JOINT CANADA-UNITED STATES
NATIONAL STANDARD

ANSI/CAN/UL 5840:2022

STANDARD FOR SAFETY

Electrical Systems of Battery Powered Aviation Ground Support Equipment

Approved American National Standard
ANSI
ANSI/UL 5840-2022

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SCC FOREWORD

National Standard of Canada

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UL Standard for Safety for Electrical Systems of Battery Powered Aviation Ground Support Equipment, ANSI/CAN/UL 5840

First Edition, Dated May 25, 2022

Summary of Topics

This is the First Edition of ANSI/CAN/UL 5840, Standard for Electrical Systems of Battery Powered Aviation Ground Support Equipment, dated May 25, 2022 including applicable requirements for Canada. These requirements cover the electrical system of lithium based battery powered airport ground support equipment (GSE) with respect to a risk of fire, electric shock, and explosion hazards associated with the battery powered electrical system. These requirements also cover these electrical systems when they are used to convert fueled GSE to battery powered GSE.

The new requirements are substantially in accordance with Proposal(s) on this subject dated February 11, 2022.

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MAY 25, 2022

ANSI/CAN/UL 5840:2022

Standard for Electrical Systems of Battery Powered Aviation Ground Support Equipment

First Edition

May 25, 2022

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

The most recent designation of ANSI/UL 5840 as an American National Standard (ANSI) occurred on May 25, 2022. 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 25, 2022.

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Preface

This is the First Edition of ANSI/CAN/UL 5840, Standard for Electrical Systems of Battery Powered Aviation Ground Support Equipment.

UL 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.

This ANSI/CAN/UL 5840 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. 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.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at http://csds.ul.com.

To purchase UL Standards, visit the UL Standards Sales Site at http://www.shopulstandards.com/HowToOrder.aspx or call tollfree 1-888-853-3503.

This Edition of the Standard has been formally approved by the UL Standards Technical Panel (STP) on Battery Powered Aviation Ground Support Equipment, STP 5840.

This list represents the STP 5840 membership when the final text in this standard was balloted. Since that time, changes in the membership may have occurred.

STP 5840 Membership

Name	Representing	Interest Category	Region
Bablo, Joseph	UL LLC	Testing and Standards	USA
Carmell, Coleson	Textron Specialized Vehicles	Producer	USA
Frohlich, Mark	JBT Aerotech	Producer	USA
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Harney, James	City Of Chicago	Government	USA
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Kaplan, James	Harlan Global Manufacturing LLC	Supply Chain	USA
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STP 5840 Membership Continued

Name	Representing	Interest Category	Region
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Vaughan, Tim	Flux Power INC	Supply Chain	USA
Vaughn, Trenton	Unitron LP	Supply Chain	USA
Wechsler, David	American Chemistry Council	General	USA
Zhang, Qingsong	Civil Aviation University of China Center for Aircraft Fire and Emergency	General	China

International Classification for Standards (ICS): 29.220; 53.060

For further information on UL standards, please contact:

Underwriters Laboratories Inc.
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Web site: ul.org

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

INTRODUCTION

1 Scope

1.1 These requirements cover the electrical system of lithium based battery powered airport ground support equipment (GSE) with respect to a risk of fire, electric shock, and explosion hazards associated with the battery powered electrical system.

1.2 These requirements also cover these electrical systems when they are used to convert fueled GSE to battery powered GSE.

1.3 In accordance with 1.1, the minimum GSE electrical system consists of the battery and integral battery management system, interconnecting cables, and input connections for recharging the battery. In addition, the electrical system can also include power train components, electric motors, electric brakes, charging equipment and the like based on manufacturer preference.

1.4 GSE that is capable of being moved and used as a temporary source of power for other equipment, whether that equipment is either located on board the GSE or off board the GSE, is additionally evaluated based on mobile energy storage systems requirements.

1.5 This standard does not address the functional or operations aspects of the GSE such as steering, lifting, towing, and the like.

1.6 This standard does not address any equipment or electrical systems of equipment that are not considered GSE as defined within this standard.

1.7 In relation to conversion systems, these requirements do not address the function or mechanical state of the GSE being converted, or the parts located external to the manufacturer's defined electrical conversion system that may be powered from the electrical conversion system.

2 Components

2.1 A component of a product covered by this Standard shall:

a) Comply with the requirements for that component as specified in this Standard;

b) Be used in accordance with its rating(s) established for the intended conditions of use; and

c) Be used within its established use limitations or conditions of acceptability.

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

a) Involves a feature or characteristic not required in the application of the component in the product;

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 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.

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 UL 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 Products covered by this standard shall comply with the referenced installation codes and standards noted in this clause as referenced in the individual clauses of this standard.

4.3 The following publications are referenced in this Standard:

ANSI Z97.1, *Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test*

ASTM D1525, *Standard Test Method for Vicat Softening Temperature of Plastics*

ASTM E230/E230M, *Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples*

CSA C22.2 No. 0.8, *Safety Functions Incorporating Electronic Technology*

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

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

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

CAN/CSA C22.2 No. 75, *Thermoplastic – Insulated Wires and Cables*

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

CAN/CSA C22.2 No. 96, *Portable Power Cables*

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

CAN/CSA C22.2 No. 107.1, *Power Conversion Equipment*

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

CSA C22.2 No. 182.3, *Special Use Attachment Plugs, Receptacles, and Connectors*

CAN/CSA C22.2 No. 210, *Appliance Wiring Material Products*