UL 2596-1

STANDARD FOR SAFETY

Tests for Battery Materials: Torch and Grit (TaG) Method

UL Standard for Safety for Tests for Battery Materials: Torch and Grit (TaG) Method, UL 2596-1

First Edition, Dated March 27, 2026

Summary of Topics

This is the First Edition of ANSI/UL 2596-1, Standard for Tests for Battery Materials: Torch and Grit (TaG) Method, dated March 27, 2026.

The new requirements are substantially in accordance with Proposal(s) on this subject dated November 7, 2025 and March 6, 2026.

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.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

UL 2596-1

Standard for Tests for Battery Materials: Torch and Grit (TaG) Method

First Edition

March 27, 2026

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

The most recent designation of ANSI/UL 2596-1 as an American National Standard (ANSI) occurred on March 27, 2026. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

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

© 2026 ULSE Inc. All rights reserved.

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

CONTENTS

1 Scope 5
2 Units of Measurement 5
3 Referenced Publications 5
4 Glossary 5
5 Apparatus 6
5.1 Apparatus and instrumentation 6
6 Specimens and Conditioning 8
6.1 Specimen dimensions 8
6.2 Test sample pre-conditioning 8
6.3 Test ambient 8
7 Test Method 8
7.1 Method A 8
8 Report 10
9 Classification 10

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.

1 Scope

1.1 These requirements cover a test method for the performance of battery system materials in response to the thermal and mechanical abrasive hazards presented during the thermal runaway of lithium-ion cells. The method evaluates materials intended to perform as a contingency by containing and/or redirecting the hazards (e.g., enclosure) as well as to evaluate component materials (e.g., busbar insulation, wire sheathing, gaskets) ability to maintain functional integrity during and after exposure to thermal runaway conditions.

1.2 Two methods are presented. Method A is a standardized method with set parameters that allows for the screening of various materials under a common condition. It also allows material performance to be ranked using the median number of full cycles and the maximum temperature of the back surface thermocouple reported under a standardized classification system. Method Custom allows for test parameters to be set to more directly assess the hazards associated with different battery cell geometries, chemistries, and energy densities and is useful in the research and design of specific systems.

1.3 The performance characteristics of a material determined by this Standard are not to be assumed to correlate with its performance in the end-use application. The actual response of materials depends upon the end-use design and application of the product using the material.

1.4 Tests conducted on a material under the conditions specified are intended to provide information when comparing the relative performance characteristics of different materials or assessing any change in performance characteristics prior to or during use.

1.5 This Standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

2 Units of Measurement

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

3 Referenced Publications

3.1 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.

3.2 The following publications are referenced in this Standard:

IEC 60695-4, *Fire hazard testing – Part 4: Terminology Concerning Fire Tests for Electrotechnical Products*

ISO 13943, *Fire safety – Vocabulary*

4 Glossary

4.1 For the purposes of this Standard, the following definitions apply.

NOTE: For the purposes of this document, the terms and definitions given in ISO 13943, IEC 60695-4, and the following apply. ISO and IEC maintain terminology databases for use in standardization at the following addresses:

a) IEC Electropedia: available at https://www.electropedia.org/; and

ULSE INC. COPYRIGHTED MATERIAL – NOT AUTHORIZED FOR FURTHER REPRODUCTION OR DISTRIBUTION WITHOUT PERMISSION FROM ULSE INC.