UNITED NATIONS

ECONOMIC COMMISSION FOR EUROPE

CODES FOR UNITS OF MEASURE
USED IN INTERNATIONAL TRADE

REVISION OF RECOMMENDATION 20
95-08-02

WORKING PARTY ON FACILITATION OF INTERNATIONAL TRADE PROCEDURES

NOTE: The units of measure where the use is identified by a “Z” shall remain in the list for a period of not more than three years, at which time they will be deleted, unless a written justification and definition of the unit has been provided to the UN/ECE secretariat.
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The Working Party on Facilitation of International Trade Procedures, a subsidiary body of the United Nations Economic Commission for Europe, agreed to include in its original programme of work (1973) a project to study units of measure for length, mass (weight), volume and other quantities used in international trade and to establish a list of required units with coded representations.

A first study was issued in 1974 listing some frequently used units. A second more comprehensive study was conducted in 1982 and finalized in 1984.

In preparation for the present Recommendation 20 a revision was undertaken in 1992 in order to provide for a better harmonization for units of measure used for automated data interchange and to include a complete set of technical and scientific units.

Units of measure are used for many purposes. ISO/TC 12 identifies them as relating to base and derived units using the Système International d'unités (International System of Units) framework with annexes showing other still common units in other systems (cgs, fps, imperial, US). UN/EDIFACT concentrates on trade units. ANSI expands on this concept and includes any units to which a price may be applied. These include package units, sales units, shipping and transport units, industry specific units, counts, decimals, fractions.

This revision of 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.

National and international consultations took place in the course of the study particularly with ISO/TC 12; relevant subsidiary bodies of the Inland Transport Committee of the Economic Commission for Europe were consulted as well as other international organizations interested in ECE-recommended trade facilitation standards in particular the Customs Co-operation Council (CCC). Representatives of the regional and worldwide bodies participating in sessions of Group of experts No.1: Data Elements and Automatic Data Interchange and of the Working Party also contributed to the development of the Recommendation.

The Recommendation reproduced below was adopted at the xxxx session of the Working Party in MM CCYY.

RECOMMENDATION

The Working Party on Facilitation of International Trade Procedures,

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 list annexed to the present Recommendation.

CAVEAT

The units of measure offered herein are provided to the user for the representation of physical quantities currently employed in international or regional trade. This collection of units does not purport 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.

At the fifty-first session of the Working Party representatives attended from:
Albania; Austria; Belarus; Belgium; Bosnia and Herzegovina; Bulgaria; Canada; Croatia; Cyprus; Czech Republic; Denmark; Estonia; Finland; France; Germany; Hungary; Iceland; Ireland; Israel; Italy; Latvia; Liechtenstein; Lithuania; Luxemburg; Malta; Netherlands; Norway; Poland; Portugal; Republic of Moldova; Romania; Russian Federation; San Marino; Slovak Republic; Slovenia; Spain; Sweden; Switzerland; Turkey; Ukraine; United Kingdom of Great Britain and Northern Ireland; United States of America; Yugoslavia and European Economic Community. Representatives from Australia, Gabon, Japan, Korea, Nigeria, Senegal and South Africa participated under Article 11 of the Commission's terms of reference.

The following intergovernmental and non-governmental organizations were also represented:

- Customs Co-operation Council (CCC)
- International Chamber of Commerce (ICC)
- International Organization for Standardization (ISO)
- International Air Transport Association (IATA)
- International Association of Ports and Harbours (IAPH)
- International Chamber of Shipping (ICS)
- International Civil Airports Association (ICAA)
- International Road Transport Union (IRU)
- International Union of Railways (UIC)
- International Railway Transport Committee (CIT)

1. 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 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.

3. The Système International d'unités (International System of Units), with the abbreviation SI, 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.

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

8. ISO Technical Committee 12 (TC 12) - Quantities, units, symbols, conversion factors - has published the relevant standards (see section 5 - References). The comprehensive and timely action taken by TC 12 in preparation of the current transitional period constitutes an important contribution to harmonization of standards in a field of the greatest importance for international trade.

9. In view of the differences in national laws which regulate the use of units of measure, countries linked by treaties for economic co-operation or integration have agreed on further harmonization.

2. SCOPE

10. 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..

![Diagram of Units of Measure Schema Components](image)

<table>
<thead>
<tr>
<th>&quot;Informative&quot;</th>
<th>&quot;Normative&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Qualified Base Units</td>
<td>Packing Units</td>
</tr>
<tr>
<td>Multiples + Fractions + Decimals</td>
<td>Industry Specific Units</td>
</tr>
<tr>
<td>Integers Numbers Ratios</td>
<td>&quot;Normative Equivalent&quot;</td>
</tr>
</tbody>
</table>

UNITS OF MEASURE
SCHEMA COMPONENTS

figure 1

3. 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. It includes the content of ISO 31 - 0, ..., - 13:1992 and 1000:1992 as well as ANSI ASC X12 Data Element 355 Table.
4. **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.

5. **REFERENCES**

Metre Convention, Paris 1875

International Convention Relating to Economic Statistics (1928)

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

ISO 31:1992  Quantities and units
ISO 31-0:1992  General principles
ISO 31-1:1992  Space and time
ISO 31-2:1992  Periodic and related phenomena
ISO 31-3:1992  Mechanics
ISO 31-4:1992  Heat
ISO 31-5:1992  Electricity and magnetism
ISO 31-6:1992  Light and related electromagnetic radiations
ISO 31-7:1992  Acoustics
ISO 31-8:1992  Physical chemistry and molecular physics
ISO 31-9:1992  Atomic and nuclear physics
ISO 31-10:1992  Nuclear reactions and ionizing radiations
ISO 31-12:1992  Characteristic numbers
ISO 31-13:1992  Solid state physics
ISO 1000:1992  SI units and recommendations for the use of their multiples and of certain other units
ISO 2955-1974  Information processing - Representation of SI and other units for use in systems with limited character sets
ECE/TRADE/151 Recommendation 20: Codes for units of measurement used in International Trade, Geneva, March 1985
ECE/TRADE/158 Recommendation 21: Codes for types of cargo, packages and packaging material (with complementary codes for package names), Geneva, March 1986
ANSI ASC X12  Data Element Number 355 - Units of Measure Data

6. **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 interchange makes it desirable to establish such codes. For enterprises that use the United Nations system of aligned trade documents, or use the United Nations Trade Data Elements Directory (UNTDED) and/or the United Nations Trade Data Interchange Directory (UNTDID) for electronic trade data interchange, 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.

15. In view of the practical aim of the Recommendation, the Working Party agreed that the code list should not be restricted to SI units but should also contain other units of measure which are widely used in international trade. However, some members of the Working Party stressed their reluctance to include these units in view of the importance that their Governments attach to the worldwide harmonization of units of measure in accordance with the SI system within the near future. In this connection it was decided to divide the code list into three levels:

- **Level 1 - normative**: the units from ISO 31-1, ..., -13 in SI notation are the central core. They include the reference unit plus the standard prefixes (decimal multiples and sub-multiples) as established in ISO 31;

- **Level 2 - normative equivalent**: the units based on the equivalents of the SI units in the cgs/fps/imperial/US formats;

- **Level 3 - informative**: sets of units, which include all those units which do not fit into the first two levels but which are required to satisfy the practical user needs. They may be subdivided into sub-categories. The sub-categories are:
  - units which are widely used in the international environment;
  - units used at regional level which may have a broader international interest;
  - units which are regional or sectoral only.

The total structure is shown in figure 2.
16. When reaching these agreements, the Working Party 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)

17. 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". (ibid.)

18. 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 No. L357 of 7 December 1989. This date may not be later than 31 December 1994.

19. 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.

7. **CODE STRUCTURE AND PRESENTATION**

20. 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.

21. 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

22. When discussing the principles for the code structure the Working Party considered that for the purpose of data interchange the need for a single list of standard code elements for use worldwide should be established.

23. However, the existence of mandatory or widely-accepted abbreviations should be taken into account. Some difficulties arose from this decision as many internationally accepted abbreviations are alpha-numeric and of variable length.

24. The Working Party agreed to take into account the needs of the business community. This required a pragmatic approach and the following principles for establishing the code list, which are reflected in the present Recommendation, were agreed. 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.

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

a) **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 - 1, ..., - 13.

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

b) **LEVEL/CATEGORY**

Identification of the normative or informative relevance of the unit:

1 = SI units, standard and commonly used multiples (normative)

NOTE: standard multiples are identified with "S" and commonly used multiples with "M" e.g. "1 metre", "1S centimetre", "1M hectometre").
2 = SI equivalent units (UK, US, etc.) and commonly used multiples (normative equivalent)
3 = 9 categories of units given for information only:
   3.1 Qualified base units from 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:
   A for international use
   B for regional use with international potential
   C regional use only

c) **USE IDENTIFICATION**
An indication about the use of the unit:
Blank Accepted for general use
X The use of these units is deprecated (pending final decision of BIPM)
Z These units are in use, but coding them is questioned. However, they are
   included for information purposes only. **They shall remain in the list for a period of
   not more than three years, at which time they will be deleted, unless a written justification
   and definition of the unit has been provided to the UN/ECE secretariat**

d) **NAME**
The name of the unit of measure taken from the reference documents

e) **CONVERSION FACTOR**
The value used to convert units to the equivalent SI unit when applicable

f) **REPRESENTATION SYMBOL**
The symbol used to represent the unit of measure as in ISO 31 - 1, ..., - 13

g) **EXISTING CODES**
The values of the codes representing the unit of measure as contained in the following tables:
   • Code for units of measure, ECE Recommendation 20, edition 1985. For the explanation of
     the code structure and presentation, see Annex A of the document.
     fixed length (three characters) alphabetic coded representations;
     fixed length (three characters) numeric coded representations.
   • Code for package type names, ECE Recommendation 21 'Codes for types of cargo, packages
     fixed length (two characters) numeric coded representations.
   Note: Only those codes used in the unit of measure table are referenced.
   • ANSI ASC X12Unit of Measure Code Table 355
     fixed length (two characters) alphanumeric coded representations.

h) **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 ECE Recommendation 20
b) alphanumeric code values for units of measure as in ANSI ASC X12 table 355

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

c) code values for new units of measure will be based on sequential coding according to the format Alpha-Numeric-Numeric (ann) starting with A01 up to Z99.

i) CROSS REFERENCE

For ease of use, the code list is presented as three tables:

• Table 1 - ordered by quantity and listing the columns: Quantity, Level/category, Use identification, Name, Conversion factor, Representation symbol, Cross reference;

• Table 2 - sorted by name and listing the columns: Level/category, Use identification, Name, Representation symbol, Common code, Cross reference;

• Table 3 - sorted by common code and listing the columns: Level/category, Use identification, Common code, Name, Existing codes, Cross reference.

The cross reference is a sequential number allowing to move from one table to another.

26. The units of measure are presented in the main list of code elements in a structured manner. Quantity represented by a unit of measure was chosen the criterion for grouping units of measure. Additional code lists are provided containing units of measure in the alphabetic order of their names. For ease of presentation, the code list is split into three tables. the cross reference allowing to move from one table to another.

8. PROVISION FOR MAINTENANCE

27. The list of code elements for units of measure provided is intended to allow ease of maintenance, harmonization and simplification.

28. Requests for updating the lists of code elements annexed to this Recommendation shall be addressed to the Working Party through the ECE Trade Division. The relevant Maintenance Agency will assess the request and decide accordingly.

29. The units of measure where the use is identified by a “Z” shall remain in the list for a period of not more than three years, at which time they will be deleted, unless a written justification and definition of the unit has been provided to the UN/ECE secretariat.

30. When a decision is made which affects the code list (addition, change or deletion), the ECE secretariat will issue an amending supplement or a revised list of codes, whichever is most appropriate.

31. When a unit of measure is deleted from the code list, the common code element assigned to it will not be re-assigned to another unit of measure.
ANNEX A. CODE STRUCTURE OF UNTDED 1990 - Code elements for units of measure

32. The codes of UNTDED Units of Measure (column 6) provide for:
   - fixed length (three characters) alphabetic coded representations;
   - fixed length (three characters) numeric coded representations.

33. The alphabetic coded representations are based, whenever possible, on internationally-accepted abbreviations or on a mnemonic approach where this seems more appropriate:

Examples:

<table>
<thead>
<tr>
<th>name</th>
<th>symbol</th>
<th>code</th>
</tr>
</thead>
<tbody>
<tr>
<td>metre</td>
<td>m</td>
<td>MTR</td>
</tr>
<tr>
<td>cubic decimetre</td>
<td>dm3</td>
<td>DMQ</td>
</tr>
<tr>
<td>kilogram</td>
<td>kg</td>
<td>KGM</td>
</tr>
<tr>
<td>minute</td>
<td>min</td>
<td>MIN</td>
</tr>
</tbody>
</table>

As to the problem of using lower- and/or upper-case letters as recommended in ISO 1000, it was agreed that, bearing in mind the difficulty - or even the impossibility in telex applications - of using a mixture of lower- and upper-case letters, either could be used, depending on user's equipment.

In order to retain a fully alphabetic code alternative, the letters "K" and "Q" are used in the last position of alphabetic codes in this Recommendation to denominate two-dimensional (square) and three-dimensional (cubic) applications of units related to area (K) and volume (Q). Letter combinations starting with the letter "Z" are reserved for national and company use.
ANNEX B. UNITS OF MEASURE: Code elements listed by quantities
ANNEX C UNITS OF MEASURE: Code elements listed by name
ANNEX D. UNITS OF MEASURE: Code elements listed by common code