



Designation: F3431 – 21

Standard Specification for Determining Flammability of Materials for Recreational Camping Tents and Warning Labels for Associated Hazards¹

This standard is issued under the fixed designation F3431; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

This specification establishes material performance requirements and test methods to evaluate the flammability of recreational camping tents when exposed to a flame under three conditions (as received, after leaching, and after weathering).

This specification also incorporates precautionary warnings for fire safety and other risks associated with camping.

1. Scope

1.1 This specification covers requirements and contains test methods for outdoor recreational camping tents for persons. These requirements include controlled small flame test methods for materials used to manufacture tents. The requirements are intended to specify materials that do not present an unreasonable risk of flammability and injury to occupants.

1.2 This specification does not apply to products intended for indoor use only, products that are not intended to shelter people, products used principally for commercial purposes only, or products subject to the requirements of the NFPA Fire Code (NFPA 1), NFPA Life Safety Code (NFPA 101), or the International Fire Code, as adopted by certain U.S. states. Additional articles not covered by this specification are:

- 1.2.1 Baby boat with sunshade;
- 1.2.2 Bivouac sack;
- 1.2.3 Car port;
- 1.2.4 Children's indoor play tent, toy tent, toy bed canopy, and similar products;
- 1.2.5 Garden green house;
- 1.2.6 Hammock, hammock with insect nets, hammock with shades, hammock shelter, and similar products;
- 1.2.7 Packaging material, such as tent bags, pole bags, bivouac sacks, stake bags, carrying bags or rope, shock cord, or cordage material used for anchoring;
- 1.2.8 Tarp cover;
- 1.2.9 Sun or beach umbrella with or without a sidewall; and

1.2.10 Other similar items that are not primarily designed to provide shelter to persons for outdoor use, which do not have sides which are fully enclosed to the ground, and which do not have limited means of egress.

1.3 This performance specification relies on test methods from (established) consensus flammability test standards for outdoor recreational camping tents, specifically Sections 2-5 of CAN/CGSB-182.1.

1.4 This consumer safety specification is intended to deal with reasonably foreseeable use and misuse of the products. This consumer safety specification does not apply to products that are blatantly misused, nor does it apply to products used by consumers in a careless manner that violate normal practice or disregard the instructions or warnings provided with the product or both.

1.5 This specification is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.

1.6 This specification is used to predict or provide a quantitative measure of the fire hazard from a specified set of fire conditions involving specific materials, products, or assemblies. This assessment does not necessarily predict the hazard of actual fires that involve conditions other than those assumed in the analysis.

1.7 This specification is used to establish a means of combining the potential for harm in fire scenarios with the probabilities of occurrence of those scenarios. Assessment of fire risk using this specification depends on many factors, including the manner in which the user selects scenarios and uses them to represent all scenarios relevant to the application.

¹ This specification is under the jurisdiction of ASTM Committee F08 on Sports Equipment, Playing Surfaces, and Facilities and is the direct responsibility of Subcommittee F08.22 on Camping Softgoods.

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This specification cannot be used to assess fire risk if any conditions are different from those contained in this specification.

1.8 This specification revises CPAI-84, *Specification for Flame-Resistant Materials Used in Camping Tentage* as it relates to recreational camping tents.²

1.9 *Units*—The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

1.10 *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.*

1.11 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

F2441 Practice for Labeling of Backpacking and Mountaineering Tents and Bivouac Sacks

2.2 NFPA Standards:⁴

NFPA 1 Fire Code

NFPA 101 Life Safety Code

2.3 Other Standards:

ANSI Z535.4 Safety Labels Construction⁵

CAN/CGSB-182.1 Flammability and labelling requirements for tents⁶

CPAI-84 A Specification for Flame-Resistant Materials Used in Camping Tentage⁷

IFC International Fire Code⁸

3. Terminology

3.1 Definitions:

3.1.1 *camping appliance, n*—device typically used to cook or heat and powered by gas, wood, or another solid state fuel.

² ASTM International owns the rights to CPAI-84, *A Specification for Flame-Resistant Materials Used in Camping Tentage*, having purchased the rights to the standard from the Industrial Fabrics Association International (formerly the Canvas Products Associated International, or CPAI). The CPAI-84 standard was last updated in 1995.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ Available from National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, MA 02169-7471, <http://www.nfpa.org>.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁶ Available from Sales Centre Canadian General Standards Board, 11 Laurier St., Gatineau, Canada K1A 1G6 and at <https://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/boutique-store-eng.html>.

⁷ Available from www.ifai.com at https://www.ifai.com/nf_inventory_category/specifications/.

⁸ Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

3.1.2 *tent, n*—portable temporary shelter for persons intended for outdoor use as protection from environmental elements, made of fabric and other pliable materials the sides of which are fully enclosed to the ground, and which has structural elements that create a controlled method for egress of the structure such as doors, flaps, walls, or similar elements.

3.1.2.1 *Discussion*—In the event of a fire to a recreational camping tent, an individual's safest immediate course of action is to exit the burning tent as quickly as possible. A canopy without sidewalls or doors would likely not restrict a tent's occupant(s) ability to escape the interior of a tent in the event of a fire.

4. Purpose

4.1 This specification sets forth revised and updated test methods for recreational camping tents in recognition of the variety of new materials and technologies used to manufacture modern tents of mostly synthetic materials since the CPAI-84 standard was developed in 1972 and last updated in 1995. **Appendix X3** includes summaries of newly available global, comparative injury surveillance data for tent flammability strongly suggesting that the change in the design and manufacturing of tents to use these mostly synthetic materials has led to a further reduction in what had previously been observed to be a low incidence rate of fires and associated injuries with recreational camping tents.

4.2 This specification also incorporates by reference Practice **F2441** which specifies warnings and labels that shall be added to tents to inform users of the risk of fires and of other commonly recognized hazards involving tents in outdoor consumer recreational camping.

5. Flammability Requirements and Test Methods

5.1 Tents which are marketed as acceptable for the use of camping appliances within them shall be evaluated to and comply with the test methods set forth in sections 2-5 of CAN/CGSB-182.1 described in this standard.

5.1.1 Permission for use has been granted by the Canadian General Standards Board (CGSB) and the test standard is available to the public for free at the CGSB website or upon request.

5.2 Testing Scope:

5.2.1 *Size Criteria*—Each fabric or other pliable tent material in a consumer tent with a surface area greater than 1000 cm², based on a length by width measurement, is evaluated according to the test method described in this standard.

5.2.2 *Tent Components or Accessories*—Tent components or accessories made of fabric or other pliable material, and intended to be used with the tent, such as side panels, curtains, and flies, whether sold with the tent or sold separately, are subject to the flammability requirements (but not the labelling requirements) if they meet the size criteria.

5.3 Testing Exemptions:

5.3.1 *Size Criteria*—Each fabric or other pliable tent material with a surface area equal to or less than 1000 cm², based on a length by width measurement, is not required to be evaluated according to the test method described in this specification.

5.3.2 *Composition*—“No-see-um”-type netting or mesh materials weighing 50g/m² or less are exempted from the testing requirements of this specification (from existing CPAI-84).

5.4 *Component Testing*—Materials that have passed the test methods in 5.1 in previous testing and for which no material changes are known to have occurred shall be deemed to be compliant through the use of so-called component testing.

6. Product Marking

6.1 Tents which are marketed as acceptable for the use of camping appliances within them shall be labeled in accordance with the appropriate warning set forth in Practice F2441.

6.2 Tents which are not marketed as acceptable for the use of camping appliances within them shall be labeled in accordance with the appropriate warning set forth in Practice F2441.

6.3 The size of the tent label shall be large enough so that the font and images are drafted in accordance with ANSI Z535.4.

7. Keywords

7.1 camping; camping appliance; flame retardants; flammability; recreational; tents

APPENDIXES

(Nonmandatory Information)

X1. RATIONALE FOR 2019 REVISIONS

X1.1 The product category exclusions of 1.2 were selected due to their historical inclusion in the CPAI-84 standard (over that standard’s 45 years of existence) and upon a review of current incident data, none of which demonstrated a need to include these products in this safety specification. The subcommittee agrees that it should periodically revisit these product categories to if new reports of harm and data suggest it to be necessary.

X1.2 The definition of tent in 3.1.2 was tailored to focus specifically on products where egress could inhibit an immediate exit to safety from a burning tent. Where a tent is open on one or more sides, the subcommittee did not include such a product within the scope of this standard specification as such a product would not normally impede an occupant from exiting the tent in the event of a fire. This specification is intended to address only the immediate risk of acute injury associated with a fire and not with the health and safety effects potentially associated with a loss of shelter due to the event of a fire.

X1.3 The size exclusion of 1000 cm² described in 5.3.1 is based on the historical inclusion of this exemption (described in CPAI-84 as “1 ft”) through the existence of the CPAI-84 standard and is also consistent with a similar exclusion in the current Canada National Standard CAN/CGSB-182.1.

X1.4 The exclusion of “No-see-um”-type netting or mesh materials weighing 50g/m² or less described in 5.3.2 is based on the historical inclusion of this exemption throughout the existence of the CPAI-84 standard since 1972 and the lack of empirical incident data suggesting a need to include this material in this safety specification.

X1.5 The subcommittee’s reliance on sections 2-5 of CAN/CGSB-182.1 as the designated test method described in 5.1 of this standard specification is based on a multiple year effort coordinated by the Canadian General Standards Board, resulting in independent laboratory testing of multiple samples of textiles to that new standard by the CGSB, a governmental body in Canada.⁹ The method outlined in sections 2-5 of CAN/CGSB-182.1, undertaken at the request of Health Canada, has produced repeatable and reproducible results in a manner that CPAI-84 (and Canada’s *Tents Regulations*, which relied upon sections of CPAI-84) did not. Health Canada recognized the need for a new test method to update its *Tents Regulations* and provided funding to underwrite the standards development. Health Canada acknowledged that most tents in today’s contemporary market are made of synthetic, lighter-weight materials, such as polyester and nylon, with significantly different burning properties than those of paraffin-coated (waxed) cotton canvas for which the original CPAI-84 was designed. Health Canada also acknowledged “The current *Regulations* may also inhibit industry from developing and using tent materials that would likely be deemed safe from a risk perspective but cannot meet the current regulatory requirements.”¹⁰

⁹ Results of these tests undertaken at the behest of CGSB are available in the ASTM collaboration portal for this standard or upon direct request to ASTM International. The test results are provided as a courtesy by CGSB and their use is limited by CGSB solely for the purpose and use of this subcommittee in promulgating this standard. The test results shall not be relied upon for any other purpose. The test results were conducted during development of the CAN/CGSB-182.1 test methods.

¹⁰ Notice to interested parties – Proposal to amend the *Tents Regulations*, including consequential amendments to the Toys Regulations at <https://www.canada.ca/en/health-canada/programs/consultation-amend-tent-regulations/document.html> (Accessed July 2019).