



ANSI/CAN/UL 583:2025

JOINT CANADA-UNITED STATES
NATIONAL STANDARD

STANDARD FOR SAFETY

Electric-Battery-Powered Industrial Trucks



ANSI/UL 583-2025



SCC FOREWORD

National Standard of Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

UL Standard for Safety for Electric-Battery-Powered Industrial Trucks, ANSI/CAN/UL 583

Eleventh Edition, Dated December 15, 2022

Summary of Topics

This revision of ANSI/CAN/UL 583 dated May 1, 2025 includes the following changes in requirements:

– Revision to Update Paragraph Reference in [19.1\(c\)](#);

– Addition of Requirements for Safety Markings; Markings and Advisory Notes for Sections [28](#), [38](#), [50](#), [56](#), [60](#), [62](#), [67](#), Annex [A5](#), and Annex [B](#)

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 new and revised requirements are substantially in accordance with Proposal(s) on this subject dated July 26, 2024 and February 7, 2025.

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.

No Text on This Page



ANSI/UL 583-2025

DECEMBER 15, 2022
(Title Page Reprinted: May 1, 2025)



1

ANSI/CAN/UL 583:2025

Standard for Electric-Battery-Powered Industrial Trucks

The first edition was titled Industrial Gasoline-Tractors. The second and third editions were titled Power-Operated Industrial Trucks (Electric Battery-Powered & Gasoline-Powered). The fourth edition was titled Power-Operated Industrial Trucks.

First Edition – January, 1950
Second Edition – March, 1951
Third Edition – May, 1954
Fourth Edition – November, 1956
Fifth Edition – January, 1971
Sixth Edition – May, 1972
Seventh Edition – December, 1977
Eighth Edition – September, 1991
Ninth Edition – June, 1996
Tenth Edition – August, 2012

Eleventh Edition

December 15, 2022

This ANSI/CAN/UL Safety Standard consists of the Eleventh Edition including revisions through May 1, 2025.

The most recent designation of ANSI/UL 583 as an American National Standard (ANSI) occurred on May 1, 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 May 1, 2025.

© 2025 ULSE Inc. All rights reserved.

No Text on This Page

CONTENTS

Preface 7

INTRODUCTION

1 Scope 11

2 Components 11

3 Units of Measurement 11

4 Referenced Publications 11

5 Glossary..... 13

6 Samples 14

TYPE E TRUCKS

CONSTRUCTION

7 General 14

8 Motors and Electromechanical Brakes 15

9 Motors..... 16

10 Electric Controls 16

11 Wiring..... 17

12 Overcurrent Protection..... 18

13 Power Source Compartment or Enclosure..... 19

14 Industrial Truck Power Sources 22

 14.1 Lead acid batteries 22

 14.2 Lithium batteries 22

 14.3 Fuel cells 22

 14.4 Electrochemical capacitors 22

 14.5 Onboard battery chargers..... 23

15 Power Source Connectors 23

16 Lamps, Lampholders, and Horns 23

 16.1 General..... 23

 16.2 Horns..... 23

17 Spacings 24

 17.1 General..... 24

 17.2 Barriers..... 25

18 Low-Voltage Limited Energy Circuit 26

19 Separation of Circuits 27

PERFORMANCE

20 Abnormal Operation 27

21 Temperature Test 28

 21.1 General..... 28

 21.2 Fork-lift and platform-lift trucks 30

 21.3 Load-carrying, fixed-platform trucks 30

 21.4 Tractors 30

22 Brake Test 31

23 Dielectric Voltage Withstand..... 31

24 Arc-Rupturing Test..... 32

 24.1 Motor controllers and contactors in motor circuits 32

 24.2 Switches controlling other than motor circuits..... 32

 24.3 Overload test..... 33

25 Burnout 33

26	Solid-State Circuitry	35
27	Marking-Plate-Adhesion Test	35
27.1	General.....	35
27.2	Oven aging test	35
27.3	Immersion test.....	35
27.4	Standard atmosphere test	35

MARKINGS

28	Details.....	35
----	--------------	----

SERVICE MANUAL

29	Instructions	37
----	--------------------	----

TYPE EE TRUCKS

CONSTRUCTION

30	General	37
31	Motors and Electromechanical Brakes	37
32	Electric Controls	37
33	Wiring.....	38
34	Overcurrent Devices.....	38
35	Battery Enclosure.....	38
36	Static-Discharge Devices	39

PERFORMANCE

37	General	39
----	---------------	----

MARKINGS

38	Details.....	39
----	--------------	----

TYPE EX TRUCKS FOR USE IN HAZARDOUS LOCATIONS, CLASS I, DIVISION 1

CONSTRUCTION

39	General	40
40	Wiring.....	40
41	Protection Against Mechanical Sparks	41
42	Motors.....	41
43	Electric Controls.....	41
44	Battery Enclosure.....	41
45	Battery	42
46	Battery Plugs and Receptacles.....	42
47	Wheels and Tires	42

PERFORMANCE

48	General	42
49	Nonmetallic Conductive Tires	43
49.1	Wheels	43



Documents

Document Sharing Hub

49.2 Tire specimens 43

MARKINGS

50 Details 44

TYPE EX TRUCKS FOR USE IN HAZARDOUS LOCATIONS, CLASS II, GROUP G, DIVISION 1

CONSTRUCTION

51 General 46

52 Motors 46

53 Battery 46

54 Exterior-Surface Temperatures.....46

PERFORMANCE

55 General 46

MARKINGS

56 Details 47

TYPE ES TRUCKS

CONSTRUCTION

57 General 48

PERFORMANCE

58 General 48

59 Resistors 49

MARKINGS

60 Details 49

ELECTRICAL ACCESSORIES FOR FIELD INSTALLATION BY QUALIFIED PERSONNEL

CONSTRUCTION

61 General 50

MARKINGS

62 Details 50

BATTERIES FOR INDUSTRIAL TRUCKS

CONSTRUCTION

63 Type E Batteries 50

64 Type EE Batteries.....50

65 Type EO Batteries 51

66 Type EX Batteries.....51

MARKINGS

67 Types E, EE, and EO Batteries 51

68 Type EX Batteries.....51

ANNEX A (Normative) – ELECTRIC-BATTERY-POWERED INDUSTRIAL/COMMERCIAL FLOOR CLEANING MACHINES

GENERAL

A1 Scope 52

A2 Application of Requirements 52

PERFORMANCE

A3 Temperature Test.....52

A4 Operation Test for Push Type, Walk Behind Floor Cleaners 52

MARKINGS

A5 Details 53

| ANNEX B (Informative) – SAFETY MARKING TRANSLATIONS

Preface

This is the Eleventh Edition of ANSI/CAN/UL 583, Standard for Electric-Battery-Powered Industrial Trucks.

ULSE is accredited by the American National Standards Institute (ANSI) and 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.

Annex A is identified as Normative, as such, form mandatory parts of this Standard.

Annex B, identified as Informative, is for information purposes only.

This ANSI/CAN/UL 583 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.

In Canada, there are two official languages, English and French. For this reason, where this Standard requires safety markings, it must provide a French translation of such markings. Annex B provides translations in French of the English safety markings specified in this Standard, for use wherever required in Canada.

This Eleventh Edition joint American National Standard and National Standard of Canada is based on, and now supersedes, the Tenth Edition of UL 583.

Comments or proposals for revisions on any part of the Standard may be submitted 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.

This Edition of the Standard has been formally approved by the Technical Committee (TC) on Industrial Trucks, TC 583.

This list represents the TC 583 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

TC 583 Membership

Name	Representing	Interest Category	Region
Bablo, Joseph	UL Solutions	Testing & Standards Org.	USA
Bender, Curtis	Tennant CO	Producer	USA
Bhattacharya, Rana	Electrovaya	Supply Chain	Canada
Burch, Christopher	FM Approvals LLC	Testing & Standards Org.	USA

TC 583 Membership Continued on Next Page



TC 583 Membership Continued

Name	Representing	Interest Category	Region
Coles, Michael	Advanced Motors And Drives INC	Supply Chain	USA
Coric, Milos	UL Standards & Engagement	TC Chair – Non-voting	USA
Davison, Patrick	MHI	Supply Chain	USA
Dormann, Susanne	TUV SUD	Testing & Standards Org.	Germany
Feng, Drew	Dongguan Poweramp Technology Limited	Supply Chain	China
Getzie, Travis	Coficab	Supply Chain	USA
Gonzales, Jandrew	OTTO by Rockwell Automation	Producer	Canada
Guzman, Ted	HYSTER-YALE GROUP INC	Producer	USA
Henesy, Shannon	UL Standards & Engagement	TC Project Manager – Non-voting	USA
Hill, Ken	EnerSys Delaware INC	Supply Chain	USA
Hilliard, Steven	Mitsubishi Logisnext Americas INC	Producer	USA
Johnson, John	Johnson Engineering Services INC	General Interest	USA
Kamble, Sudesh	Intertek Testing Services	Testing & Standards Org.	USA
Klave, Michael	Toyota Material Handling, INC.	Producer	USA
Lacerte, Marc-Olivier	Ingeniarts Technologies Inc	Supply Chain	Canada
McLachlan, Robert	Raymond Corp	Producer	USA
McNabb, Charon	National Carbon Monoxide Awareness Association	General Interest	USA
Merther, Christoper	Industrial Truck Association	General Interest	USA
Nager, Urs	Anderson Power Products INC	Producer	USA
Noakes, Steven	Pyroban LTD	Supply Chain	United Kingdom
Parker, Alan	Yanmar America Corp	Supply Chain	USA
Riley, Rolland	U S Army Ccdc Ground Vehicle Systems Center	Government	USA
Rupp, Mark	American Association Of Cleaning Equipment Manufacturers	General Interest	USA
Sanders, K	East Penn MFG CO INC	Producer	USA
Smith, R.	R K Smith Engineering INC	General Interest	USA
Spencer, Richard	Crown Equipment Corporation	Producer	USA
Sudler III, Samuel	SEA LTD	General Interest	USA
Tao, Luke	Hua Zhen(Guang Zhou) Standards Technical Services Co., Ltd	Testing & Standards Org.	China
Tepen, M.	Ford Motor CO	Commercial / Industrial User	USA
Wechsler, David	American Chemistry Council	General Interest	USA
Weidner, Gary	GW Technical Services	General Interest	USA
Xu, Michael	Cummins Inc	Supply Chain	Canada

International Classification for Standards (ICS): 53.060

For information on ULSE Standards, visit <https://www.shopulstandards.com>, call toll free 1-888-853-3503 or email us at ClientService@shopULStandards.com.

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.

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET
ANGLAISE

No Text on This Page

INTRODUCTION

1 Scope

1.1 These requirements cover electric battery-powered industrial trucks, such as tractors, platform-lift trucks, fork-lift trucks, and other vehicles designed for specific industrial uses, with respect to a risk of fire, electric shock, and explosion. These requirements do not cover such electric powered industrial trucks with respect to other possible risks that may be associated with the use of such trucks.

1.2 These requirements cover power sources intended for use in the electric powered industrial trucks specified in [1.1](#), with respect to the risk of fire, electric shock, and explosion.

1.3 These requirements cover Types E, CGH, E or CGH, EE, ES, and EX electric powered industrial trucks.

2 Components

2.1 Except as indicated in [2.2](#), a component of a product covered by this standard shall comply with the requirements for that component.

2.2 A component of a product covered by this Standard is not required to comply with a specific requirement that:

- a) Involves a feature or characteristic not needed in the application of the component in the product covered by this standard;
- b) Is superseded by a requirement in this standard; or
- c) Is separately investigated when forming part of another component, provided the component is used within its established ratings and limitations.

2.3 Specific components are recognized as being 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 for which they have been recognized.

2.4 A component that is also intended to perform other functions such as overcurrent protection, ground-fault circuit-interruption, surge suppression, any other similar functions, or any combination thereof, shall comply additionally with the requirements of the applicable standard(s) that cover devices that provide those functions.

3 Units of Measurement

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

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

CSA C22.2 No. 0.17, *Evaluation of Properties of Polymeric Materials*

CSA C22.2 No. 0.2, *Insulation Coordination*

CSA C22.2 No. 14, *Industrial Control Equipment*

CSA C22.2 No. 25, *Enclosures for Use in Class II, Division 1, Groups E, F, and G Hazardous Locations*

CSA C22.2 No. 30, *Explosion-Proof Equipment*

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

CSA C22.2 No. 100, *Motors and Generators*

CAN/CSA-C22.2 No. 107.2, *Battery Chargers*

CSA C22.2 No. 145, *Electric Motors and Generators for Use in Hazardous (Classified) Locations*

CAN/CSA-C22.2 No. 157, *Intrinsically Safe and Non-incendive Equipment for Use in Hazardous Locations*

CSA C22.2 No. 243, *Vacuum Cleaners, Blower Cleaners, and Household Floor Finishing Machines*

CSA C22.2 No. 269.1, *Surge Protective Devices – Type 1 – Permanently Connected*

CSA C22.2 No. 269.2, *Surge Protective Devices – Type 2 – Permanently Connected*

CSA C22.2 No. 269.3, *Surge Protective Devices – Type 3 – Cord Connected, Direct Plug-in and Receptacle Type*

CSA C22.2 No. 269.4, *Surge Protective Devices – Type 4 – Component Assemblies*

CSA C22.2 No. 269.5, *Surge Protective Devices – Type 5 – Components*

CAN/CSA-C22.2 No. 60079-11, *Explosive Atmospheres – Part 11: Equipment Protection by Intrinsic Safety “I”*

CAN/CSA-C22.2 No. 61058-1, *Switches for Appliances – Part 1: General Requirements*

CSA E60730-1, *Automatic Electrical Controls – Part 1: General Requirements*

NFPA 70, *National Electrical Code*

SAE J1128, *Low Voltage Primary Cable*

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 508, *Industrial Control Equipment*

UL 558, *Industrial Trucks, Internal Combustion Engine-Powered*

UL 674, *Electric Motors and Generators for Use in Hazardous (Classified) Locations*

UL 746C, *Polymeric Materials – Use in Electrical Equipment Evaluations*

UL 758, *Appliance Wiring Material*

UL 810A, *Electrochemical Capacitors*

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

UL 913, *Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division 1, Hazardous (Classified) Locations*

UL 1004-1, *Rotating Electrical Machines – General Requirements*

UL 1017, *Vacuum Cleaners, Blower Cleaners, and Household Floor Finishing Machines*

UL 1063, *Machine-Tool Wires and Cables*

UL 1203, *Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations*

UL 1276, *Outline of Investigation for Welding Cable*

UL 1426, *Electrical Cables for Boats*

UL 1449, *Surge Protective Devices*

UL 1564, *Industrial Battery Chargers*

UL 2267, *Fuel Cell Power Systems for Installation in Industrial Electric Trucks*

UL/ULC 2271, *Batteries for Use In Light Electric Vehicle (LEV) Applications*

UL/ULC 2580, *Batteries for Use in Electric Vehicles*

UL 60730-1, *Automatic Electrical Controls – Part 1: General Requirements*

UL 61058-1, *Switches for Appliances – Part 1: General Requirements*

5 Glossary

5.1 For the purposes of this standard, the following definitions apply.

5.2 In the text of this Standard, the term truck is used to mean an electric powered industrial truck. The type or types of truck to which a specific requirement applies is identified by the heading under which the requirement is located and by specific references in the text to the applicable requirements.

5.3 **ARCING OR SPARKING PART** – A component that emits arcs or sparks under normal operating conditions (e.g. motor brushes or contactor).

5.4 **BATTERY** – One or more electrical cells, electrically connected so that the combination furnishes current as a unit. There is one positive and one negative externally accessible connection and no externally accessible inter-cell connections.

5.5 **BATTERY ASSEMBLY/MONOBLOC** – A multi-cell battery design that is ready for use, contains a common pressure vessel construction, a single vent line assembly, shared hardware and is furnished with a single connection cable that has electrical connector at the end. The connector shall prevent accidental matings of mismatched voltages and polarities.

5.6 **LOW-VOLTAGE, LIMITED-ENERGY (LVLE) CIRCUIT** – A circuit considered to result in a reduced risk of fire and electric shock, characterized by the circuit limitations defined in [Table 18.1](#).

5.7 **TYPE CGH** – A compressed hydrogen powered unit utilizing a fuel cell that has minimum acceptable safeguards against inherent fire and electric shock hazards.

5.8 **TYPE E** – An electrically powered unit that has minimum acceptable safeguards against inherent fire and electric shock hazards.

5.9 **TYPE EE** – An electrically powered unit that, in addition to meeting all requirements for Type E and ES units, has its electric motors and all other electric equipment completely enclosed.

5.10 **TYPE E or CGH** – A unit that has met all requirements for both a Type E and CGH.

5.11 **TYPE ES** – An electrically powered unit that, in addition to meeting all requirements for Type E units, is provided with additional safeguards to the electric system to prevent the emission of hazardous sparks and to limit surface temperatures.

5.12 **TYPE EX** – An electrically powered unit in which the electric fittings and equipment are so designed, constructed, and assembled that the unit can be used in atmospheres containing specifically named flammable vapors, dusts, and, under certain conditions, fibers.

5.13 **ULTIMATE ENCLOSURE** – Any exposed surface that could be subjected to impact or damage by external means.

6 Samples

6.1 Unless otherwise stated, compliance with the performance requirements for a truck shall be determined by testing a representative model of a new vehicle.

TYPE E TRUCKS

CONSTRUCTION

7 General

7.1 All electrical parts shall be mounted within the body of the truck.

7.2 All current-carrying parts of a truck shall be constructed and enclosed so as to reduce the likelihood of mechanical damage and to resist the abuses to which they may be subjected.