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NATIONAL STANDARD OF THE
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CCS A 80

GB 45835-2025

**Packaging for dangerous goods - Safety technical code for
packaging containing a variety of dangerous goods**

危险货物运输包装 内装多种危险品的包装安全技术规范

Issued on: May 30, 2025

Implemented on: June 01, 2026

**Issued by: State Administration for Market Regulation;
Standardization Administration of the People's Republic of China.**

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Packaging for dangerous goods - Safety technical code for packaging containing a variety of dangerous goods

1 Scope

This document defines the classification of dangerous goods and packaging, and specifies the codes and marks for combination packaging containing a variety of dangerous goods, transport marks and labels, packaging requirements, and special requirements for limited quantities and excepted quantities.

This document applies to combination packaging containing a variety of dangerous goods.

It does not apply to:

- a) packages with a net mass exceeding 400 kg;
- b) packaging containing liquid and with a capacity exceeding 450 L, excluding combination packaging;
- c) packaging containing Division 6.2 infectious substances;
- d) packaging containing radioactive material;
- e) gas aerosols, gas containers, pressure receptacles, and cryogenic receptacles.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB 6944 Classification and code of dangerous goods

GB 19270-2009 Safety code for inspection of packaging of dangerous goods transported by water

GB 28644.1 Excepted quantities and packing requirements of dangerous goods

GB 28644.2 Limited quantities and packing requirements of dangerous goods

UN, Recommendations on the Transport of Dangerous Goods - Model Regulations (Twenty-third Revised Edition)

IMO, International Maritime Dangerous Goods Code

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB 6944, GB 19270-2009, and UN, Recommendations on the Transport of Dangerous Goods - Model Regulations (Twenty-third Revised Edition) (hereinafter referred to as the “Model Regulations”), as well as the following, apply.

3.1

combination packaging

A combination of packaging for transport purposes, consisting of one or more inner packaging secured in an outer packaging.

3.2

inner packaging

A packaging for which an outer packaging is required for transport.

3.3

outer packaging

The outer protection of a composite or combination packaging together with any absorbent materials, cushioning, and any other components necessary to contain and protect the inner receptacles or inner packaging.

3.4

package

The completed product of the packing operation, consisting of the packaging and its contents prepared for transport.

NOTE: Also called a parcel.

3.5

maximum net mass

The maximum net mass of contents of a single packaging or the maximum combined mass of multiple inner packaging and their contents.

NOTE: In kilograms.

3.6

dangerous goods

Substances and articles that possess dangerous properties such as explosiveness, flammability, toxicity, infection, corrosiveness, and radioactivity, and that may cause personal injury, property damage, or environmental pollution during transportation, storage, production, handling, use, and disposal, and therefore require special protection.

NOTE: These are referred to as dangerous goods in civil aviation management.

4 Classification of dangerous goods and packaging

4.1 Classification of dangerous goods

Dangerous goods are classified into 9 classes according to the hazard or the most predominant of the hazards they present. Some of these classes are further subdivided into divisions.

a) Class 1: Explosives

- Division 1.1: Substances and articles which have a mass explosion hazard;
- Division 1.2: substances and articles which have a projection hazard but not a mass explosion hazard;
- Division 1.3: substances and articles which have a fire hazard and either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard;
- Division 1.4: Substances and articles which present no significant hazard;
- Division 1.5: Very insensitive substances which have a mass explosion hazard;
- Division 1.6: Extremely insensitive articles which do not have a mass explosion hazard.

b) Class 2: Gases

- Division 2.1: Flammable gases;
- Division 2.2: Non-flammable, non-toxic gases;
- Division 2.3: Toxic gases.

c) Class 3: Flammable liquids

d) Class 4: Flammable solids; substances liable to spontaneous combustion; substances which, in contact with water, emit flammable gases

- Division 4.1: Flammable solids, self-reactive substances, solid desensitized explosives, and polymerizing substances
- Division 4.2: Substances liable to spontaneous combustion;
- Division 4.3: Substances, which in contact with water, emit flammable gases.

e) Class 5: Oxidizing substances and organic peroxides

- Division 5.1: Oxidizing substances;
- Division 5.2: Organic peroxides.

f) Class 6: Toxic and infectious substances

- Division 6.1: Toxic substances;
- Division 6.2: Infectious substances.

g) Class 7: Radioactive material

h) Class 8: Corrosive substances

i) Class 9: Miscellaneous dangerous substances and articles, including environmentally hazardous substances

NOTE: The numerical order of the classes and divisions is not that of the degree of danger.

4.2 Classification of packaging for dangerous goods

For packing purposes, dangerous goods other than those of Classes 1, 2, 7, Division 5.2 of Class 5, Division 6.2 of Class 6, and self-reactive substances of Division 4.1 of Class 4 are divided into 3 packing groups in accordance with the degree of danger they present:

- a) Packing group I - Substances presenting high danger;
- b) Packing group II - Substances presenting medium danger;
- c) Packing group III - Substances presenting low danger.

5 Packaging codes and marks

5.1 Packaging containing a variety of dangerous goods shall bear a durable, easily identifiable, and clear mark that is appropriately positioned and sized relative to the packaging. The packaging codes shall comply with the relevant provisions of 5.1 of GB

19270-2009, and the packaging marks shall comply with the relevant provisions of 5.2 of GB 19270-2009. An example of mark for packaging containing a variety of dangerous goods are provided in Annex A.

NOTE: The corresponding requirements in GB 19270, GB 19269, GB 19433, and GB 19359 are identical.

5.2 For packages with a gross mass greater than 30 kg, the mark or a copy of the mark shall be affixed to the top or side of the packaging. The height of the letters, numbers, and symbols shall be no less than 12 mm. If the package volume is less than or equal to 30 L or the maximum net mass is less than or equal to 30 kg, the height of the letters, numbers, and symbols shall be no less than 6 mm. If the package volume is less than or equal to 5 L or the maximum net mass is less than or equal to 5 kg, the mark shall be of appropriate size.

5.3 Packaging containing a variety of dangerous goods shall use the code of outer packaging.

5.4 The packing group for packaging containing a variety of dangerous goods shall be determined based on the highest packing group required by the dangerous goods contained.

6 Transport marks and transport labels

6.1 General requirements

6.1.1 When two or more dangerous goods are packed in the same outer packaging, the package shall be marked and labeled according to the requirements for each dangerous good. If the hazard is already reflected on the predominant hazard label, a subsidiary hazard label is not required.

6.1.2 The marks shall:

- a) be clearly visible and legible;
- b) withstand weathering without significant degradation;
- c) be displayed on a contrasting background on the outer surface of the package;
- d) not be placed with other marks that might significantly reduce their effectiveness.

6.2 Transport marks

6.2.1 Proper shipping names and UN numbers

6.2.1.1 Packaging containing a variety of dangerous goods shall be marked with the proper shipping name of the dangerous goods and the corresponding UN number

7 Packaging requirements

7.1 General requirements

7.1.1 Each dangerous good in a combination packaging shall be packed in a separate inner packaging.

7.1.2 The forms of inner and outer packaging and the special packaging provisions (if any) to which they apply shall comply with the requirements of the appropriate packaging instructions. The specific requirements of the packaging instructions may be determined by the packaging instruction code and special provision code (if any) listed in the international regulations for the corresponding mode of transport of the dangerous goods contained.

7.1.3 The packaging shall be strong and able to withstand the shocks and loads normally encountered during transport. The packaging structure and closure shall prevent loss of the contents due to vibration or changes in temperature, humidity, or pressure (e.g., pressure due to altitude) under normal transport conditions.

7.1.4 The outer surfaces of the inner and outer packaging shall be clean and free from residue, contamination, or leakage. The contents shall not spill onto the outer surface of the packaging or between the outer and inner packaging.

7.1.5 Packaging containing liquids shall have sufficient underfill space to prevent leakage or permanent deformation due to expansion of the liquid caused by temperature fluctuations that may occur during transport. Unless otherwise specified in the regulations, liquids shall not be fully filled at 55 °C.

7.1.6 The packing group shall be equal to or higher than the highest packing group required for all the dangerous goods contained.

7.1.7 Packaging used for powdered or granular substances shall be sift-proof or equipped with a liner.

7.1.8 For packaging containing moist or diluted substances, the closure shall ensure that the percentage of liquid (water, solvent, or phlegmatizer) does not drop below the specified limit during transport.

7.1.9 For solids that become liquid under the temperature conditions likely to be encountered during transport, the packaging used shall be capable of containing the substance in liquid form.

7.1.10 Inner packaging shall be positioned within outer packaging in such a manner that, under normal transport conditions, they will not break, be punctured, or leak their contents into the outer packaging. Inner packaging containing liquids shall be packed with the closure facing upward and positioned within the outer packaging in accordance

with the directional arrow marks specified in 6.2.3. Inner packaging that are easily broken or punctured, such as those made of glass, ceramic, stoneware, or certain plastics, shall be secured within the outer packaging using appropriate cushioning material.

7.1.11 All parts of the packaging that come into direct or potential direct contact with dangerous goods shall meet the following conditions:

- a) They shall not be affected by the dangerous goods or have their strength significantly weakened by them;
- b) They shall not cause hazardous effects, such as initiating a reaction or reacting with the dangerous goods;
- c) They shall not allow dangerous goods to penetrate and pose a danger under normal transport conditions.

Where necessary, these parts shall be appropriately coated or treated.

7.1.12 If pressure could build up inside a package due to the release of gases from the contents (due to temperature rise or other reasons), the package shall be equipped with vents. The released gases shall not pose a danger due to their toxicity, flammability, or emissions. If dangerous overpressure could occur due to the normal decomposition of the substance, ventilation shall be installed. The vents shall be designed to ensure that, in the intended transport configuration and under normal transport conditions, no hazardous conditions such as leakage of the contents or ingress of foreign matter can occur. Venting of the package is not permitted during air transport.

7.1.13 If ice is used as a coolant, it shall not affect the integrity of the packaging.

7.2 Assembly safety requirements

7.2.1 Two or more dangerous goods shall not be packed in the same outer packaging if they could react dangerously with each other and cause the following effects:

- a) combustion and/or release of significant heat;
- b) release of flammable, toxic, or asphyxiating gases;
- c) production of corrosive substances; or
- d) production of unstable substances.

7.2.2 During normal transport, substances that may be generated or released by any of the contents shall not react with other contents in the same outer packaging or cause other hazardous effects.

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