

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



Standards Council of Canada
Conseil canadien des normes

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

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”

National Standard of Canada

CSA C22.2 No. 273:14 **Cablebus**



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



*Published in February 2014 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 store.csagroup.org
or call toll-free 1-800-463-6727 or 416-747-4044.*

*ICS 33.060.40
ISBN 978-1-77139-233-4*

*© 2014 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

Technical Committee on Wiring Products	3
Subcommittee on Cablebus	5
Preface	6
1 Scope	7
2 Reference publications	7
3 Definitions	9
3.1 Definitions	9
3.2 Abbreviations and symbols	10
4 Design and construction	10
4.1 General ratings	10
4.2 Voltage rating	10
4.3 Enclosure material	11
4.4 Enclosure	11
4.5 Finishes	12
4.6 Fittings	14
4.7 Fasteners and cable supports	14
4.7.5 Cable supports	15
4.8 Quality of work	16
4.9 Load capacity	16
4.10 Bonding	17
4.11 Phase conductor types, lugs, and terminations	18
4.12 Allowable ampacity ratings	18
4.12.1 General	18
4.12.2 <i>Canadian Electrical Code, Part I</i> method	19
4.12.3 Temperature rise method	20
4.13 Conductor phase area element	20
4.14 Short circuit current rating	20
4.15 Voltage drop	20
5 Marking	20
5.1 General	20
5.2 Nameplates (marking on product)	21
5.2.1 General	21
5.3 Installation instructions	23
6 Type tests	23
6.1 Loading tests	23
6.1.1 General	23
6.1.2 Test specimen	23
6.1.3 Type and length of span	24
6.1.4 Orientation of specimen	24

6.1.5	Supports	24
6.1.6	Loading material	24
6.1.7	Load application	24
6.1.8	Loading to destruction (Method A)	25
6.1.9	Interpolation of test data (for Clause 6.1.8 (Method A) only)	25
6.2	Verification of temperature-rise limits	25
6.2.1	Arrangement of the conductor trunking system	25
6.2.2	Temperature rise limits (stabilization method)	26
6.3	Bonding test	27
6.3.1	Electrical continuity of connections	27
6.3.2	Electrical continuity of enclosure used as a bond conductor	27
6.4	Resistance to impact — Covers	27
6.5	Verification of short circuit current rating	28
6.5.1	Short circuit withstand strength test at rated voltage	28
6.5.2	Short circuit withstand strength test at reduced voltage	32
6.5.3	Enclosure joint short time fault current test	35
6.6	Gasket test	35
6.6.1	General	35
6.7	Vertical installation cable slippage test	36
6.8	Class A testing requirements	36
6.8.1	Loading test for the cablebus cover	36
6.8.2	Impact test	36
6.8.3	Probe test	37
6.8.4	Tamper-resistant test	37
6.9	Cable movement test for non-insulated blocks, supports and clamps	37
6.10	Effect of solar radiation	37

Annex A (informative) — Markings — French translations	54
Annex B (Informative) — Recommended test guidelines for cables in cablebus	55
Annex C (Informative) — Sample cablebus nameplate	59
Annex D (Informative) — Sample voltage drop calculation (See Clause 4.15)	60

Preface

This is the first edition of CSA C22.2 No. 273, *Cablebus*. It is one of a series of Standards issued under Part II of the *Canadian Electrical Code*.

For general information on the Standards of the *Canadian Electrical Code, Part II*, see the Preface of the latest edition of CAN/CSA-C22.2 No. 0.

This Standard was prepared by the Subcommittee on Cablebus, under the jurisdiction of the Technical Committee on Wiring Products 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.”

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.

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.*

CSA C22.2 No. 273:14

Cablebus

1 Scope

1.1

This Standard applies to a complete cablebus system (termination to termination) and associated fittings rated at not more than 46 kV and intended for use in accordance with the *Canadian Electrical Code, Part I* and *General Requirements — Canadian Electrical Code, Part II*, CSA C22.2 No. 0. These requirements do not apply to metal enclosed busways, as covered by CSA C22.2 No. 201 and CSA C22.2 No. 27.

1.2

For the purpose of these requirements, a cablebus is an assembly of insulated cable conductors designed as a system to transmit large magnitudes of electrical current and to withstand the effects of specified system requirements (i.e. short circuit current, circuit loading, bending etc) with fittings and conductor terminations in a completely enclosed, ventilated, or non-ventilated protective metal housing.

1.3

The values given in SI (metric) units are mandatory. Any other values given are for information only.

Note: Lengths are shown in millimetres or metres (inches or feet). Widths, deflections, and similar measurements are generally defined in millimetres (fractions of inches), and load bearing capacity in kilograms/metre (pounds/foot).

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 (nonmandatory) to define their application.

2 Reference publications

Where reference is made to other publications, such reference shall be considered to refer to the latest edition and all amendments published to that edition up to the time when this Standard was approved.