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Safety technical specification for packing dangerous goods in containers transported by sea

海运危险货物集装箱装箱安全技术要求

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Safety technical specification for packing dangerous goods in containers transported by sea

1 Scope

This standard specifies the basic requirements for packing dangerous goods in containers transported by sea, the preparations before packing, the packing and sealing operation requirements, the post-packing requirements, and the recording and documentation requirements.

This standard applies to the packing operation of dangerous goods containers carried by ships.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this standard.

GB/T 19854 General rules of explosion-proof techniques of industrial trucks for explosive atmospheres

JT/T 812 Requirements for the filling of non-refrigerated liquefied gas tanks (UN-T50)

JT/T 813 Technical requirements for the carriage of non-refrigerated liquefied gas tanks by ship

Technical Regulations for Statutory Inspection of Containers. Maritime Safety Administration of the People's Republic of China

IMO CSC International Convention for Safe Containers 1972

IMO IMDG International Maritime Dangerous Goods Code

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 dangerous goods

The goods listed in IMO IMDG have the characteristics of flammability, explosion, poison, corrosion, radiation, pollution, etc., which may cause personal injury, property damage, or environmental pollution during the transportation of ships and require special protective measures.

3.2 container

A device for transporting goods and having the following features.

a) It has durability and sufficient strength for repeated use.

b) It is specially designed to facilitate the transport of goods in one or more modes of transport without the need for intermediate reloading.

c) For securing and/or ease of loading and unloading, corner pieces are provided.

d) The area enclosed by the 4 outer bottom corner fittings shall be one of the following two:

1) At least 14 m^2 (150 square feet);

2) At least 7 m^2 (75 square feet) if fitted with roof corner fittings.

Note 1: Containers, as defined above, include offshore containers, portable tanks, multiple element gas containers (MEGCs), and bulk containers that meet the above characteristics, but do not include vehicles and packaging.

Note 2: Rewrite the "General definition 9.2(4)" in Technical Regulations for Statutory Inspection of Containers (2017).

3.3 portable tank

A tank for the transport of dangerous goods, conforming to the definition of a container, and having the following characteristics:

a) It consists of the shell and auxiliary equipment and structural devices required for the transport of dangerous goods;

b) It can be loaded and unloaded without dismantling structural devices;

c) It has stable structural parts outside the shell, and can be lifted when fully loaded;

d) It is equipped with bases, securing devices, and accessories that facilitate mechanized operation so that it can be hoisted to transport vehicles or ships.

Note: Rewrite the "General definition 9.2(6)" in Technical Regulations for Statutory Inspection of

4 Basic requirements

4.1 Container and packaging

4.1.1 Containers

4.1.1.1 The design, manufacture, inspection, test, and operation of containers, portable tanks, and multiple element gas containers (unless otherwise specified, hereinafter referred to as "containers") shall comply with the regulations of the Technical Regulations for Statutory Inspection of Containers, IMO CSC and IMO IMDG, and a valid certificate or report shall be attached.

4.1.1.2 The content and posting of the inspection mark and safety certificate or nameplate obtained after the container has passed the inspection shall meet the requirements of the Technical Regulations for Statutory Inspection of Containers, IMO CSC, and IMO IMDG. The inspection mark and inspection date of a container that has passed the periodic inspection shall be marked on or near the safety approval plate, and shall be durable, wear-resistant, corrosion-resistant, and remain clearly visible. Containers inspected in accordance with the Accredited Continuous Inspection Program (ACEP) shall be marked with the approval number of the Continuous Inspection Program on or near the safety approval plate.

4.1.1.3 Portable tanks for transporting non-refrigerated liquefied gas shall comply with the provisions of JT/T 813.

4.1.1.4 Portable tanks and multiple element gas containers shall be clearly marked on the connection parts (such as inlet pipes, discharge ports and other accessories, and stop valves) of the tank body with their purpose. Portable tanks carrying dangerous goods and multiple element gas containers carrying non-refrigerated gases shall have a nameplate at a conspicuous place that is easily inspected (usually installed at the rear end thereof), which is displayed permanently on the corrosion-resistant metal and complying with the requirements of IMO IMDG.

4.1.2 Packaging

4.1.2.1 The packaging shall be firm and in good condition; the parts in contact with the goods shall not reduce their performance due to the characteristics of the goods, and can withstand the general risks of loading, unloading, and shipping.

4.1.2.2 The packaging shall be inspected and qualified, and have the corresponding certificate of conformity and the packaging mark.

4.1.2.3 The hazard signs and markings on the packaging shall comply with the regulations of IMO IMDG.

4.2 Personnel

4.2.1 Personnel engaged in the packing and inspection of dangerous goods containers shall be familiar with or understand relevant knowledge and skills in accordance with the requirements of IMO IMDG, especially on personnel protection and emergency measures, etc.

4.2.2 An on-site inspector of container packing shall be familiar with the technical requirements of the packing operation. During the packing operation, the inspector shall be responsible for the command or monitoring of the packing site on behalf of his organization, and issue a “Container Packing Certificate”.

4.2.3 When loading and securing dangerous goods, the packing personnel shall work under the direct command or supervision of the on-site inspector of container packing.

4.2.4 The packing personnel shall wear suitable protective equipment during the operation, shall clean up in time after the operation, and shall not eat or drink during the operation.

4.3 Operating environment

4.3.1 Packing shall be carried out in a well-lit or well-lit environment.

4.3.2 The packing operation shall not be carried out under lightning weather.

4.3.3 For packing sites that do not have good shielding conditions, in case of bad weather such as rain, snow, and strong wind, the operation shall be stopped and the doors of the containers shall be closed.

4.3.4 Appropriate measures shall be taken at packing sites to prevent fire; no smoking, fire work, or operations that may generate sparks shall be performed around the dangerous goods.

4.3.5 All kinds of safety protection devices, lighting, signals, monitoring instruments, warning signs, lightning protection, alarm devices and other equipment shall be certified and regularly inspected, and shall not be dismantled and occupied at will.

4.3.6 If it is necessary to supply power to the container to operate refrigeration or heating equipment, ensure that the connection plug is available.

4.4 Loading and unloading equipment

4.4.1 Loading and unloading equipment shall be selected according to the nature and quality of the packaging of the goods, and the machinery and its ancillary equipment shall not affect the integrity of the packaging.

4.4.2 Protective measures shall be taken when using a forklift to load, unload, and carry

approval plate of the container.

5.2.1.3 The center of gravity of the goods in the container shall be at or near the center of the longitudinal length of the container, and at the lower half of the height of the container's cargo space.

5.2.1.4 The goods shall be evenly distributed in the container, and the weight of the goods within half the length of the container shall not exceed 60% of the total weight of the goods in the container.

5.2.1.5 For heavy objects with a small contact surface with the bottom of the container, cushion materials shall be used to increase the contact surface, so that the concentrated load of the cargo can be transferred to the structural beams and longitudinal bottom girders of the container to avoid local overloading of the bottom of the container.

5.2.1.6 If dangerous goods have special requirements on the ventilation of containers, ventilated containers shall be used. If the goods cannot be ventilated, general cargo containers shall not be ventilated or in contact with external humid air, and the ventilation holes of the container shall be closed before packing.

5.2.1.7 The appropriate stacking method shall be selected according to the type and specification of the packaging to prevent the goods from shifting or collapsing during transportation. For example, the alternate stacking or stacking wall can be chosen for the bagged goods.

5.2.1.8 An appropriate padding method and padding materials shall be selected according to the characteristics, quality, shape, and structural strength of the cargo.

5.2.1.9 If there is a gap between the cargo and the container body, an appropriate method shall be selected for securing and binding.

5.2.1.10 When using portable tanks to transport dangerous goods, the applicable portable tanks shall be selected according to the regulations of IMO IMDG.

5.2.2 LCL stowage

5.2.2.1 LCL stowage shall consider various cargo properties and their compatibility, including the packages and the type or strength of their packaging, the possibility of cross-contamination of cargo odor and dust, and physical or chemical compatibility. Dusty and dirty goods shall not be loaded near clean and easily contaminated goods, such as food packaged in breathable materials.

5.2.2.2 Unless they have been properly segregated and/or effectively protected with appropriate protective materials, incompatible goods shall not be shipped in the same container.

5.2.2.3 When the goods are LCL in the container, the segregation shall be carried out in accordance with the strictest requirements of the hazard and sub-hazard of the goods, and shall comply with the segregation requirements in the various segregation tables and the list of dangerous goods in IMO IMDG.

5.2.2.4 Solid cargoes shall not be placed under liquid cargoes; sharp objects shall not be loaded adjacent to cargoes with fragile surfaces; cargoes that release moisture shall not be loaded on or near moisture-sensitive cargoes.

5.2.2.5 Heavy cargo shall not be loaded on top of light cargo and fragile items.

5.2.2.6 When consolidating dangerous goods and ordinary goods, the dangerous goods shall be loaded later and unloaded first, and shall be loaded at the easy-to-unload place at the door of the container.

5.3 Placement of containers

5.3.1 Containers shall be placed on a firm and level ground or on a trailer, and the ground on which containers are placed shall be free of any debris or protrusions that may damage the bottom structure (cross member or floor bearer) of the container.

5.3.2 When loading containers through a platform, appropriate slopes shall be used as safe passages for entering and exiting the containers, and there shall be a safe and effective connection between the platform and containers.

5.3.3 When using a trailer for packing, measures shall be taken to prevent the body from tilting and the vehicle from moving.

5.3.4 Containers shall be placed on a hard road without soil, vegetation, hanging branches, and searchlights; pests, insects and other organisms shall be prevented from entering containers and causing secondary pollution.

5.4 Inspection of containers

5.4.1 Inspection of the external of a container

5.4.1.1 The main frame of a container shall be complete, and there is no serious structural defect specified by IMO CSC.

5.4.1.2 The walls, bottom structure, and roof structure of a container shall be in good condition, and there shall be no obvious deformation.

5.4.1.3 There shall be no cracks near and inside where the outer surface has traces of bending, dents, creases, scratches, etc. There shall be no signs of water leakage caused by loose or broken rivets at the joints of the outer panels.

5.4.1.4 The air holes in the roof structure of a container shall be free from damage and

strength of the fastening devices and the method of securing.

5.4.3 Inspection of the door of a container

5.4.3.1 The door of a container shall be able to open and close smoothly and be properly fixed when opening.

5.4.3.2 The gaskets around the container door shall be tight and can ensure airtightness.

5.4.3.3 The handle of the container door shall be able to operate flexibly; the container door can be completely locked and a seal can be added.

5.4.3.4 The locking structure of the container door shall enable the container door to be opened in time in an emergency.

5.4.4 Inspection of a reefer

5.4.4.1 The refrigeration system of a reefer shall be able to operate normally.

5.4.4.2 The plugs and wires of the reefer shall be free of defects.

5.4.5 Inspection of portable tanks

5.4.5.1 The IMDG nameplate of a portable tank shall be marked with correct information and displayed clearly.

5.4.5.2 The frame structure of a portable tank shall meet the requirements of IMO CSC, and the tank body and fixed devices including valves and pressure regulating devices shall meet the requirements of IMO IMDG.

5.4.5.3 Confirm the characteristics of the goods. If there are heating requirements during transportation and loading and unloading, the loading and unloading place shall have a steam source and power supply equipment.

5.4.6 Inspection of multiple element gas containers

5.4.6.1 The IMDG nameplate of a multiple element gas container shall be marked with correct information and displayed clearly.

5.4.6.2 Each unit and frame of a multiple element gas container shall be free from deformation and damage. If there is any doubt about its condition, a further examination or inspection may be requested, and fill the container after that.

5.4.6.3 All instruments, pipelines, valves, and accessories of a multiple element gas container shall be in normal working condition.

5.5 Inspection of the packaging of dangerous goods

5.5.1 Package inspection

5.5.1.1 The packaging shall not show any signs of damage, leakage, and spillage. Wooden crate packaging shall not have exposed nails.

5.5.1.2 The package shall not show signs of being contaminated. For packages showing signs of being contaminated, their safety and acceptability shall be determined.

5.5.1.3 Before packing, the water, snow, ice, and other attachments on the outside of the package shall be removed.

5.5.2 Pallet cargo inspection

5.5.2.1 Pallet goods shall be arranged in a regular shape, the sides shall be kept vertical, and the top shall be kept horizontal.

5.5.2.2 The strapping materials used shall be compatible with the cargo and be able to maintain effective securing under conditions of humidity, sudden temperature changes, and sunlight.

5.5.2.3 The pallet shall be in good condition and meet the strength requirements for loading, unloading, and the mass of dangerous goods. No protrusions such as nails, screws, and wood thorns.

5.5.3 Inspection of marks and marking

5.5.3.1 Marks

5.5.3.1.1 A package shall have correct marks of hazard.

5.5.3.1.2 The positions of marks shall meet the following requirements:

a) Box packaging: Marks shall be displayed at a conspicuous place on the end or side of a package;

b) Bag packaging: Marks shall be displayed at an obvious place on a package;

c) Drum packaging: Marks shall be displayed at the body or the lid of a barrel;

d) Tank packaging: Marks shall be displayed at an obvious place of the body of a tank;

e) IBCs or bulk packaging with a capacity exceeding 450 L: Marks shall be displayed at opposite sides;

f) Marks of marine pollutants shall be displayed at a position near the marks of dangerous goods; if there are no marks of dangerous goods, marks of marine

packaging forms, effective padding materials shall be used as the partition between the goods.

6.2.2 For dangerous goods in barrels, effective padding materials shall be padded between the upper and lower layers to disperse the load of the upper layer. If the top of the lower drum package and the bottom of the upper drum package are designed as embedded structures that closely fit, and the drum package of the bottom layer of goods has sufficient strength, there can be without padding materials.

6.2.3 Effective padding materials should be used between the goods in a container and container walls to prevent the goods from moving.

6.2.4 The pads shall have sufficient protective strength to effectively avoid damage caused by the vertical or horizontal displacement of the goods in a container during transportation.

6.2.5 When pads such as pallets, plywood, wood slats, and wooden boards are used, they shall be supported on the corner posts, corner fittings, end posts, and side posts of a container, so as to avoid being supported on the side wall panels and door panels and causing the side wall panels and door panels to be damaged.

6.3 Securing dangerous goods in containers

6.3.1 The goods in a container shall be secured to prevent movement. The method of securing the goods shall not result in damage to the goods or the container.

6.3.2 Securing materials (such as steel wire ropes, fiber ropes, steel belts, nylon belts, air bags, telescopic rods, protective nets, and adhesive tapes) shall have sufficient strength to withstand various stresses caused by changes in transportation acceleration and not lead to a safety hazard for the dangerous goods in a container.

6.3.3 The fasteners used for securing in a container shall have locking devices. After securing, all fasteners shall be in the locked position to prevent the fasteners from loosening and the decreased securing effect due to factors such as vibration and rocking during transportation.

6.3.4 The use of air bags shall meet the following requirements.

a) The use of air bags shall comply with the requirements for filling pressure and maximum void width in the product manual. Taking into account the possibility of increasing or decreasing the temperature inside a container, keep a margin according to the situation when filling the air bags.

b) When air bags are used to fill the gap at the door of a container, precautionary measures shall be taken to prevent air bags from suddenly opening the door during unpacking.

c) If the void surface is uneven, there is a risk of scratching or puncturing air bags, appropriate measures shall be taken to keep the void surface reasonably smooth.

6.3.5 When nails are used for fixing, the nails or nail caps shall not be exposed.

6.4 Special packing requirements

6.4.1 Explosives

6.4.1.1 Explosives shall be packed according to the requirements of the stowage category.

6.4.1.2 Extremely sensitive substances such as detonators and fuses shall be packed on the surface of the cargo.

6.4.1.3 The floor in the container shall be a wooden structure or the cargo shall be loaded on a tight grid or wooden pallet pad. If sparks and static electricity may be generated between the packaging and the container body due to friction, collision, etc., wooden boards or other equivalent padding materials shall be used around the container wall to isolate it.

6.4.1.4 When the securing operation is carried out in the container, tools that are resistant to sparks shall be used, and the impact, vibration, and excessive force shall be avoided; the nails used shall not be scattered in the container.

6.4.2 Gases

6.4.2.1 Containers stained with oil shall not be used.

6.4.2.2 Do not wear oil-stained work clothes, and do not use oil-stained gloves for operations.

6.4.2.3 Steel cylinders shall meet the following requirements.

a) Safety caps shall be tightened and there is no peculiar smell. If any cylinder cap is loose, take effective tightening measures.

b) Cylinder walls shall be free of corrosion, depression, and damage.

c) Other accessories (such as valves, cylinder bodies, and paint) shall comply with product standards.

d) Protective aprons of steel cylinders shall be complete.

6.4.2.4 Safety caps of steel cylinders shall not be held during operation, and steel cylinders shall not be thrown, collided, or rolled.

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