INTERNATIONAL STANDARD ISO 2955

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Information processing — Representations of SI and other units for use in systems with limited character sets

Traitement de l'information — Représentations des unités SI et autres unités pour utilisation dans des systèmes comprenant des jeux de caractères limités

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

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It has been approved by the Member Bodies of the following countries :

Australia	Germany	South Africa, Rep. of
Belgium	Hungary	Spain
Brazil	Italy	Sweden
Bulgaria	Japan	Switzerland
Canada	Mexico	Thailand
Czechoslovakia	Netherlands	Turkey
Denmark	New Zealand	United Kingdom
Egypt, Arab Rep. of	Poland	U.S.A.
France	Romania	

No Member Body expressed disapproval of the document.

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Information processing — Representations of SI and other units for use in systems with limited character sets

1 SCOPE AND FIELD OF APPLICATION

1.1 This International Standard provides representations for units to be used in data interchange, in place of their international symbols, by systems with limited graphic character sets as specified in 1.2.

The representations apply to names of SI units and other internationally recognized[1] units, and their decimal multiples and sub-multiples formed by the use of prefixes (see annex).

The representations of units as listed herein are intended for use only in systems with limited graphic character set capabilities. They are not intended to replace the international symbols, which are preferred and given in ISO 31 and ISO 1000. When these international symbols are not available, the unabbreviated unit names should preferably be used.

1.2 This International Standard specifies two sets of representations :

Form I : For systems which have the capability to use both upper- and lower-case letters (double case), digits, and other graphics, at least the graphical symbols apostrophe ('), quotation mark ("), hyphen (-), full stop or period (.), and solidus (/), as provided for example in ISO 646[2] among other graphics; but which do not have the capability to use the Greek letters Ω and μ and angle sign (°), and letters, digits and signs in superscript position.

Form II : For systems which have the capability to use single-case letters only (either upper or lower), digits, and other graphics, at least the graphical symbols hyphen (-), full stop or period (.), and solidus (/), as provided for example in ISO 646[2] and CCITT Alphabet No. 2 among other graphics; but which do not have the capability to use the Greek letters Ω and μ and angle sign (°), and letters, digits and signs in superscript position.

The representations of Form II are intended primarily for the interchange of information among data processing systems and associated equipment, and within message transmission systems. They should never be printed out for publication or for other forms of public information transfer. In these cases the special representations of Form II must be replaced by the international symbols or by the full names of the units.

2 RULES

The following rules shall be observed when forming representations :

Rule No. 1

In narrative (free text) data, a space character shall be used to separate the numeric value and the unit representation, for example 10 m, 2 m2. In formatted data, as in records, the use of the space character as a separator is optional, since its use or non-use is defined in the format description.

1) International Conference on Weights and Measures; see ISO 1000.

2) ISO 646, *7-bit coded character set for information processing interchange.*

Rule No. 2

To indicate multiplication of units, a full stop (.) between the representations of units (combined with prefix or not) is necessary.

Examples :

1) Pa.s to designate pascal second, unit of dynamic viscosity.

2) N.m to designate metre newton.

This position of the two letters is intended to avoid confusion which could occur between m.N (metre newton) and mN (millinewton).

Rule No. 3

To indicate division of units, the numerator and the denominator are separated by a solidus (/); alternatively, the denominator may be expressed with a negative exponent (see Rule No. 5), for example m/s or m.s−1 for metre per second.

Rule No. 4

Positive exponents are indicated by the respective numerals without any further sign, directly after the representation of the unit; for example m2 for m^2.

Rule No. 5

Negative exponents are indicated by a minus sign followed by the respective numeral, both together directly after the representation of the unit; for example m−3 for m^{-3}.

Rule No. 6

A prefix representation is combined with a unit representation to form a new unit representation which can be raised to a power with positive or negative exponent and which can be combined with other unit representations to form representations or compound units. There is no separator or space between the prefix representation and the unit representation; for example cm2 for cm^2, kN/m2 or kN.m−2 for kN/m^2.

NOTES

1 A prefix is not allowed to stand alone, without combination with a unit; for example, T alone means tesla but not tera. Compound prefixes should not be used; for example, nm (nanometre) should be used instead of mum (millimicrometre).

2 In the case of the base SI unit kilogram, which contains a prefix in its name, the representations for decimal multiples and sub-multiples are formed by use of the corresponding prefix representation together with the representation of the unit gram; for example, the representation for 10^{-6} kilogram = 10^{-3} gram is denoted by mg and **not** by ukg.

The representations of units and prefixes are listed in clauses 3 and 4. For comparison, the international symbols (see ISO 31 and ISO 1000) are given in the tables.

3 REPRESENTATIONS OF UNITS

Name of unit	International symbol (common use symbol)	Representation		
		Form I (double case)	Form II (single case lower)	Form II (single case upper)
3.1 Base SI units				
metre	m	m	m	M
kilogram	kg	kg	kg	KG
second	s	s	s	S
ampere	A	A	a	A
kelvin	K	K	k	K
mole	mol	mol	mol	MOL
candela	cd	cd	cd	CD
3.2 Supplementary SI units				
radian	rad	rad	rad	RAD
steradian	sr	sr	sr	SR
3.3 Derived SI units with special names				
hertz	Hz	Hz	hz	HZ
newton	N	N	n	N
pascal	Pa	Pa	pa	PA
joule	J	J	j	J
watt	W	W	w	W
coulomb	C	C	c	C
volt	V	V	v	V
farad	F	F	f	F
ohm	Ω	Ohm	ohm	OHM
siemens	S	S	sie	SIE
weber	Wb	Wb	wb	WB
tesla	T	T	t	T
henry	H	H	h	H
lumen	lm	lm	lm	LM
lux	lx	lx	lx	LX
3.4 Other units from ISO 1000				
grade (angle)	g (s)*	gon	gon	GON
degree (angle)	° (s)	deg	deg	DEG
minute (angle)	′ (s)	′ (s)	mnt	MNT
second (angle)	″ (s)	″ (s)	sec	SEC
litre	l	l	l	L
are	a	a	are	ARE
minute (time)	min	min	min	MIN
hour	h	h	hr	HR
day	d	d	d	D
year	a	a	ann	ANN
gram	g	g	g	G
tonne	t	t	tne	TNE
bar	bar	bar	bar	BAR
poise	P	P	p	P
stokes	St	St	st	ST
electronvolt	eV	eV	ev	EV
degree Celsius	°C	Cel	cel	CEL
atomic mass unit	u	u	u	U

* (s) indicates symbol is used in the right superscript position (like an exponent).

4 REPRESENTATIONS OF PREFIXES

Prefix	Factor by which the unit is multiplied	International symbol (common use symbol)	Representation		
			Form I (double case)	Form II (single case lower)	Form II (single case upper)
tera	10^{12}	T	T	t	T
giga	10^{9}	G	G	g	G
mega	10^{6}	M	M	ma	MA
kilo	10^{3}	k	k	k	K
hecto	10^{2}	h	h	h	H
deca	10^{1}	da	da	da	DA
deci	10^{-1}	d	d	d	D
centi	10^{-2}	c	c	c	C
milli	10^{-3}	m	m	m	M
micro	10^{-6}	μ	u	u	U
nano	10^{-9}	n	n	n	N
pico	10^{-12}	p	p	p	P
femto	10^{-15}	f	f	f	F
atto	10^{-18}	a	a	a	A