CSA Standard

C22.1-06
Canadian Electrical Code, Part I

Safety Standard for Electrical Installations

(Twentieth Edition)

CANADIAN STANDARDS ASSOCIATION

- *The* Canadian Electrical Code, Part I, *is a voluntary code for adoption and enforcement by regulatory authorities.*
- *The* Canadian Electrical Code, Part I, *meets the fundamental safety principles of International Standard IEC 60364,* Electrical Installations of Buildings.
- *Consult with local authorities regarding regulations that adopt and/or amend this Code.*

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M. Wilson	CSA, Mississauga, Ontario

Section 54 — Community antenna distribution and radio and television installations

J. Poulin *(Chair)*	Bell Canada, Longueuil, Québec
E. Chantigny	General Electric Canada, Pointe-Claire, Québec
B. Nameh	Rogers Cable Systems Ltd., Don Mills, Ontario

P. Olders	Terra Communications, Inc., Scarborough, Ontario *(Representing International Association of Electrical Inspectors)*
L. Radom	SaskPower, Regina, Saskatchewan
G. Tubrett	CSA, Mississauga, Ontario

Section 56 — Optical fiber cables

C.B. Chan *(Chair)*	MTS Communications Inc., Winnipeg, Manitoba
S. Finnagan	Algonquin College, Ottawa, Ontario
B. Haydon	CSA, Mississauga, Ontario
P. Olders	Terra Communications, Inc., Scarborough, Ontario *(Representing International Association of Electrical Inspectors)*
J. Poulin	Bell Canada, Longueuil, Québec
V.G. Rowe	Marex Canada Limited, Westbank, British Columbia
A.Z. Tsisserev	City of Vancouver, British Columbia

Section 60 — Electrical communication systems

J. Poulin *(Chair)*	Bell Canada, Longueuil, Québec
D.J. Andrews	D.J.A. Engineering, Calgary, Alberta
C.B. Chan	MTS Communications Inc., Winnipeg, Manitoba
E. Chantigny	General Electric Canada, Pointe-Claire, Québec
P. Desilets	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec
S. Finnagan	Algonquin College, Ottawa, Ontario
E.S. Guevara	Industry Canada, Ottawa, Ontario
D. Schultz	TELUS Communications (B.C.) Inc., Edmonton, Alberta
R. Smith	Aliant Telecom, Moncton, New Brunswick
A.Z. Tsisserev	City of Vancouver, British Columbia
M. Wilson	CSA, Mississauga, Ontario

Section 62 — Fixed electric space and surface heating systems

V.G. Rowe *(Chair)*	Marex Canada Limited, Westbank, British Columbia
J. Turner *(Vice-Chair)*	Swansea Consulting, Toronto, Ontario
J. Adam	Syncrude Canada Limited, Fort McMurray, Alberta
R. Barth	Thermon Manufacturing Company, San Marcos, Texas, USA
P. Desilets	Leviton Manufacturing of Canada Limited, Pointe-Claire, Québec
T.S. Driscoll	Shell Canada, Calgary, Alberta
W.E. Hanthorn	Tyco Thermal Controls (Canada) Ltd., Trenton, Ontario
T. Pope	CSA, Mississauga, Ontario
R. Stromer	Imperial Oil Resources Limited, Calgary, Alberta
S. Tetreault	Shell Canada Ltd., Montréal, Québec
J. Thomson	Electrical Safety Authority, Corunna, Ontario *(Representing International Association of Electrical Inspectors)*

Section 66 — Amusement parks, midways, carnivals, film and TV sets, TV remote broadcasting locations, and travelling shows

G. Montminy *(Chair)*	Régie du bâtiment du Québec, Québec, Québec
D. Burke	Victoria, British Columbia
T. Olechna	Electrical Safety Authority, Mississauga, Ontario
A. Paquette	Régie du bâtiment du Québec, Montréal, Québec
M. Perreault	Canadian Broadcasting Corporation, Montréal, Québec

L. Radom	SaskPower, Regina, Saskatchewan
A. Wanuch	Robertson Electric Wholesale, Toronto, Ontario
W. White	City of Vancouver, British Columbia

Section 68 — Pools, tubs, and spas

S.W. Douglas *(Chair)*	Electrical Safety Authority, Cambridge, Ontario *(Representing International Association of Electrical Inspectors)*
T. Bartoffy	CSA, Mississauga, Ontario
D. Letcher	Don Letcher (E.S.C.O.) Enterprises, Sherwood Park, Alberta *(Representing International Association of Electrical Inspectors)*
T. Minna	EPI Electrical Contractors, Brampton, Ontario
G. Montminy	Régie du bâtiment du Québec, Québec, Québec
T. Olechna	Electrical Safety Authority, Mississauga, Ontario
L.B. Ross	Newmarket, Ontario
D.K. Stuebing	Solon Enterprises Ltd., Peace River, Alberta
K. Tomihiro	Pool and Hot Tub Council of Canada, Markham, Ontario

Section 70 — Electrical requirements for factory-built relocatable structures and non-relocatable structures

R. May *(Chair)*	British Columbia Safety Authority (BCSA), New Westminster, British Columbia
M.S. Anderson	City of Winnipeg, Manitoba
J. Einarson	Department of Community Services, Whitehorse, Yukon
K. Maynard	Canadian Manufactured Housing Institute, Ottawa, Ontario
R. Morin	Economical Insurance Group, Oshawa, Ontario *(Representing International Association of Inspectors)*

Section 72 — Mobile home and recreational vehicle parks

R. May *(Chair)*	British Columbia Safety Authority (BCSA), New Westminster, British Columbia
M.S. Anderson	City of Winnipeg, Manitoba
J. Baker	OPCA, Embro, Ontario
W. Donald	Winnipeg, Manitoba
J. Einarson	Department of Community Services, Whitehorse, Yukon
D. Letcher	Don Letcher (E.S.C.O.) Enterprises, Sherwood Park, Alberta *(Representing International Association of Electrical Inspectors)*
G. Montminy	Régie du bâtiment du Québec, Québec, Québec
T. Olechna	Electrical Safety Authority, Mississauga, Ontario

Section 74 — Airport installations

R. May *(Chair)*	British Columbia Safety Authority (BCSA), New Westminster, British Columbia
D. Henry *(Vice-Chair)*	Department of National Defence, Westwin, Manitoba
E.J. Alf	Transport Canada, Ottawa, Ontario
G.W. Bradbury	B.T.E. Engineering Technology Services, St. Petersburg, Florida, USA *(Representing International Association of Electrical Inspectors)*
D.H. Dunsire	Winnipeg, Manitoba
G.T. Gingara	AMEC Americas Limited, Saskatoon, Saskatchewan
R. Kowalik	Alberta Transportation and Utilities, Edmonton, Alberta
N. Mancini	CSA, Toronto, Ontario

Section 76 — Temporary wiring

W.G. McMullan *(Chair)*	Manitoba Hydro, Winnipeg, Manitoba
S. Douglas *(Vice-Chair)*	Electrical Safety Authority, Cambridge, Ontario *(Representing International Association of Electrical Inspectors)*
B. Doan	Summer Electric London Ltd., Komoka, Ontario
N. Mancini	CSA, Toronto, Ontario
B. O'Donnell	AC Powerline Construction, Pickering, Ontario
T. Olechna	Electrical Safety Authority, Mississauga, Ontario

Section 78 — Marinas, yacht clubs, marine wharves, structures, and fishing harbours

A. Sutherland *(Chair)*	Department of Public Works and Government Services Canada, Hull, Québec
T. Branch	Department of Public Safety, Bathurst, New Brunswick
A. Donaldson	Ontario Marinas Operators' Association, Penetanguishene, Ontario
T.A. Fekete	Scarborough, Ontario
K. McCormick	Electrical Safety Authority, Cobourg, Ontario
K.L. Rodel	Hubbell Canada LP, Pickering, Ontario
M. Vollmer	Burlington, Ontario

Section 80 — Cathodic protection

T. Simmons *(Chair)*	British Columbia Institute of Technology, Burnaby, British Columbia
E. Court	Court Consulting Ltd., Calgary, Alberta
S.J. Croall	Manitoba Hydro, Winnipeg, Manitoba
J.G. Demers	Marex Canada Ltd., Calgary, Alberta
N. Mancini	CSA, Toronto, Ontario
R.J. Maynard	Aurora Environmental Consulting Ltd., Calgary, Alberta
W.G. McMullan	Manitoba Hydro, Winnipeg, Manitoba
D. Schill	SaskPower, Yorkton, Saskatchewan *(Representing International Association of Electrical Inspectors)*
R. Stromer	Imperial Oil Resources Ltd., Calgary, Alberta
A.Z. Tsisserev	City of Vancouver, British Columbia
R.G. Wakelin	Correng Consulting Services, Markham, Ontario

Section 82 — Closed-loop and pre-closed-loop power distribution

C.B. Chan *(Chair)*	MTS Communications Inc., Winnipeg, Manitoba
G.N. Bowling	Ottawa, Ontario
D. Juden	C.C.G., Ottawa, Ontario
N. Mancini	CSA, Toronto, Ontario
D. Pilon	SaskPower Electrical Inspectors, Prince Alberta, Saskatchewan *(Representing International Association of Electrical Inspectors)*

Section 84 — Interconnection of electric power production sources

F.L. Kaempffer *(Chair)*	British Columbia Hydro, Burnaby, British Columbia
M.S. Anderson	City of Winnipeg, Manitoba
R.A. Burpee	Saint John Energy, Saint John, New Brunswick
D. Desrosiers	Direction Principale, Montréal, Québec
D.H. Dunsire	Winnipeg, Manitoba
D. Heron	Electrical Safety Authority, Worthington, Ontario *(Representing International Association of Electrical Inspectors)*

A. Mak	EPCOR Distribution and Transmission Inc., Edmonton, Alberta
T. Pope	CSA, Mississauga, Ontario
V.G. Rowe	Marex Canada Limited, Westbank, British Columbia
T. Simmons	British Columbia Institute of Technology, Burnaby, British Columbia

Section 86 — Electric vehicle charging systems

T.W. Odell *(Chair)*	General Motors of Canada, Oshawa, Ontario
R. Field	Norvik Technologies Inc., Mississauga, Ontario
D. Hulford	CSA, Mississauga, Ontario
C. Keyes	Kinetrics Inc., Toronto, Ontario
S. Lines	Natural Resources Canada, Ottawa, Ontario
N. Mancini	CSA, Toronto, Ontario
A.Z. Tsisserev	City of Vancouver, British Columbia

Appendix C

A.Z. Tsisserev *(Chair)*	City of Vancouver, British Columbia

Appendix D

S. Paulsen *(Chair)*	Department of Public Safety, Fredericton, New Brunswick

Appendix E

V.G. Rowe *(Chair)*	Marex Canada Limited, Westbank, British Columbia

Appendix F

V.G. Rowe *(Chair)*	Marex Canada Limited, Westbank, British Columbia

Appendix G

A.Z. Tsisserev *(Chair)*	City of Vancouver, British Columbia

Appendix H

V.G. Rowe *(Chair)*	Marex Canada Limited, Westbank, British Columbia

Appendix J

V.G. Rowe *(Chair)*	Marex Canada Limited, Westbank, British Columbia

Preface

This twentieth edition of the *Canadian Electrical Code, Part I,* was approved by the Committee on the *Canadian Electrical Code, Part I*, and by the Regulatory Authority Committee at their June 2005 meetings in Kelowna, British Columbia. This twentieth edition supersedes the previous editions, published in 2002, 1998, 1994, 1990, 1986, 1982, 1978, 1975, 1972, 1969, 1966, 1962, 1958, 1953, 1947, 1939, 1935, 1930, and 1927.

Sections 0 to 16 and 26 are considered general sections, and the other sections supplement or amend the general sections.

Various requirements were revised as a result of the continuing efforts toward harmonization. In addition, there are significant changes to Sections 2, 10, 18 (particularly in Appendices B and J), 26, and 32. Sections 74 and 84 have been revised considerably to reflect new technology and industry practices.

A new Subsection was added to Section 22 to include the requirements for Sewage Lift and Treatment Plants. A new Appendix I has been added listing the interpretations that have been approved since the last edition, in the cases where the Rule in question has not been clarified yet. A new Appendix K has been added giving the fundamental safety principles contained in IEC 60634-1.

General arrangement

The Code is divided into numbered Sections, each covering some main division of the work. The Sections are divided into numbered Rules, with captions for easy reference, as follows:

(a) **Numbering system** — With the exception of Section 38, even numbers have been used throughout to identify Sections and Rules. Rule numbers consist of the Section number separated by a hyphen from the 3- or 4-digit figure. The intention in general is that odd numbers may be used for new Rules required by interim revisions. Due to the introduction of some new Rules and the deletion of some existing Rules during the revision of each edition, the Rule numbers for any particular requirement are not always the same in successive editions.

(b) **Subdivision of Rules** — Rules are subdivided in the manner illustrated by Rules 8-204 and 8-206, and the subdivisions are identified as follows:

00-000	Rule
(1)	Subrule
(a)	Item
(i)	Item
(A)	Item

(c) **Reference to other Rules, etc.** — Where reference is made to two or more Rules, the first and last Rules mentioned are included in the reference. Where reference is made to a Subrule or Item in the same Rule, only the Subrule number and/or Item letter and the word "Subrule" or "Item" need be mentioned. If the reference is to another Rule or Section, then the Rule number and the word "Rule" shall be stated (e.g., "Rule 10-200(3)" and not "Subrule (3) of Rule 10-200").

The principal changes that have been made between the 2002 edition of the *Canadian Electrical Code, Part I,* and this new edition published in 2006 are marked in the text of the Code by the symbol delta (Δ) in the margin. Where revisions to or deletions from the text have caused existing Rules to be renumbered, only the first renumbered Rule in the sequence is marked. Users of the Code are advised that the change markers in the text are not intended to be all-inclusive and are provided as a convenience only; such markers cannot constitute a comprehensive guide to the reorganization or revision of the Code. Care must therefore be taken not to rely on the change markers to determine the current requirements of the Code. As always, users of the Code must consider the entire Code and any local amendments.

Acknowledgement

Acknowledgement is made for the use of material contained in the *National Electrical Code.*

The history and operation of the *Canadian Electrical Code, Part I*

The preliminary work in preparing the *Canadian Electrical Code* was begun in 1920 when a special committee, appointed by the main Committee of the Canadian Engineering Standards Association, recommended that this project be undertaken. A third meeting of this Committee was held in June 1927 with representatives from

Nova Scotia, Québec, Ontario, Manitoba, Saskatchewan, and British Columbia attending. At this meeting, the revised draft, which had been discussed at the previous two meetings, was formally approved and a resolution was made that it be printed as Part I of the *Canadian Electrical Code*.

The present Committee on *CE Code, Part I*, is composed of 41 members, with representation from inspection authorities, industry, utilities, and allied interests. The main Committee meets once a year and deals with reports that have been submitted by the 42 Section Subcommittees, which work under the jurisdiction of the main Committee. Suggestions for changes to the Code may be made by any member of the Committee or anyone outside the Committee as outlined in Clause C6.

January 2006

Notes:

(1) *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.*

(2) *CSA Standards are subject to periodic review, and suggestions for their improvement will be referred to the appropriate committee.*

(3) *All enquiries regarding this Standard, including requests for interpretation, should be addressed to Canadian Standards Association, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6.*

Requests for interpretation will also be accepted by the Committee (see Clause C9). They should be worded in such a manner as to permit a specific "yes" or "no" answer based on the literal text of the requirement concerned.

Interpretations are published in CSA's periodical Info Update*, which is available on the CSA Web site at www.csa.ca.*

Metric units

Symbols and conversion factors for SI units

Recognized symbols for SI units have been used in the *Canadian Electrical Code, Part I*. For the convenience of the user, these symbols and the units they represent have been listed in the following table; the table also gives a multiplying factor that may be used to convert the SI unit to the previously used unit.

Symbol	SI unit	Multiplying factor for conversion to previously used unit	Previously used unit
A	ampere(s)	1	ampere(s)
cm^3	cubic centimetre(s)	0.061	cubic inch(es)
°(s)	degree(s) (angle)	1	degree(s) (angle)
°C rise	degree(s) Celsius	1.8	degree(s) Fahrenheit
°C temperature	degree(s) Celsius	1.8 plus 32	degree(s) Fahrenheit
h	hour(s)	1	hour(s) (time)
Hz	hertz	1	cycles per second
J	joule(s)	0.7376	foot-pound(s)
kg	kilogram(s)	2.205	pound(s)
kJ	kilojoule(s)	737.6	foot-pound(s)
km	kilometre	0.621	mile(s)
kPa	kilopascal(s)	0.295	inch(es) of mercury
		0.334	feet of water
		0.145	pound(s) per square inch (psi)
kW	kilowatt	3415.179	BTU/h
lx	lux	0.093	foot-candle(s)
L	litre	0.220	gallon(s)
m	metre(s)	3.281	feet
m^2	square metre(s)	10.764	square feet
m^3	cubic metre(s)	35.315	cubic feet
MHz	megahertz	1	megacycles per second
min	minute(s)	1	minute(s)
mL	millilitre(s)	0.061	cubic inch(es)
mm	millimetre(s)	0.03937	inch(es)
mm^2	square millimetre(s)	0.00155	square inch(es)
Ω	ohm(s)	1	ohm(s)
Pa	pascal(s)	0.000295	inch(es) of mercury
		0.000334	feet of water
		0.000145	pounds per square inch (psi)
V	volt(s)	1	volt(s)
W	watt(s)	1	watt(s)
μF	microfarad(s)	1	microfarad(s)

Conduit sizes

In the previous edition of the Code, changes to the identification of the size of conduit were made throughout the Code. The metric trade designator was given first, with the value in inches following in parentheses. In this edition, only the metric trade designator is used.

Conduit trade sizes

1998 edition	2002 edition	2006 edition
3/8 (12)	12 (3/8)	12
1/2 (16)	16 (1/2)	16
3/4 (21)	21 (3/4)	21
1 (27)	27 (1)	27
1-1/4 (35)	35 (1-1/4)	35
1-1/2 (41)	41 (1-1/2)	41
2 (53)	53 (2)	53
2-1/2 (63)	63 (2-1/2)	63
3 (78)	78 (3)	78
3-1/2 (91)	91 (3-1/2)	91
4 (103)	103 (4)	103
5 (129)	129 (5)	129
6 (155)	155 (6)	155

Reference publications

This Standard refers to the following publications, and the year dates shown indicate the latest editions available at the time the Standard was approved:

CSA (Canadian Standards Association)

B44-04, *Safety Code for Elevators and Escalators*
CAN/CSA-B44.1-04/ASME-A17.5-2004, *Elevator and Escalator Electrical Equipment*
B52-05, *Mechanical Refrigeration Code*
CAN/CSA-B72-M87 (R2003), *Installation Code for Lightning Protection Systems*
CAN/CSA-B137.1-02, *Polyethylene Pipe, Tubing, and Fittings for Cold-Water Pressure Services*
CAN/CSA-B149.1-05, *Natural Gas and Propane Installation Code*
CAN/CSA-B149.2-05, *Propane Storage and Handling Code*
CAN/CSA-B355-00, *Lifts for Persons with Physical Disabilities*
CAN/CSA-B613-00, *Private Residence Lifts for Persons with Physical Disabilities*
CAN/CSA-C22.2 No. 0-M91 (R2001), *General Requirements — Canadian Electrical Code, Part II*
C22.2 No. 1-04, *Audio, Video, and Similar Electronic Equipment*
C22.2 No. 3-M1988 (R2004), *Electrical Features of Fuel-Burning Equipment*
CAN/CSA-C22.2 No. 14-95 (R2001), *Industrial Control Equipment*
C22.2 No. 22-M1986 (R2004), *Electrical Equipment for Flammable and Combustible Fuel Dispensers*
C22.2 No. 25-1966 (R2004), *Enclosures for Use in Class II Groups E, F, and G Hazardous Locations*
C22.2 No. 30-M1986 (R2003), *Explosion-Proof Enclosures for Use in Class I Hazardous Locations*
C22.2 No. 33-M1984 (R2004), *Construction and Test of Electric Cranes and Hoists*
C22.2 No. 41-M1987 (R2004), *Grounding and Bonding Equipment*
C22.2 No. 59-M1987 (R2004), *Attachment Plugs, Receptacles, and Similar Wiring Devices for Use in Hazardous Locations: Class I, Groups A, B, C, and D; Class II, Groups G, in Coal or Coke Dust, and in Gaseous Mines*
C22.2 No. 59.1-M1987 (R2001), *Fuses (Both Plug and Cartridge-Enclosed Types)*
C22.2 No. 82-1969 (R2004), *Tubular Support Members and Associated Fittings for Domestic and Commercial Service Masts*
CAN/CSA-C22.2 No. 106-M92 (R2001), *HRC Fuses*
C22.2 No. 107.1-01, *General Use Power Supplies*
C22.2 No. 111-00, *General-Use Snap Switches*
CAN/CSA-C22.2 No. 114-M90 (R2005), *Diagnostic Imaging and Radiation Therapy Equipment*
C22.2 No. 124-04, *Mineral-Insulated Cable*
C22.2 No. 125-M1984 (R2004), *Electromedical Equipment*
C22.2 No. 126.1-02, *Metal Cable Tray Systems*
CAN/CSA-C22.2 No. 130-03, *Requirements for Electrical Resistance Heating Cables and Heating Device Sets*
CAN/CSA-C22.2 No. 130.1-M90 (R2001), *Heat-Tracing Cable Systems for Use in Industrial Locations (withdrawn)*
C22.2 No. 137-M1981 (R2004), *Electric Luminaires For Use in Hazardous Locations*
C22.2 No. 141-02, *Unit Equipment for Emergency Lighting*
C22.2 No. 145-M1986 (R2004), *Motors and Generators for Use in Hazardous Locations*
C22.2 No. 152-M1984 (R2001), *Combustible Gas Detection Instruments*
CAN/CSA-C22.2 No. 157-92 (R2002), *Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations*
C22.2 No. 174-M1984 (R2003), *Cables and Cable Glands for Use in Hazardous Locations*
C22.2 No. 178-1978 (R2001), *Automatic Transfer Switches*
C22.2 No. 211.0-03, *General Requirements and Methods of Testing for Nonmetallic Conduit*
C22.2 No. 213-M1987 (R2004), *Non-incendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations*
CAN/CSA-C22.2 No. 248 series (R2005), *Low-Voltage Fuses*
CAN/CSA-C22.2 No. 601 series, *Medical Electrical Equipment*
CAN/CSA-C22.2 No. 60529:05, *Degrees of Protection Provided by Enclosures (IP Code)*
CAN/CSA-C22.3 No. 1-01, *Overhead Systems*
C22.3 No. 7-94 (R2004), *Underground Systems*
C83-96 (R2005), *Communication and Power Line Hardware*
CAN3-C235-83 (R2000), *Preferred Voltage Levels for AC Systems,* 0 *to* 50 000 V
CAN/CSA-C282-00, *Emergency Electrical Power Supply for Buildings*
CAN/CSA-C1264-99 (R2004), *Ceramic Pressurized Hollow Insulators for High-Voltage Switchgear and Controlgear*

CAN/CSA-C50052-99 (R2003), *Cast Aluminium Alloy Enclosures for Gas-Filled High-Voltage Switchgear and Controlgear*
CAN/CSA-C50064-99 (R2003), *Wrought Aluminium and Aluminium Alloy Enclosures for Gas-Filled High-Voltage Switchgear and Controlgear*
CAN/CSA-C50068-99 (R2003), *Wrought Steel Enclosures for Gas-Filled High-Voltage Switchgear and Controlgear*
CAN/CSA-C50069-99 (R2003), *Welded Composite Enclosures of Cast and Wrought Aluminium Alloys for Gas-Filled High-Voltage Switchgear and Controlgear*
CAN/CSA-C50089-99 (R2003), *Cast Resin Partitions for Metal-Enclosed Gas-Filled High-Voltage Switchgear and Controlgear*
CAN/CSA-E60079-0-02, *Electrical Apparatus for Explosive Gas Atmospheres — Part 0: General Requirements*
CAN/CSA-E60079-1-02, *Electrical Apparatus for Explosive Gas Atmospheres — Part 1: Flameproof Enclosures "d"*
CAN/CSA-E60079-2-02, *Electrical Apparatus for Explosive Gas Atmospheres — Part 2: Electrical Apparatus — Type of Protection "p"*
CAN/CSA-E60079-5-02, *Electrical Apparatus for Explosive Gas Atmospheres — Part 5: Powder Filling "q"*
CAN/CSA-E60079-6-02, *Electrical Apparatus for Explosive Gas Atmospheres — Part 6: Oil-Immersion "o"*
CAN/CSA-E60079-7-03, *Electrical Apparatus for Explosive Gas Atmospheres — Part 7: Increased Safety "e"*
CAN/CSA-E60079-11-02, *Electrical Apparatus for Explosive Gas Atmospheres — Part 11: Intrinsic Safety "i"*
CAN/CSA-E60079-15-02, *Electrical Apparatus for Explosive Gas Atmospheres — Part 15: Electrical Apparatus with Type of Protection "n"*
CAN/CSA-E79-18-95 (R2004), *Electrical Apparatus for Explosive Gas Atmospheres — Part 18: Encapsulation "m"*
CAN/CSA-E61241-1-1-02, *Electrical Apparatus for Use in the Presence of Combustible Dust — Part 1-1: Electrical Apparatus Protected by Enclosures and Surface Temperature Limitations — Specification for Apparatus*
CAN/CSA-M421-00, *Use of Electricity in Mines*
CAN/CSA-S413-94 (R2000), *Parking Structures*
CAN/CSA-Z32-04, *Electrical Safety and Essential Electrical Systems in Health Care Facilities*
CAN/CSA-Z240 MH Series-92 (R2001), *Mobile Homes*
CAN/CSA-Z240 RV Series-99 (R2004), *Recreational Vehicles*
CAN/CSA-Z241 Series-03, *Park Model Trailers*
CAN/CSA-Z267-00, *Safety Code for Amusement Rides and Devices*
CAN/CSA-Z662-03, *Oil and Gas Pipeline Systems*

ANSI/API (American National Standards Institute/American Petroleum Institute)
505 (1997), *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Zone 0, and Zone 2*

ANSI/ASME (American National Standards Institute/American Society of Mechanical Engineers)
B1.20.1-1983 (R2001), *Pipe Threads, General Purpose (Inch)*
Z535.4-2002, *Product Safety Signs and Labels*

ANSI/IEEE (American National Standards Institute/Institute of Electrical and Electronics Engineers)
487-2000, *Recommended Practice for the Protection of Wire-Line Communication Facilities Serving Supply Locations*

ANSI/NEMA (American National Standards Institute/National Electrical Manufacturers Association)
WD 6-2002, *Wiring Devices — Dimensional Requirements*

API (American Petroleum Institute)
500 (1997), *Recommended Practice for Classification of Locations for Electrical Installations of Petroleum Facilities Classified as Class I, Division 1 and Division 2*
2216 (2003), *Ignition Risk of Hydrocarbon Liquids and Vapors by Hot Surfaces in the Open Air*

CEA (Canadian Electricity Association)
249 D541-1989, *Simplified Rules for Grounding Customer-Owned High Voltage Substations*

IEC (International Electrotechnical Commission)
60079-1A:2003, *Electrical apparatus for explosive gas atmospheres — Part 1: Flameproof enclosures "d"*
60079-4:1975, *Electrical apparatus for explosive gas atmospheres — Part 4: Method of test for ignition temperature*

60079-4A:1970, *Electrical apparatus for explosive gas atmospheres — Part 4: Method of test for ignition temperature — First supplement*
60079-10:2002, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas*
60079-12:1978, *Electrical apparatus for explosive gas atmospheres — Part 12: Classification of mixtures of gases of vapours with air according to their maximum experimental safe gaps and minimum igniting currents*
60079-13:1982, *Electrical apparatus for explosive gas atmospheres — Part 13: Construction and use of rooms or buildings protected by pressurization*
60079-14:2002, *Electrical apparatus for explosive gas atmospheres — Part 14: Electrical installations in hazardous areas (other than mines)*
60079-16:1990, *Electrical apparatus for explosive gas atmospheres — Part 16: Artificial ventilation for the protection of analyser(s) houses*
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60079-19:1993, *Electrical apparatus for explosive gas atmospheres — Part 19: Repair and overhaul for apparatus used in explosive atmospheres (other than mines or explosives)*
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60529:2001, *Degrees of protection provided by enclosures (IP Code)*
60721, *Classification of Environmental Conditions*
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Section 0 — Object, scope, and definitions
(See Appendix G)

Object (see Appendix B)

Δ The object of this Code is to establish safety standards for the installation and maintenance of electrical equipment. In its preparation, consideration has been given to the prevention of fire and shock hazards, as well as proper maintenance and operation.

Compliance with the requirements of this Code and proper maintenance will ensure an essentially safe installation. Safe installations may also be ensured by compliance with the objective-based fundamental safety principles of IEC 60364-1 (see Appendix K). Compliance with these objective-based installation criteria by industrial and similar users may be achieved through the implementation of specific quality management programs or equivalent programs acceptable to the authorities adopting and enforcing this Code.

Wiring installations that do not make provision for the increasing use of electricity may be overloaded in the future, resulting in a hazardous condition. It is recommended that the initial installation have sufficient wiring capacity and that there be some provision made for wiring changes that might be required as a result of future load growth.

This Code is not intended as a design specification nor as an instruction manual for untrained persons.

The requirements in this Code address the fundamental principles of protection for safety contained in Section 131 of IEC 60364-1, which encompasses protection against electric shock, thermal effects, overcurrent, fault currents, and overvoltage.

Scope

This Code covers all electrical work and electrical equipment operating or intended to operate at all voltages in electrical installations for buildings, structures, and premises, including factory-built relocatable and non-relocatable structures, and self-propelled marine vessels stationary for periods exceeding five months and connected to a shore supply of electricity continuously or from time to time, with the following exceptions:

Δ (a) installations or equipment employed by an electric, communication, or community antenna distribution system utility in the exercise of its function as a utility, as recognized by the regulatory authority having jurisdiction, and located outdoors or in buildings or sections of buildings used for that purpose;
(b) equipment and facilities that are used in the operation of an electric railway and are supplied exclusively from circuits that supply the motive power;
(c) installations or equipment used for railway signalling and railway communication purposes, and located outdoors or in buildings or sections of buildings used exclusively for such installations;
(d) aircraft; and
(e) electrical systems in ships that are regulated under Transport Canada.

For mines and quarry applications, see also CAN/CSA-M421.

This Code and any standards referenced herein do not make or imply any assurance or guarantee by the authority adopting this Code with respect to life expectancy, durability, or operating performance of equipment and materials referenced herein.

Definitions

For the purpose of correct interpretation, certain terms have been defined and where such terms or their derivatives appear throughout this Code they shall be understood to have the following meanings. The ordinary or dictionary meaning of terms shall be used for terms not specifically defined in this Code.

Acceptable — acceptable to the authority enforcing this Code.

Accessible (as applied to equipment) — admitting close approach because the equipment is not guarded by locked doors, elevation, or other effective means.

Accessible (as applied to wiring methods) —
(a) not permanently closed in by the structure or finish of the building; and
(b) capable of being removed without disturbing the building structure or finish.

Accredited certification organization — an organization that has been accredited by the Standards Council of Canada, in accordance with specific criteria, procedures, and requirements, to operate, on a continuing basis, a certification program for electrical equipment.