

The People's Republic of China

EDICT OF GOVERNMENT

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GB 190 (2008) (English): Packing symbol of dangerous goods



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National Standard of the People's Republic of China

GB190-XXXX
Replaces GB 190-1990

Packing symbol of dangerous goods

Draft for approval

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**Issued by the General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

Standardisation Administration of the People's Republic of China (SAC)

Foreword

Clause 3 and Clause 4 of this Standard are mandatory, whilst the rest are recommended

This Standard is an adoption and modification of the United Nations' Model Regulations "Recommendations on the Transport of Dangerous Goods" (15th Edition, Part 5: Consignment Procedures, Chapter 5.2 Markings and Labelling).

The main technical differences between this Standard when compared to the said Regulations:

- the pictorial symbols are described in table format;
- content that does not concern symbol application has been deleted.

The main differences between this Standard when compared to GB 190-1990:

- the number of symbols for Explosive Substances has increased from the original 3 to 4;
- the number of symbols for Gaseous Substances has increased from the original 3 to 5;
- the number of symbols for Flammable Liquids has increased from the original 1 to 2;
- the number of symbols for Class 4 substances has increased from the original 3 to 4;
- the symbols for Class 5 substances, major changes to Organic Peroxide Oxidising Substances;
- the number of symbols for Toxic Substances has decreased from the original 3 to 1;
- Fissionable Substances has been added to the symbols for Class 7 substances;
- 4, Marks has been added;
- requirements for the applications of marking and labelling have been added (Appendix A)

Appendix A of this Standard is a normative annex.

This Standard is proposed by and is under the jurisdiction of the Dangerous Chemicals Management of the Standardisation Administration of China.

The organisation responsible for the drafting of this Standard:
Standards and Metrology Research Institute of MOR

The main authors of this Standard are: Zhang Jin, Zhao Jingyu, Zhao Hua, Lan Shumei, Su Xuefeng.

This standard replaces the previously issued Standards:
GB 190-1990.

This Standard was first issued in 1985, first revised in 1990, this is the second revision.

Packing symbol of dangerous goods

1 Scope

This Standard specifies the classified pictures, dimensions, colours and application methods for pictorial packing symbols for dangerous goods (hereinafter referred to as the symbols).

This Standard applies to the transport packaging of dangerous goods.

2 Normative References

The provisions of the following documents become provisions of this Standard after being referenced. For dated reference documents, all later amendments (excluding corrigenda) and versions do not apply to this Standard; however, the parties to the agreement are encouraged to study whether the latest versions of these documents apply. For undated reference documents, the latest versions apply to this Standard.

GB 6944 Classification and code of dangerous goods

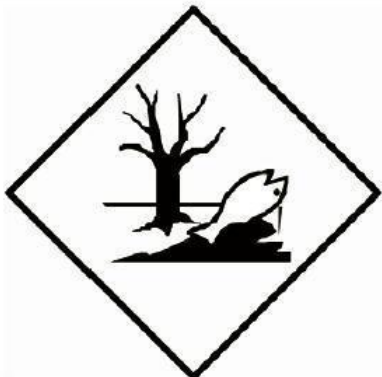
GB 11806 Regulations for the safe transport of radioactive material

GB 12268 List of dangerous goods

3 Symbol classifications

The symbols are divided into Marks (see Table 1) and Labels (see Table 2). There are 4 Marks and 26 Labels, their pictures indicate the main characters of the 9 Classes dangerous goods.

Table 1 Marks

Serial Number	Mark Name	Pictorial Marking
1	Symbols for environmental hazard substances and articles	 (Symbol: black; Background: white)

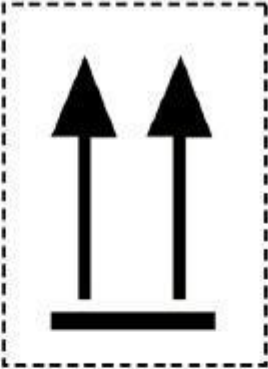
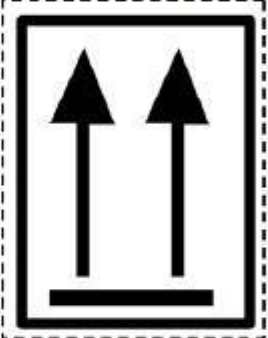















2	<p>Orentation arrows</p>	 <p>(Symbol: black or red; Background: white)</p>  <p>(Symbol: black or red; Background: white)</p>
3	<p>Marks for carriage at elevated temperature</p>	 <p>(Symbol: red; Background: white)</p>





Table 2 Labels



Class	Symbol Name	Graphic Symbol	Corresponding dangerous goods division
1	Explosive Articles or Substances	 (Symbol: black; Background: orange)	1.1 1.2 1.3
		 (Symbol: black; Background: orange)	1.4
		 (Symbol: black; Background: orange)	1.5
		 (Symbol: black; Background: orange) ** Place for division to be left blank if explosive is the subsidiary risk * Place for compatibility groups to be left blank if explosive is the subsidiary risk	1.6




2	Flammable gases	 (Symbol: black; Background: red)	2.1
	Non-flammable non-toxic gases	 (Symbol: white; Background: red)	2.2
	Toxic gases	 (Symbol: black; Background: white)	2.3


3	Flammable liquids	 <p>(Symbol: black; Background: red)</p>  <p>(Symbol: white; Background: red)</p>	3
4	Flammable solids	 <p>(Symbol: black; Background: red-white stripes)</p>	4.1
	Spontaneously combustible substances	 <p>(Symbol: black; Background: upper half white, lower half red)</p>	4.2

	Water-reactive substances	 <p>(Symbol: black; Background: blue)</p>  <p>(Symbol: white; Background: blue)</p>	4.3
5	Oxidizing substances	 <p>(Symbol: black; Background: yellow)</p>	5.1

	Organic peroxide oxidizing substances	 <p>(Symbol: black; Background: red or yellow)</p>  <p>(Symbol: white; Background: red or yellow)</p>	5.2
6	Toxic substances	 <p>(Symbol: black; Background: white)</p>	6.1
	Infections substances	 <p>(Symbol: black; Background: white)</p>	6.2

7	Category I radioactive substances	 <p>(Symbol: black; Background: white, following a red bar)</p> <p>Text: black in lower half of label:</p> <p>"RADIOACTIVE" "CONTENTS....." "ACTIVITY....."</p> <p>One red bar shall follow the word "RADIOACTIVE"</p>	7A
	Category II radioactive substances	 <p>(Symbol: black; Background: upper half yellow, lower half white)</p> <p>Text: black in lower half of label:</p> <p>"RADIOACTIVE" "CONTENTS....." "ACTIVITY....."</p> <p>In black outlined box: "TRANSPORT INDEX"</p> <p>Two red bars shall follow the work "RADIOACTIVE"</p>	7B

	Category III radioactive substances	 <p>(Symbol: black; Background: upper half yellow, lower half white)</p> <p>Text: black in lower half of label: "RADIOACTIVE" "CONTENTS....." "ACTIVITY....."</p> <p>In black outlined box: "TRANSPORT INDEX" Three red bars shall follow the word "RADIOACTIVE"</p>	7C
	Fissile materials	 <p>(Symbol: black; Background: white)</p> <p>Text: black in upper half of label: "FISSILE"</p> <p>In black outlined box in the lower half of the label: "CRITICALITY SAFETY INDEX"</p>	7E
8	Corrosive substances	 <p>(Symbol: upper half black and lower half white; Background: upper half white and lower half black)</p>	8

9	Miscellaneous dangerous substances and articles	 <p>(Symbol: black; Background: white)</p>	9
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4 Dimensions and colours of symbols

4.1 Symbol dimension

The dimensions of the symbols generally divide into 4 types, see Table 3.

Table 3 Unit mm

Dimension Sequence	Length	Width
1	50	50
2	100	100
3	150	150
4	250	250
Note: in the case of transport packages which are extra large or extremely small, the dimension of the symbol can be appropriately enlarged or reduced in accordance with provisions.		

4.2 Symbol colour

The colours of the symbols must comply with the provisions set out in Table 1 and Table 2.

5 Symbol application methods

5.1 Each type of dangerous goods must be differentiated and required symbols must be applied in accordance with the relevant provisions as specified in GB 6944, GB 12268 and as prescribed by the national competent authority for transport. The symbols used for export goods must be used in accordance with the international conventions (regulations) implemented by China.

Appendix A

(Normative Annex)

Application Requirements for Marking and Labelling

A.1 Marking

A.1.1 Unless otherwise specified, the proper shipping name for the dangerous goods as determined in accordance with GB 12286 and the corresponding number, must be displayed on each package. In the case of unpackaged articles the marking must be displayed on the article, on its cradle or on its handling, storage or launching device.

A.1.2 All package markings required by A.1.1:

- a) must be readily visible and legible;
- b) must be able to withstand open weather exposure without a substantial reduction in effectiveness;
- c) must be displayed on a background of contrasting colour on the external surface of the package;
- d) must not be located with other package markings that could substantially reduce their effectiveness.

A.1.3 Salvage packaging must also be marked with the word “SALVAGE”.

A.1.4 Intermediate bulk containers of more than 450 litres capacity and large packaging must be marked on two opposing sides.

A.1.5 Special marking provisions for Class 7

- a) Special markings, transport units and packaging forms for Class 7 must be in accordance with the provisions set out in GB 11806;
- b) Each package must be legibly and durably marked on the outside of the packaging with an identification of either the consignor or consignee, or both;
- c) For every package (with the exception of packages specified in GB 11806 that are excluded) must be legibly and durably marked on the outside of the packaging with the number GB 12286 and the correct shipping name. In the case of excepted packages, only the GB 12286 number is required.
- d) Each package of gross mass exceeding 50 kg must have its permissible gross mass legibly and durably marked on the outside of the packaging;
- e) A package which conforms to:
 - A Type IP-1 package, a Type IP-2 package or a Type IP-3 package design must be legibly and durably marked on the outside of the packaging with “TYPE IP-1”, “TYPE IP-2” OR “TYPE IP-3” as appropriate;
 - A Type A package design must be legibly and durably marked on the outside of the packaging with “TYPE A”;
 - A Type IP-2 package, a Type IP-3 or a Type A package design must be legibly and durably marked on the outside of the packaging with the International Vehicle Registration Code (VRI Code) of the country of origin of design and either the name of the manufacturer or other identification of the packaging specified by the competent authority for transport of the country of origin of design;
- f) Each package which conforms to a design approved by the competent authority for transport must be legibly and durably marked on the outside of the packaging with:

- The identification mark allocated to that design by the competent authority for transport;
 - A serial number to uniquely identify each packaging which conforms to that design;
 - In the case of a Type B(U) or Type B(M) package design, with “TYPE B(U)” or “TYPE B(M)”;
 - In the case of a Type C package design, with “TYPE C”.
- g) Each package which conforms to a Type B(U), Type B(M) or Type C package design must have the outside of the outermost receptacle which is resistant to the effects of fire and water plainly marked by embossing, stamping or other means resistant to the effects of fire and water with the trefoil symbol shown in the figure below:

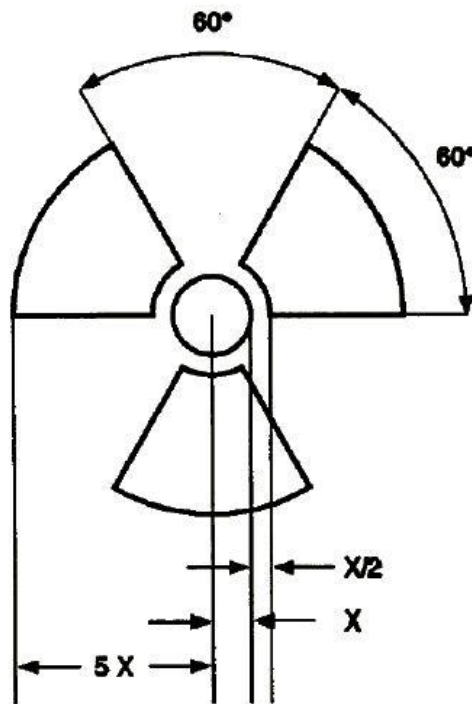


Figure A.1 Basic trefoil symbol

Note: Its dimension proportion is based on a central circle of radius X. The minimum allowable size of X shall be 4mm.

- h) Where LSA-I or SCO-I material is contained in receptacles or wrapping materials and is transported under exclusive use as permitted by the competent authority for transport, the outer surface of these receptacles or wrapping materials may bear the marking “RADIOACTIVE LSA-I” or “RADIOACTIVE SCO-I” as appropriate;
- i) In case of international transport of packages requiring the design or shipment approval from the competent authority for transport, for which different approval types apply in the different countries concerned, marking must be in accordance with the certificate of the country of origin of the design;

A.1.6 Special marking provisions for environmentally hazardous substances

- a) Packages containing environmentally hazardous substances meeting the criteria of Standards GB 12268 and GB 6944 (UN 3077 and UN 3082) must be durably marked with the environmentally hazardous substance mark with the exception of single packaging and combination packaging containing inner packaging with:

- content of 5 L or less for liquids;
content of 5 kg or less for solids.
- b) The environmentally hazardous substance mark must be located adjacent to the markings required by A.1.1. The requirements of A.1.2 and A.1.4 must be met;
- c) The environmentally hazardous substance mark must be as shown in serial number 1 of Table 1. The marking dimensions of the packaging must conform to the requirements of Table 3, except in the case of packages of such dimensions that they can only bear smaller marks. For transport units, the minimum dimensions must be 250mm x 250mm;

A.1.7 Application requirements of orientation arrows

- a) a) Except as provided in b):
 - combination packaging having inner packaging containing liquid dangerous goods;
 - single packaging fitted with vents;
 - cryogenic receptacles intended for the transport of refrigerated liquefied gases;
 must be legibly marked with package orientation arrows which are similar to the illustration shown in serial number 2 of Table 1, or with those meeting the specifications of GB/T 191. The orientation arrows must appear on two opposite vertical sides of the package with the arrows pointing in the correct upright direction. They must be rectangular and of a size that is clearly visible, proportionate to the size of the package. Depicting a rectangular border around the arrows is optional.
- b) Orientation arrows are not required on the packages below:
 - Pressure receptacles;
 - Dangerous goods in inner packaging of not more than 120 ml which are prepared with sufficient absorbent material between the inner and outer packaging to completely absorb the liquid contents;
 - Division 6.2 infectious substances in primary receptacles of not more than 50 ml;
 - Class 7 radioactive material in type B(U), type B(M) or type C packages;
 - Articles which are leak-tight in all orientations (e.g. alcohol or mercury in thermometers, aerosols, etc.).
- c) Arrows for purposes other than indicating proper package orientation must not be displayed on a package marked in accordance with this Standard.

A.1.8 Marking application for transport at an elevated temperature

When transport units are offered for transport, if it contains a liquid substance at a temperature equal to or exceeding 100 °C, or a solid state substance at a temperature equal to or exceeding 240°C, must apply the mark shown in serial number 3 of Table 1 on each side and on each end. The mark must be a triangular shape, must have sides of at least 250mm, and must be shown in red.

A.2 Labelling

A.2.1 Labelling provisions

A.2.1.1 These provisions relate essentially to classified labels of contents (shown in Table 2). However, additional markings or symbols indicating precautions to be taken in handling or storing a package (e.g. A symbol representing an umbrella indicating that a package must be kept dry) may

be appropriately displayed on a package.

A.2.1.2 Labels identifying primary and subsidiary risks must conform to models Nos 1 to 9 illustrated in Table 2. The “EXPLOSIVE” subsidiary risk label is model No 1.

A.2.1.3 Where articles or substances are specifically listed in the Dangerous Goods List, a danger class label must be affixed for the hazard shown in Column 4 of GB 12268. A subsidiary risk label must also be affixed for any risk indicated by a class or division number in the Column 5 of the Dangerous Goods List. However, special provisions may also require a subsidiary risk label where no subsidiary risk is indicated in Column 5 or may be exempt from the requirement for a subsidiary risk label where such a risk is indicated in the Dangerous Goods List.

A.2.1.4 If a substance which meets the definition of more than one class is not specifically listed by name in the Dangerous Goods List in GB 12268, the provisions in GB 6944 must be used to determine the primary risk class of the goods. In addition to the label required for that primary risk class, subsidiary risk labels must also be applied as specified in the Dangerous Goods List.

Packages containing substances of Class 8 need not bear the subsidiary risk label model No 6.1 if the toxicity arises solely from the destructive effect on tissue. Packages containing substances of Division 4.2 need not bear the subsidiary risk label model No 4.1.

A.2.1.5 See Table A1 for the labels for Class 2 gases with subsidiary risk(s)

Division	Subsidiary risk(s) shown in GB 6944	Primary risk label	Subsidiary risk label(s)
2.1	None	2.1	None
2.2	None	2.2	None
	5.1	2.2	5.1
2.3	None	2.3	None
	2.1	2.3	2.1
	5.1	2.3	5.1
	5.1, 8	2.3	5.1, 8
	8	2.3	8
	2.1, 8	2.3	2.1, 8

Table A1

A.2.1.6 Three separate labels have been provided for Class 2, one for flammable gases of Division 2.1 (red), one for non-flammable, non-toxic gases of Division 2.2 (green) and one for toxic gases of Division 2.3 (white). Where the Dangerous Goods List in GB 12268 indicates that a Class 2 gas possesses single or multiple subsidiary risks, labels must be used in accordance with the table in A.2.1.5.

A.2.1.7 Except as provided in A.2.2.1.2, each label must:

- be located on the same surface of the package near the proper shipping name marking, if the package dimensions are adequate;
- be placed on the packaging so as not to be covered or obscured by any part or attachment to the packaging or any other label or marking;

- c) Where primary and subsidiary risk labels are required, they must be displayed next to each other.

Where a package is of such an irregular shape or small size that a label cannot be satisfactorily affixed, the label may be attached to the package by a securely affixed tag or other suitable means.

A.2.1.8 Intermediate bulk containers of more than 450 litres capacity and large packaging must be labelled on two opposing sides.

A.2.1.9 Labels must be affixed on a surface of contrasting colour.

A.2.1.10 Special provisions for the labelling of self-reactive substances

An “EXPLOSIVE” subsidiary risk label (Model No 1) must be applied for type B self-reactive substances, unless the competent authority for transport has permitted this label to be dispensed with for specific packaging because test data have proved that the self-reactive substance in such packaging does not exhibit explosive behaviour.

A.2.1.11 Special provisions for the labelling of organic peroxides

The Division 5.2 label in Table 2 (model No 5.2) must be affixed to packages containing organic peroxides classified as types B, C, D, E or F. This label also implies that the product may be flammable and hence no “FLAMMABLE LIQUID” subsidiary risk label (model No 3) is required. In addition, the following subsidiary risk labels must be applied:

- a) An “EXPLOSIVE” subsidiary risk label (model No 1) for organic peroxides type B, unless the competent authority for transport has permitted this label to be dispensed with for specific packaging because test data have proved that the organic peroxide in such packaging does not exhibit explosive behaviour;
- b) A “CORROSIVE” subsidiary risk label (model No 8) is required when packing group I or II criteria of Class 8 are met.

A.2.1.12 Special provisions for the labelling of infectious substances packages

In addition to the primary risk label (model No 6.2), infectious substances packages must bear any other label required by the nature of the contents.

A.2.1.13 Special provisions for the labelling of radioactive material

- a) Except the circumstances which are for large freight containers and tanks specified in GB 11806, each package, overpack and freight container containing radioactive material must bear at least two labels which conform to the models No 7A, No 7B and No 7C as appropriate according to the category (see Table 7 in GB 11806) of that package, overpack or freight container. Labels must be affixed to two opposite sides on the outside of the package or on the outside of all four sides of the freight container. Each overpack containing radioactive material must bear at least two labels on opposite sides of the outside of the overpack. In addition, each package, overpack and freight container containing fissile material must bear labels which conform to model No 7E; such labels, where applicable must be affixed adjacent to the labels for radioactive material. Labels must not cover the specified markings. Any labels which do not relate to the contents must be removed or covered.

- b) Must conform to the provisions specified in GB 11806, each label conforming to models numbers 7A, 7B, and 7C must be completed with the following information:
- Contents:
 - Except for LSA-I material, the name(s) of the radionuclide(s) as taken from Table 1 in Section 5.3.1.1 of GB 11086, using the symbols prescribed therein. For mixtures of radionuclides, the most restrictive nuclides must be listed to the extent the space on the line permits. The group of LSA or SCO must be shown following the name(s) of the radionuclide(s). The terms “LSA-II”, “LSA-III”, “SCO-I” and “SCO-II” must be used for this purpose;
 - For LSA-I material, the term “LSA-I” is all that is necessary, the name of the radionuclide is not necessary;
 - Activity: The maximum activity of the radioactive contents during transport expressed in units of becquerels (Bq) with the appropriate SI prefix symbol. For fissile material, the mass of fissile material in units of gram (g), or multiples thereof, may be used in place of activity;
 - For overpacks and freight containers the “contents” and “activity” entries on the label must bear the information required in A.2.1.12.2(a) and A.2.1.12.2(b), respectively, totalled together for the entire contents of the overpack or freight container except that on labels for overpacks or freight containers containing mixed loads of packages containing different radionuclides, such entries may read “See Transport Documents”.
 - Transport index: See Chapter 6.8 of GB 11806. (no transport index entry is required for category I-WHITE).
- c) Each label conforming to the model No 7E must be completed with the criticality safety index (CSI) as stated in the certificate of approval for special arrangement or the certificate of approval for the package design issued by the competent authority for transport.
- d) For overpacks and freight containers, the criticality safety index (CSI) on the label must bear the information required in c) of A.2.1.12 totalled together for the fissile contents of the overpack or freight container.
- e) In the case of international transport of packages requiring design or shipment approval from the competent authority for transport, for which different approval types apply in the different countries concerned, labelling must be in accordance with the certificate of the country of origin of design.

A.2.2 Provisions for labels

Labels must satisfy the provisions of this section and conform, in terms of colour, symbols and general format, to the specimen labels shown in Table 2 where appropriate, labels in Table 2 can be shown with a dotted outer boundary in accordance with the provisions in a) below. This is not required when the label is applied on a background of contrasting colour.

- a) Labels must be in the form of a square set at an angle of 45° (diamond-shaped), the dimensions must conform to the provisions set out in 4.1, except in the case of packages of such dimensions that they can only bear smaller labels and as provided in b). There must be a line which has the same colour as the symbol, and is running parallel with the edge, the distance from the line to the edge is 5mm. Label must be displayed on a background of contrasting colour, or must have either a dotted or solid outer boundary line.
- b) Cylinders for Class 2 may, on account of their shapes, orientation and securing mechanisms for transport, bear labels representative of those specified in Class 2 of Table 2, the dimensions must conform to the provisions set out in 4.1., however, in all cases, the labels

representing the primary hazard and the numbers appearing on any label must remain fully visible and the symbols recognisable.

- c) The label is divided into two halves – upper and lower – with the exception of Division 1.4, 1.5 and 1.6, where the upper half of the label must contain the pictorial symbol and the lower half must contain the text, the class or division number of the goods and the compatibility group letter as appropriate.
- d) Except for Division 1.4, 1.5 and 1.6, the lower half of the labels for Class 1 shows the division number and compatibility group letter for the substance or article. The upper half of the labels for Divisions 1.4, 1.5 and 1.6 shows the division number and in the lower half show the compatibility group letter. For Division 1.4, Compatibility Group S, no label is generally required. However, in cases where a label is considered necessary for such goods, it must be based on model No 1.4.
- e) On labels other than those for material of Class 7, the insertion of any text (other than the class or division number) in the space below the symbol must be confined to particulars indicating the nature of the risk and precautions to be taken in handling.
- f) The symbols, text and numbers must be shown in black on all labels except for:
 - the Class 8 label, where the text and class number must appear in white;
 - labels with entirely green, red or blue backgrounds where they may be shown in white;
 - the Division 2.1 label displayed on cylinders and gas cartridges for liquefied petroleum gases, where they may be shown in the background colour of the receptacle if adequate contrast is provided.
- g) All labels must be able to withstand open weather exposure without a substantial reduction in effectiveness.