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Item 10 of the provisional agenda

RECOMMENDATION No. 20

CODES FOR UNITS OF MEASURE USED IN INTERNATIONAL TRADE

Submitted by the Codes Working Group (CDWG)*

This document is submitted to the Centre for approval.

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Recommendation 20

CODES FOR UNITS OF MEASURE USED IN INTERNATIONAL TRADE

I. PREAMBLE

The United Nations through UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business) supports activities dedicated to improving the ability of business, trade and administrative organisations, from developed, developing and transitional economies, to exchange products and relevant services effectively. Its principal focus is to facilitate international transactions, through the simplification and harmonization of procedures and information flows.¹

The UN/CEFACT work-program emphasizes 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 Codes Working Group (CDWG) 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 UN/ECE Recommendations related to codes.

This fifth revision of Recommendation 20 was prepared by the UN/ECE Trade Division in collaboration with the CDWG and ISO/TC 154 (Technical Committee - Processes, data elements in commerce, industry and administration). ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies.

Recommendation 20 is intended to provide for:

- standardization leading to ease of communication;
- greater clarity and ease of use leading to harmonization via a comparative approach;
- addressing the practical user needs;
- 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

UN/CEFACT,

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. And taking note that this collection of units neither claims to address quantities or units of measure of a non-physical nature nor does it include historic units of measure not 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. INTRODUCTION

1. 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.

2. 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 (English and French) Web site at <http://www.bipm.fr>.

3. 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.

4. 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.

¹ From the mission statement of UN/CEFACT

5. In countries where the International System of Units has been introduced, national units of measure are harmonized with those of other SI unit countries. In countries where other systems prevail, quantities are recorded for the general purpose of trade, transport and statistics in units of measure other than SI units. To achieve comparability in international trade and transport statistics, factors should be provided for conversion from units of one system of measure to corresponding units of another system.

6. Basic relationships between the metric system and the British imperial system of weights and measures and the above-mentioned factors were provided in 1966 by the Statistical Office of the United Nations in the publication "World Weights and Measures. Handbook for Statisticians", Statistical Papers, Series M, No.21, Rev.1, Sales No.66. XVII.3.

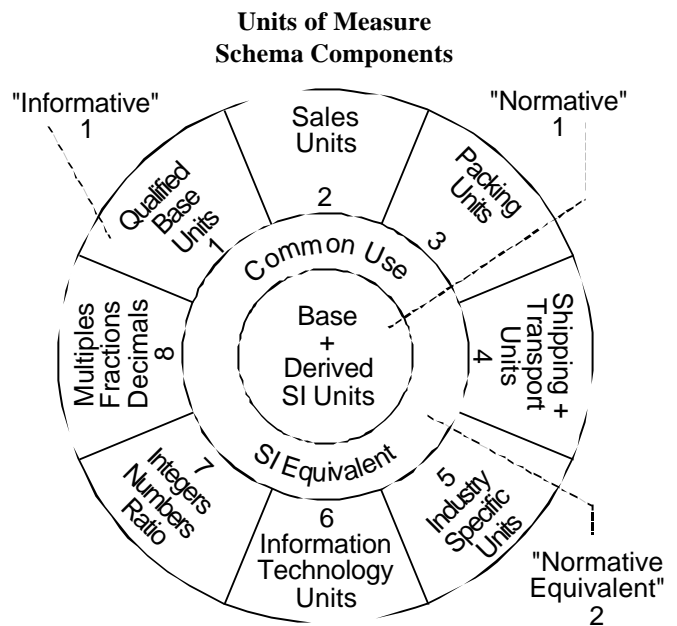
7. Metric units are being introduced in nations where the British (imperial) system prevails and the SI system has been adopted in principle. To avoid transitional difficulties it has, however, been necessary to provide for a period during which units of measure non-compatible with the SI system can be phased out.

8. International standardization bodies, in particular ISO/TC 12 (ISO Technical Committee 12 - Quantities, units, symbols, conversion factors), and ISO/IEC JTC1 SC32 (ISO/IEC Joint Technical Committee 1, Sub Committee 32 - Data management and interchange) have published the relevant standards (see section VII - References). This collection of work constitutes an important contribution to the harmonization of standards for international trade. For additional information on ISO, refer to the ISO Web site at <http://www.iso.ch>.

IV. SCOPE

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

Figure 1



V. FIELD OF APPLICATION

10. 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.

11. 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.

VI. TERMINOLOGY

12. 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.

VII. REFERENCES

Metre Convention, Paris 1875

International Convention Relating to Economic Statistics (1928)

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

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
- UN/ECE Recommendation 20:** Codes for units of measurement used in International Trade, Geneva, edition 1985
- UN/ECE Recommendation 21:** Codes for passengers, types of cargo, packages and packaging materials
- ANSI ASC X12 Data Element Number 355** - Unit or basis for measurement code

Statistical Papers, series M, No.21, Rev.1, (66.XVII.3) World Weights and Measures. Handbook for Statisticians. Statistical Office of the United Nations, New York, 1966

Statistical Papers, series M, No.52, Rev.1, (E.82.XVII.14) International Trade Statistics. Concepts and Definitions, Statistical Office of the United Nations, New York, 1982

VIII. PRINCIPLES FOR INCLUSION IN THE CODE LIST

13. 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 the harmonization of terms used in trade aiming at greater clarity and facility in the execution of international trade transactions.

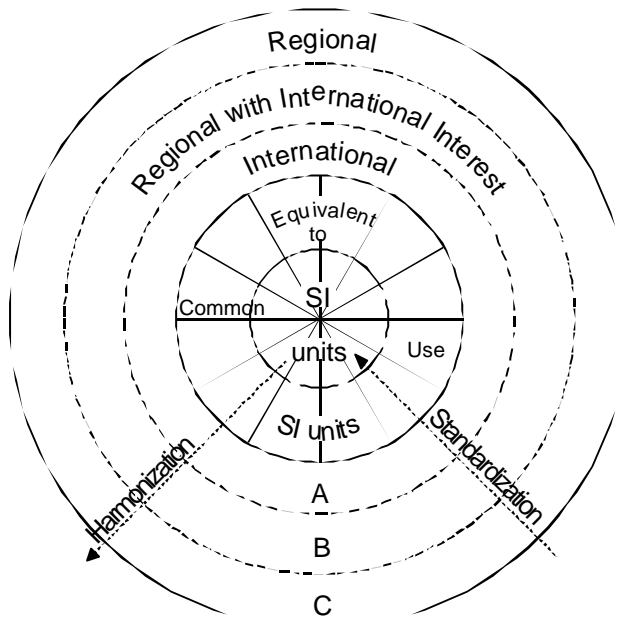
14. In view of the practical aim of the Recommendation, the code list should not be restricted to a single category of units, but should also contain other units of measure, which are widely used in international trade. However, in order to attach importance to the need for worldwide harmonization of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

- **Level 1 - normative:** the units from ISO 31 in SI notation, including reference unit plus the standard prefixes as established in ISO 31;
- **Level 2 - normative equivalent:** the units based on the equivalents of the SI units;
- **Level 3 - informative:** sets of units, which do not fit into the first two levels but which are required to satisfy user needs. They may be subdivided into sub-categories. The sub-categories are:
 - units that are widely used in the international environment;
 - units used at regional level, that may have a broader international interest;
 - units, that are regional or sectoral only.

The total structure is shown in figure 2.

Figure 2

**UOM “Onion Skin” Levels
Of Standardization**



15. When reaching these agreements, the UN/ECE 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:

"The unit or units of measure in which quantities of each commodity are stated -weight, length, area, capacity, etc. - shall be precisely defined."

"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)

16. 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)

17. 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 Official Journal of the European Communities No. L357 of 7 December 1989

18. 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.

IX. CODE STRUCTURE AND PRESENTATION

19. 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.

20. 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

21. 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. Therefore they shall not be presented in coded form.

22. The code list is presented as a table with the following columns:

a) CHANGE INDICATOR (CI)

Indication of the changes applied with this release of the codes list.

- a plus sign (+) for an addition
- a hash sign (#) for changes to the code name
- a vertical bar (|) for changes other than code name, e.g. level
- a letter D (D) temporary indicator, for units not recommended (deprecated), pending final decision before 2001-02-16 by the *Bureau International des Poids et Mesures* BIPM
- a letter X (X) for marked for deletion in this edition (will not appear in the next edition)

b) QUANTITY

The name of the physical phenomenon being measured.

- 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.
- In level 3 they are broken down into the 9 categories as defined in this recommendation.

c) LEVEL/CATEGORY

Identification of the normative or informative relevance of the unit:

level 1 - normative = SI units, standard and commonly used multiples

level 2 – normative equivalent = SI equivalent units (UK, US, etc.) and commonly used multiples

level 3 – informative = 9 categories of units given for information only:

- 3.1 Qualified base units from levels 1 and 2
- 3.2 Sales units
- 3.3 Packing units

- 3.4 Shipping and transportation units
- 3.5 Industry specific units (various)
- 3.6 Information technology units
- 3.7 Integers/Numbers/Ratios
- 3.8 Multiples/Fractions/Decimals
- 3.9 Miscellaneous (note: some of these may be repositioned after final review with the affected parties)

These categories are further sub-divided into sub-categories:

- A for international use
- B for regional use with international potential
- C regional or sectoral use only

d) NAME

The name of the unit of measure taken from the reference documents

e) 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 appropriate, shall be taken from recognized sources. All new entries shall be applied to the code list with a description

f) CONVERSION FACTOR

The value used to convert units to the equivalent SI unit when applicable

g) REPRESENTATION SYMBOL

The symbol used to represent the unit of measure as in ISO 31

h) REFERENCE CODES

The corresponding code values as specified in the following source reference documents:

- Code for units of measure, UN/ECE Recommendation 20, edition 1985
 - fixed length (three characters) alphabetic coded representations;
 - fixed length (three characters) numeric coded representations.
- Code for package type names, UN/ECE Recommendation 21 'Codes for passengers, types of cargo, packages and packaging material'.

- fixed length (two characters) alphanumeric coded representations.

Note: Only those codes considered applicable are included.

- ANSI ASC X12 Code for unit of measure specified for data element number 355, fixed length (two characters) alphanumeric coded representations.

i) COMMON CODE

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

- 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:
 - a) alphabetic code values for units of measure as in UN/ECE Recommendation 20, edition 1985
 - b) alphanumeric code values for units of measure as in ANSI ASC X12 data element number 355

NOTE: Where there are both UN/ECE Recommendation 20 and ASC X12 data element number 355 code values for a unit of measure, the UN/ECE Recommendation 20 code value only is retained.

- c) code values for new units of measure shall be allocated by the UN/ECE Secretariat based on sequential coding according to the format Alpha-Numeric-Numeric (ann) starting with A01 up to Z99.

j) 3 ANNEXES with cross reference number

For ease of use, the code list is presented in three separate annexes. The cross reference number is provided to facilitate moving from one annex to another annex.

- **Annex I** – Code elements listed by **quantity category**. The columns represented in this annex are:
 - Change indicator,
 - **Quantity**,
 - Level/category
 - Name,
 - Conversion factor,
 - Representation symbol,
 - Cross reference number.

- **Annex II** – Code elements listed by unit of measure **name**. The columns represented in this annex are:
 - Change indicator,
 - **Name**,
 - Representation symbol,
 - Common code,
 - Level/category
 - Cross reference number;
 - Description.

- **Annex III** – Code elements listed by common **code**. The columns represented in this annex are:
 - Change indicator,
 - **Common code**,
 - Name,
 - Level/category
 - Reference codes,
 - Cross reference number.

X. PROVISION FOR MAINTENANCE

23. This Recommendation shall be maintained on behalf of UN/CEFACT by the UN/CEFACT Codes Working Group (CDWG).

24. Proposals for updating this Recommendation should be addressed to the Trade Facilitation Section, United Nations Economic Commission for Europe, Palais des Nations, CH-1211 Geneva 10, Switzerland or via e-mail to: cefact@unece.org

25. Draft revisions to the body text and/or code list of this Recommendation shall be issued by the CDWG when required and shall be made available on the CDWG Web page: <http://www.unece.org/cefact/>

26. 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 CDWG shall address all comments received. Depending on the comments received, the CDWG shall issue a new draft revision or shall prepare a final revision for approval.

27. Final revisions of the body text of this Recommendation shall be approved by the UN/CEFACT Plenary.

28. Final revisions of the code list of this Recommendation shall be approved by the CDWG Plenary or in the case where the body text has also been revised, by the UN/CEFACT Plenary.