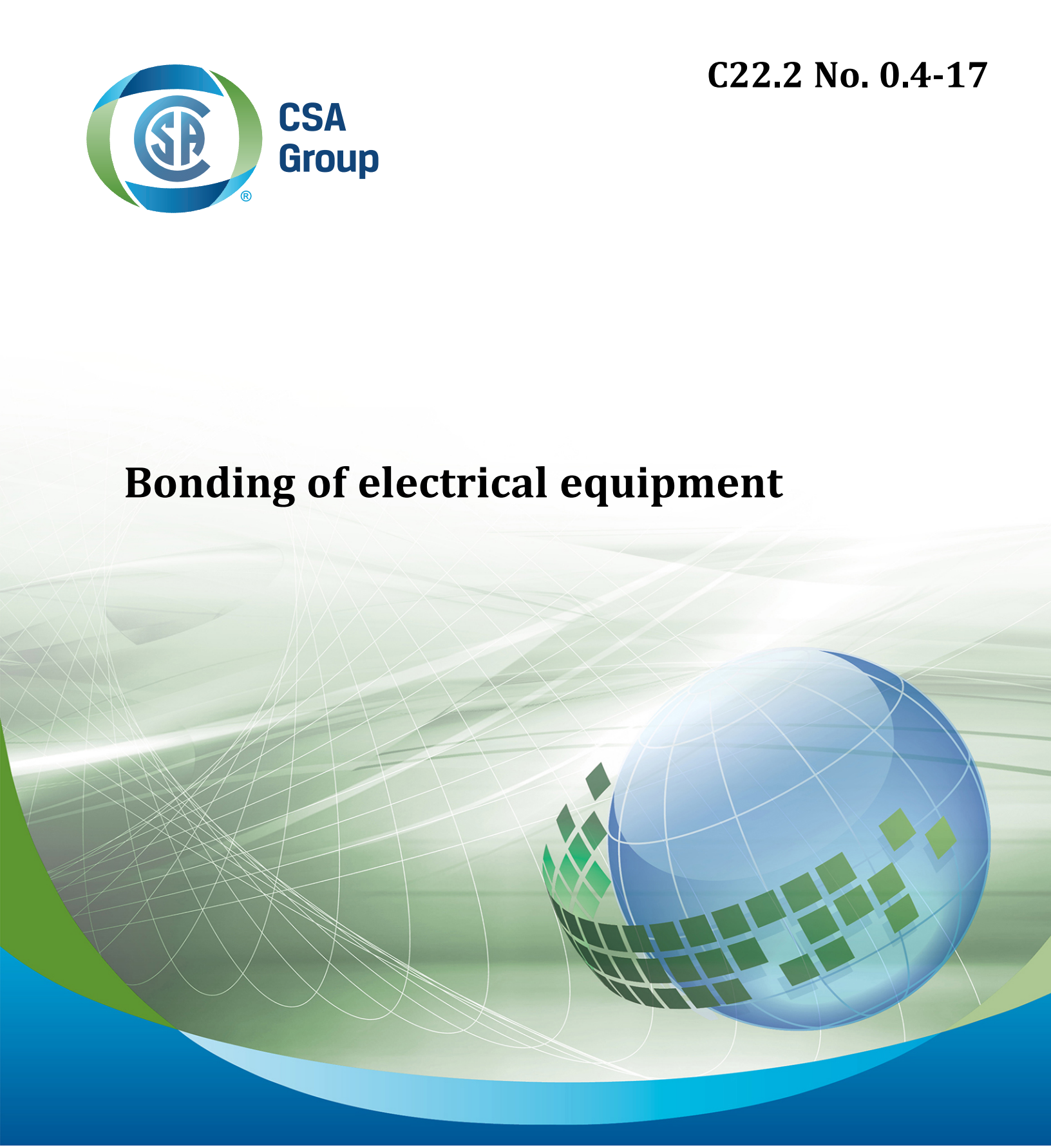
CSA Group

C22.2 No. 0.4-17

Bonding of electrical equipment



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

C22.2 No. 0.4-17
April 2017

Title: *Bonding of electrical equipment*

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 **2425205**.

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.

C22.2 No. 0.4-17
Bonding of electrical equipment

Published in April 2017 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.

ISBN 978-1-4883-0783-6

Contents

Technical Committee on General Requirements, CE Code, Part II

G. Lobay	CSA Consumer Network, Ottawa, Ontario *Category: General Interest*	*Chair*
R.J. Kelly	Government of Nunavut-Dept. of Community & Government Services, Iqaluit, Nunavut *Category: Regulatory Authority*	*Vice-Chair*
M.S. Anderson	SaskPower, Regina, Saskatchewan *Category: Regulatory Authority*	
W.J. Bryans	Electro-Federation Canada, Toronto, Ontario *Category: Producer Interest*	
P. Corby	City of Victoria, Victoria, British Columbia *Category: Regulatory Authority*	
P. Desilets	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec *Category: Producer Interest*	
V.V. Gagachev	Eaton, Burlington, Ontario *Category: Producer Interest*	
W. Hassan	Northern Lights Asset Management Ltd., Oakville, Ontario *Category: General Interest*	
D.R. MacLeod	Department of Labour and Advanced Education, Halifax, Nova Scotia *Category: Regulatory Authority*	
D. Mascarenhas	Brampton, Ontario *Category: General Interest*	

T. Olechna	Electrical Safety Authority, Mississauga, Ontario *Category: Regulatory Authority*	
M. Smith	Cambridge, Ontario *Category: Producer Interest*	
A.Z. Tsisserev	AES Engineering, Vancouver, British Columbia *Category: General Interest*	
Z. Al-Ali	CSA Group, Toronto, Ontario	*Project Manager*

Subcommittee on Bonding of Electric Equipment

R. Leduc	Marex Canada Limited, Calgary, Alberta	*Chair*
V. Andersen	CSA Group Europe GmbH, Frankfurt, Hessen, Germany	
G. Benjamin	Thomas & Betts Limited, Dorval, Quebec	
Y. Boodram	Schneider Electric Canada, Inc., Mississauga, Ontario	
S.W. Douglas	International Association of Electrical Inspectors (IAEI), Toronto, Ontario	
R.W. Horner	Atkore International (Allied Tube & Conduit Corporation), Harvey, Illinois, USA	
M. Lusk	CSA Group, Charlotte, North Carolina, USA	
A. Manche	Schneider Electric USA, Inc. Square D, Lexington, Kentucky, USA	
J.N. Martin	Electrical Safety Authority Field Evaluation (ESAFE), Ottawa, Ontario	
M. Smith	Cambridge, Ontario	
G. Steinman	Thomas & Betts Limited, St-Jean-sur-Richelieu, Québec	
C.J. Workman	Eaton Industries (Canada) Company, Burlington, Ontario	
A. Hawley	CSA Group, Toronto, Ontario	*Project Manager*

Preface

This is the fourth edition of CSA C22.2 No. 0.4, *Bonding of electrical equipment*, one of a series of Standards issued by CSA Group under Part II of the *Canadian Electrical Code*. It supersedes the previous editions published in 2004, 1982, and 1972.

The major changes in this edition are as follows:

a) the addition of an informative annex showing possible techniques for bonding;
b) a definition of "Exposed", since the usage in this Standard is different from that in the *Canadian Electrical Code, Part I*;
c) clarification of which symbol to use for bonding;
d) allowing the option of DC testing for DC only products; and
e) reorganizations according to current editorial practice.

This Standard was prepared by the Subcommittee on Bonding of Electric Equipment, under the jurisdiction of the Technical Committee on General Requirements, CE Code, Part II and the Strategic Steering Committee on Requirements for Electrical Safety, and has been formally approved by the Technical Committee.

Interpretations: The Strategic Steering Committee on Requirements for Electrical Safety has provided the following direction for the interpretation of standards under its jurisdiction: "The literal text shall be used in judging compliance of products with the safety requirements of this Standard. When the literal text cannot be applied to the product, such as for new materials or construction, and when a relevant committee interpretation has not already been published, CSA's procedures for interpretation shall be followed to determine the intended safety principle."

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 within 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.*

C22.2 No. 0.4-17
Bonding of electrical equipment

1 Scope

1.1
This Standard applies to electrical equipment that is intended for installation and use in accordance with the requirements of Part I of the *Canadian Electrical Code* (CE Code) and is

a) cord connected or permanently connected and required to be bonded by either Part I or Part II of the CE Code; or
b) constructed in a manner intended to ensure that it can be bonded when installed.

Note: *The bonding specified in this Clause does not include bonding that is applied to equipment solely for a purpose such as protection from lightning discharge or preventing electrical noise from interfering with the functioning of communications and computer circuits.*

1.2
This Standard includes provisions for certain details of construction and for testing procedures by which a certification body may determine compliance with the applicable Standard.

1.3
This Standard does not include the evaluation of bonding path provisions for equipment used as wiring methods in accordance with Section 12 of the CE Code.

Note: *Short-time-current test requirements for equipment used as a bonding path are found in CSA C22.2 No. 41* Grounding and bonding equipment*.*

1.4
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: