Vehicle Certification Agency

Carriage of Dangerous Goods: Approval Scheme for Bulk Containers BK1 and BK2

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APPROVAL SCHEME FOR BULK CONTAINERS BK1 and BK2

(Other than freight containers that are fitted with a CSC plate)

Background

The carriage of dangerous goods by rail, road and sea is subject to the requirements of RID[1], ADR[2] and the IMDG Code[3]. Some substances may be carried in bulk (i.e. other than in packages or tanks) in containers meeting the design, construction, inspection and testing requirements of ISO 1496-4:1991, which have been approved in accordance with the Convention on Safe Containers (CSC).

Bulk containers that do not meet that standard cannot be approved under the CSC. Nevertheless they may be used for the carriage of dangerous goods if they have been approved for the purpose by the competent authority. These containers are usually skips or specially designed and/or constructed vehicle bodies.

The VCA Dangerous Goods Office has set up a scheme for the approval of bulk containers in accordance with 6.11.4 of RID/ADR and 6.9.4 of the IMDG Code, on behalf of The Secretary of State for Transport, who is the competent authority in that regard.

Overview

Normally it will be the manufacturers of bulk containers who seek approval as they will have to hand the relevant design and construction specifications for their products. Applications for retrospective approval may be considered from operators of fleets of containers (see *Retrospective Approvals* below). Applications should be supported by a set of engineering drawings in A4 format showing the construction and dimensions of the shell, doors and lids (metal or plastic), lifting lugs, reinforcements, fastenings, locks and hinges, along with a welding plan and detail of the material type and thickness. If the container is closed by a sheet e.g. tarpaulin, then it should be described along with dimensions and method of retention.

The application must indicate the class or classes of dangerous goods for which the bulk container has been manufactured and the maximum safe working load which it will carry.

Applications must be accompanied by the appropriate fee.

The bulk container design will be assessed for compliance with the definition and construction requirements of RID/ADR and the IMDG Code and if acceptable, a unique approval code will be issued.

[1] Regulations concerning the International carriage of Dangerous Goods by Rail (RID)
[2] The European Agreement on the Transport of Dangerous Goods by Road (ADR).
[3] The international Maritime Dangerous Goods Code (IMDG).

Definition

RID/ADR and the IMDG Code define bulk containers as follows:

Sheeted bulk container *(BK1)* means an open-top bulk container with rigid bottom (including hopper-type bottom), side and end walls and a non-rigid covering.

Closed bulk container (BK2) means a totally closed bulk container having a rigid roof, sidewalls, end walls and floor (including hopper-type bottoms). The term includes bulk containers with an opening roof, side or end wall that can be closed during carriage. 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 carriage the release of solid contents as well as the penetration of rain and splash water.

Construction

Bulk containers must be constructed in accordance with the requirements of Chapter 6.11 of RID/ADR (6.9 in the IMDG Code). Additional requirements for each class of dangerous goods where bulk transport is permitted are set down in 7.3.2 of RID/ADR and 4.3.2 of the IMDG Code and hence the construction needs to take account of these also (see Annex 1).

Approval of Bulk Containers (other than vehicles)

No bulk container for dangerous goods shall contain a drain hole. For sheeted bulk containers the sheet must have a means of being positively attached to the container and for closed bulk containers all opening shall be capable of being locked.

The Health and Safety Executive have published “Skip and container safety in waste management and recycling” this document forms the basis for the approval of skips as bulk containers. In the HSE publication all bulk containers shall meet the following requirements:

- All skips shall be metal
- The skip shell shall be fully welded on all external edges and corners.

Extra heavy-duty skips (e.g. those used for scrap metal) shall also be fully welded on the inside, and additional reinforcing plates fitted to the discharge corners. (Some manufacturers weld the inside and outside of all skips as standard practice.)

- All upper edges shall be reinforced with channel section.
- All drop-down doors shall have a locking device keeping them securely closed and a secondary lock fitted to the main lock to ensure that the door remains closed and safe during moving and transporting.

Locks shall be of robust construction to withstand the rough treatment they are likely to receive, but shall be easy to operate. Loading doors fitted to the sides of large single-ended skips rear-end loader (REL) skips shall have their hinges fitted towards the rear end of the

skip, to avoid injury to the operator in the event of a door falling open while the skip is being discharged.

Lifting lugs shall:

- pass through horizontal channel sections which extend the full length of the skip or vertical channels welded between two horizontal channels, depending on the capacity of the skip

- have reinforcing plates welded to the inside of the skip shell where the shank of the lifting lug passes through the side plate and all channels which carry lifting lugs shall be fully welded to the side plate.

Skips may have plastic components such as lids or doors.

Any hinged covers fitted to skips should be light enough to permit safe opening and closing by hand from ground level. Hinges and locking devices should be designed for ease of operation and durability.

Approval of vehicles as bulk containers

Where the bodywork is permanently fixed to vehicles used for bulk transport applications must include the same data as above and in addition detail the method of fixing the body to the chassis. Where a vehicle is designed and constructed as a bulk container, the bodywork (i.e. the load carrying compartment) including the floor and walls shall be designed to prevent leakage of the dangerous substance and must not contain any drain hole.

Inspection of bulk containers before approval

All bulk containers (including vehicles) may be required to undergo an inspection. If an inspection is necessary it will be subject to a charge to cover the costs incurred.

Marking of bulk containers

Bulk containers conforming to the CSC will bear the appropriate compliance marks, but there is no equivalent identification for non-CSC containers which nevertheless conform to the requirements of RID/ADR and the IMDG code. VCA will therefore issue a unique marking for each approved design, which by licence may be applied to serially produced bulk containers to signify competent authority approval.
Subject to the terms of the licence, each bulk container conforming to the approved design type shall be marked by means of a corrosion resistant metal plate of dimension 200 mm x 100 mm, permanently attached in a conspicuous place, readily accessible for inspection by enforcement authorities. The licence mark shall be applied to the plate in permanent form, e.g. by stamping, engraving or embossing, in characters at least 12 mm high, and will be of the form:

BK1 or **BK2** - the code for the type of bulk container
GB - country code of the issuing competent authority
Nnnn - a unique four digit code issued to the approved design type
yy - the last two digits of the year of manufacture
xxxxx - a unique serial number of the bulk container, allocated by the manufacturer.

An example of the approval mark is:

BK1/GB/0022/11/00068

The mark may be positioned in a single line as above or with the serial number on a second line, as:

BK1/GB/0022/11
00068

The mark may only be applied by the licensee or someone acting on their express authority, to bulk containers conforming to the approved design type. VCA DGO maintains a register of approved design types, and manufacturers will be required to make an annual return of the serial numbers of bulk containers they have produced. In the case of approvals held by operators, returns shall confirm the number of containers of each design type on the fleet, and the numbers of any new examples of the type procured since the last return.

Validity of approvals

A design type approval will be valid whilst the design, material(s) and method of construction of the bulk container are unchanged. However, the licence permitting the approval holder to apply the mark to serially produced bulk containers is renewable annually. The approved design shall be reviewed for compliance once every five years.

Fees

The current fees for various functions under the scheme are published periodically on the VCA dangerous goods Office website. Present (October 2011) fees, exclusive of VAT are:

- Design approval and licence fee to 31 December £500
- Annual licence fee per design type £200

Retrospective Approvals

Operators of bulk containers who wish to apply for retrospective approval for their existing fleet must be able to provide suitable drawings and specifications. Such applications will be considered on a case by case basis but will almost always be subject to an inspection of representative specimens of the type(s) for which approval is requested.

Applications

Applications for approval of a bulk container should be sent to:

Vehicle Certification Agency
Dangerous Goods Office
Cleeve Road
Leatherhead
Surrey
KT22 7NF
01372 226111
Email: dgenquiries@vca.gov.uk

ANNEX 1

EXTRACTS from ADR – 2009: *Construction requirements*

CHAPTER 6.11

REQUIREMENTS FOR THE DESIGN, CONSTRUCTION, INSPECTION AND TESTING OF BULK CONTAINERS

6.11.1 Definitions

For the purposes of this section:

Closed bulk container means a totally closed bulk container having a rigid roof, sidewalls, end walls and floor (including hopper-type bottoms). The term includes bulk containers with an opening roof, side or end wall that can be closed during carriage. 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 carriage 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;

6.11.2 Application and general requirements

6.11.2.1 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 carriage.

6.11.2.2 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.

6.11.2.3 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

6.11.2.4 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.

6.11.3 Requirements for the design, construction, inspection and testing of containers conforming to the CSC used as bulk containers

6.11.3.1 Design and construction requirements

6.11.3.1.1 The general design and construction requirements of this sub-section are deemed to be met if the bulk container complies with the requirements of ISO 1496-4:1991 "Series 1 Freight containers- Specification and testing – Part 4: Non pressurized containers for dry bulk" and the container is siftproof.

6.11.3.1.2 Containers designed and tested in accordance with ISO 1496-1:1990 "Series 1 Freight containers- Specification and testing - Part 1:
General cargo containers for general purposes" shall be equipped with operational equipment which is, including its connection to the container, designed to strengthen the end walls and to improve the longitudinal restraint as necessary to comply with the test requirements of ISO 1496-4:1991 as relevant.

6.11.3.1.3 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 carriage. For ventilated bulk containers any liner shall not impair the operation of ventilating devices.

6.11.3.1.4 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.

6.11.3.1.5 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.

6.11.3.2 Service equipment

6.11.3.2.1 Filling and discharge devices shall be so constructed and arranged as to be protected against the risk of being wrenched off or damaged during carriage 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.

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

6.11.3.2.3 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 carriage of flammable substances or substances emitting flammable gases or vapours shall be designed so as not to be a source of ignition.

6.11.3.3 Inspection and testing

6.11.3.3.1 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.

6.11.3.3.2 Containers used and qualified as bulk containers shall be inspected periodically according to the CSC.

6.11.3.4 Marking

6.11.3.4.1 Containers used as bulk containers shall be marked with a Safety Approval Plate in accordance with the CSC.

6.11.4 Requirements for the design, construction and approval of bulk containers other than containers conforming to the CSC

NOTE: *When containers conforming to the provisions of this section are used for the carriage of solids in bulk, the following statement shall be shown on the transport document*: *"Bulk container BK(x) approved by the competent authority of ……". (see 5.4.1.1.17)".*

6.11.4.1 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.

NOTE: *These bulk containers also include containers conforming to the UIC leaflets 591 and 592-2 to 592-4 as mentioned in 7.1.3 which do not conform to the CSC.*

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

6.11.4.3 (Reserved).

6.11.4.4 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 6.11.2.3 and the requirements for inspection and testing as appropriate.

6.11.4.5 Where it is necessary to use a liner in order to retain the dangerous goods it shall meet the provisions of 6.11.3.1.3.

CHAPTER 7.3

PROVISIONS CONCERNING CARRIAGE IN BULK

Operational requirements

7.3.1 General provisions

7.3.1.1 Goods may not be carried in bulk in bulk containers, containers or vehicles unless:

(a) either a special provision, identified by the code BK, explicitly authorizing this mode of carriage is indicated in column (10) of Table A of Chapter 3.2 and the relevant conditions of 7.3.2 are satisfied in addition to those of this section; or

7.3.2 Additional provisions for the carriage in bulk when the provisions of 7.3.1.1 (a) are applied

7.3.2.1 The codes BK1 and BK2 in column (10) of Table A of Chapter 3.2 have the following meanings:

BK1: Carriage in bulk in sheeted bulk containers is permitted;

BK2: Carriage in bulk in closed bulk containers is permitted.

7.3.2.2 The bulk container used shall conform to the requirements of Chapter 6.11.

7.3.2.3 Goods of Class 4.2

The total mass carried in a bulk container shall be such that its spontaneous ignition temperature is greater than 55 °C.

7.3.2.4 Goods of Class 4.3

These goods shall be carried in bulk containers which are watertight.

7.3.2.5 Goods of Class 5.1

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

7.3.2.6 Wastes of Class 6.2

7.3.2.6.1 Animal material containing infectious substances (UN Nos. 2814, 2900and 3373) is authorized for carriage in bulk containers provided the following conditions are met

(a) Sheeted bulk containers BK1 are permitted provided that they are not filled to maximum capacity to avoid substances coming into contact with the sheeting. Closed bulk containers BK2 are also permitted;

(b) Closed and sheeted bulk containers, and their openings, shall be leak-proof by design or by the fitting of a suitable liner;

(c) The animal material shall be thoroughly treated with an appropriate disinfectant before loading prior to carriage;

(d) Sheeted bulk container shall be covered by an additional top liner weighted down by absorbent material treated with an appropriate disinfectant;

(e) Closed or sheeted bulk containers shall not be re-used until after they have been thoroughly cleaned and disinfected.

***NOTE**: Additional provisions may be required by appropriate national health authorities."*

7.3.2.6.2 Wastes of Class 6.2 (UN 3291)

(a) (Reserved): [Only BK2 containers are permitted]

(b) Closed bulk containers and their openings shall be leak-proof by design. These bulk containers shall have non-porous interior surfaces and shall be free from cracks or other features which could damage packagings inside, impede disinfection or permit inadvertent release;

(c) Wastes of UN No. 3291 shall be contained within the closed bulk container in UN type tested and approved sealed leak-proof plastics bags tested for solids of packing group II and marked in accordance with 6.1.3.1. Such plastics bags shall be capable of passing the tests for tear and impact resistance according to ISO 7765-1:1988 "Plastics film and sheeting – Determination of impact resistance by the free-falling dart method - Part 1: Staircase methods" and ISO 6383-2:1983 "Plastics - Film and sheeting - Determination of tear resistance. Part 2: Elmendorf method". Each bag shall have an impact resistance of at least 165 g and a tear resistance of at least 480 g in both parallel and perpendicular planes with respect to the length of the bag. The maximum net mass of each plastics bag shall be 30 kg;

(d) Single articles exceeding 30 kg such as soiled mattresses may be carried without the need for a plastics bag when authorized by the competent authority;

(e) Wastes of UN No. 3291 which contain liquids shall only be carried in plastics bags containing sufficient absorbent material to absorb the entire amount of liquid without it spilling in the bulk container;

(f) Wastes of UN No. 3291 containing sharp objects shall only be carried in UN type tested and approved rigid packagings meeting the provisions of packing instructions P621, IBC620 or LP621;

(g) Rigid packagings specified in packing instructions P621, IBC620 or LP621 may also be used. They shall be properly secured to prevent damage during normal conditions of carriage. Wastes carried in rigid packagings and plastics bags together in the same closed bulk container shall be adequately segregated from each other, e.g. by suitable rigid barriers or dividers, mesh nets or otherwise securing, such that they prevent damage to the packagings.

(h) Wastes of UN No. 3291 in plastics bags shall not be compressed in a closed bulk container in such a way that bags may be rendered no longer leak-proof;

(i) The closed bulk container shall be inspected for leakage or spillage after each journey. If any wastes of UN No. 3291 have leaked or been spilled in the closed bulk container, it shall not be re-used until after it has been thoroughly cleaned and, if necessary, disinfected or decontaminated with an appropriate agent. No other goods shall be carried together with UN No. 3291 other than medical or veterinary wastes. Any such other wastes carried in the same closed bulk container shall be inspected for possible contamination.

7.3.2.7 Material of Class 7

For the carriage of unpackaged radioactive material, see 4.1.9.2.3.

7.3.2.8 Goods of Class 8

These goods shall be carried in bulk containers which are watertight.