

COMMITTEE OF EXPERTS ON THE TRANSPORT OF
DANGEROUS GOODS AND ON THE GLOBALLY
HARMONIZED SYSTEM OF CLASSIFICATION
AND LABELLING OF CHEMICALS

Sub-Committee of Experts on the
Transport of Dangerous Goods
(Twenty –second session, 2-6 December 2002,
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ADDITIONAL PROVISIONS FOR THE TRANSPORT OF GASES

Section 6.2.2.1. Composite Cylinder Life

Transmitted by the Expert from the United Kingdom

Background

1. The expert from the United Kingdom notes that the proposed entries in 6.2.2.1.1 for ISO 11119 parts 1, 2 and 3 have a note attached in square brackets which states that *"The life of these cylinders shall be limited to 15 years and the expiry of the life shall be specified by the marking in 6.2.2.7.6."*
2. However the UK has allowed the use of composite cylinders for the domestic market since January 1999 with a design life of up to 30 years.
3. One example of an approved specification is HSE-AL-FW2 "Specification for fully wrapped carbon composite containers". In this, section 9 deals with the life of the cylinder :- Below are the relevant extracts from this specification.

"9 IN-SERVICE PERFORMANCE MONITORING

The principal aim of the in-service performance monitoring is to be satisfied that the long term behaviour of a new composite cylinder design does not deteriorate faster than the original performance tests would predict and also that the cylinders are not unnecessarily scrapped where a satisfactory level of performance has been proven and future integrity can be assured.

- 9.1 *Fifteen years from the date of the first hydrostatic pressure test all composite cylinders shall be returned to the manufacturer or competent organisation authorised to test composite cylinders on behalf of the manufacturer, for reassessment. The manufacturer, in conjunction with the competent organisation where appropriate, and the approved Inspection Body shall establish suitability for further service. The Health and Safety Executive shall be advised.*
- 9.2 *The cylinders may continue in service to the end of their design lifetime or for a further period of up to 15 years, whichever is the shorter, only with the written consent of the manufacturer and the approved Inspection Body.*
- 9.3 *Thirty years from the date of the first hydrostatic pressure test any composite cylinders still in service shall be returned to the manufacturer or competent organisation) authorised to test composite cylinders on behalf of the manufacturer, for reassessment. Thereafter they may continue in service to the end of their design life only with the written consent of the manufacturer and the approved Inspection Body.*

9.4 *At the end of the cylinders' designated design life, they shall be withdrawn from service and shall be rendered unserviceable by a method listed in 5.2.12."*

4. The specification also deals with periodic examination in the appendix 1 and ensures that conditions are met whereby the data for justifying extended periods of operation are properly recorded :

APPENDIX 1 - PERIODIC EXAMINATION AND TESTING

1. *Composite cylinders to this specification shall be examined for defects externally by visual inspection at each cylinder fill, by a person having appropriate training, experience and facilities.*
2. *Within the period of 3 years* from the date of the last hydraulic pressure test every composite cylinder to this specification shall be examined for defects externally and internally, and before continuing in service, subjected to a hydrostatic pressure test in accordance with the British Standard BS 5430 Part 3 1990. Clause 4.7.3. and the manufacturer's recommended procedure, by the manufacturer or a station authorised to test composite cylinders on behalf of the manufacturer.*
3. *The procedure for external and internal inspection shall be specified by the manufacturer, including the appropriate damage identification criteria for the acceptance or rejection of cylinders for further service. This procedure may refer to relevant guidance published by the Compressed Gas Association in the USA (CGA Pamphlet C-6.2 1988) and the relevant sections of BS 5430: Part 3 1990 in respect of non-wrapped and internal surfaces, excluding any method of cleaning or surface preparation that might damage the composite.*
4. *A cylinder with superficial damage only that has no adverse effect on its safety and integrity, may continue in service.*
5. *Cylinders with minor damage below the rejection level in accordance with the criteria specified under paragraph 3 of this Appendix including minor flaws in the reinforcement that may be repaired, shall be returned to the manufacturer or his authorised tester/repairer for examination or repair and subject to hydrostatic pressure test in accordance with the manufacturer's recommended procedure.*
6. *Cylinders shall be rejected if they do not meet the volumetric expansion criteria or if any flaw has grown following repair and testing.*
7. *Rejected cylinders shall be rendered unserviceable from holding gas under pressure by one of the methods listed in 5.2.12 of this specification.*
8. *In the event of doubt or dispute in connection with paragraphs 4 to 7 of this Appendix, the manufacturer and, if necessary, the approved Inspection Body shall be consulted.*
9. *Records of all periodic examinations and testing shall be held by the manufacturer together with materials and test certificates and inspection reports relating to the manufacture of the cylinder, for the lifetime of the cylinder.*

**NB After the first re-test, the re-test performance data will be reviewed by the manufacturer, or the competent organisation, or the approved Inspection Body where appropriate. Satisfactory performance will result in the extension of the re-test period from 3 to 5 years. The Health and Safety Executive will need to be notified of the change.*

PROPOSAL

5. By controlling composite cylinders in this way the UK will allow a lifespan for composite cylinders of up to 30 years. The UK therefore proposes that the notes to the additional entries to 6.2.2.1.1 be changed from 15 years to read 30 years.
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