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NATIONAL STANDARD

ANSI/CAN/UL/ULC 1487:2025

STANDARD FOR SAFETY

Battery Containment Enclosures

Approved American National Standard
ANSI

ANSI/UL 1487-2025

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UL Standard for Safety for Battery Containment Enclosures, ANSI/CAN/UL/ULC 1487

First Edition, Dated February 10, 2025

Summary of Topics

This First Edition of ANSI/CAN/UL/ULC 1487 dated February 10, 2025 is being issued as a new joint US/Canada Standard for Battery Containment Enclosures. This publication reflects the latest ANSI and SCC approval dates incorporating the proposals dated June 7, 2024 and December 6, 2024. This Standard addresses battery containment enclosures intended to mitigate the heat, fire, and deflagration hazards that can result from lithium-ion battery thermal runaway. The Standard details safety requirements for enclosures, including performance requirements such as the Internal Thermal Runaway Test and Internal Deflagration Test.

The new requirements are substantially in accordance with Proposal(s) on this subject dated June 7, 2024 and December 6, 2024.

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ANSI/UL 1487-2025

FEBRUARY 10, 2025

ANSI/CAN/UL/ULC 1487:2025

Standard for Battery Containment Enclosures

First Edition

February 10, 2025

This ANSI/CAN/UL/ULC Safety Standard consists of the First Edition.

The most recent designation of ANSI/UL 1487 as an American National Standard (ANSI) occurred on February 10, 2025. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, Title Page, Preface or SCC Foreword.

This Standard has been designated as a National Standard of Canada (NSC) on February 10, 2025.

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Preface

This is the First Edition of ANSI/CAN/UL/ULC 1487, Standard for Battery Containment Enclosures.

ULSE is accredited by the American National Standards Institute (ANSI) and the Standards Council of Canada (SCC) as a Standards Development Organization (SDO). ULC Standards is accredited by the Standards Council of Canada (SCC) as a Standards Development Organization (SDO).

This Standard has been developed in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization.

This ANSI/CAN/UL/ULC 1487 Standard is under continuous maintenance, whereby each revision is approved in compliance with the requirements of ANSI and SCC for accreditation of a Standards Development Organization. In the event that no revisions are issued for a period of four years from the date of publication, action to revise, reaffirm, or withdraw the standard shall be initiated.

Annexes A, D, E, and F identified as Informative, are for information purposes only.

Annexes B, C, G, and H are identified as Normative, as such, form mandatory parts of this Standard.

In Canada, there are two official languages, English and French. All safety warnings must be in French and English. Attention is drawn to the possibility that some Canadian authorities may require additional markings and/or installation instructions to be in both official languages.

Requests for interpretation of this Standard should be sent to ULC Standards. The requests should be worded in such a manner as to permit a "yes" or "no" answer based on the literal text of the requirement concerned.

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This Edition of the Standard has been formally approved by the Technical Committee (TC) on Battery Containment Enclosures, TC 1487.

This list represents the TC 1487 membership when the final text in this Standard was balloted. Since that time, changes in the membership may have occurred.

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This Standard is intended to be used for conformity assessment.

The intended primary application of this Standard is stated in its scope. It is important to note that it remains the responsibility of the user of the standard to judge its suitability for this particular application.

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INTRODUCTION

1 Scope

1.1 This Standard addresses battery containment enclosures intended to mitigate the heat, fire, and deflagration hazards that can result from lithium-ion battery thermal runaway.

1.2 These requirements do not address the toxicity hazards associated with thermal runaway of lithium-ion cells, batteries, battery packs, or battery-powered devices.

1.3 A battery containment enclosure covered by this Standard may be used for storage and/or transport of lithium-ion cells, batteries, battery packs, and battery-powered devices.

1.4 A battery containment enclosure covered by this Standard is not intended to be used with lithium-ion cells, batteries, battery packs, and/or battery-powered devices combined with other potential hazard-producing materials, such as combustible or flammable liquids, acids, bases, combustible metals or dusts, or compressed gases.

1.5 These requirements are not intended to supersede applicable transportation, packaging, and shipping regulations enacted by the authority having jurisdiction for transporting lithium-ion cells, batteries, battery packs, or battery-powered devices. Battery containment enclosures used for transportation of lithium-ion cells, batteries, battery packs, or battery-powered devices shall comply with all applicable transportation, packaging, and shipping requirements and regulations.

NOTE: See Annex F for additional information on transportation of lithium-ion batteries.

1.6 A battery containment enclosure covered by this Standard may include integral systems and/or internal electrical power distribution for charging lithium-ion cells, batteries, battery packs, or battery-powered devices.

1.7 These requirements do not address energy storage systems, as these systems are intended to be covered by UL 9540, the Standard for Energy Storage Systems and Equipment, and/or UL 9540A, the Standard for Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems.

NOTE: See Annex E for further explanation.

1.8 This Standard does not cover hazard mitigation systems of a battery containment enclosure unless they are integral to the battery containment enclosure product.

1.9 This Standard covers battery containment enclosures for indoor and outdoor installations and/or portable/mobile battery containment enclosures. Battery containment enclosures covered by this Standard are intended to be used in ordinary locations in non-residential occupancies, dedicated non-habitable installation locations within multi-occupancy residential buildings, laboratory non-hazardous environments, and/or outdoors, all in accordance with governing building and fire codes and regulations. These products are not intended to be installed or used in residential dwellings.

2 Components and Subassemblies

2.1 Except as indicated in 2.2, a component or subassembly of a product covered by this Standard shall comply with the requirements of that component or subassembly. See Annex G for a list of standards covering potential components and subassemblies considered in the products covered by this Standard.

2.2 A component or subassembly is not required to comply with a specific requirement that:

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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 or subassembly shall be used in accordance with its rating and in accordance with its 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 Where values of measurement are specified in both SI and U.S. Customary units, it is the responsibility of the user of this Standard to determine the unit of measurement appropriate for the user's needs.

4 Referenced Publications

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.

4.2 The following publications are referenced in this Standard:

CSA C22.2 No. 0.15, *Adhesive Labels*

CSA C22.2 No. 94.1, *Enclosures for Electrical Equipment*

CSA C22.2 No. 94.2, *Enclosures for Electrical Equipment, Environmental Considerations*

CSA C22.2 No. 308, *Cord Reels and Multi-Outlet Assemblies*

ICC International Building Code (IBC)

ICC International Residential Code (IRC)

UL 50, *Enclosures for Electrical Equipment, Non-Environmental Considerations*

UL 50E, *Enclosures for Electrical Equipment, Environmental Considerations*

UL 94, *Tests for Flammability of Plastic Materials for Parts in Devices and Appliances*

UL 111, *Multioutlet Assemblies*

UL 962A, *Furniture Power Distribution Units*

UL 969, *Marking and Labeling Systems*

UL 9540, *Energy Storage Systems and Equipment*

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UL 9540A, *Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems*

5 Glossary

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

5.2 BATTERY CONTAINMENT ENCLOSURE (BCE) – A product that encloses and stores lithium-ion cells, batteries, battery packs, and battery-powered devices and is intended to mitigate the heat, fire, and deflagration hazards generated by lithium-ion battery thermal runaway.

NOTE: A BCE might be used for storage, transport, and/or charging of lithium-ion cells, batteries, battery packs, and/or battery-powered devices. See also 1.5 regarding transportation regulations.

5.3 CELL – The basic functional electrochemical unit containing an assembly of electrodes, electrolyte, separators, containers, and terminals. It is a source of electrical energy by direct conversion of chemical energy.

5.4 CHARRING – Conversion of a virgin material to a carbonaceous residue caused by heat exposure. The carbonaceous residue may be brittle and discolored or blackened in appearance.

5.5 DEDICATED VENT – A purposefully designed feature where thermal runaway effluent gases from inside a BCE are released from the BCE or where ambient air is drawn into the BCE.

5.6 DEFLAGRATION – Propagation of a combustion zone at a velocity that is less than the speed of sound in the unreacted medium.

5.7 DEVICE UNDER TEST (DUT) – A representative BCE product sample being tested to the requirements of this Standard.

5.8 DWELLING – See the definition for "dwelling" in the IBC and the IRC.

5.9 ELECTRICAL ENCLOSURE – A surrounding case constructed to provide a degree of protection to personnel against access to hazardous parts and to provide a degree of protection to the enclosed equipment against specified environmental conditions.

NOTE: The construction or components of a BCE, such as a power distribution unit, may include electrical enclosures.

5.10 ELECTRICAL ENERGY CAPACITY – The stored electrical energy, in watt-hours (Wh), of a cell, test cell pack, battery, battery pack, battery-powered device, or collection thereof. Electrical energy capacity is calculated as the product of ampere-hour (Ah) rating and nominal voltage (V).

5.11 EXPLOSION – The rupture of an enclosure due to pressure generation from a deflagration. The rupture releases energy that can generate pressure waves, thermal radiation, and projectiles traveling away from the source.

5.12 EXTERNAL FIRE RATING – The number of minutes, in increments of ten, that a DUT remains compliant with the performance criteria of the External Fire Test, Annex D.

5.13 FLAMMABLE MIXTURE – A gaseous, oxidizer-fuel mixture that is capable of being ignited by a competent ignition source such as open flame, electric arc or spark, or hot surface above the ignition temperature of the oxidizer-fuel mixture.

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