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APPROVAL OF NEW RECOMMENDATIONS AND STANDARDS

Recommendation No. 20

Codes for Units of Measure used in International Trade

Note by the secretariat^{1, 2}

Summary

At its fifth session, in 1999, the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) approved the recommendation of its Steering Group to delegate the authority for maintenance of the code lists associated with UN/CEFACT Recommendations to the Code Working Group. This authorization was transferred to the Information Content Management Group (ICG) in the reorganization of UN/CEFACT's structure in 2003. The ICG approved the latest³ code list in June 2009 (Revision 6) and is submitting these updated lists to the Plenary for information. The lists are too lengthy for inclusion in this paper and may be downloaded from UN/CEFACT's website⁴.

¹ This document was submitted late due to resource constraints.

² All information provided in this Recommendation, including in its associated annexes, is provided "as is", without warranty of any kind, either express or implied, including, without limitation, warranties of merchantability, fitness for a specific purpose and non-infringement. UN/CEFACT specifically does not make any warranties or representations as to the accuracy or completeness of any information published in this Recommendation. Under no circumstances shall UN/CEFACT be liable for any loss, damage, or expense incurred or suffered that is claimed to have resulted from the use of this Recommendation. The use of this Recommendation is at the user's sole risk.

³ Earlier versions include Revision 5 (ECE/TRADE/C/CEFACT/2008/6), Revision 4 (CEFACT/ICG/2006/IC001) and Revision 3 (TRADE/CEFACT/2005/19).

⁴ http://www.unecce.org/cefact/recommendations/rec_index.htm.

I. INTRODUCTION

1. The United Nations, through its Centre for Trade Facilitation and Electronic Business (UN/CEFACT), supports activities dedicated to improving the ability of business, trade and administrative organizations, from developed, developing and transitional economies, to exchange products and relevant services effectively. Its principal focus is on facilitating national and international transactions, through the simplification and harmonization of processes, procedures and information flows, and so contribute to the growth of global commerce.⁵
2. The UN/CEFACT work programme emphasises the need for developing recommendations, which simplify and harmonize the current practices and procedures used in international transactions. Within this context, the role of the UN/CEFACT Information Content Management Group (ICG) is to secure the quality, relevance and availability of code sets and code structures to support the objectives of UN/CEFACT, including managing the maintenance of UNECE Recommendations related to codes. The ICG prepared this latest revision of the code list for Recommendation No. 20.
3. The accompanying code list annexes (I, II and III) are intended to supersede and replace the code list annexes released with revision five of Recommendation No. 20 (CEFACT/ICG/2008/IC006) approved by the ICG, in May 2008.
4. Recommendation No. 20 is intended to provide for:
 - (a) Standardization leading to ease of communication;
 - (b) Greater clarity and ease of use leading to harmonization via a comparative approach addressing the practical user needs;
 - (c) Ease of maintenance of the code entries.

To that purpose, a single list of code elements for units of measure for use worldwide in administration, commerce, transport, science and technology is provided.

II. RECOMMENDATION

The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)

- (a) *Taking note* that the units of measure specified herein are provided to the user for the representation of physical quantities currently employed in international or regional trade;
- (b) *Taking note* that this collection of units neither claims to address quantities or units of measure of a non-physical nature nor caters for the inclusion of historic units of

⁵ TRADE/R.650/Rev.4.

measure, with the exception of those historic units that are generally encountered in present day usage;

Recommends that participants in international trade, when there is a need for coded representations of units of measure, use the codes for such units presented in the lists annexed to this present Recommendation.

III. EXPLANATORY NOTE

A. INTRODUCTION

5. In international trade there is a need for the greatest possible clarity in the use of units of measure not only for the fulfilment of commercial contracts but also for the application of laws and regulations governing international trade procedures.

6. In 1875 the Bureau International des Poids et Mesures BIPM (International Bureau of Weights and Measures) was established at Sèvres (France). The Bureau was provided for in the Convention du mètre signed that year at the first General Conference on Weights and Measures. The BIPM has a bilingual Web site.

7. The *Système International d'Unités* (International System of Units), with the abbreviation SI (see BIPM Web site above), was adopted by the eleventh General Conference on Weights and Measures in 1960.

8. These and other international efforts to harmonize units of measure and to ensure comparable results through common rules of application of standardized measures have aimed at contributing, *inter alia*, to a better understanding between trading partners, to improved conditions for Customs clearance and to ensuring comparability of international trade and transport statistics.

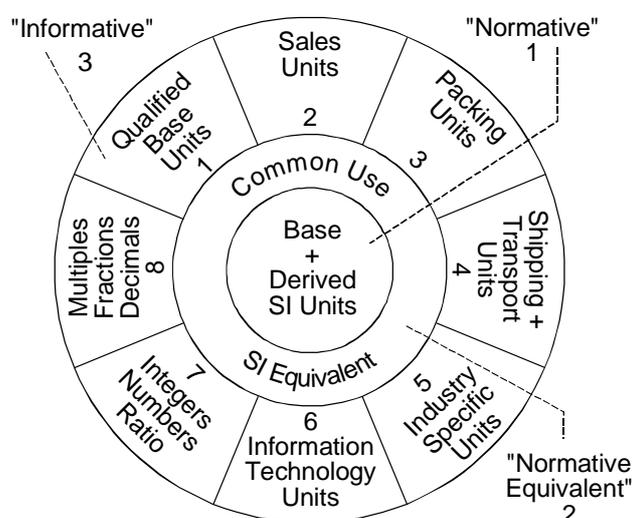
B. BACKGROUND TO THE CURRENT EDITION

9. This edition of Recommendation No. 20 is a limited update to the previous version and includes a number of additions and changes to the code list entries in code list annexes I, II and III.

C. SCOPE

10. This Recommendation establishes a single list of code elements to represent units of measure for length, mass (weight), volume and other quantities (including units of count) as shown in figure 1 and covering administration, commerce, transport, science, technology, industry etc.

Figure 1: Units of measure schema components



IV. FIELD OF APPLICATION

11. The code elements provided for in this recommendation are intended for use in manual and/or automated systems for the exchange of information between participants in international trade and of other economic, scientific and technological activities.

12. This Recommendation does not affect the use of code elements, other than those presented in the Annexes, which have been laid down in international conventions or agreements, binding on participants in international trade.

V. TERMINOLOGY

13. For the purpose of this Recommendation, the following definition applies:

Unit of measure: Particular quantity, defined and adopted by convention, with which other quantities of the same kind are compared in order to express their magnitudes relative to that quantity.

VI. PRINCIPLES FOR INCLUSION IN THE CODE LIST

14. This Recommendation provides a list of code elements for units of measure to be used in the exchange of information. The codes are intended for application in everyday trade transactions where the increasing use of electronic data exchange makes it desirable to establish such codes. For enterprises that use the United Nations system of aligned trade documents (based

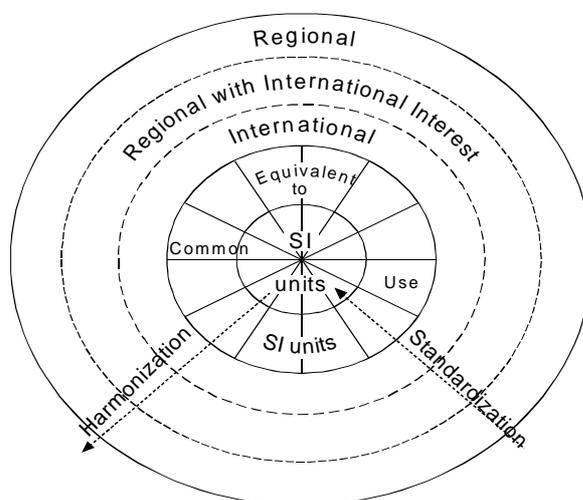
on the UN Layout Key for trade documents), or use the United Nations Trade Data Elements Directory (UNTDDED) and/or the United Nations Trade Data Interchange Directory (UNTDID) for Electronic Data Interchange (EDI), the code list provides another international instrument for harmonizing the terms used in trade, aiming at greater clarity and facility in carrying out international trade transactions.

15. In view of the practical aim of the Recommendation, the code list should not be restricted to a single category of units, but should also contain other units of measure that are widely used in international trade. However, in order to attach importance to the need for worldwide harmonization of units of measure, it was decided to divide the code list into three levels:

- (a) Level 1 - normative: the units from ISO 31 / 80000 in SI notation, including reference unit plus the standard prefixes as established in ISO 31 / 80000;
- (b) Level 2 - normative equivalent: the units based on the equivalents of the SI units;
- (c) Level 3 - informative: sets of units, which do not fit into the first two levels but which are required to satisfy user needs. This includes:
 - (i) units that are widely used in the international environment;
 - (ii) units used at regional level, that may have a broader international interest;
 - (iii) units, that are regional or sectorial only.

16. The total structure is shown in figure 2.

Figure 2: Units of measure “onion skin” levels of standardization



17. When reaching these agreements, UNECE took into account that no binding provisions exist, worldwide, for using a special system. For example, on this point the International Convention Relating to Economic Statistics states only:

- (a) "The unit or units of measure in which quantities of each commodity are stated -

weight, length, area, capacity, etc. - shall be precisely defined.”;

- (b) “When the quantity of goods of any kind is expressed in any unit or units of measure other than weight, an estimate of the average weight of each unit, or multiple of units, shall be shown in the annual returns.”

In case of weights, precise definitions shall be given of the meaning of terms such as “gross weight”, “net weight” and “legal net weight”, with due regard to the varying significance of the same term when applied to different classes of goods (Statistical Papers, series M, No. 52, Rev.1, para. 118).

18. In this context the United Nations Statistical Office notes:

"It will be noted that this permits countries to use units suited to domestic purposes, while at the same time making it possible to convert these units to units of weight for purposes of international comparability. Because of the substantial divergence in the units of quantity used by countries, such a provision offers the greatest possibility of obtaining uniform quantity information at low cost. Thus, Governments are urged to take advantage of this option whenever possible" (Statistical Papers, series M, No. 52, Rev.1, para. 118).

19. The imperial system was introduced in 1824. The United Kingdom Weights and Measures Act 1963 establishes units of both the imperial and metric systems as "United Kingdom primary standards". A substantial number of imperial units were no longer officially authorized for use as from 1 September 1980, including square inch, square mile, cubic foot, grain, stone, hundredweight, ton and horsepower. The deadline for phasing out the remaining imperial units is stated in the Official Journal of the European Communities No. L357 of 7 December 1989.

20. Inch/pound units of measure used in the United States, often referred to as "United States of America customary units" are generally the same as those of the imperial system; there are, however, some important exceptions for capacity, length and weight units. Private and official action is taken in the United States of America to increase the use of SI units.

VII. CODE STRUCTURE AND PRESENTATION

21. The names of SI, imperial and other units of measure are standardized, as are their symbols. Laws and regulations affecting foreign trade often make the use of these symbols obligatory when an abbreviated version of the name of a unit is required.

22. ISO 1000 includes rules for writing SI units and symbols: clause 6.1 is reproduced below:

“6.1 Unit symbols shall be printed in roman (upright) type (irrespective of the type used in the rest of the text), shall remain unaltered in the plural, shall be written without a final full stop (period) except for normal punctuation, e.g. at the end of a sentence, and shall be placed after the complete numerical value in the expression for a quantity, leaving a space between the numerical value and the unit symbol”.

Unit symbols shall in general be written in lower case letters except that the first letter is written in upper case when the name of the unit is derived from a proper name.

Examples: m metre
 s second
 A ampere
 Wb weber

23. The following principles for establishing the code list are reflected in the present Recommendation. Only standard multiples such as mega, giga, shall be used. Non-standard multiples such as 10 mega, 100 mega shall not be coded as separate units. Numeric values, e.g. 10, 25, are not units of measure and should therefore not be presented in coded form.

24. The code list is presented in three annexes with the following table columns:

STATUS. An indication of the maintenance status of individual units of measure.

- (a) a plus sign (+) Added. New unit added in this release of the code list;
- (b) a hash sign (#) Changed name. Changes to the unit name in this release of the code list;
- (c) a vertical bar (|) Changed characteristic(s). Changes other than to the unit name in this release of the code list, e.g. a change to the level/category;
- (d) a letter D (D) Deprecated. Units not recommended for use by the Bureau International des Poids et Mesures (BIPM);
- (e) a letter X (X) Marked as deleted. Units marked as deleted will be retained indefinitely in the code lists. When appropriate, these units may subsequently be reinstated via the maintenance process;
- (f) an equals sign (=) Reinstated. Units previously marked as deleted and reinstated in this release of the code list.

QUANTITY. The name of the physical phenomenon being measured.

- (a) In levels 1 and 2 (SI or SI equivalent), the phenomena pertaining to a certain category are listed under a heading giving the name of the relevant part in ISO 31 / ISO 80000;
- (b) In level 3 they are broken down into the 9 categories as defined below under level/category.

LEVEL/CATEGORY. Identification of the normative or informative relevance of the unit:

- (a) **Level 1** - normative = SI normative units, standard and commonly used multiples;
 - (i) NOTE: standard multiples are identified with "S" and commonly used multiples with "M" e.g. "1 metre", "1S centimetre", "1M hectometre").
- (b) **Level 2** – normative equivalent = SI normative equivalent units (UK, US, etc.) and commonly used multiples.
- (c) **Level 3** – informative = 9 categories of informative units (units of count and other miscellaneous units), invariably with no comprehensive conversion factor to SI. These units are provided for information and to facilitate the assignment and usage of a common code value to represent such units.
 - (i) 3.1 Qualified base units from levels 1 and 2;
 - (ii) 3.2 Sales units;
 - (iii) 3.3 Packing units;
 - (iv) 3.4 Shipping and transportation units;
 - (v) 3.5 Industry specific units (various);
 - (vi) 3.6 Information technology units;
 - (vii) 3.7 Integers/Numbers/Ratios;
 - (viii) 3.8 Multiples/Fractions/Decimals;
 - (ix) 3.9 Miscellaneous.

NAME. The name of the unit of measure.

DESCRIPTION. A plain text specification of the named unit of measure, not exceeding 350 characters in length and in English. It should be noted that such descriptions shall be progressively introduced for existing entries and where possible, shall be taken from recognized sources. All new entries having no conversion factor to SI units shall be applied to the code list with a description. A description is optional for units provided with a conversion factor.

CONVERSION FACTOR TO SI. The value used to convert units to the equivalent SI unit when applicable.

REPRESENTATION SYMBOL. The symbol used to represent the unit of measure as in ISO 31 / 80000.

COMMON CODE. This is the recommended single list of standard codes which is based on the following conventions:

- (a) The representation format for the code values shall be alphanumeric variable length 3 characters (an..3); wherever possible, existing code values are retained according to the following order of precedence for assigning values:
 - (i) alphabetic code values for units of measure as in UNECE Recommendation No. 20, edition 1985;

- (b) Alphanumeric code values for units of measure as in ANSI ASC X12 data element number 355;
- (c) NOTE: Where there are both UNECE Recommendation No. 20 and ASC X12 data element number 355 code values for a unit of measure, the UNECE Recommendation No. 20 code value only is retained;
- (d) Code values for new units of measure shall be allocated by the UNECE Secretariat, typically based on sequential coding according to the format Alpha-Numeric-Numeric (ann) starting with A01 up to Z99.

25. The three annexes are structured accordingly:

- (a) **Annex I** – Code elements listed by quantity category. This annex is normative and contains only level 1 and 2 entries. The columns represented in this annex are:
 - (i) Quantity;
 - (ii) Status;
 - (iii) Level/category;
 - (iv) Name;
 - (v) Description;
 - (vi) Representation symbol;
 - (vii) Conversion factor to SI;
 - (viii) Common Code.
- (b) **Annex II** – Code elements listed by name. This annex is informative and contains all level 1, 2 and 3 entries. The columns represented in this annex are:
 - (i) Status
 - (ii) Name
 - (iii) Description
 - (iv) Level/category
 - (v) Representation symbol
 - (vi) Conversion factor to SI
 - (vii) Common Code.
- (c) **Annex III** – Code elements listed by common code. This annex is informative and contains all level 1, 2 and 3 entries. The columns represented in this annex are:
 - (i) Status
 - (ii) Common Code
 - (iv) Description
 - (v) Level/category
 - (vi) Representation symbol
 - (vii) Conversion factor to SI.

VIII. MAINTENANCE AND UPDATING

26. Recommendation No. 20 is maintained on behalf of UN/CEFACT by the UN/CEFACT Information Content Management Group (ICG). Proposals for updating this Recommendation should be addressed to the Global Trade Solutions Section, United Nations Economic Commission for Europe, Palais des Nations, CH-1211 Geneva 10, Switzerland, or by email <cefact@unece.org>.

27. Draft revisions to the body text and/or code list of this Recommendation shall be issued by the ICG when required and shall be made available on the website <http://www.uncefactforum.org/ICG/>.

28. Draft revisions shall be subject to a public comment period of at least two months. UN/CEFACT Heads of Delegation shall be notified of the availability of a draft revision and the period for comment. Following the conclusion of the comment period, the ICG shall address all comments received. Depending on the comments received, the ICG shall issue a new draft edition for comment or shall prepare a final edition for approval.

29. Final revisions to the body text of this Recommendation shall be approved by the UN/CEFACT Plenary and shall be made available on the UN/CEFACT Web site (<http://www.unece.org/cefact>).

30. Final revisions to the code lists of this Recommendation shall be approved by the ICG Plenary and notified to the UN/CEFACT Plenary. These revisions shall be made available on the UN/CEFACT website.

IX. BIBLIOGRAPHY

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Decision by the eleventh General Conference on Weights and Measures, 1960, to adopt the *Système international d'unités* (International System of Units) with the abbreviation SI

<http://www.bipm.fr/en/si/>

ISO 31 Quantities and units

ISO Guide 31 Reference materials – Contents of certificates and labels

ISO 31-0 General principles

ISO 31-1 Space and time

ISO 31-2 Periodic and related phenomena

ISO 31-3 Mechanics

ISO 31-4 Heat

- ISO 31-5 Electricity and magnetism
- ISO 31-6 Light and related electromagnetic radiations
- ISO 31-7 Acoustics
- ISO 31-8 Physical chemistry and molecular physics
- ISO 31-9 Atomic and nuclear physics
- ISO 31-10 Nuclear reactions and ionizing radiations
- ISO 31-11 Mathematical signs and symbols for use in the physical sciences and technology
[part 11 is not relevant for this Recommendation]
- ISO 31-12 Characteristic numbers
- ISO 31-13 Solid state physics

ISO 1000 SI units and recommendations for the use of their multiples and of certain other units

ISO 2955 Information processing - Representation of SI and other units in systems with limited character sets

ISO IEC 18025 Information technology - Computer graphics and image processing -
Environmental Data Coding Specification (EDCS).

http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_IEC_18025_Ed1.html

ISO 80000 Quantities and units (some parts under development, supersedes ISO 31)

ISO 80000-1 General

ISO 80000-2 Mathematical signs and symbols to be used in the natural sciences and technology

ISO 80000-3 Space and time

ISO 80000-4 Mechanics

ISO 80000-5 Thermodynamics

IEC 80000-6 Electromagnetism

ISO 80000-7 Light

ISO 80000-8 Acoustics

ISO 80000-9 Physical chemistry and molecular physics

ISO 80000-10 Atomic and nuclear physics

ISO 80000-11 Characteristic numbers

ISO 80000-12 Solid state physics

IEC 80000-13 Information science and technology

IEC 80000-14 Telebiometrics related to human physiology

IEC 80000-15 Telebiometrics related to telehealth and world-wide telemedicines

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NIST (National Institute of Standards and Technology) Special Publication 811 – 2008 Edition, Guide for the Use of the International System of Units (SI)

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<http://physics.nist.gov/Pubs/SP811/>

SI Brochure

English: http://www.bipm.org/en/si/si_brochure/

French: http://www.bipm.org/fr/si/si_brochure/

German: <http://www.ptb.de/de/publikationen/download/pdf/si.pdf>

DIN (German Institute for Standardization)

NSM (German Product Property Standards Committee)

DINsml.net - Standardized Masters Library for Product Properties

<http://www.din.de>

<http://www.dinsml.net>
