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-first session, 1-10 July 2002, agenda item 4)

INFORMATION PAPER

TRANSPORT OF SOLID SUBSTANCES IN BULK IN CONTAINERS

New provisions

Amendments to Chapters 1.2.1, 3.2, 4.3 and 6.8

Transmitted by the Chairman of the Lunch-time Working Group

Proposed text

1.2.1 Definitions

Bulk containers are containment systems (including any liner or coating) intended for the transport of solid substances which are in direct contact with the containment system. Packagings, intermediate bulk containers (IBCs), large packagings and portable tanks are not included.

Bulk containers are:

- of a permanent character and accordingly strong enough to be suitable for repeated use;
- specially designed to facilitate the transport of goods by one or more means of transport without intermediate reloading;
- fitted with devices permitting its ready handling;
- have a capacity of not less than 1.0 cubic metres.

Examples of bulk containers are freight containers, off-shore bulk containers, skips, bulk bins, swap bodies, trough-shaped containers, roller containers and load compartments of vehicles.

Freight Container means: an article of transport equipment that is of a permanent character and accordingly strong enough to be suitable for repeated use; specially designed to facilitate the transport of goods, by one or other modes of transport, without intermediate reloading: designed to be secured and /or readily handled, having fittings for these purposes, and approved in accordance with the International Convention for Safe Freight Containers (CSC), 1972, as

amended. The term "freight container" includes neither vehicle nor packaging. However a freight container that is carried on a chassis is included. For freight containers for the transport of Class 7 materials, see 2.7.2.

Offshore bulk container means: a bulk container specially designed for repeated use for transport of dangerous goods to, from and between offshore facilities. An offshore bulk container is designed and constructed in accordance with the Guidelines for the Approval of Containers Handled in Open Seas specified by the International Maritime Organization in document MSC/Circ.860."

4.3 Use of bulk containers

4.3.1 General provisions

4.3.1.1 This section contains general provisions applicable to the transport of solid substances in bulk containers. Substances shall be transported in bulk containers conforming to the applicable bulk container code in the Dangerous Goods List. The bulk container shall conform to the design requirements of 6.8.

4.3.1.2 Except as provided in 4.3.1.3, bulk containers shall only be used when a substance is assigned to a bulk container code in Column 8 of the Dangerous Goods List in Chapter 3.2.

4.3.1.3 oods List in Chapter 3.2, interim approval for transport may be issued by the competent authority of the country of origin. The approval shall be included in the documentation of the consignment and contain, as a minimum, the information normally provided in the bulk container instruction and the conditions under which the substance shall be transported. Appropriate measures should be initiated by the competent authority to include the assignment in the Dangerous Goods List.

~~4.3.1.4~~ Substances which may become liquid at temperatures likely to be encountered during transport, are not permitted in bulk containers.

~~4.3.1.5~~ Bulk containers shall be siftproof and shall be so closed that none of the contents can escape under normal conditions of transport including the effect of vibration, or by changes of temperature, humidity or pressure.

4.3.1.6 Bulk solids shall be loaded into bulk containers and evenly distributed in a manner that minimises movement that could result in damage to the container or leakage of the dangerous goods.

4.3.1.7 Where venting devices are fitted they shall be kept clear and operable.

4.3.1.8 Bulk solids shall not react dangerously with the material of the bulk container, gaskets, equipment including lids and tarpaulins and with protective coatings which are in contact with the contents or significantly weaken them. Bulk containers shall be so constructed or adapted that the goods can not penetrate between wooden floor coverings or come into contact with those parts of the bulk containers that may be affected by the materials or residues thereof.

4.3.1.9 Before being filled and offered for transport each bulk container shall be inspected and cleaned to ensure that it does not contain any residue on the interior or exterior of the bulk container that could

- cause a dangerous reaction with the substance intended for transport;
- detrimentally affect the structural integrity of the bulk container; or
- affect the dangerous goods retention capabilities of the bulk container.

4.3.1.10 During transport, no dangerous residues shall adhere to the outer surfaces of bulk containers.

4.3.1.11 If several closure systems are fitted in series, the system which is located nearest to the substance to be transported shall be closed first before filling.

4.3.1.12 Empty bulk containers that have contained a dangerous substance shall be treated in the same manner as is required by these Regulations for a filled bulk container, unless adequate measures have been taken to nullify any hazard.

4.3.1.13 If bulk containers are used for the transport of bulk goods liable to cause a dust explosion, or evolve flammable vapours, e. g. for certain wastes measures shall be taken to exclude sources of ignition and prevent dangerous electrostatic discharge during transport filling or discharge of the substance.

4.3.1.14 Substances, for example wastes, which may react dangerously with one another and substances of different classes and goods not subject to these Regulations, which are liable to react dangerously with one another shall not be mixed together in the same bulk container. Dangerous reactions are:

(a) combustion and/or evolution of considerable heat;
(b) emission of flammable and/or toxic gases;
(c) formation of corrosive liquids; or
(d) formation of unstable substances.

4.3.1.15 Before a bulk container is filled it shall be visually examined to ensure it is structurally serviceable, its interior walls, ceiling and floors are free from protrusions or damage and that any inner liners or substance retaining equipment are free from rips, tears or any damage that would compromise its cargo retention capabilities. Structurally serviceable means the bulk container does not have major defects in its structural components, such as top and bottom side rails, top and bottom end rails, door sill and header, floor cross members, corner posts, and corner fittings in a freight container. Major defects include:

(a) ~~Dents,~~ Bends, cracks or breaks in the structural or supporting members that affect the integrity of the container.
(b) More than one splice or an improper splice (such as a lapped splice) in top or bottom end rails or door headers;
(c) More than two splices in any one top or bottom side rail;
(d) Any splice in a door sill or corner post;
(e) Door hinges and hardware that are seized, twisted, broken, missing, or otherwise inoperative;
(f) Gaskets and seals that do not seal;
(g) Any distortion of the overall configuration great enough to prevent proper alignment of handling equipment, mounting and securing chassis or vehicle, or insertion into ships' cells;
(h) Any damage to lifting attachments or handling equipment interface features; or
(i) Any damage to service or operational equipment.

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4.3.2 Additional provisions applicable to bulk goods of Divisions 4.2, 4.3, 5.1 and Classes 7 and 8

4.3.2.1 Bulk goods of Division 4.2

Only closed bulk containers (code BK2) shall be used . The total mass carried in a bulk container shall be such that its spontaneous ignition temperature is greater than 55 °C.

4.3.2.2 Bulk goods of Division 4.3

Only Closed bulk containers (code BK2) shall be used. These goods shall be transported in bulk containers which are watertight.

4.3.2.3 Bulk goods of Division 5.1

Bulk containers shall be so constructed or adapted that the goods can not come into contact with wood or any other incompatible material.

4.3.2.4 Bulk goods of Class 7

For the transport of unpackaged radioactive material, see 4.1.9.2.3.

4.3.2.5 Bulk goods of Class 8

Only closed bulk containers (code BK2) shall be used . These goods shall be transported in bulk containers which are watertight.

6.8 Requirements for the design, construction, testing and inspection of bulk containers

6.8.1 Definitions

For the purposes of this section:

Closed bulk container means a totally closed bulk container having a rigid roof, sidewalls, end walls and bottom (including hopper-type bottoms). The term includes bulk containers with an opening roof, bottom, side or end wall that can be closed during transport. Closed bulk containers may be equipped with openings to allow for the exchange of vapours and gases with air and which prevent under normal conditions of transport the release of solid contents as well as the penetration of rain and splash water.

Sheeted bulk container means an open top bulk container with rigid bottom (including hopper-type bottom), side and end walls and a non-rigid covering;

6.8.2 Application and general requirements

6.8.2.1 Bulk containers and their service and structural equipment shall be designed and constructed to withstand, without loss of contents, the internal pressure of the contents and the stresses of normal handling and transport.

6.8.2.2 Where a discharge valve is fitted, it shall be capable of being made secure in the closed position and the whole discharge system shall be suitably protected from damage. Valves having lever closures shall be able to be secured against unintended opening and the open or closed position shall be readily apparent.

6.8.2.3 ***Code for designating types of bulk container***

The following table indicates the codes to be used for designating types of bulk containers:

Types of bulk containers	Code
Sheeted bulk container	BK1
Closed bulk container	BK2

6.8.2.4 In order to take account of progress in science and technology, the use of alternative arrangements which offer at least equivalent safety as provided by the requirements of this chapter may be considered by the competent authority.

6.8.3 Requirements for the design, construction, inspection and testing of freight containers used as bulk containers.

6.8.3.1 Design and construction requirements

6.8.3.1.1 The general design and construction requirements of this section are deemed to be met if the bulk container complies with the requirements of ISO 1496-4 1994.

6.8.3.1.2 Freight containers designed and tested in accordance with ISO 1496-1 shall be equipped with operational equipment which is, including its connection to the freight container, designed to strengthen the end walls and to improve the longitudinal restraint as necessary to comply with the test requirements of ISO 1496-4 as relevant.

6.8.3.1.3 Bulk containers shall be siftproof. Where a liner is used to make the container siftproof it shall be made of a suitable material. The strength of material used for, and the construction of, the liner shall be appropriate to the capacity of the container and its intended use. Joins and closures of the liner shall withstand pressures and impacts liable to occur under normal conditions of handling and transport. For ventilated bulk containers any liner shall not impair the operation of ventilating devices.

6.8.3.1.4 The operational equipment of bulk containers designed to be emptied by tilting shall be capable of withstanding the total filling mass in the tilted orientation.

6.8.3.1.5 Any movable roof or side or end wall or roof section shall be fitted with locking devices with securing devices designed to show the locked state to an observer at ground level.

6.8.3.2 Service equipment

6.8.3.2.1 Filling and discharge devices shall be so constructed and arranged as to be protected against the risk of being wrenched off or damaged during transport and handling. The filling and discharge devices shall be capable of being secured against unintended opening. The open and closed position and direction of closure shall be clearly indicated.

6.8.3.2.2 Seals of openings shall be so arranged as to avoid any damage by the operation, filling and emptying of the bulk container.

6.8.3.2.3 Where ventilation is required bulk containers shall be equipped with means of air exchange, either by natural convection, e.g. by openings, or active elements, e.g. fans. The ventilation shall be designed to prevent negative pressures in the container at all times. Ventilating elements of

bulk containers for the transport of flammable substances or substances emitting flammable gases or vapours shall be designed so as not to be a source of ignition.

6.8.3.3 Inspection and testing

6.8.3.3.1 Freight containers used, maintained and qualified as bulk containers in accordance with the requirements of this section shall be tested and approved in accordance with the CSC Convention.

6.8.3.3.2 Freight containers used and qualified as bulk containers shall be inspected periodically according to the CSC convention.

6.8.3.4 ***Marking***

6.8.3.4.1 Freight containers used as bulk containers shall be marked with a Safety Approval Plate in accordance with the CSC convention.

6.8.4 Requirements for the design, construction and approval of bulk containers other than freight containers

6.8.4.1 Bulk containers covered in this section include skips, offshore bulk containers, bulk bins, swap bodies, trough shaped containers, roller containers, and load compartments of vehicles.

6.8.4.2 These bulk containers shall be designed and constructed so as to be strong enough to withstand the shocks and loadings normally encountered during transport including, as applicable, transhipment between modes of transport.

6.8.4.3 Vehicles shall comply with the requirements of, and be acceptable to, the competent authority responsible for land transport of the materials to be transported in bulk.

6.8.4.4 These bulk containers shall be approved by the competent authority and the approval shall include the code for designating types of bulk containers in accordance with 6.8.2.3. and requirements for inspection and testing as appropriate.

6.8.4.5 Where it is necessary to use a liner in order to retain the dangerous goods it shall meet the provisions of 6.8.3.1.3.

6.8.4.6 The following statement shall be shown on the transport document.

"Bulk container BK(x) approved by the competent authority of … …"

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Annex 2

UN No. (1)	Name and description (2)	Class or division (3)	Subsid-iary risk (4)	UN Packing Group (5)					Bulk container codes
1334	NAPHTHALENE, CRUDE or NAPHTHALENE, REFINED	4.1		III					BK1 BK2
1350	SULPHUR	4.1		III					BK1 BK2
1376	IRON OXIDE, SPENT or IRON SPONGE, SPENT obtained from coal gas purification	4.2		III					BK2
1408	FERROSILICON with 30% or more but less than 90% silicon	4.3	6.1	III					BK2
1438	ALUMINIUM NITRATE	5.1		III					BK1 BK2
1454	CALCIUM NITRATE	5.1		III					BK1 BK2
1474	MAGNESIUM NITRATE	5.1		III					BK1 BK2
1486	POTASSIUM NITRATE	5.1		III					BK1 BK2
1495	SODIUM CHLORATE	5.1		II					BK1 BK2
1498	SODIUM NITRATE	5.1		III					BK1 BK2
1499	SODIUM NITRATE AND POTASSIUM NITRATE MIXTURE	5.1		III					BK1 BK2
1942	AMMONIUM NITRATE with not more than 0.2% combustible substances, including any organic substance calculated as carbon, to the exclusion of any other added substance	5.1		III					BK1 BK2

UN No. (1)	Name and description (2)	Class or division (3)	Subsid-iary risk (4)	UN Packing Group (5)					Bulk container codes
2067	AMMONIUM NITRATE FERTILIZERS:	5.1		III					BK1 BK2
2213	PARAFORMALDEHYDE	4.1		III					BK1 BK2
2950	MAGNESIUM GRANULES, COATED, particle size not less than 149 microns	4.3		III					BK2
2969	CASTOR BEANS or CASTOR MEAL or CASTOR POMACE or CASTOR FLAKE	9		II					BK1 BK2
3170	ALUMIUM SMELTING BY PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3		II					BK1 BK2
3170	ALUMIUM SMELTING BY PRODUCTS or ALUMINIUM REMELTING BY-PRODUCTS	4.3		III					BK1 BK2
3175	SOLIDS CONTAINING FLAMMABLE LIQUID, N.O.S.	4.1		II					BK1 BK2
3243	SOLIDS CONTAINING TOXIC LIQUID, N.O.S.	6.1		II					BK1 BK2
3244	SOLIDS CONTAINING CORROSIVE LIQUID, N.O.S.	8		II					BK1 BK2
3378	SODIUM CARBONATE PEROXYHYDRATE	5.1		II					BK1 and BK2
3377	SODIUM PERBORATE MONOHYDRATE	5.1		III					BK1 and BK2

Annex 3

Consequential amendments

Data sheet – Figure 1

(Note the numbering will change if sections dealing with large packagings and environmental hazards are also added.)

Add new text as follows: -

"6.2.X Bulk containers (6.8*/) ? yes/no

If yes, give details in Sections … … and/or X.

Section Y. BULK CONTAINERS (only complete if yes in 6.2.X)

Y.1 Proposed type(s) … …"

1.1.1.2

Delete (a) and consequently (b) and (c) become (a) and (b).

3.2.1

Add the following text to the column which will contain the BK codes.

"Bulk container code – a code including the letters "BK" refers to types of bulk containers used for the transport of bulk goods described in Chapter 6.8."

Dangerous Goods List

Amend the title of Column 10/11 to read " Portable tanks and Bulk containers"

Add the relevant BK codes against the substances included in Annex 2.

5.3.1.1.4

Amend the first sentence as follows: - "… in unpurged tanks or empty uncleaned bulk containers shall "

5.3.2.1.1

Add a new (b) as follows: -

"(b) Solids in bulk containers;"

As a consequence (b) to (d) become (c) to (e).

5.4.1.4.3(b)

Amend the title to read: -

"… packagings, bulk containers and tanks"

and amend the text in parenthesis as follows; -

"(including … … IBCs, bulk containers, portable tanks, … …)"

New **5.4.1.5.8**

Bulk Containers

The following statement shall be shown on the transport document:

‘Bulk Container BK(x) approved by the competent authority of…….”