



Secretariat

Distr.  
GENERAL

ST/SG/AC.10/C.3/2007/42  
7 September 2007

Original: ENGLISH

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**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

Thirty-second session  
Geneva, 3-12 (a.m.) December 2007  
Item 6 of the provisional agenda

**MISCELLANEOUS PROPOSALS OF AMENDMENTS TO THE MODEL REGULATIONS  
ON THE TRANSPORT OF DANGEROUS GOODS**

Proposals concerning requirements for open cryogenic receptacles

Transmitted by the expert from the United Kingdom<sup>\*/</sup>

**Introduction**

1. The Sub-Committee will recall the discussion that took place during the 31<sup>st</sup> session in July when the expert from the United Kingdom presented ST/SG/AC.10/C.3/2007/8 on developing regulations for the transport of open cryogenic receptacles. The expert from the United Kingdom was encouraged by the discussion at the last session and is pleased to have received helpful comments from EIGA and from the experts of Canada, Netherlands, Germany and Belgium and these have been taken into account in the development of this paper. This new paper takes the process of developing regulations for open cryogenic receptacles to the next stage by making draft proposals for text. In doing so the expert from the United Kingdom is seeking to avoid over-regulating what are in practice simple and robust receptacles.

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<sup>\*/</sup> In accordance with the programme of work of the Sub-Committee for 2007-2008 approved by the Committee at its third session (refer to ST/SG/AC.10/C.3/60, para. 100 and ST/SG/AC.10/34, para. 14) (Provisions for the transport of dangerous goods in open cryogenic receptacles).

2. The expert from the United Kingdom believes the Sub-Committee will find it helpful to have an outline of the considerations that have gone into the drafting of the proposals in paragraphs 7-12 below:

- (a) No changes are proposed to construction requirements of Chapter 6.2 which remains restricted to pressure receptacles (including closed cryogenic receptacles). All the requirements for construction of open cryogenic receptacles are included in a new packing instruction P204, which mirrors the approach taken in air transport and European land transport. The construction provisions have been written in terms of essential safety requirements, rather than detailed prescriptive provisions, to allow for technical innovation;
- (b) Representations have been made to increase the proposed capacity of open cryogenic receptacles in line with current practice by the land mode. A maximum capacity of 450 litres (in line with packaging thresholds) is being proposed. It is however recognised that the air mode may well wish to retain its current limit of 50 litres;
- (c) The Sub-Committee will note that on further consideration, the expert from the United Kingdom proposes that the range of gases that can be transported in these vessels has been reduced so as to permit only the non-oxidizing refrigerated liquefied gases of Division 2.2. It is believed that this is in line with current industry practice.

3. A special provision is proposed to exempt from regulations small double walled glass receptacles used for carrying nitrogen, refrigerated liquid. Such receptacles are widely used for carrying small quantities of nitrogen, refrigerated liquid for medical and veterinary use. The expert from the United Kingdom does not believe it is practicable or necessary to regulate the large numbers of such receptacles used by a sector remote from the transport regulations. A second special provision, similar to the ICAO TI's A152, exempts 'dry shippers' i.e., insulated receptacles cooled by liquid nitrogen absorbed in a porous medium. Both of these special provisions have avoided specifying the intended use of the contents.

4. It has been drawn to the attention of the expert from the United Kingdom that a frequent means of emptying these receptacles is by pressurising the contents. However, the pressures used are so low that there is insufficient risk to necessitate involving the regulations in this aspect of design.

5. The provision that there shall be no hoar frost on the outside of the receptacle should prevent the transport of defective receptacles since the freezing of atmospheric moisture on the exterior is a certain sign that the vacuum has deteriorated and evaporation losses are considerably increased.

## **Proposals**

6. Insert the following definition in section 1.2.1.

“*Open cryogenic receptacle* means a transportable thermally insulated receptacle for refrigerated liquefied gases maintained at atmospheric pressure by continuous venting of the refrigerated liquefied gas.”

7. In the Dangerous Goods List of Chapter 3.2.

(a) Insert P204 in column (8) for the following refrigerated liquefied gases:

UN 1913 NEON, REFRIGERATED LIQUID  
UN 1951 ARGON, REFRIGERATED LIQUID  
UN 1963 HELIUM, REFRIGERATED LIQUID  
UN 1970 KRYPTON, REFRIGERATED LIQUID  
UN 1977 NITROGEN, REFRIGERATED LIQUID  
UN 2591 XENON, REFRIGERATED LIQUID  
UN 3136 TRIFLUOROMETHANE, REFRIGERATED LIQUID  
UN 3158 GAS, REFRIGERATED LIQUID, N.O.S.

(b) Insert special provisions 33X and 33Y in column (6) for UN 1977 NITROGEN, REFRIGERATED LIQUID.

8. Insert in section 3.3.1 the following special provisions.

33X This gas contained in open cryogenic receptacles of less than 1 litre capacity constructed with glass double walls having the space between the inner and outer wall evacuated (vacuum insulated) is not subject to these Regulations provided each receptacle is transported in an outer packaging with suitable cushioning or absorbent materials to protect it from impact damage.

33Y Open cryogenic receptacles conforming to the requirements of P204 and containing no dangerous goods except for UN 1977, nitrogen, refrigerated liquid which is fully absorbed in a porous material are not subject to these Regulations.

9. Delete the second sentence in Packing Instruction P203: “Refrigerated liquefied gases in open cryogenic receptacles shall conform to the construction, testing and filling requirements approved by the competent authority.”

10. Insert the following packing instruction in sub-section 4.1.4.1.

P204	PACKING INSTRUCTION	P204
<p data-bbox="193 275 1328 342">This instruction applies to Division 2.2 non oxidising refrigerated liquefied gases in open cryogenic receptacles.</p> <p data-bbox="193 375 1206 409">Open cryogenic receptacles shall be constructed to meet the following requirements.</p> <ol data-bbox="193 443 1328 1438" style="list-style-type: none"><li data-bbox="193 443 1328 541">1. The receptacles shall be designed, calculated, manufactured, tested and equipped in such a way as to withstand all conditions, including fatigue, to which they will be subjected during their normal use and during normal conditions of transport.</li><li data-bbox="193 548 808 581">2. The capacity shall be not more than 450 litres.</li><li data-bbox="193 588 1328 686">3. The receptacle shall have a double wall construction with the space between the inner and outer wall being evacuated (vacuum insulation). The insulation shall prevent the formation of hoar frost on the exterior of the receptacle.</li><li data-bbox="193 693 1328 751">4. The materials of construction shall have suitable mechanical properties at the service temperature.</li><li data-bbox="193 758 1328 856">5. Materials which are in direct contact with the dangerous goods shall not be affected or weakened by the dangerous goods intended and shall not cause a dangerous effect, e.g. catalysing a reaction or reacting with the dangerous goods.</li><li data-bbox="193 863 1328 961">6. Receptacles of glass double wall construction shall have an outer packaging with suitable cushioning or absorbent materials which withstand the pressures and impacts liable to occur under normal conditions of transport.</li><li data-bbox="193 968 1328 1066">7. The receptacle shall be designed to remain in an upright position during transport, e.g. have a base whose smaller horizontal dimension is greater than the height of the centre of gravity when filled to capacity or be mounted on gimbals.</li><li data-bbox="193 1073 1328 1171">8. The openings of the receptacles shall be fitted with devices allowing gases to escape, preventing any splashing out of liquid, and so configured that they remain in place during transport.</li><li data-bbox="193 1178 1328 1438">9. Open cryogenic receptacles shall bear the following marks permanently affixed e.g. by stamping, engraving or etching:<ul data-bbox="280 1234 1256 1438" style="list-style-type: none"><li data-bbox="280 1234 776 1268">- the manufacturer's name and address;</li><li data-bbox="280 1274 654 1308">- the model number or name;</li><li data-bbox="280 1314 643 1348">- the serial or batch number;</li><li data-bbox="280 1354 1256 1413">- the UN number and proper shipping name of gases for which the receptacle is intended;</li><li data-bbox="280 1419 776 1438">- the capacity of the receptacle in litres.</li></ul></li></ol>		