



**CSA
Group**

CSA/ANSI C22.2 No. 336-17
National Standard of Canada



**Particular requirements for rechargeable
battery-operated commercial robotic floor
treatment machines with traction drives**



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National Standard of Canada

CSA/ANSI C22.2 No. 336-17
Particular requirements for
rechargeable battery-operated
commercial robotic floor treatment
machines with traction drives



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Preface

This is the first edition of CSA/ANSI C22.2 No. 336, *Particular requirements for rechargeable battery-operated commercial robotic floor treatment machines with traction drives*.

This Standard is structured to be used in conjunction with the general requirements of CSA C22.2 No. 0.23 (first edition)/UL 2595 (second edition).

This Standard is to be used in conjunction with the latest edition of CAN/CSA-C22.2 No. 60335-1 and its amendments.

Note: When “Part 1” is mentioned in this Standard, it refers to CAN/CSA-C22.2 No. 60335-1 (second edition)/UL 60335-1 (sixth edition).

This Standard contains particular requirements that supplement or modify the corresponding clauses in CAN/CSA-C22.2 No. 60335-1 (second edition)/UL 60335-1 (sixth edition). When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. When this Standard states “addition”, “modification”, or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

Note: The following numbering system is used:

- a) subclauses, tables, and figures that are numbered starting from 101 are additional to those in Part 1;
- b) unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause; and
- c) additional annexes are lettered AA, BB, etc.

This Standard has been developed in recognition of the safety issues presented by newly emerging autonomous commercial floor treatment machines. The autonomous commercial floor treatment machines are designed to avoid contact with persons in the environment applied. This binational Standard for Canada and the United States focuses on the safety requirements for rechargeable battery-operated commercial robotic floor treatment machines with traction drives intended for indoor use.

It is recognized that commercial floor cleaning robots might require operation within close proximity to large groups of people, such as in shopping malls and schools.

Additional work on different international standardization levels is being conducted. Future editions of this binational Standard might include additional requirements on particular types of robot environments if deemed necessary. Therefore, the CSA Subcommittee on Electrical Motor and Battery-Operated Cleaning Appliances for Industrial and Commercial Use will monitor the development of other Standards and update this Standard as required.

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

This Standard was prepared by the CSA Subcommittee on Electrical Motor and Battery-Operated Cleaning Appliances for Industrial and Commercial Use, 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 Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group. This Standard was approved by the American National Standards Institute (ANSI) as an American National Standard on December 4, 2017.

Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *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.*
- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
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 - b) *relevant clause, table, and/or figure number;*
 - c) *wording of the proposed change; and*
 - d) *rationale for the change.*

CSA/ANSI C22.2 No. 336-17

Particular requirements for rechargeable battery-operated commercial robotic floor treatment machines with traction drives

1 Scope

This clause of Part 1* is replaced by the following.

* For the purposes of this Standard, the term "Part 1" means "CAN/CSA-C22.2 No. 60335-1 (second edition)/UL 60335-1 (sixth edition)".

The machines covered in this Standard are intended for floors with an artificial surface and used for the following applications:

- a) sweeping;
- b) scrubbing;
- c) wet or dry pickup;
- d) polishing;
- e) application of wax, sealing products, and powder-based detergents; and
- f) shampooing.

Their cleaning motion is more linear than lateral or periodic.

This Standard deals with the safety requirements of rechargeable battery-operated **commercial robotic floor treatment machines with traction drive** intended for indoor use in accordance with CSA C22.1, *Canadian Electric Code, Part I*, in Canada, and with the *National Electrical Code*, NFPA 70 in the U.S., the rated voltage of the battery being not more than 75 V dc.

NOTE 101 Commercial uses are, for example, in hotels, schools, hospitals, factories, shops, warehouses, and offices for other than normal housekeeping purposes.

This Standard covers machines that are powered by rechargeable batteries that are recharged by **built-in battery chargers** or off-board battery chargers which may be incorporated within the circuitry of the machine, or mounted on the machine and incorporated within the enclosure of the machine; or powered by batteries that need to be removed to be recharged with a charger that is external to the machine.

NOTE 102 When the term "machine" is used in this Standard, it is used to denote commercial robotic floor treatment machines.

This Standard does not apply to battery chargers. Off-board chargers are covered by separate applicable standards (see CSA C22.2 No. 107.1, CAN/CSA-C22.2 No. 107.2, CSA C22.2 No. 223, CAN/CSA-E60335-2-29, UL 1012, and UL 1310).

This Standard covers the safe functioning of lithium-ion and non-lithium-ion battery systems used in commercial robotic floor treatment machines.

Machines covered by this Standard may operate in **autonomous** or **manual mode**.

This Standard does not apply to

- machines designed for use on slopes with a gradient exceeding 20%;
- machines designed for use in corrosive or explosive environments (i.e., dust, vapour, or gas);
- machines designed for picking up hazardous dusts (as defined in CAN/CSA-E60335-2-69), inflammable substances, or glowing particles;
- powered ride-on and powered walk-behind machines intended for commercial indoor or outdoor use (those machines are covered by CAN/CSA-C22.2 No. 60335-2-72/UL 60335-2-72); and
- machines with robotic arms (end effectors).

2 Normative references

This clause of Part 1* is applicable except as follows.

* For the purposes of this Standard, the term "Part 1" means "CAN/CSA-C22.2 No. 60335-1 (second edition)/UL 60335-1 (sixth edition)".

Note: When this Standard states "addition", "modification", or "replacement", the relevant text in Part 1 is to be adapted accordingly.

Addition:

CSA Group

C22.1-15

Canadian Electrical Code, Part I

C22.2 No. 0.23-15

General requirements for battery-powered appliances

C22.2 No. 107.1-16

Power conversion equipment

CAN/CSA-C22.2 No. 107.2-01 (R2016)

Battery chargers

C22.2 No. 223-15

Power supplies with extra-low-voltage Class 2 outputs

CAN/CSA-C22.2 No. 60335-1:16

Household and similar electrical appliances — Safety — Part 1: General requirements

CAN/CSA-C22.2 No. 60335-2-72:17

Household and similar electrical appliances — Safety — Part 2-72: Particular requirements for floor treatment machines with or without traction drive, for commercial use

CAN/CSA-C22.2 No. 62471:12 (R2017)

Photobiological safety of lamps and lamp systems

CAN/CSA-E60335-2-29-06 (R2016)

Household and similar electrical appliances — Safety — Part 2-29: Particular requirements for battery chargers