



# UL 7001

## SUSTAINABILITY STANDARD

### Household Refrigeration Appliances



Standard for Sustainability for Household Refrigeration Appliances, UL 7001

Third Edition, Dated October 27, 2021

### **Summary of Topics**

***This new edition of the Sustainability Standard for Household Refrigeration Appliances, AHAM 7001/CSA R7001/UL 7001, dated October 27, 2021, is to add a note to 9.5.2.1(b) to provide guidance and clarification to the standard's text and to make editorial revisions to address administrative requirements listed in the standard.***

These requirements are substantially in accordance with Proposal(s) on this subject dated February 26, 2021.

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AHAM 7001-2021  
Third Edition



CSA Group  
CSA R7001:21  
Second Edition



Underwriters Laboratories Inc.  
UL 7001  
Third Edition

## Sustainability Standard for Household Refrigeration Appliances

October 27, 2021



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This standard is issued jointly by the Association of Home Appliance Manufacturers (AHAM), the Canadian Standards Association (operating as "CSA Group"), and Underwriters Laboratories Inc. (UL). Comments or proposals for revisions on any part of the standard may be submitted to AHAM, CSA Group, or UL at any time.

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## Preface

This is the second edition of CSA R7001, the third edition of UL 7001, and the most recent version of AHAM 7001, Sustainability Standard for Household Refrigeration Appliances.

This harmonized standard was prepared by the Association of Home Appliance Manufacturers (AHAM), CSA Group, and Underwriters Laboratories Inc. (UL). The efforts and support of the Technical Harmonization Committee are gratefully acknowledged.

This standard was prepared by CSA Technical Committee on Sustainability of Household Appliances under the jurisdiction of CSA Strategic Steering Committee on Business Management and Sustainability and has been formally approved by the CSA Technical Committee. This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

The environmental performance of refrigeration home appliances is commonly evaluated on the single environmental attribute of electricity consumption during use. This Standard takes a multi-attribute, life cycle approach to measuring a broad spectrum of environmental and social impacts of refrigeration home appliances as a means of assessing sustainability performance. The multi-attribute approach was developed using representative product life cycle assessment (LCA) information along with other key factors such as hot-spot or hot-button analyses influencing product environmental performance. The attributes and criteria in this Standard are drawn from a much larger list and reflect the understanding of the attributes and criteria that are most prominent in sustainable performance and over which the manufacturers of these products have control. This approach, detailed in Annex [A](#), determined the environmental attributes of refrigeration appliances for inclusion in this Standard. The authors acknowledge that revisions to this Standard will be considered periodically and that future editions may consider a broader range of sustainability criteria.

It has been contemplated by all parties that this Standard will be updated to reflect new U.S. Department of Energy or Natural Resources Canada minimum energy performance standards for refrigeration products. Many of the measurements included in this Standard are unique and have not been conducted on other appliance categories. The Standard's committees expect to learn much from the application of this First Edition in subsequent years. The use of this Standard and self-assessment by refrigeration products manufacturers and external third-party assessment bodies will be used to improve the Standard in drafting the second and subsequent editions.

This Standard was written specifically for products placed on the market in the United States and Canada. At the present time, a number of the calculations are based on systems and designs of products in North America.

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## Foreword

The Association of Home Appliance Manufacturers (AHAM), CSA Group, and Underwriters Laboratories Inc. (UL), as a Task Force, under the jurisdiction of the AHAM Major Appliance Engineering Council, CSA Strategic Steering Committee on Business Management and Sustainability, and UL Environment, collaborated with experts and stakeholders to initiate development of product standards for home appliances as the first step in a broader product sustainability initiative. The overall goal of this family of standards is to provide meaningful product sustainability performance information to consumers and stakeholders. It is intended for this initiative to drive innovation and continual improvement in the sustainability performance of home appliances by empowering consumers. This Standard is based on product life cycle information and consideration for consumer expectations. It provides information for consumers, governments, retailers, and other program developers to help distinguish between products based on environmental criteria.

AHAM, CSA, and UL would like to acknowledge the assistance of PE INTERNATIONAL and Five Winds Strategic Consulting whose staff served as experts and project managers.

### AHAM

The Association of Home Appliance Manufacturers (AHAM) represents manufacturers of major, portable, and floor care home appliances, and suppliers to the industry in the U.S. and Canada. AHAM's membership includes over 150 companies throughout the world. AHAM is also a standards development organization, accredited by the American National Standards Institute (ANSI), and authors numerous appliance performance testing standards used by manufacturers, consumer organizations, and governmental bodies to rate and compare appliances. AHAM administers several appliance rating verification programs, employing third party laboratories. AHAM's consumer safety education program has educated millions of consumers on ways to properly and safely use appliances such as portable heaters, clothes dryers, and cooking products.

### CSA

Canadian Standards Association (operating as "CSA Group") is a not-for-profit membership-based association serving business, industry, government, and consumers in the global marketplace. As a solutions-oriented organization, we work around the world to develop standards that address real needs such as enhancing public safety and health, advancing the quality of life, helping to preserve the environment, and facilitating trade.

### UL

Underwriters Laboratories Inc. (UL) is a global independent safety science company offering expertise across five key strategic businesses: Product Safety, Environment, Life & Health, Knowledge Services, and Verification Services. Our breadth, established objectivity, and proven history mean we are a symbol of trust and enable us to help provide peace of mind to all. In addition to being a leader in safety science, UL is a world leader in standards development for safety, health, and sustainability. Through more than a century of involvement in the standards and conformity assessment community, UL is recognized for its unrivaled technical expertise, and our Standards are used to evaluate and certify products and systems. UL Standards are used by manufacturers to help them design products and systems to meet the requirements for certification, by code development organizations that adopt and reference them in their codes, and by certification organizations that utilize UL requirements for their own certifications.

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# Sustainability Standard for Household Refrigeration Appliances

## 1 Scope

1.1 This Standard covers two-phase refrigerant compression-type refrigeration appliances for household use included within the scope of the U.S. Department of the Energy (DoE) and Canadian Federal Energy Efficiency Regulations minimum energy performance requirements. This includes the following product categories:

- (a) refrigerators;
- (b) refrigerator-freezers;
- (c) chest and upright freezers; and
- (d) compact refrigerator/freezers.

1.2 This Standard does not cover absorption-type refrigerators or refrigeration appliances for commercial use.

## 2 General

2.1 In this Standard, "shall" is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; "should" is used to express a recommendation or that which is advised but not required; and "may" is used to express an option or that which is permissible within the limits of the Standard. Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material. Notes to tables and figures are considered part of the table or figure and may be written as requirements. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

## 3 References

### 3.1 Normative references

3.1.1 Where reference is made to any Standards, such reference shall be considered to refer to the latest editions and revisions thereto available at the time of printing, unless otherwise specified.

#### Canadian Competition Bureau

*The Competition Act, R.S.C. 1985 c. C-34*

*Consumer Packaging and Labelling Act, R.S.C. 1985, c. C-38*

*Textile Labelling Act, R.S.C. 1985, c. T-10*

#### CDP (Carbon Disclosure Project)

*Supply Chain Program*

**CSA Group**

CAN/CSA-C300-18

*Energy performance and capacity of household refrigerators, refrigerator-freezers, freezers, and wine chillers*

CAN/CSA-ISO 14001:16

*Environmental management systems – Requirements with guidance for use*

CAN/CSA ISO 14021:00

*Environmental labels and declarations – Self-declared environmental claims (Type II environmental labelling)*

**European Commission**

*Regulation (EC) No. 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a community eco-management and audit scheme (EMAS)*

**European RoHS Directive (Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment)**

*Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment*

**Government of Canada**

Energy Efficiency Regulations, SOR/94-651

**IPC (Association Connecting Electronics Industries)**

1752A-2010

*Materials Declaration Management*

**ISO (International Organization for Standardization)**

11469:2000

*Plastics – Generic identification and marking of plastics products*

14001:2015

*Environmental management systems – Requirements with guidance for use*

14020:2000

*Environmental labels and declarations – General principles*

14024:1999

*Environmental labels and declarations – Type I environmental labelling – Principles and procedures*

14040:2006

*Environmental management – Life cycle assessment – Principles and framework*

14044:2006

*Environmental management – Life-cycle assessment – Requirements and guidelines*

14050:2009

*Environmental management – Vocabulary*

14064-1:2006

*Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*

14064-2:2006

*Greenhouse gases – Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements*

**ISO/IEC (International Organization for Standardization/International Electrotechnical Commission)**

Guide 67:2004

*Conformity assessment – Fundamentals of product certification*

17000:2004

*Conformity assessment – Vocabulary and general principles*

**SAE (Society of Automotive Engineers)**

J1344:1997

*Marking of Plastic Parts*

**TCR (The Climate Registry)**

*General Reporting Protocol, Version 2.0, March 2013*

**UL (Underwriters Laboratories)**

113 (2010)

*Procedure for the Preparation of a Toxicological Assessment*

2789 (2014)

*Environmental Claim Validation Procedure for Calculation of Estimated Recyclability Rate*

**UNEP (United Nations Environment Programme)**

*Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer*

[http://ozone.unep.org/Publications/MP\\_Handbook/MP-Handbook-2009.pdf](http://ozone.unep.org/Publications/MP_Handbook/MP-Handbook-2009.pdf)

**US Government**

16 CFR Part 260 (2012)

*Federal Trade Commission's Guides for the Use of Environmental Marketing Claims*

<https://www.ftc.gov/policy/federal-register-notices/guides-use-environmental-marketing-claims-green-guides-and-packaging>

42 U.S.C. 6201

*Energy Policy and Conservation Act*

## 4 Definitions

4.1 The following definitions shall apply in this Standard:

**Note:** For consistency, where possible, the definitions in this Standard are taken from existing standards and guidance documents listed as Normative References. Source documents are noted in brackets following the definition.

4.2 **Accreditation** – third-party attestation related to a conformity assessment body conveying a formal demonstration of its competence to carry out specific conformity assessment tasks.

**Note:** These tasks include sampling and testing, inspection, certification, and registration. [ISO/IEC 17000, Conformity assessment – Vocabulary and general principles]

4.3 **Attestation** – issue of a statement, based on a decision following review, that fulfillment of specified requirements has been demonstrated. [ISO/IEC 17000]

4.4 **Attribute** – a characteristic of a product that has a direct influence on the environmental performance of the product.

4.5 **Brand owner** – a company that manages a brand name.

**Note:** This company might or might not have engineering, manufacturing, or quality assurance activities. This company might be an original equipment manufacturer (OEM) but might also purchase a finished product from an OEM and conduct sales, marketing, and management of the brand name.

4.6 **Certification** – third-party attestation related to products, processes, or persons that conveys assurance that specified requirements have been demonstrated. [ISO/IEC 17000]

4.7 **Conformity assessment** – demonstration that specified requirements relating to a product, process, system, person, or body are fulfilled. [ISO/IEC 17000]

**Note:** For this Standard, conformity assessment includes:

- (a) sampling and testing;
- (b) inspection;
- (c) first-party declaration of conformity;
- (d) certification;
- (e) registration;
- (f) accreditation of the competence of those activities by a third-party; and
- (g) recognition (usually by a government agency) of an accreditation program's capability.

4.8 **Criteria** – the environmental requirements that the product needs to meet in order to be awarded an environmental label. [ISO 14024]

4.9 **Dematerialization** – the reduction of the mass of and/or number of materials used in the production of the final product.

**Note:** In the Task Force's opinion, for appliances, a more appropriate measure is the more efficient use of raw materials. For example, reintroducing scrap materials into the production process might not result in a reduction in mass but would constitute a more efficient use of raw materials.

**4.10 Environmental management system (EMS)** – part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects. [ISO 14050]

**4.11 EU eco-management and audit scheme (EMAS)** – an environmental performance management tool covered in Regulation (EC) No. 1221/2009 of the European Parliament and of the Council of 25 November 2009 based on Environmental Management System (EMS) guided by ISO 14001.

**Note:** EMAS provides a methodology for environmental audit, policy development, and system implementation, and requires independent third-party verification and validation of the EMAS and results in a registry listing and certified eco-label: [http://ec.europa.eu/environment/emas/index\\_en.htm](http://ec.europa.eu/environment/emas/index_en.htm).

**4.12 First, second, and third party –**

**First party** – generally the person or organization that provides the object.

**Note:** In the case of this Standard, the first party is the appliance manufacturer.

**Second party** – generally the person or organization that has a user interest in the product, such as the customer.

**Third party** – the person or body that is recognized as being independent of the person or organization that provides the object, as well as the user or customer of the object. [ISO/IEC 17000]

**4.13 First-party declaration** – a procedure by which a first party conveys assurance that the object of conformity fulfills specified requirements. [ISO/IEC 17000]

**4.14 Global warming potential (GWP)** – a factor describing the radiative forcing impact of one mass-based unit of a given GHG relative to an equivalent unit of carbon dioxide over a given period of time.

**4.15 Greenhouse gas (GHG)** – the gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. [ISO 14050]

**4.16 Greenhouse gas (GHG) scopes [ISO 14064-1] –**

**Direct greenhouse gas emission (scope I)** – GHG emission from greenhouse gas sources owned or controlled by the organization.

**Energy indirect greenhouse gas emission (scope II)** – GHG emission from the generation of imported electricity, heat, or steam consumed by the organization.

**Other indirect greenhouse gas emission (scope III)** – GHG emission, other than energy indirect GHG emissions, which is a consequence of an organization's activities but arises from greenhouse gas sources that are owned or controlled by other organizations.

**4.17 Hot buttons** – issues of high concern for consumers when thinking about sustainability and, more specifically, about the impact of product life cycles.

**Note:** "Hot buttons" (consumer-identified issues) might or might not align with "hot spots" (expert-identified issues).

**4.18 Hot spots** – areas of a product life cycle that have significant potential impact on a given environmental, social, or economic aspect.

**Note:** While there are no set quantitative criteria to determine a hot spot, it is generally regarded as contributing more than 5% of the total impact on a given aspect. In some instances, a hot spot might not be represented as a percentage of impact due to lack of data or complexity of the system. In these instances, a hot spot can be identified based solely on expert opinion.

**4.19 Impact category** – a class representing environmental issues of concern to which LCA results can be assigned.

**Note:** Commonly accepted LCA impact categories include:

- (a) climate change potential (also known as “global warming potential” – GWP);
- (b) acidification potential (AP);
- (c) ozone depletion potential (ODP); and
- (d) eutrophication potential (EP).

*For some impact categories, LCA might not be the most appropriate quantification tool. For example, the ecotoxicity (ET) and human toxicity (HT) impact categories are more commonly determined using chemical risk assessment.*

**4.20 Industrial scrap** – materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

**4.21 Interested parties** – a person or group that has a stake in the success or performance of this Standard and that might be influenced by the development and use of this Standard or that might have an influence over it.

**Note:** Examples of interested parties include customers, suppliers, NGOs, government, consumer groups, or members of the general public. Interested parties are also referred to as “stakeholders”.

**4.22 Life cycle assessment (LCA)** – compilation and evaluation of the inputs, outputs, and potential environmental impacts of a product system throughout its life cycle. [ISO 14040]

**4.23 Life cycle inventory (LCI)** – the step in conducting a life cycle assessment that involves data collection and modeling of the product system, as well as description and verification of data. This encompasses all data related to environmental (e.g., CO<sub>2</sub>) and technical (e.g., intermediate chemicals) quantities for all relevant unit processes within the study boundaries that compose the product system.

**Note:** Examples of inputs and outputs quantities include inputs of materials, energy, chemicals, and “other”, and outputs of air emissions, water emissions, or solid waste. Other types of exchanges or interventions such as radiation or land use can also be included. [ISO 14040 and ISO 14044]

**4.24 Mapping** – developing a methodology to easily identify the location of recyclable materials within the product.

**4.25 Metric** – quantification of the criteria that can be measured.

**4.26 Original equipment manufacturer (OEM)** – the manufacturer or assembler of the complete appliance.

**Note:** The OEM could include fabrication of components, molded or stamped parts, or partial assemblies. The OEM also refers to the location where the completed refrigeration product is assembled for shipment to the retailer or end customer.

**4.27 Packaging** – a coordinated system of preparing goods for transport, warehousing, logistics, sale, and end use.

**Note:** Packaging might include the material that contains, protects, preserves, and transports the product, and which also provides information about the product to the customer. Packaging includes the customized containment intended for storage and protection of the appliance during its useful life.

4.28 **Post-consumer material** – material generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. See Annex [E](#).

4.29 **Pre-consumer material** – material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it. See Annex [E](#).

4.30 **Product certification** – an activity by which a third-party gives written assurance that a product fulfills specified requirements. [ISO/IEC Guide 67]

4.31 **Product stewardship** – a product-centered approach to environmental protection. It calls on those in the product lifecycle – manufacturers, retailers, users, and disposers – to share responsibility for reducing the environmental impacts of products.

**Note:** *Product stewardship is described by the U.S. EPA at <https://archive.epa.gov/wastes/conserve/tools/stewardship/web/html/index.html>.*

4.32 **Progress** – the ability to show, based on empirical data, an increase or decrease in the relevant measurement over a specified time period. The specified time period will be defined as the term is used in individual sections.

4.33 **Recycle** – the series of activities, including collection, separation, and processing, by which products or other materials are recovered from the solid waste stream for use in the form of raw materials for the manufacture of new products (other than fuel).

4.34 **Registration** – third-party attestation related to systems that convey assurance that specified requirements have been demonstrated.

**Note:** *Such systems include those established for the management of product, process, or service quality and environmental performance. [ISO/IEC 17000]*

4.35 **Stakeholder** – those groups or individuals

(a) who can reasonably be expected to be significantly affected by the organization's activities, products, and/or services; or

(b) whose actions can reasonably be expected to affect the ability of the organization to successfully implement its strategies and achieve its objectives. [GRI]

4.36 **Standard** – document approved by a recognized body, that provides, for common and repeated use, rules, guidelines, or characteristics for products or related processes and production methods, with which compliance is not mandatory. [WTO TBT Agreement]

4.37 **Sustainable development** – development that meets the needs of the present without compromising the ability of future generations to meet their own needs. [UN World Commission on the Environment and Development]

4.38 **Task force** – the original AHAM-CSA Group-UL Task Force responsible for the development of the original seed document of this Standard.

4.39 **Test** – technical operation that consists of the determination of one or more characteristics of a given product, material, equipment, organism, person's qualification, physical phenomenon, process, or service in accordance with a specified technical procedure (test method). [ISO/IEC 17000]