



**ASSE 1070-2020/
ASME A112.1070-2020/
CSA B125.70:20**
National Standard of Canada
American National Standard

Performance requirements for water temperature limiting devices



Standards Council of Canada
Conseil canadien des normes

Legal Notice for Harmonized Standard Jointly Developed by ASME, ASSE, and CSA Group

Intellectual property rights and ownership

As between American Society of Mechanical Engineers (“ASME”), ASSE International Chapter of IAPMO, LLC. (“ASSE”), and Canadian Standards Association (Operating as “CSA Group”) (collectively “ASME, ASSE, and CSA Group”) and the users of this document (whether it be in printed or electronic form), ASME, ASSE, and CSA Group are the joint owners 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. The unauthorized use, modification, copying, or disclosure of this document may violate laws that protect the intellectual property of ASME, ASSE, and CSA Group and may give rise to a right in ASME, ASSE and CSA Group to seek legal redress for such use, modification, copying, or disclosure. ASME, ASSE, and CSA Group reserve all intellectual property rights in this document.

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. ASME, ASSE, and CSA Group do not warrant the accuracy, completeness, or currency of any of the information published in this document. ASME, ASSE, and CSA Group make no representations or warranties regarding this document’s compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL ASME, ASSE, AND CSA GROUP, THEIR RESPECTIVE 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 ASME, ASSE, OR CSA GROUP HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, ASME, ASSE, and CSA Group are 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 ASME, ASSE, and CSA Group accept no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

ASME, ASSE, and CSA Group have no power, or do they undertake, to enforce compliance with the contents of the standards or other documents they jointly publish.

Authorized use of this document

This document is being provided by ASME, ASSE, and 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 ASME, ASSE, and 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 ASME, ASSE, and 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.



Standards Update Service

*ASSE 1070-2020/
ASME A112.1070-2020/
CSA B125.70:20
October 2020*

Title: *Performance requirements for water temperature limiting devices*

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

- go to store.csagroup.org
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **2427761**.

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 n'est disponible qu'en anglais.

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”*

CSA Group

The 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 Groups 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 Groups 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 product 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,
Canada M9W 1R3

American National Standards Institute

The American National Standards Institute (ANSI), Inc. is the nationally recognized coordinator of voluntary standards development in the United States through which voluntary organizations, representing virtually every technical discipline and every facet of trade and commerce, organized labor and consumer interests, establish and improve the some 10,000 national consensus standards currently approved as American National Standards.

ANSI provides that the interests of the public may have appropriate participation and representation in standardization activity, and cooperates with departments and agencies of U.S. Federal, State and local governments in achieving compatibility between government codes and standards and the voluntary standards of industry and commerce.

ANSI represents the interests of the United States in international nontreaty organizations such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). The Institute maintains close ties with regional organizations such as the Pacific Area Standards Congress (PASC) and the Pan American Standards Commission (COPANT). As such, ANSI coordinates the activities involved in the U.S. participation in these groups.

ANSI approval of standards is intended to verify that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standards has been achieved. ANSI coordination is intended to assist the voluntary system to ensure that national standards needs are identified and met with a set of standards that are without conflict or unnecessary duplication in their requirements.

Responsibility of approving American standards rests
with the
American National Standards Institute, Inc.
25 West 43rd Street, Fourth floor
New York, NY 10036

ASSE/ASME/CSA Standard

***ASSE 1070-2020/ASME A112.1070-2020/
CSA B125.70:20***

Performance requirements for water temperature limiting devices



®A trademark of the Canadian Standards Association and CSA America Inc., operating as "CSA Group"

*Published in October 2020 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3
1-800-463-6727 • 416-747-4044*

Visit the CSA Group Online Store at store.csagroup.org

*The American Society of Mechanical Engineers (ASME)
Two Park Avenue
New York, NY 10016-5990, USA
1-800-843-2763*

Visit the ASME Online Store at www.asme.org

*ASSE International (ASSE)
18927 Hickory Creek Dr., Suite 220
Mokena, IL 60448, USA
(708) 995-3019*

Visit the ASSE International Webstore at www.assewebstore.com

Commitment for Amendments

This Standard is issued jointly by the American Society of Mechanical Engineers (ASME), ASSE International Chapter of IAPMO, LLC. (“ASSE”), and the Canadian Standards Association (Operating as “CSA Group”). Amendments to this Standard will be made only after processing according to the Standards writing procedures of both ASME, ASSE, and CSA Group.

The American Society of Mechanical Engineers (ASME)
Two Park Avenue
New York, NY 10016-5990
USA
1-800-843-2763
Visit the ASME Online Store at
www.asme.org

ISBN 978-0-7918-7394-6
Copyright © 2020 by The American Society of Mechanical Engineers (ASME)

This Standard is available for public review on a continuous basis. This provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public at large.

ASSE International
10027 Hickory Creek Dr., Suite 220
Mokena, IL 60448
Tel. (708) 995-3019
Fax: (708) 479-6139

E-mail: general.info@asse-plumbing.org

www.asse-plumbing.org

© ASSE International — 2020

Published in October 2020 by
CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard
Toronto, Ontario, Canada
M9W 1R3
1-800-463-6727 or 416-747-4044
Visit the CSA Group Online Store at
store.csagroup.org

ISBN 978-1-4883-2646-2
ICS 17.120
© 2020 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.

Contents

ASME A112 Standards Committee on Plumbing Materials and Equipment 3

ASSE Product Standards Committee 7

CSA Technical Committee on Plumbing Fittings 9

Preface 15

Section I 18

1 Scope 18

Section II 19

2 Reference publications and definitions 19

2.1 Reference publications 19

2.2 Definitions 19

Section III 20

3 Design and general requirements 20

3.1 Rated pressure, flow rate, and temperature range 20

3.1.1 Rated pressure 20

3.1.2 Flow rate 20

3.1.3 Temperature range 20

3.2 End connections 20

3.3 Function 20

3.4 Cross-flow 21

3.5 Toxicity and lead content 21

3.6 Devices incorporating electrical features 21

3.7 Servicing 22

Section IV 22

4 Performance requirements and test methods 22

4.1 General 22

4.1.1 Preconditioning 22

4.1.2 Installation for testing 22

4.1.3 Test sequence 22

4.2 High-temperature conditioning test 22

4.2.1 Purpose 22

4.2.2 Procedure 22

4.2.3 Failure criteria 23

4.3 Working pressure and temperature test 23

4.3.1 General 23

4.3.2 Purpose 23

4.3.3 Procedure with the valve closed 23

4.3.4 Procedure with the valve opened and the outlet(s) blocked 23

4.3.5	Test temperatures and pressures	23
4.3.6	Failure criteria	23
4.4	Cross-flow test	24
4.4.1	Purpose	24
4.4.2	Procedures	24
4.4.3	Failure criteria	24
4.5	Life cycle test	24
4.5.1	Purpose	24
4.5.2	Procedure	24
4.5.3	Failure criteria	24
4.6	Pressure and temperature variation test	25
4.6.1	Data gathering (see Figure 1)	25
4.6.2	Procedure (see Figure 1)	25
4.6.3	Failure criteria	26
4.7	Cold water supply failure test	26
4.7.1	Purpose	26
4.7.2	Procedure	26
4.7.3	Failure criteria	27
4.8	Hydrostatic pressure test	27
4.8.1	Purpose	27
4.8.2	Procedure	27
4.8.3	Failure criteria	27

Section V 27

5	Markings, packaging, instructions, and literature	27
5.1	Product markings	27
5.2	Temperature control setting identification	27
5.3	Packaging	28
5.4	Installation and maintenance instructions	28
5.5	Rated flow	28
5.6	Water temperature	28

Annex A (informative) — Unit conversion and rounding criteria 30

Annex B (informative) — Verifying the time constant of the temperature-measuring equipment 31

Preface

This is the second edition of ASSE 1070/ASME A112.1070/CSA B125.70, *Performance requirements for water temperature limiting devices*. It supersedes the previous edition published in 2015.

This Standard is considered suitable for use for conformity assessment within the stated scope of the Standard.

This Standard was prepared by the ASSE/ASME/CSA Harmonization Task Group on Plumbing Fittings, under the jurisdiction of the ASME A112 Standards Committee on Plumbing Materials and Equipment, the ASSE Product Standards Committee, and the CSA Technical Committee on Plumbing Fittings. The CSA Technical Committee operates under the jurisdiction of the CSA Strategic Steering Committee on Construction and Civil Infrastructure.

This Standard has been formally approved by the ASME Standards Committee on Plumbing Materials and Equipment, the ASSE Product Standards Committee, and the CSA Technical Committee on Plumbing Fittings.

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.

This Standard was approved as an American National Standard by the American National Standards Institute on July 17, 2020.

ASME Notes:

- 1) *This standard was developed under procedures accredited as meeting the criteria for American National Standards and it is an American National Standard. The Standards Committee that approved the code or standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed Standard was made available for public review and comment that provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.*
- 2) *ASME does not “approve,” “rate,” or “endorse” any item, construction, proprietary device, or activity.*
- 3) *ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor assume any such liability. Users of a standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.*
- 4) *Participation by a federal agency representative(s) or person(s) affiliated with industry is not to be interpreted as government or industry endorsement of this standard.*
- 5) *ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.*
- 6) *ASME issues written replies to inquiries concerning interpretation of technical aspects of this Standard. All inquiries regarding this Standard, including requests for interpretations, should be addressed to:
Secretary, A112 Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990*

A request for interpretation should be clear and unambiguous. The request should

- cite the applicable edition of the Standard for which the interpretation is being requested.
- phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The inquirer may also include any plans or drawings, which are necessary to explain the question; however, they should not contain proprietary names or information.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee.

Interpretations are published on the ASME Web site under the Committee Pages at <https://cstools.asme.org/> as they are issued.

CSA Notes:

- 1) Use of the singular does not exclude the plural (and vice versa) when the sense allows.
- 2) 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 of the Standard to judge its suitability for their particular purpose.
- 3) This publication was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.
- 4) To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include “Request for interpretation” in the subject line:
 - a) define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
 - b) provide an explanation of circumstances surrounding the actual field condition; and
 - c) where possible, phrase the request in such a way that a specific “yes” or “no” answer will address the issue.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csa.ca.

- 5) This Standard is subject to review five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include “Proposal for change” in the subject line:
 - a) Standard designation (number);
 - b) relevant clause, table, and/or figure number;
 - c) wording of the proposed change; and
 - d) rationale for the change.

ASSE Notes:

Notes:

1) Requests for interpretation

Requests for interpretation may be sent to any of the (3) standards organizations. All interpretations are reviewed and agreed upon by the ASSE International, ASME, and CSA prior to response. Requests for interpretations may be sent to:

Staff Engineering Group
ASSE International

18927 Hickory Creek Drive, Suite 220
Mokena, IL 60448-8399

Requests must include:

- Name and contact information of the individual requesting the interpretation;
- Name of organization the individual represents (if any);
- Appropriate references to the standard's clauses that have a bearing on the issue cited in the request;
- A concise explanation of the issue requiring a technical interpretation;
- Any supporting documentation that will assist in understanding or describing the issue;
- Any recommendations the requestor would like to make concerning a possible technical interpretation, along with appropriate justification or comments.

Forms for requests or general guidance can be obtained by emailing staffengineer@asse-plumbing.org.

2) **Endorsement vs. Listing**

ASSE International does not endorse any product, but rather lists products that have successfully been applied for and meet the given standard. In exchange the manufacturer is allowed to place the ASSE Seal with the given standard number on their product for public recognition.

In order to apply for listing, visit www.asse-plumbing.org/seal/listing_instructions.html.

3) **Patent rights**

ASSE International complies with Section 3.1 of ANSI Essential Requirements — Inclusion of Patents in American National Standards. To understand what is and is not covered, visit www.ansi.org/essentialrequirements.

4) **Committee or Working Group Membership**

Each standard is developed by a working group and then approved by the Product Standards Committee and Board of Directors of ASSE International. In order to apply for membership on a working group or any committee, the applications are available at www.asse-plumbing.org/standards/WorkingGroupApp.pdf.

ASSE 1070-2020/ ASME A112.1070-2020/ CSA B125.70:20 **Performance requirements for water temperature limiting devices**

Section I

1 Scope

1.1

This Standard covers water temperature limiting devices intended to limit the hot or tempered water temperature supplied to fittings for fixtures such as sinks, bidets, lavatories, and bathtubs to reduce the risk of scalding. These devices are not designed to address thermal shock.

Note: *Unless otherwise specified in this Standard, water temperature limiting devices are referred to as “devices”.*

1.2

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.

1.3

SI units are the units of record in Canada. In this Standard, the inch/pound units are shown in parentheses.

The values stated in each measurement system are equivalent in application; however, each system is to be used independently. Combining values from the two measurement systems can result in non-conformance with this Standard.

All references to gallons are to U.S. gallons.

For information on the conversion criteria used in this Standard, see Annex [A](#).