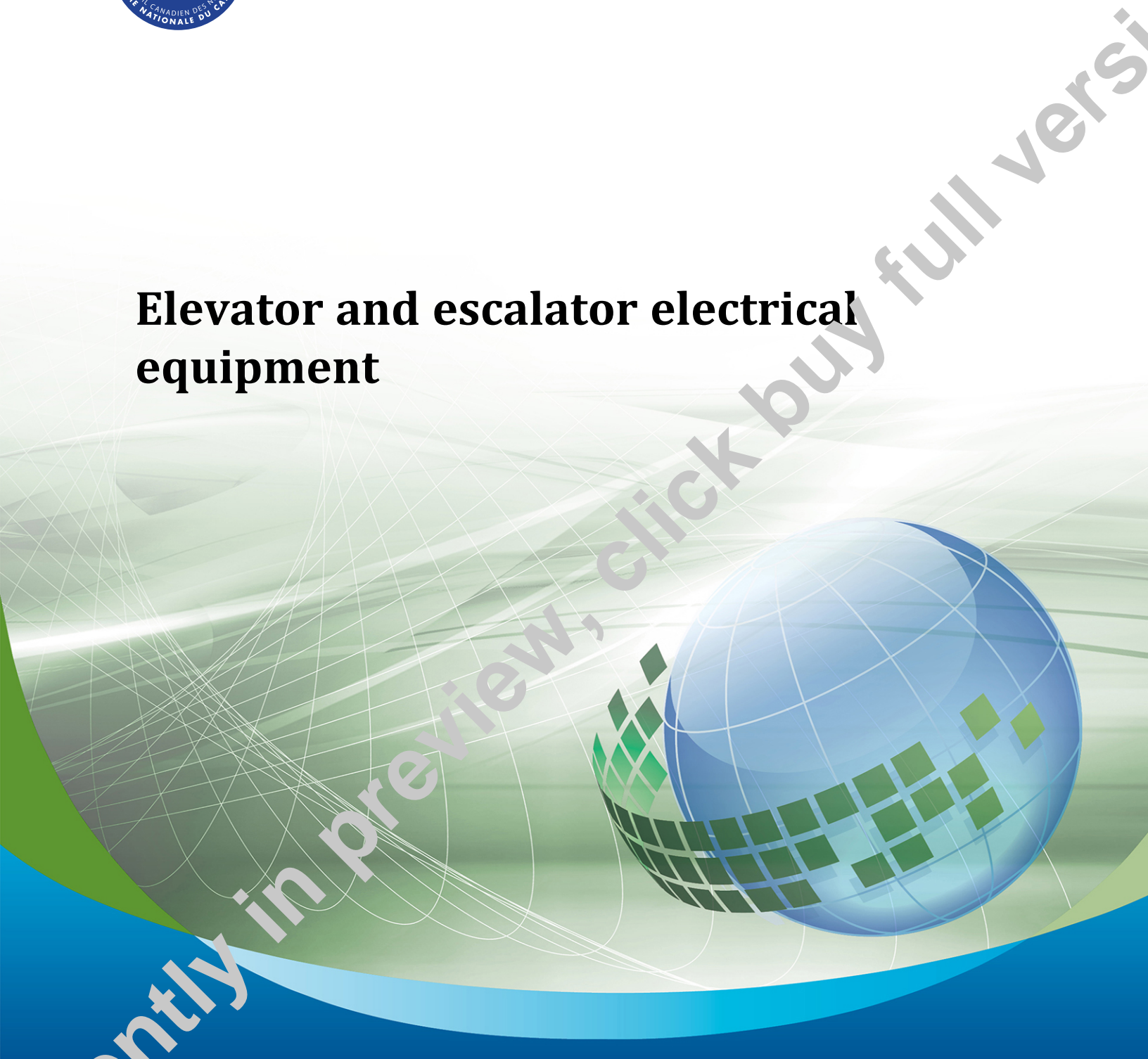




CSA B44.1:19/ASME A17.5-2019
National Standard of Canada
American National Standard

Elevator and escalator electrical equipment



Currently in preview, click buy full version



Standards Council of Canada
Conseil canadien des normes

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

Intellectual property rights and ownership

As between American Society of Mechanical Engineers (“ASME”) and Canadian Standards Association (Operating as “CSA Group”) (collectively “ASME and CSA Group”) and the users of this document (whether it be in printed or electronic form), ASME 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 and CSA Group and may give rise to a right in ASME and CSA Group to seek legal redress for such use, modification, copying, or disclosure. ASME 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 and CSA Group do not warrant the accuracy, completeness, or currency of any of the information published in this document. ASME 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 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 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 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 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 and CSA Group have no power, nor 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 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 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 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

CSA B44.1:19/ASME A17.5-2019 February 2019

Title: *Elevator and escalator electrical equipment*

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

- go to store.csagroup.org
- click on **CSA Update Service**

The **List ID** that you will need to register for updates to this publication is **24259.1**

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



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 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”

*National Standard of Canada
American National Standard*

*CSA B44.1:19/ASME A17.5-2019
Elevator and escalator electrical
equipment*



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

*Published in February 2019 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/shop

Commitment for Amendments

This Standard is issued jointly by The American Society of Mechanical Engineers (ASME) 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 and CSA Group.

The American Society of Mechanical Engineers (ASME)
Two Park Avenue
New York, NY 10016-5990 USA
www.asme.org

ISBN 978-0-7918-7307-6

Copyright © 2019 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.

Published in February 2019 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard
Toronto, Ontario, Canada M9W 1R3
www.csagroup.org

ICS 91.140.90
ISBN 978-1-4883-1263-2

© 2019 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 A17 Elevator and Escalator Standards Committee	4
CSA Technical Committee on the Elevator Safety Code	6
CSA B44.1/ASME A17.5 Joint Committee on Elevator and Escalator Electrical Equipment	11
Preface	13
1 Scope	16
2 Reference publications, definitions, and abbreviations	17
2.1 Reference publications	17
2.2 Definitions	19
2.3 Abbreviations	22
3 Construction	23
4 Enclosure construction	23
4.1 General	23
4.2 Thickness of cast-metal enclosures for live parts	24
4.3 Thickness of sheet-metal enclosures for live parts	24
5 Doors and covers	25
6 Polymeric enclosures	25
7 Openings in enclosures	28
7.1 Requirements for all enclosures	28
7.2 Requirements for equipment enclosures marked in accordance with Clause 20.23	29
8 Wire-bending space	29
9 Enclosures with environmental ratings	30
10 Protection against corrosion	30
11 Insulating material	30
12 Protective devices	30
12.1 Overcurrent protection	30
12.2 Number, arrangement, and ratings or settings of protective devices	31
12.3 Supplementary overcurrent protection	31
12.4 Disconnecting means	31
12.5 Power from more than one source	33
13 Protection of control circuits	33
13.1 Control circuit conductor protection	33

13.2	Control circuit transformer protection	34
13.3	Use of supplementary protectors in control circuits	35
14	Internal wiring	35
15	Wiring terminals and leads	36
16	Electrical spacings	38
17	Grounding	43
18	Printed circuit boards	43
19	Tests	44
19.1	General	44
19.2	Endurance	44
19.3	Solid-state ac motor controller tests	45
19.3.1	General	45
19.3.2	Test voltage	45
19.3.3	Temperature test	45
19.3.4	Dielectric voltage withstand test	45
19.3.5	Overvoltage and undervoltage tests	45
19.3.6	Overload and endurance tests	45
19.3.7	Exception	46
19.3.8	Short-circuit test	46
19.3.9	Breakdown of components test	47
19.3.10	Verification of electronic motor overload protection test	47
19.4	Power-conversion equipment	47
19.4.1	General	47
19.4.2	Temperature test	48
19.4.3	Dielectric voltage withstand test	48
19.4.4	Operation tests	48
19.4.5	Normal operation	49
19.4.6	Contactors	49
19.4.7	Single phasing	49
19.4.8	Inoperative blower motor	49
19.4.9	Clogged filter	49
19.4.10	Current-limiting control	49
19.4.11	Breakdown of components	49
19.4.12	Electronic motor overload protection test	50
19.4.13	Short-circuit test	51
19.5	Impact test	51
19.6	Printed circuit board coatings	52
19.6.1	General	52
19.6.2	Dielectric strength (new samples)	52
19.6.3	Dielectric strength (aged samples)	52
19.6.4	Dielectric strength (after humidity conditioning)	52
19.6.5	Adhesion	52
19.7	Transient-voltage-surge suppression	52

19.8	Compression	53
19.9	Deflection	53
19.10	Cord pullout	53
19.11	Crushing resistance test	53

20 Marking 54

Annex A (informative)	— Application examples	86
Annex B (informative)	— CSA Group and ASME elevator and escalator publications	92
Annex C (normative)	— French marking translations	94

ASME A17 Elevator and Escalator Standards Committee

J.W. Coaker, Coaker & Co. PC, *Chair*

R.E. Baxter, Baxter Residential Elevators, LLC, *Vice-Chair*

H.E. Peelle III, The Peelle Company Ltd., *Vice-Chair*

G.A. Burdeshaw, The American Society of Mechanical Engineers (ASME), *Secretary*

S.P. Reynolds, *Alternate*, The Peelle Company Ltd.

E.V. Baker, IUEC

M.D. Morand, *Alternate*, Qualified Elevator Inspector Training Fund (QEITF)

T.D. Barkand, U.S. Department of Labor

L. Bialy, Otis Elevator Company

B. Blackaby, Otis Elevator Company

K.L. Brinkman, National Elevator Industry, Inc.

J. Brooks, Wagner Consulting Group, Inc.

R.C. Burch, GAL Manufacturing Corp.

D.A. Witham, *Alternate*, GAL Manufacturing Corp.

R.A. Gregory, Consultant, Vertex Corp.

P.S. Rosenberg, *Alternate*, Performance Elevator Consulting, LLC

P. Hampton, Thyssenkrupp Elevator

J.D. Henderson, *Alternate*, Thyssenkrupp Elevator

J.T. Herrity, VTE

D.A. Kalgren, KONE Inc.

D.S. Roubier, *Alternate*, KONE Inc.

J. Kuchak, Elevator Safety Solutions, LLC

M. Simpkins, *Alternate*, Thyssenkrupp Elevator

R. Kremer, Technical Standards & Safety Authority

D. McColl, Otis Canada Inc.

D. McLellan, Technical Standards & Safety Authority

A.L. Peck, VDA (Van Deusen & Associates)

J. Rearick, Rearick & Company Inc.

A. Rehman, Schindler Elevator Corp.

J. Carlson, *Alternate*, Schindler Elevator Corp.

V.P. Robibero, Schindler Elevator Corp.

J.W. Blain, *Alternate*, Schindler Elevator Corp.

R.S. Seymour, Robert L. Seymour & Associates, Inc.

R.D. Shepherd, NAESA International

J. Day, *Alternate*, NAESA International

W.M. Snyder, VTE Solution, LLC

M.H. Tevyaw, MHT Codes & Consulting

D.L. Turner, Davis L Turner & Associates, LLC

M. Farinola, *Alternate*, MV Farinola Inc.

H.M. Vyas, NYC Department of Buildings

J. Xue, *Delegate*, Shanghai Institute of Special Equipment Inspection and Technical Research

CSA Technical Committee on the Elevator Safety Code

D. McColl	Otis Canada, Inc., Mississauga, Ontario, Canada <i>Category: Producer Interest</i>	<i>Chair</i>
C.M. Ayling	PCL Constructors Canada Inc., Mississauga, Ontario, Canada <i>Category: User/General Interest</i>	
T. Baik	Toronto Transit Commission, Toronto, Ontario, Canada	<i>Non-voting</i>
L. Bialy	Otis Elevator Company, Farmington, Connecticut, USA	<i>Non-voting</i>
S. Bornstein	KONE Elevators, Mississauga, Ontario, Canada <i>Category: Producer Interest</i>	
M. Brierley	Coldwater, Ontario, Canada	<i>Non-voting</i>
K.L. Brinkman	National Elevator Industry, Inc., Eureka, Illinois, USA	<i>Non-voting</i>
D. Brockerville	Service NL, Newfoundland & Labrador, St. John's, Newfoundland and Labrador, Canada <i>Category: Regulatory Authority</i>	
D. Bruce	Alberta Municipal Affairs, Edmonton, Alberta, Canada <i>Category: Regulatory Authority</i>	
N. Chahal	Technical Safety BC, New Westminster, British Columbia, Canada <i>Category: Regulatory Authority</i>	
K.C. Cheong	MKC Engineering Corp., Vancouver, British Columbia, Canada <i>Category: User/General Interest</i>	

K. Dunbar	Government of the Northwest Territories, Yellowknife, Northwest Territories, Canada <i>Category: Regulatory Authority</i>	
D. Eastman	Service NL, Newfoundland & Labrador, St. John's, Newfoundland and Labrador, Canada	<i>Non-voting</i>
M. Fournier	STM (Société de transport Montréal), Montréal, Québec, Canada <i>Category: User/General Interest</i>	
A. Ghazanchaei	Otis Canada, Inc., Mississauga, Ontario, Canada	<i>Non-voting</i>
G.W. Gibson	George W. Gibson & Associates Inc., Sedona, Arizona, USA	<i>Non-voting</i>
A. Gower	Manitoba Office of the Fire Commissioner, Winnipeg, Manitoba, Canada <i>Category: Regulatory Authority</i>	
A.S. Hopkirk	Trident Elevator Company Limited, Scarborough, Ontario, Canada <i>Category: User/General Interest</i>	
R. Isabelle	KJA Consultants Inc., Toronto, Ontario, Canada <i>Category: User/General Interest</i>	
F. Kassem	ThyssenKrupp Elevator Canada, Montréal, Québec, Canada	<i>Non-voting</i>
J.W. Koshak	Elevator Safety Solutions, LLC, Collierville, Tennessee, USA	<i>Non-voting</i>
R. Kremer	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	<i>Non-voting</i>
D. Laguerre	Schindler Elevator Corporation, Toronto, Ontario, Canada <i>Category: Producer Interest</i>	

S.E. MacArthur	PEI Department of Community and Cultural Affairs and Labour, Charlottetown, Prince Edward Island, Canada <i>Category: Regulatory Authority</i>	
A. Marchant	Alimak Hek Inc., Shelton, Connecticut, USA <i>Category: Producer Interest</i>	
R. Marsiglio	H. H. Angus & Associates Ltd., Toronto, Ontario, Canada <i>Category: User/General Interest</i>	
B. McBain	ULC Inc., Sudbury, Ontario, Canada	<i>Non-voting</i>
P. McClare	Nova Scotia Department of Labour and Advanced Education, Dartmouth, Nova Scotia, Canada <i>Category: Regulatory Authority</i>	
K.L. McGettigan	Elevator Industry Work Preservation Fund, Effingham, New Hampshire, USA <i>Category: User/General Interest</i>	
A. McGregor	Rooney, Irving & Associates Ltd., Ottawa, Ontario, Canada	<i>Non-voting</i>
B.F. McIntyre	IUEC Local No. 50, Ajax, Ontario, Canada <i>Category: User/General Interest</i>	
D. McLellan	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada <i>Category: Regulatory Authority</i>	
S. Mercier	Régie du bâtiment du Québec, Montréal, Québec, Canada <i>Category: Regulatory Authority</i>	
M. Mihai	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	<i>Non-voting</i>
T. Miller	Priestman Neilson & Associates Ltd., Ottawa, Ontario, Canada <i>Category: User/General Interest</i>	

R. Murphy	Garaventa Canada Ltd., Surrey, British Columbia, Canada <i>Category: Producer Interest</i>	
M. Pedram	Modern Elevator Innovations Inc., Hamilton, Ontario, Canada <i>Category: Producer Interest</i>	
H. Peelle	The Peelle Company Limited, Brampton, Ontario, Canada <i>Category: Producer Interest</i>	
A. Rehman	Schindler Elevator Corporation, Morristown, New Jersey, USA	<i>Non-voting</i>
A. Reistetter	National Elevator & Escalator Association, Mississauga, Ontario, Canada	<i>Non-voting</i>
S. Reynolds	The Peelle Company Limited, Brampton, Ontario, Canada	<i>Non-voting</i>
R. Santos	Technical Safety Authority of Saskatchewan (TSASK), Regina, Saskatchewan, Canada <i>Category: Regulatory Authority</i>	
R. Scharfe	Public Works and Government Services Canada, Ottawa, Ontario, Canada <i>Category: User/General Interest</i>	
J. Singh	National Research Council Canada, Canadian Codes Centre, Ottawa, Ontario, Canada	<i>Non-voting</i>
K. Steeves	New Brunswick Department of Public Safety, Moncton, New Brunswick, Canada <i>Category: Regulatory Authority</i>	
M. Tevyaw	MHT Codes & Consulting Specialists, Burlington, Ontario, Canada	<i>Non-voting</i>
E. Towson	Technical Safety BC, West Kelowna, British Columbia, Canada	<i>Non-voting</i>
B. Virk	Unitech Elevator Company, Pickering, Ontario, Canada <i>Category: Producer Interest</i>	

J. Virk	Unitech Elevator Company, Pickering, Ontario, Canada	<i>Non-voting</i>
K. Virk	UT Elevator Inc., Toronto, Ontario, Canada	<i>Non-voting</i>
L. Yang	CSA Group, Toronto, Ontario, Canada	<i>Non-voting</i>
M. Zingarelli	MAD-Elevator Inc., Mississauga, Ontario, Canada	<i>Non-voting</i>
P. Gulletson	CSA Group, Toronto, Ontario, Canada	<i>Project Manager</i>

CSA B44.1/ASME A17.5 Joint Committee on Elevator and Escalator Electrical Equipment

M. Mueller	ThyssenKrupp Elevator, Memphis, Tennessee, USA	<i>Chair</i>
M. Mihai	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	<i>Vice-Chair</i>
J. Aitamurto	KONE Corporation, Hyvinkaa, Finland	
P.D. Barnhart	Underwriters Laboratories Inc., Research Triangle Park, North Carolina, USA	
J.W. Blain	Schindler Elevator Corporation, Morristown, New Jersey, USA	
G.A. Burdeshaw	The American Society of Mechanical Engineers (ASME), New York, New York, USA	
J.D. Busse	Fujitec America Incorporated, Mason, Ohio, USA	
J. Caldwell	Otis Elevator Company, Memphis, Tennessee, USA	
S.J. Carlton	UL LLC, Northbrook, Illinois, USA	
C. Castro	Otis Elevator Company, Florence, South Carolina, USA	
K. Chieu	CSA Group, Toronto, Ontario, Canada	
J.L. Della Porta	Southington, Connecticut, USA	

S. Feng	Shanghai Institute of Special Equipment Inspection and Technical Research, Shanghai, China	
R. Garcia	Intertek Testing Services NA, Inc., Arlington Heights, Illinois, USA	
T.B. Irmischer	KONE Elevators & Escalators, Victoria, British Columbia, Canada	
P. McDermott	Technical Standards & Safety Authority (TSSA), Toronto, Ontario, Canada	
B. Mierzejewski	Otis Elevator Company, Florence, South Carolina, USA	
S. Millett	Otis Elevator Company, Farmington, Connecticut, USA	
C. Ramirez	KONE Inc., Allen, Texas, USA	
B. Shah	Schindler Elevator Corporation, Randolph, New Jersey, USA	
R.S. Williams	Computerized Elevator Corporation, Elmont, New York, USA	
L. Yang	CSA Group, Toronto, Ontario, Canada	
P. Gulletson	CSA Group, Toronto, Ontario, Canada	<i>Project Manager</i>

Preface

This is the sixth edition of CSA B44.1/ASME A17.5, *Elevator and escalator electrical equipment*. It supersedes the previous editions published in 2014, 2011, 2004, 1996, and 1991.

The purpose of this Standard is to reduce the risk of injury to persons and damage to property from fire and electrical shock. To this end, it is a safety Standard for the design and construction of equipment to be used in conformity with the rules of the applicable elevator and electrical codes (i.e., ASME A17.1/CSA B44 and CSA C22.1, *Canadian Electrical Code, Part I*, or ANSI/NFPA 70).

This Standard arose from the need to have identical Canadian and U.S. requirements for this equipment, thereby enabling manufacturers to have their products certified by an approved testing laboratory in Canada or the United States and to have the certification ratified for acceptance in either country.

In 1986, an ad hoc committee on the certification of electrical equipment consisting of jurisdictional authorities, representatives of Canadian and U.S. testing laboratories, and Canadian and U.S. manufacturers began to develop a draft for submission to the ASME A17 Standards Committee on Elevators and Escalators and the CSA Technical Committee on the Elevator Safety Code. Its initial investigation consisted of a review of the industrial control Standards CSA C22.2 No. 14 and UL 508. These Standards could not be used as such, due to the differences in the application of industrial control equipment and elevator equipment. It was recognized that industrial control equipment normally operates continuously for a low number of operations (about 3000/year) and at full-load current. In contrast, elevator control equipment operates intermittently for a high number of operations (about 500 000/year), and at up to 200 to 250% of full-load current in order to accelerate a mass. Further, elevator equipment is usually protected by either a locked machine room or a hoistway. The applicable portions of CSA C22.2 No. 14 and UL 508 were then reviewed and adapted to elevator equipment. (Grateful acknowledgement is made to Underwriters Laboratories Inc. for the use of UL 508.) Where there were differences between the UL and CSA Group Standards, the more stringent requirements were used.

This Standard has been approved by the CSA Technical Committee on the Elevator Safety Code and the ASME A17 Standards Committee on Elevators and Escalators. It is the intent of these committees to maintain a single harmonized Standard by coordinating their procedures for revising and interpreting this Standard. To this end, interpretations and revisions of this Standard will not be issued without the approval of both committees.

Changes to this edition include:

- a) update to Clause 2.1, Reference publications;
- b) update to Clause 2.2, Definitions;
- c) update to Clause 6.4.2;
- d) update to Clause 6.7;
- e) update to Clause 7.1.1;
- f) update to Clause 17.3;
- g) update to Clauses 18.2 and 18.3;
- h) addition of Clause 19.3.10, Verification of electronic motor overload protection test;
- i) update to Clause 19.4.4.1;
- j) addition of Clause 19.4.12, Electronic motor overload protection test;
- k) addition of Clause 19.4.13, Short-circuit test;

- l) update to Clause 19.6.1;
- m) update to Clause 19.7.1;
- n) update to Clause 20, Marking;
- o) update to Table 12, Minimum conductor spacings (creepage and clearance) for printed circuit boards;
- p) update to Table 17, Sequence of tests for solid-state ac motor controllers;
- q) update to Table 18, Maximum permissible temperature rises;
- r) update to Table 19, Sequence of tests for power-conversion equipment;
- s) update to Annex B, CSA Group and ASME elevator and escalator publications; and
- t) addition of Annex C, French marking translations.

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

This Standard was prepared by the CSA B44.1/ASME A17.5 Joint Committee on Elevator and Escalator Electrical Equipment, under the jurisdiction of the CSA Technical Committee on the Elevator Safety Code, the CSA Strategic Steering Committee on Mechanical Industrial Equipment Safety, and the ASME A17 Standards Committee on Elevators and Escalators, and has been formally approved by the CSA Technical Committee and the ASME A17 Standards Committee.

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 (ANSI) on February 15, 2019.

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 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, A17 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 <http://cstools.asme.org/> as they are issued.

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 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 publication.*
- 4) *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.*
- 5) *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.

- 6) *Attention is drawn to the possibility that some of the elements of this Standard may be the subject of patent rights. CSA Group is not to 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.*

CSA B44.1:19/ASME A17.5-2019

Elevator and escalator electrical equipment

1 Scope

1.1

The requirements of this Standard apply to the following electrical equipment for elevators, escalators, moving walks, dumbwaiters, material lifts, and elevating devices for persons with physical disabilities (platform lifts and stairway chairlifts):

- a) motor controllers;
- b) motion controllers;
- c) operation controllers;
- d) operating devices; and
- e) all other electrical equipment not listed/certified and labelled/marked according to another product safety standard or code.

The equipment specified in this Standard is intended for installation in accordance with the *Canadian Electrical Code, Part I* (CSA C22.1) and the *National Electrical Code* (ANSI/NFPA 70), whichever is applicable.

Note: *Controllers (i.e., motion, motor, and operation controllers) are defined in CSA B44 and ASME A17.1.*

1.2

The electrical equipment covered by this Standard is intended

- a) to be connected to supply circuits at a nominal system voltage of 600 V or less;
- b) for internal voltages that are not more than 1500 V;
- c) for use in non-hazardous locations in accordance with the rules of the applicable electrical codes; and
- d) for use in an ambient temperature no greater than 40 °C.

Note: *This Standard does not include requirements for equipment intended for use in an ambient temperature above 40 °C. Additional investigation of the equipment will be required when equipment is to be used in ambient temperature above 40 °C.*

1.3

The object of this Standard is to reduce the risk of injury to persons and damage to property from fire and electrical shock by presenting requirements for the proper design, the good construction, and the high quality of work of the equipment listed in Clause 1.1.

1.4

This Standard does not apply to devices that are rated for connection to extra-low-voltage Class 2 supply circuits as defined in the applicable electrical code.

Note: *Extra-low-voltage circuits are circuits that have a voltage of not more than 30 V rms or 42.4 V peak.*