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## Gas cylinders — Stamp marking

*Bouteilles à gaz — Marquage*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13769 was prepared by Technical Committee ISO/TC 58, *Gas cylinders*, Subcommittee SC 4, *Operational requirements for gas cylinders*.

This second edition cancels and replaces the first edition (ISO 13769:2002) and ISO 13769:2002/Amd1:2003, which have been technically revised.

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## Introduction

This International Standard has been prepared on the basis of the 14th revised edition of the United Nations *Recommendations on the Transport of Dangerous Goods — Model Regulations*. It is intended to be applied at the time of cylinder manufacture. However, it could be applied by the cylinder user during use operations, e.g. the stamping of “empty weight” (item 10 in Figures A.1, A.2 and A.3) on to cylinders not so marked at the time of manufacture.

Some stamp markings include the year and date. The order of these time elements is given with the most significant figures (the year) to the left, in accordance with the rules given in ISO 8601.

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# Gas cylinders — Stamp marking

## 1 Scope

This International Standard specifies stamp marking of refillable transportable gas cylinders and tubes of volume greater than 0,5 l and less than or equal to 3 000 l, including:

- steel and aluminium gas cylinders;
- composite gas cylinders;
- acetylene cylinders;
- LPG cylinders (see Annex B).

These are hereafter referred to as “cylinders”.

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## 2 Normative references (standards.iteh.ai)

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 11114-1:1997, *Transportable gas cylinders — Compatibility of cylinder and valve materials with gas contents — Part 1: Metallic materials*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### permanent marking

#### stamp marking

marking applied to cylinders by hard metal stamping, engraving, casting or other similar methods

NOTE 1 This marking remains legible during the entire lifespan of the cylinder.

NOTE 2 For composite cylinders, permanent markings may be achieved by use of a printed label encapsulated either by placing it under the resin or by covering it with a permanent transparent coating on the shoulder or the side wall of the cylinder (see also 4.3).

### 3.2

#### durable marking

marking such as stencilling (marking of the item using inks and/or paints), labelling (in accordance with e.g. ISO 7225) or other suitable methods

NOTE This marking can be modified but has to remain legible for a limited period.

## 4 Application of stamp markings

### 4.1 General

Markings listed in Table 1 consist of manufacturing, operational and certification stamp marks. See 4.3 for the arrangement of stamp marks. Additional markings may be applied as agreed by the interested parties, provided the layout does not cause any confusion in their interpretation and the clarity of the other mandatory markings is not affected.

### 4.2 Workmanship

The stamp markings shown in Table 1 shall be applied permanently and legibly in such a way that the integrity of the cylinder is unaffected, e.g. on a reinforced part of the cylinder or on a permanent attachment. For welded cylinders, some stamp markings will appear on a welded identity plate or on another part permanently attached to the cylinder and not subject to gas pressure.

For composite cylinders, permanent markings may be achieved by use of a printed label encapsulated either by placing it under the resin or by covering it with a permanent transparent coating on the shoulder or the side wall of the cylinder (see 4.3). Except for the "UN" mark, the characters in the stamp markings shall be at least 5 mm in height. On cylinders with an outside diameter less than 140 mm, this height may be reduced, but in no case shall the characters be less than 2,5 mm in height. The minimum size of the "UN" mark shall be 10 mm for cylinders with a diameter greater than or equal to 140 mm and 5 mm for cylinders with a diameter less than 140 mm.

The depth of the characters in the stamp markings made by any method shall be such that they are legible and durable under all operating conditions.

The stamp marking tools used shall have such radii as are necessary to prevent the formation of sharp notches. It is recommended that the radius of the stamp marking tool is not less than 0,2 mm. Different values can be used, but it shall be demonstrated by fatigue and burst tests in accordance with the design standard or equivalent that the failure does not initiate in the markings.

### 4.3 Arrangement and position of stamp markings

All stamp markings described in Table 1 shall appear consecutively in the sequence given in the figures in Annex A, which indicates the arrangement of the stamp markings. The United Nations Model Regulations distinguish between different groups of stamp marks and give them an explicit place in the arrangement of certain markings. In Figure A.1 and Figure A.2, the top group of stamp marks includes manufacturing marks (12, 2, 3, 4, 6). The group of stamp marks in the middle includes operational marks (13, 10, 11, 17, 7). The bottom group of stamp marks includes certification marks (27, 1, 28, 8, 9). In Figure A.3, the top row includes manufacturing marks. The second and third rows include operational marks and the bottom row includes certification stamp marks.

Annex B includes examples of positions of stamp markings for metallic LPG cylinders.

When an identity plate or label (for composite cylinders) is used, all the stamp markings may be on a single plate or label, provided the layout does not cause any confusion in their interpretation and follows the requirements of Table 1.

For hoop-wrapped composite cylinders, when a label under the resin is used, for traceability purposes at least the manufacturer's identification and the manufacturing serial number shall be duplicated by stamping them on the shoulder in accordance with Annex A.



Table 1 — Stamp markings

Stamp marking number	Description of the marking	Status Mandatory (M) <sup>a</sup> Normative (N) <sup>b</sup> Optional (O)	Figures as shown in Annex A (with examples)		
			Figure A.1 Location of stamp marking for compressed gases	Figure A.2 Location of stamp marking for liquefied gases	Figure A.3 Location of stamp marking for acetylene
1	<b>Standard:</b> The identification of the relevant construction standard to which the cylinder is designed, manufactured and tested.	M	ISOXXX	ISOXXX	ISOXXX
2	<b>Country of manufacture:</b> Capital letter(s) identifying the country of manufacture of the cylinder shell using the characters of the distinguishing signs of motor vehicles in international traffic as specified in the United Nations <i>Recommendations on the Transport of Dangerous Goods — Model Regulations</i> .	M when different from country of approval (stamp marking No. 28)	CH	CH	CH
3	<b>Manufacturer's identification:</b> Name and/or trademark of cylinder manufacturer.	M	MF	MF	MF
4	<b>Manufacturing serial number:</b> Alphanumeric identification number given or assigned by the manufacturer to clearly identify the cylinder.  In the case of cylinders less than or equal to 1 l, the manufacturing batch number may replace the manufacturing serial number.	M	7654321	7654322	7654323
5	<b>Stamp for non-destructive examination (NDE):</b> Where the cylinder is tested by and meets all the requirements of NDE in accordance with an ISO standard for gas cylinders (for example ultrasonic, magnetic particle, dye penetrant, acoustic emission), the following symbols shall be used:  UT: for ultrasonic;  MT: for magnetic particle;  PT: for dye penetrant;  AT: for acoustic emission.	N if applicable	UT	MT	PT
6	<b>Identification of steel compatibility:</b> Steel cylinders and composite cylinders with steel liners compatible with hydrogen and other gases of group 2 and group 11 in ISO 11114-1:1997 shall be stamp-marked with the letter "H". Stainless-steel cylinders manufactured from high-grade stainless steel and composite cylinders with high-grade stainless-steel liners shall be stamped with the letters "HG".  EXAMPLE X2CrNiMo17-12-2, as found in ISO/TS 15510.	M if applicable	H		
7	<b>Test pressure:</b> The prefix "PH" followed by the value of the test pressure in bars and the letters "BAR".	M	PH300BAR	PH250BAR	PH60BAR
8	<b>Inspection stamp:</b> Stamp or identification of authorized inspection body.	M	#	#	#
9	<b>Initial test date:</b> Year (four figures) followed by month (two figures) of initial testing, separated by a slash.	M	2007/10	2007/10	2007/10

Table 1 (continued)

Stamp marking number	Description of the marking	Status Mandatory (M) <sup>a</sup> Normative (N) <sup>b</sup> Optional (O)	Figures as shown in Annex A (with examples)		
			Figure A.1 Location of stamp marking for compressed gases	Figure A.2 Location of stamp marking for liquefied gases	Figure A.3 Location of stamp marking for acetylene
10	<p><b>Empty weight<sup>c</sup>:</b> The weight of the cylinder in kilograms, including all integral parts (e.g. neck ring, foot ring, etc.) followed by the letters "KG". This weight shall not include the weight of the valve, valve cap or valve guard, any coating or any porous material for acetylene. The empty weight shall be expressed to three significant figures rounded up to the last digit. For cylinders of less than 1 kg, the empty weight shall be expressed to two significant figures rounded up to the last digit. For acetylene cylinders, it shall be expressed to at least one digit after the decimal point.</p> <p>EXAMPLE</p> <p>Weight measured    0,964 kg   1,064 kg   10,64 kg   106,41 kg</p> <p>To be expressed as    0,97 kg   1,07 kg   10,7 kg   107 kg</p>	M	62,1KG	43,3KG	45,3KG
11	<p><b>Water capacity:</b> The minimum water capacity, in litres, guaranteed by the cylinder manufacturer, followed by the letter "L". On request by the customer or owner of the cylinder for compressed gases, this capacity may be expressed as the nominal average water capacity with a tolerance of <math>\pm 1,5\%</math>. In such a case, the symbol "≈" shall be stamped in front of the value of the water capacity.</p> <p>In the case of liquefied gases, the water capacity in litres is expressed to three significant figures rounded down to the last digit. If the value of the minimum or nominal water capacity is an integer, the digits after the decimal point may be neglected. The actual determined volume may also be indicated on request by the customer or owner in special cases.</p> <p>For cylinders intended to contain acetylene, the stamped water capacity shall be the actual determined volume, rounded down to three significant figures.</p>	<p>M for liquefied gases</p> <p>N for acetylene</p> <p>O for compressed gases</p>	≈50L	40,6L	50,8L
12	<p><b>Identification of the cylinder thread:</b> e.g.</p> <p>25E: thread in accordance with ISO 10920;</p> <p>or</p> <p>17E: thread in accordance with ISO 11116-1.</p>	M	25E	25E	25E
13	<p><b>Minimum guaranteed wall thickness:</b> Minimum guaranteed wall thickness in millimetres (as per the type approval test) of the cylindrical shell, followed by the letters "MM".</p>	<p>M</p> <p>Exception: not mandatory for composite cylinders or cylinders <math>\leq 1</math> l</p>	5,8MM	15,5MM	4,2MM

Table 1 (continued)

Stamp marking number	Description of the marking	Status	Figures as shown in Annex A (with examples)		
			Figure A.1 Location of stamp marking for compressed gases	Figure A.2 Location of stamp marking for liquefied gases	Figure A.3 Location of stamp marking for acetylene
14	<b>Identification of aluminium alloy:</b> Number of the aluminium alloy according to The Aluminum Association (see Note), with prefix "AA" for all aluminium-alloy cylinders and composite cylinders with aluminium liners.  NOTE Address: The Aluminum Association Inc., 900 19th Street NW, Washington DC 20006-2168, USA.	N for aluminium cylinders	—	AA7060	—
15	<b>Identity of porous material:</b> For acetylene cylinders prepared with porous material, name or trademark of porous material. The country and factory of origin shall be traceable through this mark. Stamp marking No. 15 need not be stamped at the time of testing the empty cylinder shell.	N for acetylene	—	—	ZZZ
16	<b>Identification of content:</b> For acetylene cylinders, the formula "C <sub>2</sub> H <sub>2</sub> " may be stamp-marked.	O for acetylene	—	—	C <sub>2</sub> H <sub>2</sub>
17	<b>Working pressure:</b> Settled pressure, in bars, at a uniform temperature of 288 K (15 °C) for a full gas cylinder preceded by the letters "PW".	M for compressed gases and acetylene	PW200	—	PW18
18	<b>Maximum permissible filling weight:</b> The product of the water capacity of the cylinder and the filling density of the gas. The maximum permissible filling weight shall be marked by means of stamp-marking, stencilling or labelling.  If the maximum permissible filling weight is stamp-marked, it shall be followed by the letters "KG" and the name and/or chemical formula of the gas.  The maximum permissible filling weight does not apply to acetylene.	O for liquefied and compressed gases filled by weight	—	30KG CO <sub>2</sub>	—
19	<b>Total weight (gross weight):</b> For acetylene cylinders, the total weight, comprising either Tare A or Tare F (see stamp marking No. 20) plus maximum allowable acetylene content, preceded by the letters "TOTAL" and followed by the letters "KG". When only Tare S is used, the total weight may be replaced by the maximum acetylene charge (see Note), excluding saturation gas, preceded by the letters "MAX" and followed by the letters "KG".  NOTE The stamped value can be less than the approved value.	N for acetylene (C <sub>2</sub> H <sub>2</sub> )	—	—	TOTAL85,1KG