



ULC Standards
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ANSI/CAN/UL 8400

JOINT CANADA-UNITED STATES
NATIONAL STANDARD

STANDARD FOR SAFETY

Virtual Reality, Augmented Reality and
Mixed Reality Technology Equipment

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ANSI/UL 8400-2023



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UL Standard for Safety for Virtual Reality, Augmented Reality and Mixed Reality Technology Equipment, ANSI/CAN/UL 8400

First Edition, Dated April 28, 2023

Summary of Topics

This is the First Edition of ANSI/UL 8400, Standard for Virtual Reality, Augmented Reality and Mixed Reality Technology Equipment dated April 28, 2023.

The requirements are substantially in accordance with Proposal(s) on this subject dated June 3, 2022 and January 20, 2023.

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ANSI/CAN/UL 8400

**Standard for Virtual Reality, Augmented Reality and Mixed Reality
Technology Equipment**

First Edition

April 28, 2023

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

The most recent designation of ANSI/UL 8400 as an American National Standard (ANSI) occurred on April 28, 2023. ANSI approval for a standard does not include the Cover Page, Transmittal Pages, and Title Page.

This standard has been designated as a National Standard of Canada (NSC) on date April 28, 2023.

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Preface

This is the First Edition of ANSI/CAN/UL 8400, Standard for Virtual Reality, Augmented Reality and Mixed Reality Technology 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 8400 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](#) and [B](#) are identified as Normative, as such, form mandatory parts of this Standard.

Annexes [C](#), [D](#), [E](#), [F](#), [G](#) and [I](#), identified as Informative, are for information purposes only.

Annex [H](#) is identified as Normative for Canada and Informative for the US. Informative text is for informational purposes only, and Normative text is considered to be mandatory.

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 at any time. Proposals should be submitted via a Proposal Request in the Collaborative Standards Development System (CSDS) at <https://csds.ul.com>.

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This Edition of the Standard has been formally approved by the Technical Committee (TC) on Virtual Reality, Augmented Reality And Mixed Reality Technology Equipment, TC 8400.

This list represents the TC 8400 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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1 Scope

This Standard addresses the safety of electrical and electronic equipment within the field of virtual reality, augmented reality and mixed reality technologies with a rated voltage not exceeding 600 V.

EXAMPLE VR/AR/MR head-mounted displays, holographic displays, AR/MR smart glasses, hand-held VR/AR/MR devices and interactive virtual simulators.

Particular aspects addressed by this Standard include the means to reduce, as far as practicable, the effects of visually induced motion sickness, visual opacity, flicker, skin sensitization, heat exposure to the eye, biomechanical stress and optical occlusion to some extent.

This Standard does not address the following:

- psychological effects, such as modification of phobias and enhancement or repression of emotions,
- neurological effects on the visual systems, such as modification of stereoscopic vision, and visual acuity, and
- vestibular disturbances, such as nausea and vomiting.

This Standard is intended to supplement the requirements addressing risk of electrical shock, fire, thermal burn, and other general product safety aspects that are already covered by the CAN/CSA-C22.2 No. 62368-1/UL 62368-1 requirements for wearable equipment. Annex D summarizes these aspects.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document and in alphabetical order. For dated references, only the edition cited apply. Any undated reference to a code or standard appearing in the requirements of this standard shall be interpreted as referring to the latest edition to that code or standard.

ANSI/ISEA Z87.1, *Occupational and educational personal eye and face protection devices*

ANSI Z535.4: 2007, *Product Safety Signs and Labels*

ASTM Method D 1415-88, *Standard Test Method for Rubber Property – International Hardness*

CAN/CSA C22.2 E60730-1, *Automatic electrical controls – Part 1: General requirements*

CAN/CSA C22.2 No. 0.8, *Safety functions incorporating electronic technology*

CAN/CSA C22.2 No. 62368-1, *Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements*

CSA Z94.3, *Eye and Face Protectors*

EN 960, *Headforms for use in the testing of protective helmets*

IEC 31010, *Risk management – Risk assessment techniques*

IEC 60812, *Failure modes and effects analysis (FMEA and FMECA)*