

**NOTE ON THE PROGRESS MADE ON THE WORK CARRIED OUT
BY THE TECHNICAL COMMITTEE ISO/TC 58 GAS CYLINDERS**

Transmitted by the International Organization for Standardization (ISO)

A progress report on the work of technical committee ISO/TC 58 was distributed to the UN Sub-Committee of Experts on the Transport of Dangerous Goods in **July 1999** (Doc. UN/SCETDG/16/INF.25). This note is an update of that document taking into account the progress made since that time. **Please note that 3 International Standards have reached the publication stage since then.**

1. Refillable seamless gas cylinders for world-wide use

1.1 Steel gas cylinders

The trilogy of modern ISO standards for seamless steel cylinders up to 150 litres, constituting the major part of industrial high pressure cylinders manufactured today, is approaching its completion:

ISO 9809-1 *Transportable seamless steel gas cylinders -- Design, construction and testing -- Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa* is published;

ISO/DIS 9809-2 *Transportable seamless steel gas cylinders -- Design, construction and testing -- Part2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa* **was approved in the formal vote and publication is now imminent.**

The last one, dealing with normalized steel cylinders: ISO/DIS 9809-3 *Transportable seamless steel gas cylinders -- Design, construction and testing -- Part3: Normalized steel cylinders*, **is now out for enquiry, closing 2000-01-05. The formal vote is expected to take place about a year later.**

The intent is that ISO 9809, Parts 1, 2 and 3 should replace the old ISO 4705, which has become partly obsolete and now has a warning note regarding its use with steels with tensile strength above 1100 MPa.

In addition, the work on quality assurance will be finished as quickly as possible in the **form of a Technical Report ISO/TR 14600** to complement the above projects (see section 3 of this note). A technical report does not by itself carry any significance in a way of a standard, but may be adopted by a regulatory body or organization.

2. Standards for other types of gas cylinders

2.1 Non-refillable industrial gas cylinders

The International Standard, **ISO/DIS 11118:1999 *Non-refillable metallic gas cylinders -- Specification and test methods*** was approved in the formal vote and has now been published.

2.2 Gas cylinders of composite materials

The composite cylinder standardization project consists of three parts as follows:

ISO/DIS 11119-1 *Gas cylinders of composite construction -- Specification and test methods -- Part 1: Hoop wrapped composite gas cylinders;*

ISO/DIS 11119-2 *Gas cylinders of composite construction -- Specification and test methods -- Part 2: Fully wrapped fibre reinforced composite gas cylinders with load-sharing metal liners;*

ISO/DIS 11119-3 *Gas cylinders of composite construction -- Specification and test methods --Part 3:*

Fully wrapped fibre reinforced composite gas cylinders with non-metallic and non-load-sharing metal liners.

All three documents are now out for the enquiry vote, closing 2000-02-23. The formal vote is expected to take place a year later.

2.3 High-pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles

A Draft International Standard (ISO/DIS 11439) dealing with a broad spectrum of high pressure cylinder designs for the on-board storage of natural gas as a fuel for automotive vehicles has been established in a joint working group from technical committees ISO/TC 58 *Gas cylinders* and ISO/TC 22 *Road vehicles*. This working group is ISO/TC 58/SC 3/WG 17 *Compressed natural gas cylinders for road vehicles*. This Draft International Standard was accepted in a parallel enquiry within ISO and CEN. **The formal vote is expected to take place in the beginning of 2000.** The work is carried out in liaison with the meeting of Experts on Pollution and Energy and with the Subcommittee of Experts on the Transport of Dangerous Goods.

2.4 Cylinders for acetylene

The following Formal Draft International Standards are presently on **formal vote, closing 1999-12-15. If the FDISes are accepted, the final publication of the International Standards would take place in the early part of 2000.**

ISO/FDIS 3807-1 *Cylinders for acetylene -- Basic requirements -- Part 1: Cylinders without fusible plugs (Partial revision of ISO 3807:1977);*

ISO/FDIS 3807-2 *Cylinders for acetylene -- Basic requirements -- Part 2: Cylinders with fusible plugs (Partial revision of ISO 3807:1977).*

3. Quality assurance programme

A CD was sent out for comments in late 1998 and met with some principal objections, mainly related to that the proposed text imposed certain requirements on Regulatory Authorities, etc. that would be beyond the capacity of an ISO standard. It was then decided at a TC 58 plenary meeting to redirect the work and develop a Technical Report (ISO/TR 14600 *Basic rules for an international quality acceptance system for ISO gas cylinders*). This TR may then be adopted in whole or in part by UN-CETDG and incorporated into the Orange Book. A draft will be prepared by the end of 1999 and contacts will then be taken again with CASCO and ISO/TC 176 for possible harmonisation with general ISO requirements on conformity assessment standards. **The aim is to have an enquiry for the TR circulated in the beginning of 2000.** The convenor of the working group can be reached by the following address:

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4. Oxidizing gases and gas mixtures, including toxic and corrosive gases

The following Working Draft is being prepared by WG 7 of subcommittee ISO/TC 58/SC 2:

ISO/WD 13339 *Procedure for the determination of the oxipotential of oxidizing gases and gas mixtures including toxic and corrosive gases.*

This work item was overdue at the end of 1999 and subsequently cancelled. It has to be revoked to be activated again.

5. Additional work in progress

5.1 Compatibility between gases and materials

5.1.1 Metallic and non-metallic materials

The following Draft International Standard was accepted in the enquiry and is **now on parallel (CEN/ISO) formal vote closing 2000-02-02.**

prEN ISO 11114-2:1998 *Transportable gas cylinders -- Compatibility of cylinder and valve materials with gas contents -- Part 2: Non-metallic materials.*

5.1.2 Hydrogen

ISO/NP 11114-4 deals with testing for the compatibility of metallic materials with hydrogen. The scope of the project is presently limited to steels. Considerable progress was made at the last WG meeting in Oct. 1999 and a CD is expected during 2000. The next WG meeting will take place on Feb. 17, 2000 in Clearwater, Florida.

5.1.3 Terminology

The International Standard ISO 10286 *Terminology*, is presently under revision with regard to definitions of various states of gases (compressed, liquefied, dissolved, etc.) and pressures (working, settled operating, etc.) in order to harmonise with other regulations such as the UN Orange Book, ADR, etc. **A CD is now circulated for submission as a DIS, the vote closing 2000-02-01.**

5.2 On-going work within subcommittee ISO/TC 58/SC 2 Gas cylinders - Cylinder fittings

The following International Standards have been published since the last report:

ISO 10297:1999 *Gas cylinders -- Refillable gas cylinder valves -- Specification and type testing (NB All gases except LPG).*

The following International Standard is at the formal voting stage:

ISO/DIS 10692-2 *Gas cylinders -- Gas cylinder valve connections for use in microelectronic industry -- Part 2: Specification and type testing for valve to cylinder connections;*
 ISO/DIS 12209-1 *Outlet connections for gas cylinder valves for compressed breathable air-- Part 1: Yoke type connection;*
 ISO/DIS 12209-2 *Outlet connections for gas cylinder valves for compressed breathable air-- Part 2: Threaded connections;*
 ISO/DIS 12209-3 *Outlet connections for gas cylinder valves for compressed breathable air-- Part 3: Adaptor for 230 bar valves;*
 ISO/DIS 13340 *Transportable gas cylinders -- Cylinders valves for non-refillable cylinders -- Specification and type testing;*

ISO/DIS 14246 *Transportable gas cylinders -- Gas cylinder valves -- Manufacturing tests and inspections.*

The following documents are at Draft International Standard (DIS) stage:

ISO/DIS 15245-1 *Gas cylinders -- Parallel threads -- Specifications;*
ISO/DIS 15245-2 *Gas cylinders -- Parallel threads -- Gauge Inspection;*
ISO/DIS 10692-1 *Gas cylinders -- Gas cylinder valve connections for use in microelectronic industry -- Part 1: Outlet connections for single gases.*

The following documents are at Working Draft (WD) stage:

ISO/WD 407 *Small medical gas cylinders -- Pin-index yoke-type valve connections (Revision of ISO 407:1991);*
ISO 5145/DAM 1 *Updating of Annex A of ISO 5145: 1990;*
ISO/AWI 14245 *Specifications and testing for liquefied petroleum gas valves (PQ procedure in preparation);*
ISO/AWI 15995 *Manually operated liquefied petroleum gas valves -- Specifications and testing (PQ procedure in preparation);*
ISO/AWI 15996 *Residual pressure valves and their filling adaptors -- Performance and type testing.*

5.3 On-going work within subcommittee ISO/TC 58/SC 3 Gas cylinders - Cylinder design

The following draft ISO Technical Report **is being finalized for approval and publication is planned in mid 2000:**

ISO/TR 12391 *Seamless steel gas cylinders -- Toughness and acceptance levels of steels of strength levels above 1100 MPa.*

5.4 On-going work within subcommittee ISO/TC 58/SC 4 Gas cylinders - Operational requirements for gas cylinders

The following documents are at Formal Draft International Standard (FDIS) stage

ISO/DIS 10464 *Liquefied petroleum gas cylinders -- Periodic inspection and testing;*
prEN/ISO 11623 *Transportable gas cylinders -- Periodic inspection and testing of composite gas cylinders;*

The following documents are at Draft International Standard (DIS) stage:

ISO/DIS 10691 *Transportable welded steel cylinders for Liquefied Petroleum Gas (LPG) -- Procedures for checking at the time of filling;*
ISO/DIS 13769 *Gas cylinders -- Stamp marking.*

The following draft is at Committee Draft (CD) stage:

ISO/CD 11622 *Conditions for filling gases into cylinders (Filling ratios, filling pressures and provisions for safety devices for gas cylinders).*

This work item was overdue at the beginning of the year and subsequently cancelled. It has to be revoked to be activated.

The following documents are at Working Draft (WD) stage:

ISO/AWI 6406	<i>Periodic inspection and testing of seamless steel gas cylinders (under revision and will be coordinated with 10460, 10461, 10463 and 11113);</i>
ISO 10460	<i>Welded carbon steel gas cylinders -- Periodic inspection and testing (under revision and will be coordinated with 6406, 10461, 10463 and 11113);</i>
ISO 10461	<i>Seamless aluminium alloy gas cylinders -- Periodic inspection and testing (under revision and will be coordinated with 6406, 10460, 10463 and 11113);</i>
ISO 10462:1994	<i>Cylinders for dissolved acetylene -- Periodic inspection and maintenance (under revision);</i>
ISO 10463	<i>Cylinders for permanent gases -- Inspection at time of filling (under revision and will be coordinated with 6406, 10460, 10461 and 11113);</i>
ISO/NP 11624	<i>High strength seamless steel cylinders -- Periodic inspection and testing (cancelled, to become part of revised ISO 6406);</i>
ISO/NP 13771	<i>Gas cylinders -- Filling conditions for liquefied petroleum gas (cancelled);</i>
ISO/NP 16148	<i>Gas cylinders - Acoustic emission methods for cylinder requalification;</i>
ISO/NP xxxxx	<i>Methods for inspection and requalification of natural gas vehicle fuel containers.</i>

6. Meetings held and planned

ISO/TC 58	23 and 24 Sept. 1999, Venice. Next plenary meeting planned for 2001.
ISO/TC 58/WG 7*	20 and 21 Oct. 1999, Las Vegas, Nevada, 17 Feb. 2000, Clearwater, Florida.
ISO/TC 58/WG 8*	21 to 22 Oct. 1998, Vienna, no new meeting planned
ISO/TC 58/WG 9*	28 Sept. 1998, Ottawa, 10 Dec. 1999 Geneva, Switzerland.
ISO/TC 58/SC 2	31 March and 1 April 1999, Washington D.C.; 22 and 23 March 2000, Berlin.
ISO/TC 58/SC 2/WG 6*	1 and 2 Dec. 1998, Berlin.
ISO/TC 58/SC 2/WG 7*	26 January 1998, Luxembourg.
ISO/TC 58/SC 3	20 to 22 Sept. 1999, Venice, beginning of Oct. 2000, somewhere in USA.
ISO/TC 58/SC 4	7 to 9 July 1999, Stockholm. April or May 2000, place to be decided.

* Titles of Working Groups

ISO/TC 58/WG 7	Compatibility between gases and materials (Convener: Dr. H. Barthélémy)
ISO/TC 58/WG 8	Acetylene cylinders (Convener: Mr. G. König)
ISO/TC 58/WG 9	Quality assurance requirements for approval and certification of gas cylinders (Convener: Mr. J.G. Marsh)
ISO/TC 58/SC 2/WG 4	Valve system and cylinder neck threads (Convener: Mr. P. Bates)
ISO/TC 58/SC 2/WG 6	Gas cylinder valves -- Specifications and testing (Convener: Dr. G. Mair)
ISO/TC 58/SC 2/WG 7	Determination of toxicity of gas mixtures (Convener: Dr. H. Barthélémy)

ANNEX A Bibliography

List of International Standards from technical committee ISO/TC 58

ISO/TC 58 *Gas cylinders*

- ISO 32:1977 Gas cylinders for medical use -- Marking for identification of contents (**transferred to TC 58/SC4**)
- ISO 3500:1990 Seamless steel CO₂ cylinders for fixed fire-fighting installations on ships (**transferred to TC 58/SC3**)
- ISO 3807:1977 Dissolved acetylene cylinders -- Basic requirements (**under revision**)
- ISO 7225:1994/Cor.1:1995 Gas cylinders -- precautionary labels (**transferred to TC 58/SC4**)
- ISO 10286:1996 Gas cylinders -- Terminology (**under revision**)
- ISO 11114-1:1997 Transportable gas cylinders -- Compatibility of cylinder and valve materials with gas contents -- Part 1: Metallic materials
- ISO 11114-3:1997 Transportable gas cylinders -- Compatibility of cylinder and valve materials with gas contents -- Part 3: Autogenous ignition test in oxygen atmosphere

ISO/TC 58/SC 2 *Gas cylinders - Cylinder fittings*

- ISO 407:1991 Small medical gas cylinders -- Pin-index yoke-type valve connections (**under revision**)
- ISO 5145:1990 Cylinder valve outlets for gases and gas mixtures -- Selection and dimensioning (**under revision**)
- ISO/TR 7470:1988 Valve outlets for gas cylinders -- List of provisions, which are either standardized or in use
- ISO 10156:1996 Gases and gas mixtures -- Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets
- ISO 10297:1999 Gas cylinders -- Refillable gas cylinder valves -- Specification and type testing (NB All gases except LPG)**
- ISO 10298:1995 Determination of toxicity of a gas or gas mixture
- ISO 10920:1997 Gas cylinders -- 25E taper thread for connection of valves -- Specification
- ISO 11116-1:1999 Gas cylinders -- 17E taper thread for connection of valves to gas cylinders -- Part 1: Specification**
- ISO 11116-2:1999 Gas cylinders -- 17E taper thread for connection of valves to gas cylinders -- Part 2: Inspection gauges**
- ISO 11117:1998 Gas cylinders -- Valve protection caps and valve guards for industrial and medical gas cylinders -- Design, construction and tests
- ISO 11191:1997 Gas cylinders -- 25E taper thread for connection of valves to gas cylinders -- Inspection gauges
- ISO 13338:1995 Determination of tissue corrosiveness of a gas or gas mixture
- ISO 13341:1997/Cor.1:1998 Transportable gas cylinders -- Fitting of valves to gas cylinders

ISO/TC 58/SC 3 Gas cylinders - Cylinder design

ISO 3500:1990	Seamless steel CO2 cylinders for fixed fire-fighting installations on ships
ISO 4705:1983/Cor.1:1998	Refillable seamless steel gas cylinders (a technical corrigendum has been published in 1998)
ISO 4706:1989	Refillable welded steel gas cylinders
ISO 7866:1999	Refillable transportable seamless aluminium alloy gas cylinders for worldwide usage -- Design, construction and testing
ISO 9809-1:1999	Transportable seamless steel gas cylinders -- Design, construction and testing -- Part 1: Quenched and tempered steel cylinders with tensile strength less than 1100 MPa
ISO 9809-2:2000	Transportable seamless steel gas cylinders -- Design, construction and testing -- Part2: Quenched and tempered steel cylinders with tensile strength greater than or equal to 1100 MPa (publication expected early 2000)

ISO 11118:1999 Non-refillable metallic gas cylinders -- Specification and test methods

EN ISO 11120:1999	Gas cylinders -- Refillable seamless steel gas cylinders, capacity between 150 l and 3000 l -- Design and testing
ISO/TR 13763:1994	Safety and performance criteria for seamless gas cylinders

ISO/TC 58/SC 4 Gas cylinders - Operational requirements for gas cylinders

ISO 32:1977	Gas cylinders for medical use -- Marking for identification of contents. (under revision)
ISO 6406:1992	Periodic inspection and testing of seamless steel gas cylinders (under revision)
ISO 7225:1994/Cor.1:1995	Gas cylinders -- Precautionary labels (under revision)
ISO 10460:1993	Welded carbon steel gas cylinders -- Periodic inspection and testing (under revision)
ISO 10461:1993	Seamless aluminium alloy gas cylinders -- Periodic inspection and testing (under revision)
ISO 10462:1994	Cylinders for dissolved acetylene -- Periodic inspection and maintenance (corrected and reprinted 1995) (under revision)
ISO 10463:1993	Cylinders for permanent gases -- Inspection at time of filling (under revision)
ISO 11113:1995	Cylinders for liquefied gases (excluding acetylene and LPG) -- Inspection at time of filling (under revision)
ISO 11372:1995	Cylinders for dissolved acetylene -- Inspection at time of filling
ISO 11621:1997	Gas cylinders -- Procedures for change of gas service
ISO 11625:1998	Gas cylinders -- Safe handling
ISO 11755:1996	Cylinders in bundles for permanent and liquefied gases (excluding acetylene) -- Inspection at time of filling
ISO 13770:1997	Aluminium alloy gas cylinders -- Operational requirements for avoidance of neck and shoulder cracks