the appliance and adjacent cabinets and appliances. A recessed appliance is not intended for permanent attachment to the building structure or to adjacent cabinets or appliances.

3.6 APPLIANCE, STATIONARY – any appliance that is intended to be fastened in place or located in a dedicated space.

3.7 APPLIANCE, WALL-INSERT – an appliance intended to be mounted permanently in a wall or other vertical surface of a building or cabinet.

3.8 AUTOMATIC – an appliance is considered to be automatically controlled if one or more of the following condition applies:

- a) repeated starting of the appliance, beyond one complete predetermined cycle of operation, to the point where some form of limit switch opens the circuit, is independent of any manual control;
- b) during any single predetermined cycle of operation, the motor is caused to stop and restart one or more times;
- c) upon energizing the appliance, the initial starting of the motor can be intentionally delayed beyond normal, conventional starting; or
- d) during any single predetermined cycle of operation, automatic changing of the mechanical load can reduce the motor speed to re-establish starting-winding connections to the supply circuit.

3.9 BAFFLE – a paddle inside the drum that lifts and tumbles clothes.

3.10 BARRIER – a partition for the insulation or isolation of electric circuits, for the isolation of electric arcs, or for the isolation of moving parts or hot surfaces. In this respect, a barrier can serve as a portion of an enclosure and as a functional part.

3.11 BUILT-IN APPLIANCE – a stationary appliance that is constructed to be permanently installed in a cabinet or wall.

3.12 CIRCUIT, LOW-VOLTAGE – A circuit having limited voltage and energy capacity supplied by:

- a) a primary battery having an output of 30 V or less;
- b) a Class 2 transformer; or
- c) a Class 2 power supply.

Note 1: A circuit that is derived from a circuit that exceeds 30 V by connecting resistance or impedance, or both, in series with the supply circuit to limit the voltage and current, is not considered to be a low-voltage circuit.

Note 2: The term "low voltage" as used in this clause relates to "extra low-voltage" in Canada.

3.13 CIRCUIT, LINE-VOLTAGE – A circuit having characteristics in excess of those of a low-voltage circuit.

3.14 COMBINATION WASHER-DRYER – A machine utilized to wash and dry clothes within the same compartment.

3.15 CONTROL, OPERATING – Control, the operation of which starts or regulates the appliance during normal operation.

3.16 CONTROL, PROTECTIVE – Control, the operation of which is intended to prevent the risk of electric shock, fire, or injury to persons during normal or abnormal operation of the appliance.

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

3.17 COOL DOWN PERIOD – Final part of the tumble dryer cycle where the drum is continuously rotated with reduced power to the heating element and with air circulation in order to reduce the possibility of spontaneous combustion of the clothes load.

Note: Continuous rotation does not mean rotation in same direction if the intended operation is to reverse direction in normal use.

3.18 CURRENT CARRYING PARTS – Parts carrying current during normal or abnormal operation in line voltage circuits.

Note: With respect to separation of circuits, Clause [20.3](#), this term refers to parts in both low-voltage and line-voltage circuits.

3.19 ELECTRICAL CONNECTION – The physical interface between two points in a circuit such as spade terminals, pin terminals, micro switch contacts, relay contacts, timer contacts, crimped connections, and connections that are welded or soldered.

3.20 ENCLOSURE – A material used to:

- a) render inaccessible, by itself or in conjunction with acceptable enclosure barriers and supplementary enclosures, any of all uninsulated current-carrying parts, internal wiring, or electrical components not having their own enclosures;
- b) reduce the likelihood of propagation of ignition due to electrical disturbances occurring within; or
- c) both (a) and (b).

3.21 ENCLOSURE BARRIER – A material used to reduce the size of an opening in an enclosure that:

- a) will not permit the entrance of a 19.1 mm diameter rod; and
- b) does not comply with Clause [7.2\(a\)\(1\)](#) or (2).

A polymeric enclosure barrier is to be evaluated as a functional polymeric part.

3.22 ENCLOSURE, SUPPLEMENTARY – A material used to reduce the size of an opening in an enclosure that:

- a) will permit the entrance of a 19.1 mm diameter rod; and
- b) does not comply with Clause [7.2\(a\)\(1\)](#) or (2);

when enclosure barriers, if provided, are removed.

A polymeric supplementary enclosure shall be evaluated as an enclosure.

3.23 FIELD WIRING TERMINAL – A terminal to which a wire can be connected in the field, unless the wire and a means of making the connection, such as:

- a) a pressure wire connector;
- b) soldering lugs;
- c) a soldered loop; or
- d) a crimped eyelet;

factory-assembled to the wire, is provided as a part of the appliance.

3.24 FLAME CYLINDER – A projection of a vertical cylinder having a diameter of 20 mm and a height of 50 mm.

3.25 HEATER ASSEMBLY – An assembly of

- a) a heating element;
- b) electrical insulation (e.g., refractory, mica, magnesium oxide); and
- c) a frame or housing (e.g., a metal sheath or the like) that holds the assembly together.

3.26 HEATING ELEMENT – The actual electrical conducting medium that is intended to be heated by an electric current.

3.27 LAUNDRY CENTER – A machine utilized to wash and dry clothes in separate compartments.

3.28 LIVE PART – Conductor or conductive part intended to be energized in normal use, including a neutral conductor.

3.29 MEMBRANE SWITCH – A momentary switching device in which at least one contact is on, or made of, a flexible substrate.

3.30 NONCOMBUSTIBLE MATERIAL – For purposes of this Standard, a noncombustible material is:

- a) metal;
- b) a 5VA material; or
- c) a material that complies with the requirements for enclosure flammability in accordance with the 5V flame test in CAN/CSA-C22.2 No. 0.17 and the 127 mm flame test in UL 746C.

3.31 PART, DECORATIVE – A material used for no other function except appearance. A removable polymeric control knob or lever can be considered a decorative part.

3.32 PART, FUNCTIONAL – A material used in such a way that deterioration or breakage of the part would result in a risk of fire, electric shock, or injury to persons.

3.33 PART, NONFUNCTIONAL – A part, such as thermal insulation or decorative material, that does not serve as electrical insulation or to support or enclose electrical components, maintain electrical spacings, or reduce the risk of injury to persons.

3.34 RISK OF ELECTRIC SHOCK – A risk of electric shock is considered to exist if under normal conditions and single component fault conditions the potential between the part and earth ground or any other simultaneously accessible part is more than the following relevant values. These low-voltage circuits are supplied from an isolating source:

- a) 30 V rms;
- b) 42.4 V peak for sinusoidal or nonsinusoidal AC;
- c) 60 V dc continuous, or 60 V peak for interrupted DC outside the range of 10 – 200 Hz; or
- d) 24.8 V peak for DC interrupted at a rate of 200 Hz or less.

Note: A LOW-VOLTAGE CIRCUIT and the secondary circuit of a Class 2 circuit do not involve a risk of electric shock.

3.35 RISK OF FIRE – A risk of fire is considered to exist at any two points in a circuit where a power of more than 15 W can be delivered into an external variable resistor connected between the two points at the end of 5 seconds under normal conditions and single component fault conditions; see Clauses [28.4.7](#) and [SB14](#).

Note: A low power circuit does not involve a risk of fire.

3.36 COMBINATION TEMPERATURE-REGULATING AND LIMITING DEVICE – A device that functions to:

- a) regulate the temperature under normal conditions of use; and
- b) limit abnormal temperatures that might result from conditions of abnormal operation of the appliance.

3.37 TEMPERATURE-LIMITING DEVICE – A device that functions:

- a) only under conditions that produce abnormal temperatures; and
- b) that is not intended to function during normal operation of the appliance.

3.38 TEMPERATURE-REGULATING DEVICE – A device that:

- a) regulates temperature; and
- b) functions during normal operation of the appliance.

3.39 TUMBLE DRYER – An appliance in which textile material is dried by tumbling in a rotating drum through which heated air is blown or drawn.

3.40 TUMBLE DRYER, VENTED TYPE – A tumble dryer in which the heated air is then exhausted from the appliance.

3.41 TUMBLE DRYER, CONDENSATION TYPE – A tumble dryer in which the air used for the drying process is dehumidified by cooling.

3.42 WITHIN 3 MM – Falling within the dotted boundary formed by the flame cylinder with hemispherical ends, as shown in [Figure 10](#).

3.43 VULCANIZED FIBRE – A material that, if 0.8 mm thick minimum and acceptably mounted and secured, could be used as an enclosure barrier, but not as an enclosure or supplementary enclosure.

4 General Requirements

4.1 Combination washer-dryers and laundry centers shall comply with this Standard and also with the requirements of the Binational Standard CSA C22.2 No. 169 and UL 2157. Where more than one Standard applies, preference shall be given to that Standard considered to require the highest standard of construction or testing.

4.2 The values given in SI (metric) units shall be normative. Any other values given shall be for informational purposes only.

4.3 In Canada, the general requirements applicable to this Standard are given in the latest version of CSA C22.2 No. 0.

5 General Conditions for the Tests

5.1 Voltage and frequency

5.1.1 Unless otherwise specified in the requirements, all tests shall be conducted with the appliance connected to a supply circuit with a rated frequency and a voltage (V_s) of:

- a) 120 V for an appliance rated from 110 to 120 V;
- b) 240 V for an appliance rated from 220 to 240 V; or
- c) the maximum rated voltage of the appliance for an appliance rated other than as mentioned in (a) or (b).

5.1.2 The test voltage (V_t) used during the heating tests of Clause 10 and the abnormal operation tests of Clause 16 shall be adjusted so that the calculated (see formula below) heating circuit input (W_t) is achieved. This compensates for heating elements with inputs at V_s (see Clause 5.1.1) that are different than their rated (marked) inputs.

$$W_t = W_m (V_s / V_m)^2$$

in which:

- W_t is the calculated heating circuit input in, W ;
- W_m is the heating element rated (marked) input in, W ;
- V_s is the supply circuit voltage specified in Clause 5.1.1; and
- V_m is the heating element rated (marked) input in, V .

5.1.3 If it is necessary to increase the appliance test voltage beyond the voltage as specified in Clause 5.1.1, the motor shall be supplied from a separate circuit not exceeding the nominal system voltage (e.g., 120 V, 240 V).

5.2 Test load

5.2.1 Unless otherwise specified, the test load shall consist of cloths as described in Clause 5.3 and shall:

- a) be soaked in water, which shall be extracted as it would be in normal use just before the cloths are placed in the appliance; or

b) be wet until they have absorbed a mass of water equal to the dry mass of the cloths.

5.2.2 The dry mass of the test cloths shall be the greater of:

a) the maximum load recommended by the manufacturer; or

b) 0.032 kg/L of clothes-drum volume. The clothes-drum volume shall be determined by a measurement or calculation method. Whenever a referee method is necessary to determine clothes-drum volume, the measurement shall be made in accordance with the method described in CAN/CSA-C361 or Paragraph 3.1 of Appendix D to Subpart B of 10 CFR 430.

5.3 Test fabric

5.3.1 The fabric used for tests shall be bleached, preshrunk cotton suiting, having a warp of 21 – 23 threads per cm and a filling of 18 – 20 threads per cm. Individual cloths shall be 610 × 915 mm, double hemmed to a size of approximately 560 × 865 mm. A small number of smaller cloths, 305 × 305 mm, double hemmed to a size of 255 × 255 mm, may be used if necessary to make the total weight of cloth correct.

5.4 Thermocouples

5.4.1 Thermocouples shall consist of wires not larger than 24 AWG (0.21 mm²). The thermocouple wire shall conform with the requirements for Special Tolerances thermocouples as listed in the Tolerances on Initial Values of EMF versus Temperature tables in the ANSI/ASTM E230/E230M.

5.5 Laundry detergent

5.5.1 Whenever laundry detergent is required for a test in this Standard it shall be AHAM detergent or any other powdered laundry detergent having similar properties.

5.6 Cheesecloth for heating and abnormal tests

5.6.1 Whenever cheesecloth is required for a test in this Standard, the cloth shall be bleached cotton cheesecloth running approximately 34 g/m² with a thread count in the range of 10 – 13 × 9 – 12 threads/cm.

5.7 Test temperature

5.7.1 The tests shall be conducted in a draught-free location and, in general, at an ambient temperature in the range of 10 – 40°C.

6 Marking and Instructions

6.1 Marking

Note: In Canada, there are two official languages. Therefore, it is necessary to have CAUTION, WARNING, and DANGER markings in both English and French. Annex A lists acceptable French translations of the markings specified in this Standard. When a product is not intended for use in Canada, cautionary markings may be provided in English only.

6.1.1 General

6.1.1.1 A marking that is required to be permanent shall be moulded, die-stamped, paint-stenciled, stamped, or etched metal that is permanently secured, or indelibly stamped on a pressure-sensitive label secured by adhesive. Pressure-sensitive labels and adhesive shall comply with CSA-C22.2 No. 0.15 and UL 969.

6.1.1.2 A marking required to be permanent shall be located on a part that would require the use of a tool for removal.

6.1.1.3 A cautionary marking intended to instruct the operator shall be legible and visible to the operator during normal operation of the appliance. A marking giving servicing instructions shall be legible and visible when such servicing is being performed.

6.1.1.4 A cautionary marking shall be prefixed by the word "CAUTION", "WARNING", or "DANGER" in letters not less than 3.2 mm high. The remaining letters of such marking shall not be less than 1.6 mm high.

6.1.2 Appliance markings

6.1.2.1 An appliance shall be rated in volts and in amperes or watts. The number of phases shall be included in the ratings if the appliance is intended for connection to a polyphase circuit, and the ratings shall include the frequency expressed in hertz (Hz).

6.1.2.2 An appliance shall be provided with a schematic circuit diagram, attached or secured to the appliance in a location that is easily accessible for servicing, such as the back panel, the toe panel, the location of the wiring terminals, the console, or the control housing.

6.1.2.3 An appliance, as mentioned in Clause 8.2, that will not start and operate normally when connected to a circuit protected by a 15 A fuse of other than the time-delay type, but that will start and operate normally when connected to a circuit protected by a 15 A time-delay fuse, shall be plainly and permanently marked with the following or the equivalent:

"If connected to a circuit protected by fuses, use time-delay fuses with this appliance".

6.1.2.4 If replaceable fuses are provided, the maximum size in amperes of the fuse required shall be permanently marked on the appliance.

6.1.2.5 Appliances having field wiring terminals shall be marked with one of the following:

- a) "Use copper conductors only", if the terminal is acceptable only for connection to copper wire;
- b) "Use aluminum conductors only", if the terminal is acceptable only for connection to aluminum wire;
- c) "Use copper or aluminum conductors" or "Use copper, copper-clad aluminum, or aluminum conductors", if the terminal is acceptable only for connection to either copper or aluminum wire; or
- d) "Use copper-clad aluminum or copper conductors", if the terminal is acceptable only for connection to either copper or copper-clad aluminum wire.

6.1.2.6 A heating element rated more than 1 A and intended to be replaceable in the field shall be marked with:

- a) its rating in V and A or in V and W;

- b) the manufacturer's part number; or
- c) an equivalent means of identification.

The marking shall withstand the environment involved.

Note: An open-wire heating element need not be marked if it is part of an assembly that is marked as required.

6.1.2.7 Clothes dryers employing supply terminals intended for use with supply conductors rated above 60°C shall be marked on the exterior adjacent to the supply entry with the following or equivalent wording:

"USE SUPPLY CONDUCTORS RATED ___ °C (___ °F)."

The marking shall include both °C and °F. The temperature rating of the conductors used in the heating test (Clause [10](#)) shall be placed in the marking.

6.1.2.8 An appliance shall be clearly and permanently marked with a warning that the appliance is intended for use only with fabrics that have been washed with water as a cleaning agent.

6.1.2.9 A warning consisting of the following shall be included in the permanent marking on an appliance:

- a) for an appliance that includes a no-heat setting in its controls:

"WARNING – To reduce the risk of fire, do not use heat when drying articles containing foam rubber or similarly textured rubber-like materials."

or the marking given in (b).

- b) for any other appliance:

"WARNING – To reduce the risk of fire, do not dry articles containing foam rubber or similarly textured rubber-like materials."

6.1.2.10 An appliance that provides means for collection of dust and lint accumulation shall be plainly and permanently marked to indicate the necessity of keeping the lint trap cleaned out.

6.1.2.11 The markings mentioned in Clauses [6.1.2.8](#) to [6.1.2.10](#) shall be separated from other markings to reduce the likelihood of their being overlooked.

6.1.2.12 An appliance shall be permanently marked:

- a) at or near the exhaust opening of the appliance with the word "CAUTION" and the following statement or the equivalent: "Risk of Fire. A clothes dryer produces combustible lint. The dryer must be connected to an exhaust to the outdoors. See Installation Instructions"; and

- b) on a surface readily visible to the user after installation of the appliance with the word "CAUTION" and the following statement or the equivalent: "Risk of Fire. A clothes dryer produces combustible lint. The dryer must be connected to an exhaust to the outdoors. Regularly inspect the outdoor exhaust opening and remove any accumulation of lint around the outdoor exhaust opening and in the surrounding area."

6.1.2.13 The requirements in Clause [6.1.2.12](#) do not apply to condensation type tumble dryers.

6.1.2.14 For a vented laundry center or vented combination washer-dryer, the words "A clothes dryer," where used in Clause [6.1.2.12](#), shall be changed to "The dryer operation of a laundry center (or combination washer-dryer)."

In the markings, where the words "clothes dryer" appear more than once, the word "appliance" may be substituted for the subsequent use of the words "clothes dryer."

6.1.2.15 If an appliance employs a non-current-carrying metal part that is not grounded as provided in Clause [24.1.5](#), the appliance shall be permanently marked with the word "WARNING" and the following or the equivalent:

"Certain internal parts are intentionally not grounded and may present a risk of electric shock only during servicing. Service Personnel – Do not contact the following parts while the appliance is energized: _____."
(A list of ungrounded parts shall be inserted.)

The marking shall be located on the outside of the appliance, and it shall be readily visible before any servicing operation. The marking also shall be located close to each ungrounded part, and it shall be readily visible before or when the part becomes accessible.

If all approaches to ungrounded parts can be adequately covered by one marking:

- a) then only one marking, visible from the outside of the appliance and at the approach to the ungrounded parts, need be employed; or
- b) if the marking is located on the ungrounded part, only one marking need be employed.

6.1.2.16 If a manufacturer produces or assembles appliances at more than one factory, each finished appliance shall have a distinctive marking, which can be in code, by which it can be identified as the product of a particular factory.

6.1.2.17 An appliance provided with instructions for any type of user maintenance other than cleaning a lint trap shall be marked with the word "WARNING" and the following or the equivalent:

"To reduce the risk of electric shock, disconnect this appliance from the power supply before attempting any user maintenance other than cleaning the lint trap. Turning the controls to the OFF position does not disconnect this appliance from the power supply."

The marking shall be so located as to be visible before the maintenance is attempted.

Note: An appliance not equipped with a lint trap may omit the reference to a lint trap in the required marking.

6.1.2.18 An appliance shall have a permanent, legible marking that will be readily visible after the appliance has been installed as intended without the necessity of moving the appliance. The markings shall include the:

- a) manufacturer's name, trade name, trademark, or other descriptive marking by which the organization responsible for the product can be identified – hereinafter referred to as the manufacturer's name;
- b) catalogue number or the equivalent;
- c) electrical rating; and
- d) date of manufacture by week, month or quarter, and year, which may be abbreviated or in an established or otherwise acceptable code.