Joint Meeting of the RID Safety Committee and the Working Party on the Transport of Dangerous Goods
(Berne, 13-24 March 2000)

Informal document regarding progress of CEN standards for reference in RID/ADR

Transmitted by the European Committee for Standardisation (CEN)

a) amendments of standards already referred to in ADR/RID :

a.1) **EN 1081 :1996** *Transportable gas cylinders - Gas cylinder identification (excluding LPG) - Part 1: Stampmarking.* Referred to in 6.2.2.2

An amendment to this standard is ready for being sent for formal vote. The amendment refers to the use of "rings" squeezed between the cylinder body and the valve to bear the test date and the stamp of the inspection body after the periodic inspection of acetylene cylinders.
Markings on rings squeezed between the valve and the cylinder do not, according to the CEN consultant, conform to definition in ADR/RID of an "immovably affixed" marking.
The use of a ring for the same purpose has however been proposed to the Joint Meeting by France in their document Trans/WP.15/AC.1/1998/45 which is on the agenda (item 2.(e)) of this meeting

CEN is waiting for the outcome of the discussion to progress further the amendment to the standard.

a.2) **EN962:1996** *Valve protection caps and valve guards for industrial and medical gas cylinders- design, construction and tests.* Referred to in 4.1.6

This standard has already been amended twice; once in 1999 to modify the torque test for non-metallic fixed guards and a second time in 2000 to align the definition of the permitted weight to the tested weight.

CEN requests the Joint Meeting to adopt the reference to the recently amended version of the standard: EN962:1996/A2: 2000.

a.3) **EN 849: 1996** (without Annex A) *Cylinder valves: Specifications and type testing.* Referred to in 2.2.2.

This standard has been amended a first time in 1998 to define the endurance test in greater detail to ensure uniformity of testing. A second amendment has been submitted recently for formal voting. This second amendment takes into account remarks made in 1997 when the standard was assessed by the CEN consultant who recommended reference to this standard except for the Annex A. The

Annex A describes the impact test for valves of cylinders that are transported unprotected (by a cap, a guard or a shroud).
The CEN consultant objected against the reference to the Annex because he was of the opinion that the levels of impact energy were not equivalent to the equivalent energy incurred during the drop test required in EN 962:1996 for testing valve caps and valve guards. A second reason was that the impact energies required in Annex A were different from those required for the same test in standards in preparation for the valves for LPG cylinders (i.e. prEN 13152 and prEN 13153).
There is however a need to refer to a standard in 4.1.6.7 in order to show compliance to the requirements of 4.1.6.4 (d) that "Valves are designed and constructed in such a way that their ability to withstand damage without leakage of product has been demonstrated".
The impact test proposed in the Annex A is based on a UK standard BS 341:1991. The same impact test is included in ISO 10297:1999 *Gas cylinders – Refillable gas cylinder valves – Specification and type testing*. The gas industry claims that more than 1.5 millions cylinders are in use in UK and Ireland with unguarded valves.
After discussions with the experts of the gas industy and of the LPG industry, it was agreed to increase the level of energy required for the impact test in BS and ISO and to make it proportional to the permitted total weight of the cylinder and not to the capacity of the cylinder. The factor of proportionality (number of Joules = 3.6 times the permitted weight in kg) has been derived from the impact scenario that the test is reproducing, i.e. the valve is hitting an obstacle when the cylinder is falling horizontally.

CEN requests the Joint Meeting to refer to the Annex of this standard in 4.1.6.7 once the amended standard will be ratified by CEN for publication by its members.

b) standards published since the last Joint Meeting:

b.1) **EN 12962:2000** *Transportable gas cylinders - Specification for the design and construction of refillable transportable welded aluminium alloy gas cylinders*

This standard has been submitted to the Joint Meeting in document Trans/WP15/AC1/1997/70 along with other standards that in the meantime have been published and adopted by the Joint Meeting for reference in the 2001 edition of RID/ADR. This standard had been forgotten in subsequent submissions by CEN for documents to be referred to in the restructured ADR/RID.

CEN apologises for this omission and asks the Joint Meeting to add this reference into the table of standards in 6.2.2. The applicable sections are 6.2.1.1 and 6.2.1.5.

b.2) **EN ISO 11114-2 : 2000** *Transportable gas cylinders - Compatibility of cylinder and valve materials with gas contents- Part 2: Non-metallic materials*

This standard was also submitted to the Joint Meeting in document Trans/WP15/AC1/1997/70 and was kept between brackets after the Joint Meeting of March (ref. TRANS/WP.15/159/Add.6). This standard has been ratified end of April by CEN for publication by its members.

CEN asks the Joint Meeting to add this reference into the table of standards in 6.2. by removing the square brackets.

c) standards ready for formal vote, not yet published

The following standards are ready for formal vote or have been recently issued for formal vote. A synopsis of the assessments made by the CEN consultant for these standards is attached as Annex 1 .

CEN proposes to refer to those standards in the appropriate sections of the ADR/RID when the standards will be ratified by CEN for publication by its members. The CEN representative is available for further comments on the standards and will keep the Joint Meeting informed of the progress in their approval.

DOC. Reference	Title of Document	Applicable sections	To be referred to in
prEN 12245	Transportable gas cylinders - Fully wrapped composite cylinders	6.2.1.1 and 6.2.1.5	6.2.2
prEN 12257	Transportable gas cylinders - Seamless, hoop wrapped composite cylinders - Specification	6.2.1.1 and 6.2.1.5	6.2.2
prEN 12807	Transportable refillable brazed steel cylinders for liquefied petroleum gas (LPG) - Design and construction	6.2.1.1, 6.2.1.5 and 6.2.1.7	6.2.2
prEN ISO 11623	Transportable gas cylinders - Periodic inspection and testing of composite gas cylinders	6.2.1.6	P200 and 6.2.2
prEN 12972	Tanks for transport of dangerous goods - Testing, inspection and marking of metallic tanks	6.8.2.4 and 6.8.2.5/6.8.3.5	6.8.2.6

Annex 1: Synopses of assessment of standards proposed for references in RID/ADR

1. prEN ISO 11623: Periodic inspection and testing of composite gas cylinders

Conclusions: Packing Instruction P200 does not give testing periodicities for composite cylinders. Testing periodicities are to be determined by the competent authorities at the approval of the design of the cylinder. One of the objective of this standard is to seek harmonisation for the conditions determined by competent authorities for cylinders made of composite materials. The testing periodicities proposed in the standard are in line or more stringent for certain services (e.g. cylinders for breathing oxygen or air, cylinders for underwater service; cylinders for very toxic gases) with the periodicities set out in P200. This standard should be referred to in both P200 (13) and 6.2.2

Table of concordance between essential requirements of RID/ADR and clauses of PrEN ISO 11623

Sections of RID/ADR	clauses of standard
6.2.1.6.1 Refillable receptacles shall be subjected to periodic inspection under the supervision of a testing and certifying body approved by the competent authority, in accordance with the following specifications: (a) Check of the external conditions of the receptacle and verification of the equipment and the external markings; (b) Check the internal conditions of the receptacle (e.g. by weighing, internal inspection, checks of wall thickness); (c) The hydraulic test and , if necessary, verification of the characteristics of the material by suitable tests; Note 1: with the agreement of ..... replacement of hydraulic test by pneumatic test or ultrasonic test..... Note 2: with the agreement of ..... replacement of hydraulic test by acoustic emission test Note 3: with the agreement of ..... replacement of hydraulic test for small welded steel LPG receptacles	6, 7 8 10
P200 (6) If special requirements for certain substances do not appear in the table below, periodic inspections shall be carried out a) every 3 years.... b) every 5 years.... c) every 10 years.... By derogation from this paragraph, the periodic inspection of receptacles which make use of composite materials (composite receptacles) shall be determined by the competent authority of the Contracting Party to ADR (RID) which has approved the technical code for design and construction	4

2. prEN 12245 Transportable gas cylinders - Fully wrapped composite cylinders
prEN 12257 Transportable gas cylinders - Seamless, hoop wrapped composite cylinders

Conclusions: The two standards are very similar in their content and structure. Both standards refer to the construction standards of metallic cylinders for the testing of load-sharing metallic liners. They are very few essential requirements of RID/ADR specific to the scope of the standards. They are all covered in this standard except the requirement for the measurement of the wall thickness of the finished cylinder. However the standards foresee other tests including a burst test on each batch of finished cylinders. It should be noted that the standards require the use of a pressure relief device (rated at 1.15 x test pressure) for composite cylinders intended for non-flammabke, non-toxic liquefied gases. This is an essential requirement that is not (yet) in the ADR/RID

Table of concordance between essential requirements of RID/ADR and clauses of PrEN 12245 and PrEN 12257

Sections of RID/ADR	clauses of standard
6.2.1.1.1 Receptacles and their closures shall be designed, calculated, manufactured, tested and equipped in such a way as to withstand all conditions to which they will be subjected during their normal use and during normal transport conditions In the design of pressure receptacles, all relevant factors are to be taken into account such as: - internal pressure - ambient and operational temperatures including during transport; - dynamic loads Normally the wall thickness shall be determined by calculation ..... Appropriate design calculations for the shell..... The minimum wall thickness to withstand pressure shall be calculated with regard in particular to: - the calculation pressure shall	sections 4,5
6.2.3.3 For composite receptacles……, the construction shall be such that a minimum burst ratio (burst pressure divided by test pressure) is 1.67 for hoop wrapped receptacles 2.00 for fully wrapped receptacles	 5.2.5 5.2.5
6.2.1.5.1 Receptacles shall be subjected to initial inspection in accordance with the following specifications: On one adequate sample of receptacles: (a) Testing of the material of construction... (b) Measurement of wall thickness..... (c) checking the homogeneity of the material for each manufacturing For all receptacles (d) a hydraulic pressure test... (e) inspection of the markings..... (f) receptacles for acetylene.....	5.2 and Annex A (not foreseen) see prEN 1800
6.2.1.7 Marking of receptacles	Reference to EN1089-1

3. prEN12807 Transportable refillable brazed steel gas cylinders for liquefied petroleum gas (LPG) - Design and construction

Conclusions: The standard covers all essential requirements of RID/ADR on the subject as outlined in the table hereafter.

Table of concordance between essential requirements of RID/ADR and clauses of PrEN 12807

Sections of RID/ADR	clauses of standard
6.2.1.1.1 Receptacles and their closures shall be designed, calculated, manufactured, tested and equipped in such a way as to withstand all conditions to which they will be subjected during their normal use and during normal transport conditions In the design of pressure receptacles, all relevant factors are to be taken into account such as: - internal pressure - ambient and operational temperatures including during transport; - dynamic loads Normally the wall thickness shall be determined by calculation	4,5,6.1 to 6.5 6.8 7, 8

4.1.6.4 Valves shall be effectively protected from damage which could cause gas release if the receptacle falls, and during carriage and stacking. This requirement is deemed to be complied with if one or more of the following conditions are fulfilled..	6.6
6.2.1.5.1 Receptacles shall be subjected to initial inspection in accordance with the following specifications:	
On one adequate sample of receptacles:	8 in general
(a) Testing of the material of construction...	7.1
(b) Measurement of wall thickness.....	7.6.3
(c) checking the homogeneity of the material for each manufacturing batch, and inspection of the external and internal condition of the receptacles	7.5
For all receptacles	
(d) a hydraulic pressure test...	7.3
(e) inspection of the markings.....	
(f) receptacles for acetylene.....	not in scope
6.2.1.7 Refillable receptacles according to marginal 2211 shall bear the following particulars in clearly legible and durable characters	
(a) name or mark of the manufacturer;	2
(b) approval number (if design type approval);	10
(c) serial number of receptacle by manufacturer;	3
(d) tare of receptacle	8
(e) test pressure	4
(f) date(month, year) of initial test and most recent test;	6
(g) stamp of expert	5
(h) for D/A cylinders, settle pressure and total mass	not in scope
(i) water capacity in litres;	7
(j) max. fill pressure for gases filled by pressure	not in scope
These marks shall immovably	
They can be engraved.....	

4. prEN 12972 Tanks for transport of dangerous goods - Testing, inspection and marking of metallic tanks.

Conclusions: The reference to this standard has already been discussed at the Meeting of the RID Experts in February 2000 in Venise and the outcome was reported at the Joint Meeting in March 2000 . The main point of argument was the level of the leakproofness test pressure that was in line with the requirement in chapter 6.7 but not with the one for gases in chapter 6.8. The revised version of the proposed standard has eliminated the problem by referring to the pressure value as required in the regulations itself. It should be noted that the scope of the standard has clarified that it applies as well to the inspection and marking of the portable tanks of chapter 6.7 but no reference to standards is foreseen in chapter 6.7.

Table of concordance between essential requirements of RID/ADR and clauses of PrEN 12972

Sections of RID/ADR	clauses of standard
6.8.2.3. scope of the type approval; valid for tanks with minor modifications	4.1.1 + 4.1.2
21x102//definition of "leakproofness test" =MAWP, min 0.2 bar 21x258//= min 4bars-max 8 bars	5.8.2= 25% of MAWP, min 0.2bar
6.8.2.4.1 scope of the initial test	4.2.+ related sub-clauses of 5
6.8.2.4.2/6.8.3.4.7 periodic inspection: scope	4.3.+ related sub-clauses of 5
6.8.2.4.3/6.8.3.4.9 intermediate leakproofness test	4.4.+ related sub-clauses of 5
6.8.2.4.4 tests after repairs	4.5.+ related sub-clauses of 5
6.8.2.4.5 inspection certificate	4.2.2/4.3.2/4.4.2/4.5.8 + 5.12+ Annex B
6.8.2.5/6.8.3.5 markings on the shell	4.2.2/4.3.2/4.4.2/4.5.8 + 5.12.3 + Annex D or Annex E

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