CSA GROUP™

CSA Z243.4:87
National Standard of Canada
(reaffirmed 2019)

7-bit and 8-bit Coded Character Sets for Information Processing and Interchange

Standards Council of Canada
Conseil canadien des normes

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 printed 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 thereof, 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 Z243.4:87
July 1987

Title: *7-bit and 8-bit Coded Character Sets for Information Processing and Interchang*

To register for e-mail notification about any updates to this publication
- go to **store.csagroup.org**
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **20094_1**

If you require assistance, please e-mail **techsupport@csagroup.org** or call 4[illegible]-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

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

Standards Council of Canada
Conseil canadien des normes

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.

National Standard of Canada

CSA Z243.4:87

7-bit and 8-bit Coded Character Sets for Information Processing and Interchange

Published in July 1987 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.

ISSN 0317-5669

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 has been adopted by the Government of Canada.

Details concerning its use within the Government of Canada are contained in the Treasury Board Information Technology Standards publication TBITS - 3, "7-bit and 8-bit Coded Character Sets for Information Processing and Interchange". For a copy of this publication or for a complete list of the publications available in the Treasury Board Information Technology Standards series, write to:

Information Technology Management
Information Management Division
Administrative Policy Branch
Treasury Board Secretariat
10th Floor, East Tower, L'Esplanade Laurier
140 O'Connor Street
Ottawa, Ontario
K1A 0R5

Contents

Technical Committee on Character Sets and Information Coding

V.S. Umamaheswaran	IBM Canada Ltd., North York, Ontario	*Chairman*
A.M. Hlady	National Research Council of Canada, Ottawa, Ontario	*Vice-Chairman*
K. Bachmann	Unisys Corp., Montreal, Quebec	
G. Basque	Université de Montréal, Montréal, Québec	
P. Cadieux	Arabic-Latin Information Systems Inc., St-Laurent, Quebec	
Y.H. Chung	CNCP Telecommunications, Toronto, Ontario	
M. Felsky	Canadian Law Information Council, Ottawa, Ontario	
R.G. Hammond	Statistics Canada, Ottawa, Ontario	
E. Kulinek	Bell-Northern Research Limited, Toronto, Ontario	
A. Kwan	Department of Communications, Ottawa, Ontario	
A. La Bonté	Ministère des Communications du Québec, Québec	
K.F. Mabson	Westinghouse Canada Inc., Burlington, Ontario	
E.G. Patterson	Treasury Board of Canada, Ottawa, Ontario	
J.C.H. Davis	Canadian Standards Association, Rexdale, Ontario	*Standards Administrator, Nonvoting*

In addition to the members of the Committee, the following made valuable contributions to the development of this Standard:

J.W. Brahan	National Research Council of Canada, Ottawa, Ontario	*Past Chairman*

Preface

This is the third edition of CSA Standard Z243.4 (now CAN/CSA-Z243.4), *7-bit and 8-bit Coded Character Sets for Information Processing and Interchange.* It contains some corrections and modifications from the Preliminary Standard published in 1985, which superseded the previous edition, published in 1973 with the title *7-Bit Coded Character Set for Information Processing Interchange.* This Standard has been extended, relative to the 1973 edition, to include 8-bit codes and also incorporates techniques for code extension based on ISO Standards that are referenced in this Standard.

The primary 7-bit coded character set of this Standard is defined in accordance with Clause 6 of ISO Standard 646, *Information Processing—ISO 7-bit Coded Character Set for Information Interchange*, and is hence to be considered the Canadian version of ISO 646.

The first edition of this Standard was limited by the technology available at the time for implementation of the code. With advances in the technology that have taken place since, it has been possible to address these limitations in the current edition. However, the current Standard provides for compatibility with equipment based on the 1973 edition.

Since the first version of this Standard, ISO has created many related Standards. The Committee has chosen to consolidate many of those Standards into a single document for Canadian use. Thus, with a single Standard, the reader should be able to implement hardware and software that conforms to both the Canadian and international standards.

In accordance with an agreement established some time ago, the Technical Committee also assumes an advisory role to GESC (Government EDP Standards Committee) with respect to character sets and information coding Standards. To support this arrangement, the Technical Committee has active representation from a number of federal government agencies.

The Committee envisages further development of this Standard based on user requirements. So that the Standard may evolve in a meaningful and orderly manner, equipment suppliers and users are requested to notify CSA of any shortcomings of the Standard for their requirements.

This Standard was prepared by the Technical Committee on Character Sets and Information Coding under the jurisdiction of the Standards Steering Committee on Information Processing Systems. It has been approved as a National Standard of Canada by the Standards Council of Canada.

July 1987

Notes:

(1) *Use of the masculine gender in this Standard is not meant to exclude the feminine gender. Similarly, 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 user of the Standard to judge its suitability for his particular purpose.*

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

(4) *All enquiries regarding this Standard, including requests for interpretation, should be addressed to Canadian Standards Association, Standards Division, 178 Rexdale Boulevard, Rexdale, Ontario M9W 1R3.*

Requests for interpretation should

(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) be phrased where possible to permit a specific "yes" or "no" answer.

Interpretations are published in "CSA Information Update". For subscription details and a free sample copy, write to CSA Marketing or telephone (416) 747-2292.

CAN/CSA-Z243.4-87
7-bit and 8-bit Coded Character Sets for Information Processing and Interchange

1. Scope

1.1

This Standard consists of primary and supplementary graphic and control sets, 7-bit and 8-bit codes based on the above sets, and rules for code extension. The character sets are intended for general usage in data processing, programming, and information interchange. These character sets include letters, figures, punctuation marks, and other symbols and controls, with their coded representation.

1.2

The requirements for graphic characters and control functions in various applications and the limitations imposed by computer and ancillary equipment characteristics have been taken into account in determining these character sets. Specific considerations included the following:

(a) the need for a set of graphic characters sufficient to support information interchange using both the English and the French languages;
(b) the need for an adequate number of device controls and format effectors;
(c) the need to provide for compatible interchange with existing systems in North America and internationally;
(d) physical limitations of media and facilities;
(e) data manipulation and interactive computing requirements;
(f) programming requirements;
(g) keyboard conventions and limitations.

1.3

The primary and supplementary character sets described in this Standard are primarily intended for the interchange of information among data processing systems and associated equipment. They may be regarded as basic alphabets in an abstract sense. The range of applications may be extended through the application of the code extension techniques defined herein and through the use of the coded character sets included in the *ISO International Register of Coded Character Sets to be Used with Escape Sequences*, available from
Registration Authority for ISO 2375
European Computer Manufacturers Association
114, Rue du Rhône
CH-1204 Geneva
Switzerland

2. Definitions

2.1

The following definitions apply in this Standard:

Bit combination—an ordered set of bits used for representation of a character.