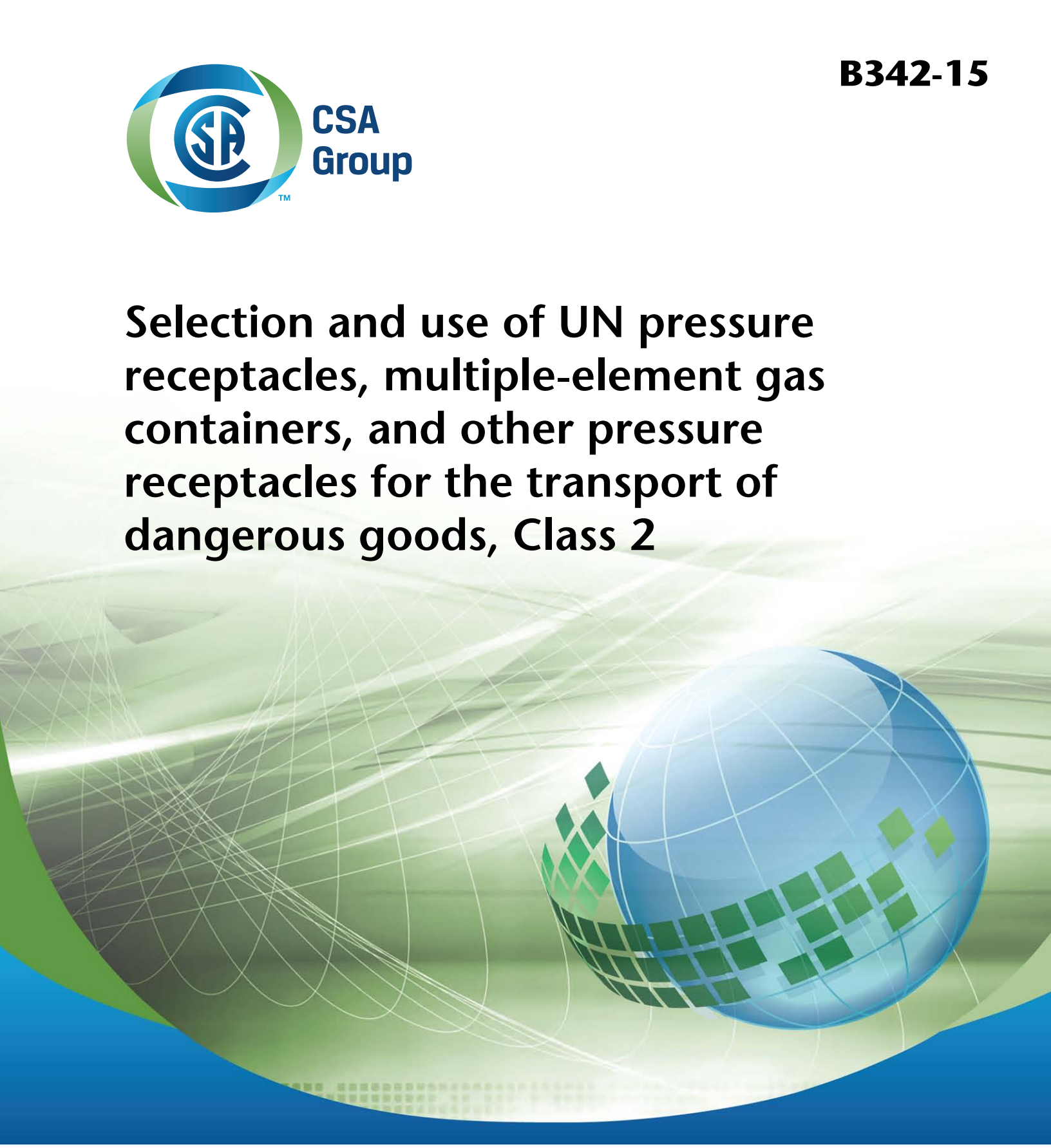
B342-15

CSA Group

Selection and use of UN pressure receptacles, multiple-element gas containers, and other pressure receptacles for the transport of dangerous goods, Class 2



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.

Standards Update Service

B342-15
September 2015

Title: *Selection and use of UN pressure receptacles, multiple-element gas containers, and other pressure receptacles for the transport of dangerous goods, Class 2*
Pagination: 48 pages (viii preliminary and 40 text), each dated **September 2015**

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 **2423374**.

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

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

B342-15

Selection and use of UN pressure receptacles, multiple-element gas containers, and other pressure receptacles for the transport of dangerous goods, Class 2

Published in September 2015 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

*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.*

ISBN 978-1-77139-759-9

Contents

Technical Committee on Cylinders, Spheres and Tubes for Transportation of Dangerous Goods

A. Park	Compressed Gas Association, Ottawa, Ontario *Category: General Interest*	*Chair*
J.H. Wedding	Norris Cylinder Company, Inc., Huntsville, Alabama, USA *Category: Producer Interest*	*Vice-Chair*
M. Abdelli	Air Liquide Canada Inc., Montréal, Québec	
S.P. Bartlett	Air Products and Chemicals Inc., Allentown, Pennsylvania, USA	*Associate*
E. Becker	Manchester Tank & Equipment Company, Elkhart, Indiana, USA	*Associate*
C. Butler	Air Products and Chemicals Inc., Allentown, Pennsylvania, USA	*Associate*
N. Chaudhary	Transport Canada, Ottawa, Ontario	*Associate*
D. Connor	Vipond Systems Group, Mississauga, Ontario *Category: User Interest*	
M. Daniels	Sherwood Valve, LLC, Washington, Pennsylvania, USA *Category: Producer Interest*	
J.W. Felbaum	FIBA Technologies Inc., Millbury, Massachusets, USA *Category: Producer Interest*	
D. Fraser	CanGas Solutions Inc., Calgary, Alberta	*Associate*
S.T. Gentry	Worthington Cylinder Corp., Columbus, Ohio, USA *Category: Producer Interest*	
J.A. Harris	T.H. Cochrane Laboratories, Ltd., Milwaukee, Wisconsin, USA	*Associate*

M. Kotb	Régie du bâtiment du Québec, Montréal, Québec *Category: Government and/or Regulatory Authority*	
S. LaGrange	Praxair Canada Inc., Brampton, Ontario *Category: User Interest*	
K.T. Lau	Alberta Boiler Safety Association (ABSA), Edmonton, Alberta	*Associate*
M. Levac	Canadian Propane Association, Ottawa, Ontario	*Associate*
K. Lum	Praxair Canada Inc., Toronto, Ontario	*Associate*
T. MacLean	Transport Canada, Ottawa, Ontario *Category: Government and/or Regulatory Authority*	
C.R. Martin	Arrowhead Industrial Services Inc., Graham, North Carolina, USA *Category: General Interest*	
M. Masse	Worthington Cylinders of Canada Corp., Tilbury, Ontario	*Associate*
R.K. Opersko	Air Products Canada Limited, Nanticoke, Ontario *Category: User Interest*	
J. Patelczyk	Chart Industries Inc., Ball Ground, Georgia, USA	*Associate*
F. Running	Diversco Supply Inc., Cambridge, Ontario *Representing Canadian Propane Association* *Category: General Interest*	
C. Scherer	Nordco Rail Services & Inspection Technologies, Ridgefield, Connecticut, USA	*Associate*
E. Sinkovits	Linde Canada Ltd., Mississauga, Ontario	*Associate*
J. Sommer	Manchester Tank & Equipment Company, Elkhart, Indiana, USA *Category: Producer Interest*	
D. Srnic	Alberta Boiler Safety Association (ABSA), Edmonton, Alberta *Category: Government and/or Regulatory Authority*	
D.J. Stainrod	Fuels Learning Centre Ltd., Bowmanville, Ontario	

D.W. Treadwell	C-P Industries, McKeesport, Pennsylvania, USA *Category: Producer Interest*	
C. Turylo	Technical Standards & Safety Authority (TSSA), Toronto, Ontario *Category: Government and/or Regulatory Authority*	
R. Wark	Linde AG, Pullach, Germany *Category: User Interest*	
J.Y. Wong	Powertech Labs Inc., Surrey, British Columbia *Category: General Interest*	
R. Meyers	CSA Group, Toronto, Ontario	*Project Manager*

Subcommittee on UN Pressure Receptacles and Multiple-Element Gas Containers for the Transport of Dangerous Goods

T. MacLean	Transport Canada, Ottawa, Ontario	*Chair*
M. Abdelli	Air Liquide Canada Inc., Montréal, Québec	
S.P. Bartlett	Air Products and Chemicals Inc., Allentown, Pennsylvania, USA	
N. Chaudhary	Transport Canada, Ottawa, Ontario	
S.T. Gentry	Worthington Cylinder Corp., Columbus, Ohio, USA	
S. LaGrange	Praxair Canada Inc., Brampton, Ontario	
R.K. Opersko	Air Products Canada Limited, Nanticoke, Ontario	
A. Park	Compressed Gas Association, Ottawa, Ontario	
E. Sinkovits	Linde Canada Ltd., Mississauga, Ontario	
J. Wedding	Norris Cylinder Company Inc., Huntsville, Alabama, USA	
R. Meyers	CSA Group, Toronto, Ontario	*Project Manager*

Preface

This is the second edition of CSA B342, *Selection and use of UN pressure receptacles, multiple-element gas containers, and other pressure receptacles for the transport of dangerous goods, Class 2*. It supersedes the previous edition published in 2009.

This Standard was prepared as a related Standard to CSA B341-15, *UN pressure receptacles and multiple-element gas containers for the transport of dangerous goods*, with the intent that it will become part of the Government of Canada*'s Transportation of Dangerous Goods Regulations* through adoption by reference.

In the development of this Standard, the Subcommittee reviewed and made extensive use of the United Nations' *Recommendations on the Transport of Dangerous Goods — Model Regulations,* 18th rev. ed. (2013) ("UN Model Regulations"). It should be noted that members of the Subcommittee participated in developing and evaluating the ISO standards that are included in the UN Model Regulations. This Standard takes into account proven experience and recent technical advances. The following requirements have been included in this Standard for consistency with North American practices:

(a) a five-year periodic inspection and test period for UN pressure receptacles in carbon dioxide service and for UN composite cylinders;
(b) when UN pressure receptacles are required to be equipped with one or more pressure-relief devices, the pressure-relief device system(s) needs to be capable of preventing rupture of normally filled UN pressure receptacles that are subjected to a fire test;
(c) UN pressure receptacles filled with a refrigerated liquefied gas or a liquefied flammable gas need to be transported in an upright position unless they are designed for horizontal service; and
(d) the use of UN composite cylinders constructed in accordance with ISO 11119-3:2002, *Gas cylinders of composite construction — Specification and test methods — Part 3: Fully wrapped fibre reinforced composite gas cylinders with non-load-sharing metallic or non-metallic liners*, is not authorized for toxic gases with an LC_{50} less than 200 mL/m^3.

This Standard was prepared by the Subcommittee on UN Pressure Receptacles and Multiple-Element Gas Containers for the Transportation of Dangerous Goods, under the jurisdiction of the Technical Committee on Cylinders, Spheres, and Tubes for the Transport of Dangerous Goods and the Strategic Steering Committee on Mechanical and Industrial Equipment Safety, and has been formally approved by the Technical Committee.

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 Standard 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.

B342-15
Selection and use of UN pressure receptacles, multiple-element gas containers, and other pressure receptacles for the transport of dangerous goods, Class 2

1 Scope

1.1
This Standard specifies requirements for the selection, use, handling, and filling of UN pressure receptacles, multiple-element gas containers, and other pressure receptacles for the transport of dangerous goods included in Class 2, gases.

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.

2 Reference publications
This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto. Where there is an inconsistency between this Standard and a referenced publication other than the *Transportation of Dangerous Goods Act* and its regulations, the requirements of this Standard shall prevail. Users of this Standard should avoid directly applying a referenced publication without carefully considering this Standard's reference to that publication.

Note: *See Annex A for information on the reference organizations.*

CSA Group
B341-15
UN pressure receptacles and multiple-element gas containers for the transportation of dangerous goods

ASME International (American Society of Mechanical Engineers)
Boiler and Pressure Vessel Code, 2013