INTERNATIONAL

RECOMMENDATION

OIML R 45

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Casks and barrels

Tonneaux et futailles

OIML R 45 Edition 1980 (E)

ORGANISATION INTERNATIONALE
DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION
OF LEGAL METROLOGY

Foreword

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CASKS and BARRELS

1. Scope.

This Recommendation applies to casks and barrels, containers which can be rolled and are used for the transport and delivery of liquids, and when completely full, to measure the liquid which they contain.

Containers used exclusively for fixed warehouse storage of liquids are not dealt with in this Recommendation.

To simplify the text, casks and barrels are referred to hereafter by the name « casks » only.

2. Definitions.

2.1. Nominal total capacity.

The nominal total capacity of a cask is the volume indicated on the cask.

2.2. Conventional true capacity.

The conventional true capacity of a cask, is the volume occupied by the liquid at a reference temperature of 20 °C [(*)], when the container is completely filled to the lower edge of the bung hole (filling orifice).

If the bung hole is extended by parts projecting into the container, the upper edge of the vents or holes which must be made in these parts, to comply with point 6.6, must be taken as the lower edge of the bung hole.

2.3. Tares.

2.3.1. Wet tare.

The expression « wet tare » defines the weight of an empty cask, including the plugs, bungs, etc., used to close the orifices, measured after prior wetting of the interior, and draining for 30 seconds.

2.3.2. Dry tare.

The expression « dry tare » defines the weight of an empty cask, including the plugs, bungs, etc., used to close the orifices, measured without prior wetting.

3. Accuracy classes.

The following accuracy classes are acceptable :
— class A casks made of metal,
— class A or class B casks made of other materials.

National regulations specify the accuracy class for casks used for each type of liquid.

(*) Note : In certain tropical countries, where it is necessary to use casks and barrels at temperatures substantially greater than 20 °C, and if these countries concerned do not wish to adopt a reference temperature of 20 °C, it is recommended that they adopt a temperature of 21 ° C.

4. Capacities.

4.1. Casks submitted for metrological control without an indication of the capacity, may have any capacity greater than 2 litres.

4.2. Casks submitted for metrological control with an indication of their capacity, must have a nominal capacity equal to :

— a multiple of 5 litres, if the nominal capacity is equal to or less than 100 litres or,

— a multiple of 50 litres, if the nominal capacity is greater than 100 litres.

5. Materials.

5.1. Casks may be manufactured in any material, with a strength, rigidity and toughness adequate for the intended use (e.g : solid wood, plywood, metal).

5.2. Materials used and their subsequent treatment must be such that the total volume of the cask is not increased by more than :

0.25 % for casks of class A, and

0.50 % for casks of class B

when the temperature varies between 10 °C and 30 °C.

5.3. Materials used in the manufacture of casks for liquids for human consumption must be approved by National Services of Public Hygiene.

5.4. National regulations may stipulate that the interior of certain casks must be covered with a protective coating, compatible with the material used for construction, and the liquids to be contained (e.g : pitch for beer casks).

6. Construction.

6.1. Casks must be of solid construction, and sufficiently resistant to wear and distorsion encountered under normal conditions of use.

They must not be dented or deformed.

6.2. The materials used in the manufacture of the casks intended for liquids under pressure, such as beer or other gaseous beverages, and their subsequent treatment, must be such that :

a) the total volume of the cask, at a temperature of 20 °C and at atmospheric pressure, does not increase by more than :

0.25 % for casks in class A, and

0.50 % for casks in class B,

when subjected to an internal pressure of 10^5 Pa, maintained for 48 hours.

b) after the casks have been subjected to a pressure of 10^5 Pa for 72 hours, and then returned to normal atmospheric pressure for 72 hours, the difference between the initial total capacity and the final total capacity, which may result from the application of the test pressure, must not exceed 1/10 of the values indicated in a).

6.3. Casks in solid wood, with butted staves held together by metal hoops, must have a curved body, with the greatest perimeter being at the mid-point of the body, and two flat or slightly curved ends.

6.4. Casks in materials other than solid wood must have one of the following shapes :

solid wood cask ; or
cylinder ; or
cylindrical body ; or
sphere.

The ends must be integral with the body, so that the cask can be moved without breaking the seals or damaging the body.

6.5. The shape of the body, ends and bung hole, must be so designed that an air pocket cannot be formed inside the container during filling.

6.6. The position of the bung hole must allow for complete filling of the cask.

If the bung hole is in the curved body, it must be located in the highest part of the body when the cask is resting normally on a horizontal surface.

If the bung hole has protruding parts extending inside the cask, these parts must be vented or provided with holes, up to their point of intersection with the body.

If the bung hole is closed by a plug screwed into a threaded socket, the latter must be constructed from one piece.

6.7. In addition to the bung hole the cask may have one or more drain orifices, clearly distinguishable from the bung hole.

7. Pattern approval.

Where the internal legislation of a Member State so provides, the casks constructed in materials other than solid wood are subject to pattern approval.

8. Metrological control.

8.1. Capacity.

8.1.1. Metal casks with a capacity of up to and including 100 litres, must be submitted for metrological control with an indication of the nominal capacity.

8.1.2. Casks in materials other than metal, and metal casks with a capacity of over 100 litres, must be submitted for metrological control :

— without an indication of the capacity ; or

— with an indication of the nominal capacity.

8.1.3. Metrological control comprises :

a) where the capacity is not indicated :

determination of the conventional true capacity of the cask (gauging), and the marking of the value on the cask, rounded in accordance with the requirements in point 8.1.6 ;

b) where the nominal capacity is indicated :

determination of the conventional true capacity of the cask, and verification that this capacity corresponds, within the limits of maximum permissible error, to the marking on the cask.

8.1.4. The measurement of the conventional true capacity of casks must be made with a degree of accuracy, such that errors do not exceed the following values :

	Maximum permissible error (positive or negative)
Up to 30 litres	0.1 litres
Over 30 litres	0.3 %

8.1.5. The measurement of the conventional true capacity of wooden casks without an internal protective coating, must be carried out after prior wetting.

For this purpose, the casks are to be filled with water or the liquid for which they are intended, for at least 24 hours prior to gauging.

8.1.6. The values to be marked on casks presented without indication of the capacity are those measured during gauging, rounded in accordance with the accuracy class in the following table :

		Class A	Class B
		Rounding down	Rounding down
Up to	5 l	Nearest 0.05 l	Nearest 0.05 l
Over	5 l to 15 l	« 0.1 l	« 0.1 l
»	15 l to 60 l	« 0.1 l	« 0.5 l
»	60 l to 150 l	« 0.2 l	« 1 l
»	150 l to 300 l	« 0.5 l	« 1 l
»	300 l to 600 l	« 1 l	« 1 l
»	600 l to 1 500 l	« 2 l	« 2 l
»	1 500 l	« 5 l	« 5 l

8.2. Measurement of the tare.

8.2.1. Where national regulations so require, the metrological control also includes the determination of the « dry tare » and/or the « wet tare » of the casks.

8.2.2. The wet or dry tare, expressed in kg, is marked on the cask after rounding down :
— to the nearest 0.1 kg for casks of less than 100 kg,
— to the nearest 1 kg for casks equal to or greater than 100 kg.

9. Maximum permissible errors.

9.1. For new or repaired casks, marked with an indication of the capacity, the maximum permissible errors on the capacity for metrological control are equal to :

± 0.5 %, but not less than 0.10 l, for class A.

± 1 %, but not less than 0.15 l, for class B.

9.2. The maximum permissible errors for casks in service, are equal to :

a) On the indicated capacity :

Class A : ± 1 %, but not less than 0.2 l

Class B : Up to 5 l ± 4 %

Over 5 l to 15 l ± 0.3 l

» 15 l to 60 l ±1 l

» 60 l to 75 l ± 1.5 l

» 75 l ± 2 %

b) On the indicated wet or dry tare :

± 0.3 kg for tares equal to or less than 30 kg

± 1 % for tares greater than 30 kg.

10. Inscriptions.

10.1. Capacity.

10.1.1. Casks must carry the following indications :

— the conventional true capacity, rounded down in accordance with the requirements in point 8.1.6, for the gauged casks.

— the nominal capacity, in accordance with the requirements in point 4.2, for the verified casks.

These indications must be expressed in digits, followed by the legal unit of volume or its symbol.

10.1.2. The indication of the nominal capacity must be clearly legible, unambiguous, and indelible under normal conditions of use.

It must be marked on the end of the cask fitted with the drain orifice, or near to the bung hole, in a protected position.

It is marked :

— either directly on the surface of the cask, by branding, or by stamping, etc.

— or on a metal identification and stamping plate, attached to the cask.

10.2. Tares.

10.2.1. Where the tares must be indicated on the cask, they must be clearly distinguished by the terms « wet tare » or « dry tare ».

10.2.2. Tares indicated are determined at the time of metrological control and are rounded down, in accordance with the requirements in point 8.2.2.

10.2.3. Digits expressing the values of the tares must be followed by the legal unit of measurement, or its symbol.

10.2.4. The provisions of point 10.1.2 are applicable to the marking of tares.

10.3. Accuracy classes.

10.3.1. Casks must carry an indication of the accuracy class to which they belong.

10.3.2. This class is indicated by the letter « A » or « B », marked in accordance with the provisions of point 10.1.2.

10.4. Casks subjected to pattern approval.

10.4.1. Casks for which legislation calls for pattern approval in accordance with point 7, must carry the following indications :
— name and address or trademark of the manufacturer,
— type of materials used in construction,
— type of internal protective coating,
— approval mark, where appropriate.

10.4.2. The indications called for in point 10.4.1 must be marked :
— either directly on the surface of the cask,
— or on an identification plate.

10.5. Additional inscriptions.

Any additional inscriptions which may lead to confusion with the statutory inscriptions are prohibited.

11. Metrological control mark.

11.1. The metrological control mark must be placed adjacent to the indication of capacity.

11.2. The identification and stamping plates must be irremovably attached to the cask by means of sealing, in positions provided for this purpose.

11.3. The joints or connections between the different parts of the cask must be protected, or made tamper-proof, if necessary by sealing.

Contents