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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO’s adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/IEC JTC 1, Information technology, SC 2, Coded character sets.


This edition includes the following significant changes with respect to the previous edition:

- New scripts covered: Adlam, Bhaiksuki, Marchen, Masaram Gondhi, Newa, Nushu, Osage, Soyombo, Tangut, and Zanabazar Square,
- Existing scripts significantly extended: Cherokee, CJK Unified Ideographs (Extension F),
- New Emoji symbols.
Introduction

This International Standard specifies the Universal Coded Character Set (UCS). It is applicable to the representation, transmission, interchange, processing, storage, input and presentation of the written form of the languages of the world as well as additional symbols.

By defining a consistent way of encoding multilingual text it enables the exchange of data internationally. The information technology industry gains data stability, greater global interoperability and data interchange. This International Standard has been widely adopted in new Internet protocols and implemented in modern operating systems and computer languages. This edition covers over 130 000 characters from the world’s scripts.
1 Scope

This International Standard specifies the Universal Coded Character Set (UCS). It is applicable to the representation, transmission, interchange, processing, storage, input, and presentation of the written form of the languages of the world as well as of additional symbols.

This International Standard

- specifies the architecture of this International Standard,
- defines terms used in this International Standard,
- describes the general structure of the UCS codespace,
- specifies the Basic Multilingual Plane (BMP) of the UCS,
- specifies supplementary planes of the UCS: the Supplementary Multilingual Plane (SMP), the Supplementary Ideographic Plane (SIP), the Tertiary Ideographic Plane (TIP), and the Supplementary Special-purpose Plane (SSP),
- defines a set of graphic characters used in scripts and the written form of languages on a world-wide scale,
- specifies the names for the graphic characters and format characters of the BMP, SMP, SIP, TIP, SSP and their coded representations within the UCS codespace,
- specifies the coded representations for control characters and private use characters,
- specifies three encoding forms of the UCS: UTF-8, UTF-16, and UTF-32,
- specifies seven encoding schemes of the UCS: UTF-8, UTF-16, UTF-16BE, UTF-16LE, UTF-32, UTF-32BE, and UTF-32LE,
- specifies the management of future additions to this coded character set.

The UCS is an encoding system different from that specified in ISO/IEC 2022. The method to designate UCS from ISO/IEC 2022 is specified in 12.2.

A graphic character will be assigned only one code point in the standard, located either in the BMP or in one of the supplementary planes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Unicode Standard Annex, UAX #15, Unicode Normalization Forms: http://www.unicode.org/reports/tr15/tr15-44.html
Unicode Technical Standard, UTS #37, Ideographic Variation Database: http://www.unicode.org/reports/tr37/tr37-8.html

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Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1 base character

graphic character which is not a combining character

Note 1 to entry — Most graphic characters are base characters. This sense of graphic combination does not preclude the presentation of base characters from adopting different contextual forms or from participating in ligatures.

Note 2 to entry — A base character typically does not graphically combine with preceding characters. The exceptions are for some complex writing systems.

3.2 Basic Multilingual Plane

BMP plane 00 of the UCS codespace

3.3 block

contiguous range of code points to which a set of characters that share common characteristics, such as a script, are allocated; one or more of the code points within a block may have no character allocated to them

3.4 canonical form

form with which characters of this coded character set are specified using a single code point within the UCS codespace

Note 1 to entry — The canonical form is not to be confused with an encoding form which describes the relationship between UCS code points and one or several code units (see 3.23).

3.5 character member of a set of elements used for the organization, control, or representation of textual data

Note 1 to entry — A graphic symbol can be represented by a sequence of one or several coded characters.

3.6 character boundary (code unit sequence) demarcation between the last code unit of a coded character and the first code unit of the next coded character

3.7 code chart code table rectangular array showing the representation of coded characters allocated within a range of the UCS codespace

Unicode Standard Version 9.0, Chapter 4, Character Properties

http://www.unicode.org/versions/Unicode9.0.0/ch04.pdf

Section 4.3, Combining Classes – Normative
Section 4.5, General Category – Normative
Section 4.7, Bidi Mirrored – Normative

Unicode Standard Version 9.0, Age Property:

http://www.unicode.org/Public/9.0.0/ucd/DerivedAge.txt