



**CSA
Group**

CAN/CSA-C300-18
National Standard of Canada



Energy performance and capacity of household refrigerators, refrigerator- freezers, freezers, and miscellaneous refrigeration products



Standards Council of Canada
Conseil canadien des normes

This is a preview. [Click here to purchase the full publication.](#)

Legal Notice for Standards

Canadian Standards Association (operating as “CSA Group”) develops standards through a consensus standards development process approved by the Standards Council of Canada. This process brings together volunteers representing varied viewpoints and interests to achieve consensus and develop a standard. Although CSA Group administers the process and establishes rules to promote fairness in achieving consensus, it does not independently test, evaluate, or verify the content of standards.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document’s fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party’s intellectual property rights. CSA Group does not warrant the accuracy, completeness, or currency of any of the information published in this document. CSA Group makes no representations or warranties regarding this document’s compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL CSA GROUP, ITS VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF CSA GROUP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, CSA Group is not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and CSA Group accepts no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

CSA Group is a private not-for-profit company that publishes voluntary standards and related documents. CSA Group has no power, nor does it undertake, to enforce compliance with the contents of the standards or other documents it publishes.

Intellectual property rights and ownership

As between CSA Group and the users of this document (whether it be in printed or electronic form), CSA Group is the owner, or the authorized licensee, of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. Without limitation, the unauthorized use, modification, copying, or disclosure of this document may violate laws that protect CSA Group’s and/or others’ intellectual property and may give rise to a right in CSA Group and/or others to seek legal redress for such use, modification, copying, or disclosure. To the extent permitted by licence or by law, CSA Group reserves all intellectual property rights in this document.

Patent rights

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. CSA Group shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Authorized use of this document

This document is being provided by CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.



This is a preview. [Click here to purchase the full publication.](#)

Standards Update Service

CAN/CSA-C300-18 *July 2018*

Title: *Energy performance and capacity of household refrigerators, refrigerator-freezers, freezers, and miscellaneous refrigeration products*

To register for e-mail notification about any updates to this publication

- go to shop.csa.ca
- click on **CSA Update Service**

The **List ID** that you will need to register for updates to this publication is **2426368**.

If you require assistance, please e-mail techsupport@csagroup.org or call 416-747-2233.

Visit CSA Group's policy on privacy at www.csagroup.org/legal to find out how we protect your personal information.

Canadian Standards Association (operating as “CSA Group”), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

Individuals, companies, and associations across Canada indicate their support for CSA Group’s standards development by volunteering their time and skills to Committee work and supporting CSA Group’s objectives through sustaining memberships. The more than 7000 committee volunteers and the 2000 sustaining memberships together form CSA Group’s total membership from which its Directors are chosen. Sustaining memberships represent a major source of income for CSA Group’s standards development activities.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in eight countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard
Toronto, Ontario, M9W 1R3
Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, Ontario, K1P 6L5
Canada



Standards Council of Canada
Conseil canadien des normes

Cette Norme Nationale du Canada est disponible en versions française et anglaise.

Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users to judge its suitability for their particular purpose.

**A trademark of the Canadian Standards Association, operating as “CSA Group”*

This is a preview. Click here to purchase the full publication.

National Standard of Canada

CAN/CSA-C300-18

Energy performance and capacity of household refrigerators, refrigerator- freezers, freezers, and miscellaneous refrigeration products



*®A trademark of the Canadian Standards Association,
operating as "CSA Group"*



*Published in July 2018 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3*

*To purchase standards and related publications, visit our Online Store at shop.csa.ca
or call toll-free 1-800-463-6727 or 416-747-4044.*

*ICS 97.040.30
ISBN 978-1-4883-1574-9*

*© 2018 Canadian Standards Association
All rights reserved. No part of this publication may be reproduced in any form whatsoever
without the prior permission of the publisher.*

[This is a preview. Click here to purchase the full publication.](#)

Contents

Technical Committee on Residential Equipment	4
C300 Harmonization Task Group (HTG)	6
Preface	7
1 Scope	9
2 Reference publications	9
3 Definitions	10
4 General requirements	22
4.1 Test room	22
4.1.1 Ambient temperature	22
4.1.2 Ambient temperature gradient	22
4.1.3 Air circulation	22
4.1.4 Radiation	22
4.1.5 Platform	22
4.2 Instruments	22
4.2.1 Temperature	22
4.2.2 Increasing the heat capacity of a thermocouple junction	23
4.2.3 Temperature measurements in a freezer/freezer compartment	23
4.2.4 Electrical measurements	24
4.2.5 Time	24
4.2.6 Length	24
4.3 General test requirements	24
4.3.1 Steady-state conditions	24
4.3.2 Power supply	24
4.3.3 Preparation of the test sample	24
4.3.4 Ambient temperature measurement	27
4.4 Intent of test procedure	27
4.4.1 General	27
4.4.2 Equipment operation	27
4.5 Product category determination	28
5 Volume calculation methods	28
5.1 Determination of volume	28
5.2 Volume of evaporator space	29
5.3 Example of volume calculations	29
6 Sampling plan — Size of sample	30
7 Data to be recorded	30
8 Refrigerators and refrigerator-freezers	30
8.1 General	30

8.1.1	General requirements	30
8.1.2	Total refrigerated volume	30
8.1.3	Total refrigerated volume data to be reported	30
8.2	Procedure for testing refrigerators and refrigerator-freezers	30
8.2.1	General	30
8.2.2	Defrost and anti-sweat heater controls	30
8.2.3	Load conditions	31
8.2.4	Temperature measurements	31
8.2.5	Temperature control settings	33
8.2.6	Testing sequence	34
8.2.7	Test period	35
8.3	Calculating the energy consumption of refrigerators or refrigerator-freezers.	38
8.3.1	Per-day energy consumption	38
8.3.2	Average per-cycle energy consumption	42
8.3.3	Basic refrigerators and refrigerator-freezers	42
8.3.4	Anti-sweat heater correction factor calculation	44
8.4	Annual energy consumption for refrigerators and refrigerator-freezers	44
8.5	Maximum energy consumption limits for refrigerators or refrigerator-freezers.	44
8.5.1	Adjustment volume for refrigerators and refrigerator freezer	44
8.5.2	Adjustment factor	45
8.5.3	Maximum energy consumption for refrigerators and refrigerator-freezers	45

9 Freezers 46

9.1	General	46
9.1.1	General requirements	46
9.1.2	Total freezer volume	46
9.1.3	Total refrigerated volume data to be reported	46
9.2	Procedure for testing freezers	46
9.2.1	Test conditions	46
9.2.2	Defrost and anti-sweat heater controls	46
9.2.3	Load conditions	46
9.2.4	Temperature measurements	47
9.2.5	Freezer compartment temperature	48
9.2.6	Temperature control settings	48
9.2.7	Testing sequence	49
9.2.8	Test period	49
9.3	Calculating the energy consumption of freezers.	51
9.3.1	Per-day energy consumption	51
9.3.2	Average per-cycle energy consumption	53
9.3.3	Compressor running time	54
9.3.4	Calculation of freezing capability	55
9.4	Maximum energy consumption limits for freezers	55
9.4.1	Adjusted volume of freezers	55
9.4.2	Maximum energy consumption for freezers	56
9.5	Annual energy consumption for freezers	56

10 Miscellaneous refrigeration products 56

10.1	General	56
10.1.1	General requirements	56

10.1.2	Total refrigerated volume	56
10.1.3	Total refrigerated volume data to be reported	56
10.2	Test conditions	56
10.2.1	General	56
10.2.2	Defrost and anti-sweat heater controls	56
10.2.3	Load conditions	57
10.2.4	Temperature measurements	57
10.2.5	Temperature control settings	60
10.2.6	Testing sequence	61
10.2.7	Test period	62
10.3	Calculating the energy consumption of miscellaneous refrigeration products	65
10.3.1	Per-day energy consumption	65
10.3.2	Average per-cycle energy consumption	68
10.3.3	Anti-sweat heater correction factor calculation	70
10.4	Annual energy consumption for miscellaneous refrigeration products	70
10.5	Maximum energy consumption limits for miscellaneous refrigeration products	71
10.5.1	Adjusted volume of miscellaneous refrigeration products	71
10.5.2	Maximum energy consumption for miscellaneous refrigeration products	71

Annex A (informative)	— Temperature settings during tests	86
Annex B (informative)	— Sampling size	87

Technical Committee on Residential Equipment

G.R. Hamer	BC Hydro, Burnaby, British Columbia <i>Category: User Interest/Regulatory Authority</i>	<i>Chair</i>
J.K. Hodge	Toronto, Ontario <i>Category: General Interest</i>	<i>Vice-Chair</i>
G. Butt	Emerson Electric Canada Limited, Markham, Ontario <i>Category: Producer Interest</i>	
A. Carrier	Hydro-Québec, Montréal, Quebec <i>Category: User Interest/Regulatory Authority</i>	
K.N. Delves	Natural Resources Canada, Ottawa, Ontario	<i>Non-voting</i>
C. Granat	SaskPower, Regina, Saskatchewan	<i>Non-voting</i>
S. Grubbe	Calgary, Alberta <i>Category: General Interest</i>	
G.D. Henriques	Henriques Consulting, Richmond, British Columbia	<i>Non-voting</i>
P. Hikspoors	Giant Factories Inc. Usines Giant Inc., Montreal, Quebec	<i>Non-voting</i>
W. Huzar	Consumers Council of Canada, Victoria, British Columbia <i>Category: General Interest</i>	
A. Kelly	Canadian Electricity Association (CEA), Ottawa, Ontario	<i>Non-voting</i>
R. Kelly	Efficiency Nova Scotia Corporation, Dartmouth, Nova Scotia	<i>Non-voting</i>

S. Krsikapa	Ontario Ministry of Energy, Toronto, Ontario <i>Category: User Interest/Regulatory Authority</i>	
T.K. Lau	BC Hydro, Vancouver, British Columbia	<i>Non-voting</i>
C. Lesage	Giant Factories Inc. Usines Giant Inc., Montreal Est, Quebec <i>Category: Producer Interest</i>	
C. Li	Hydro One Networks Inc., Toronto, Ontario	<i>Non-voting</i>
G. Lundy	IBM Canada Ltd IBM Canada Lté, Markham, Ontario <i>Category: Producer Interest</i>	
R. McIntyre	Electro-Federation Canada, Toronto, Ontario	<i>Non-voting</i>
E. Milakowski	Ontario Ministry of Energy, Toronto, Ontario	<i>Non-voting</i>
R. Mortazavi	Natural Resources Canada, Ottawa, Ontario <i>Category: User Interest/Regulatory Authority</i>	
A. Orumwense	Natural Resources Canada, Ottawa, Ontario	<i>Non-voting</i>
B.L. Rebel	Association of Home Appliance Manufacturers Canada (AHAM), Ottawa, Ontario <i>Category: Producer Interest</i>	
R.J. Singlehurst	Natural Resources Canada, Ottawa, Ontario	<i>Non-voting</i>
H. Tse	Independent Electricity System Operator (IESO), Toronto, Ontario	<i>Non-voting</i>
J. Cheema	CSA Group, Toronto, Ontario	<i>Project Manager</i>