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**Graphical symbols - Safety colors and safety signs - Part 2:**

**Design principles for product safety labels**

图形符号 安全色和安全标志 第2部分：产品安全标签设计原则

(ISO 3864-2:2016, MOD)

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# Graphical symbols - Safety colors and safety signs - Part 2: Design principles for product safety labels

**Important note:** The colors, which are presented in the electronic files of this Part of GB/T 2893, can **NEITHER** be viewed on the screen **NOR** used for printing as actual colors. Although the use of color in this Part complies with the requirements (within the allowable deviation, according to visual inspection), the printed version cannot be used for color matching. For requirements on color matching, please refer to GB/T 2893.4. This Part gives the color reference values, which are quoted from the color sequence system, whilst giving the chromaticity attributes and photometric attributes.

## 1 Scope

This Part of GB/T 2893 specifies the design principles of product safety labels, including the use of safety colors, the composition of the hazard severity panel, the composition of different types of product safety labels, etc. In the Appendix, it provides the reference data, such as the guidelines for improving the identifiability of product safety labels AND the design example of product safety labels.

The product safety labels, which are specified in this Part, apply to all products, in which safety-related problems may occur. However, the product safety labels, which are specified in this Part, do not apply to:

- Chemicals;
- Transport of dangerous substances and preparations;
- Industries, that have been bound by relevant regulations AND whose content is different from certain terms of this document.

## 2 Normative references

The following documents are essential for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 2893.1 Graphical symbols - Safety colors and safety signs - Part 1: Design principles for safety signs and safety markings (GB/T 2893.1-2013, ISO 3864-1: 2011, MOD)

### **Residual risk**

Risks that remain, after implementing protective measures.

[GB/T 20002.4-2015, Definition 3.8]

## **3.6**

### **Signal word**

Words, which are used to draw attention to product safety labels and identify risk categories.

Note: Warning words include "Danger", "Warning", "Caution".

## **3.7**

### **Product safety label**

Used on a product, a label that informs observers of a potential hazard or hazards AND describes the safety measures or actions required to avoid the hazard.

Note: Product safety labels are used to convey information on hazards, precautionary measures to avoid hazards AND/OR the consequences that will result when hazards cannot be avoided.

## **3.8**

### **Hazard severity panel**

The area, which is used in a combination product safety label or multiple product safety label, to convey the risk category, which is associated with the hazard.

Note: The display area contains general warning signs, a warning, the corresponding background color (see Table 2).

## **3.9**

### **Supplementary safety information panel**

The area of the product safety label, where the safety information symbol or safety information text serves as an additional instruction.

Note: The supplementary safety information is mainly used to introduce information, such as dangerous consequences or dangerous preventive measures.

## **3.10**

### **Combination product safety label**

Product safety labels, which combine safety signs and/or supplementary safety information and/or hazard severity, on the same rectangular label.

Note: A combination product safety label conveys only one safety message.

### 3.11

#### Multiple product safety label

A product safety label, which includes two or more safety signs on the same rectangular label, AND may also include supplementary safety information and/or hazard severity panel.

## 4 Use of safety colors

### 4.1 General requirements

The use of safety colors, on product safety labels, serves the following basic purposes:

- a) Make the product safety label easy to notice, by using color to attract people's attention;
- b) Identify product safety labels AND assign safety meanings to product safety labels and their components.

Except for the orange safety color, the chromaticity properties and photometric properties of other safety colors shall comply with the provisions of GB/T 2893.4. The orange safety color is only used in the "warning" hazard severity panel. Table 1 specifies the chromaticity and photometric properties of the orange safety color. Refer to Appendix B, for reference values of the orange safety color in the color system.

**Table 1 -- Chromaticity coordinates and luminance factors when orange safety color is used for common materials**

Coordinate	Determine the corner chromaticity coordinates of the allowable colour range: Standard illuminator D65, 2° field of view				Luminance factor $\beta$
	1	2	3	4	
<i>x</i>	0.603	0.538	0.508	0.563	$\geq 0.21$
<i>y</i>	0.397	0.382	0.412	0.436	

### 4.2 Contrasting colors

The contrasting color shall comply with the provisions of GB/T 2893.1. The contrasting color of orange is black.

## 5 Hazard severity panel

### 5.1 General requirements

If it is necessary to indicate the severity level of the hazard, the hazard severity panel shall be added to the upper part of the combination product safety label or the multiple product safety label. As shown in Table 2, the hazard severity panel shall be rectangular in shape AND shall contain the following elements:

- a) General warning signs (see Figure A.5);
- b) Color;
- c) Warning words (the warning words are optional).

### 5.2 Composition of hazard severity panel

A general warning sign shall be included on the hazard severity panel. When using warning words, the warning word is located on the right side of the general warning sign; it is displayed in the center of the hazard severity panel together with the general warning sign; the word height of the warning word shall not exceed the graphic height of the general warning sign. When no warning words are used, the general warning sign is displayed centered on the hazard severity panel (see Table 2).

Warning words should use isometric font and bold. When the product is exported outside the country, the warning words should use the language of the corresponding country and region. Appendix C gives the standard expressions of warning words in different languages.

## 6 Types and composition of product safety labels

### 6.1 General requirements

One or more safety signs shall be included in the product safety label. Product safety labels may be accompanied by one or more areas of supplementary safety information and a hazard severity panel. The supplementary safety information area shall consist of text or supplementary safety information symbols.

Product safety labels shall conform to one of the following seven types:

- a) Separate safety signs;

## **Appendix A**

### **(Informative)**

#### **Guidelines for improving the identifiability of product safety labels**

##### **A.1 Overview**

To enhance the comprehensibility of product safety labels, product manufacturers are encouraged, to include information in their product user documentation (e.g., operation manuals, instruction manuals, safety manuals, maintenance manuals, etc.), that helps people understand product safety labels. In the product accompanying documents, in addition to giving the product safety label, giving the contents of A.3 ~ A.5 will help to achieve the purpose of publicizing and explaining to product users, so as to promote people's recognition of the definition of the product safety label, which is specified in this Part.

##### **A.2 Graphical symbols**

Product safety labels always contain graphic symbols in the geometric shape of their safety signs (see A.3). The design principles of graphic symbols for safety signs are given in GB/T 2893.3. If the product safety label has a supplementary safety information symbol, the supplementary safety information symbol will be displayed in a rectangular area. The safety signs and supplementary safety information symbols, which are used on the product safety label, shall be explained in the user documentation, which can enable users to better understand the meaning of the graphic symbols, so that they can quickly identify the safety signs and supplementary safety information symbols in the future. Supplementary information may also be added to other documentation, which is provided with the product, to further clarify the safety signs and supplementary safety information symbols.

##### **A.3 Geometry**

Figure A.1, Figure A.2, Figure A.3 and their text descriptions should be included in the user documentation.

## Appendix D

### (Informative)

#### Example for design of product safety label

When designing product safety labels, that comply with this Part, the following options are available:

- Only use the safety signs, which are specified in GB/T 31523.1, either alone or together on the multiple product safety labels;
- Add supplementary safety information text to the safety signs in GB/T 31523.1;
- Add the hazard severity panel;
- Add supplementary safety information symbol;
- Use dividing lines to separate the various components of the product safety label, in a variety of ways.

The example, as shown in Figure D.1, can provide a reference for designers, when designing product safety labels, according to the principles given in this Part.

Figure D.1 shows various styles for communicating product safety information:

- D.1a): product safety label example for 6.1a);
- D.1b): product safety label example for 6.1a);
- D.1c): product safety label example for 6.1a);
- D.1d): product safety label example for 6.1f);
- D.1e): product safety label example for 6.1b);
- D.1f): product safety label example for 6.1d);
- D.1g): product safety label example for 6.1c);
- D.1h): product safety label example for 6.1e);
- D.1i): product safety label example for 6.1g);
- D.1j): product safety label example for 6.1g);
- D.1k): product safety label example for 6.1g);



## **Appendix E**

### **(Informative)**

#### **Things to consider when designing product safety labels**

##### **E.1 Hazard source analysis and risk assessment**

Before designing a product safety label, it shall assess the hazards of the product AND the risks associated with each hazard. The focus here is to assess what residual risks exist, after protective measures to prevent hazards have been taken, in the product design, AND to determine which hazards shall be addressed, by means of product safety labels. It should avoid the use of too many product safety labels, resulting in an overload of information. For most products, it is not possible to inform the user of all the predictable hazards arising from use or possible misuse, in the form of product safety labels. Safety labels should be used, for those hazards with the greatest risk. Likewise, it is necessary to decide which hazards need to be addressed in user documentation (e.g., product packaging, information sheets, operating and maintenance manuals). Such an assessment can also determine what tolerable risks exist, after proactive preventive measures have been taken (see GB/T 20002.4 for more information on hazard or risk analysis and assessment).

##### **E.2 Identify the target user**

One of the first factors to consider, when designing a product safety label, is the intended target user (i.e., those who will use or maintain the product, OR who may be exposed to the hazard). Identifying the target user can help determine the most appropriate form of product safety label design, to more effectively convey safety information. It needs to decide whether to use a safety sign as a product safety label or a safety sign with a supplementary safety information text area, as a product safety label. The following issues need to be considered:

- a) Whether it is necessary to use the hazard severity panel;
- b) If using text, whether it is necessary to translate information points or warnings into foreign languages;
- c) Whether new product safety labels need to be designed, to better convey the necessary information;
- d) Whether training is necessary, to reinforce information on product safety labels.

Special consideration should be given, according to the type of target user, i.e., general public or specially trained personnel. If part of the target user is visually impaired, consider using touch-safe labels, that include raised graphic elements and/or Braille.

The education level of the target user is also one of the considerations, in determining the need for text in product safety labels AND the need for comprehension testing of safety signs.

Some of the elements, which are contained in GB/T 5296.1 and ISO/IEC Guide 14, are helpful in designing product safety labels, which are relevant to consumers.

### **E.3 Comprehension testing and evaluation of product safety labels**

If it is necessary to evaluate the effectiveness of the product safety label, in conveying the intended safety information, the entire label can be evaluated, in a manner deemed appropriate by the product supplier.

If the product safety label consists of only one safety sign, the comprehension test can be carried out, according to the requirements of GB/T 16903.2. The pass value for the test shall be set relatively high, to ensure that the intended target user can understand the product safety label.

### **E.4 Determining when to use multiple product safety labels**

A number of factors shall be considered, when deciding how to more effectively convey product hazard information through labelling. This Part specifies the requirements to be followed, when product safety labels are formed by two or more safety signs OR when formed by one or more safety signs with auxiliary text. Product safety labels can alert people to specific hazards, AND let people know how to avoid the danger. Whether to express the necessary information through words in the label AND whether to include the hazard severity panel in the label, needs to be decided, based on a comprehensive consideration of many factors. These factors include, but are not limited to, the product's intended market, the product's transit abroad during its validity period, the characteristics of the target user, the severity and risk of encountering hazards, difficulties in providing translations, space constraints on the product, general industry practices, the laws and regulations of the corresponding country to which the product is exported, etc.

### **E.5 Size and clarity of product safety labels**

GB/T 2893.1 provides some guidelines on the size, clarity, viewing distance of safety signs. The color of the product safety label should make it stand out. Product safety labels can be made more conspicuous, by ensuring a contrasting color, between the color of the product safety label and the surface color of the product, to which it is attached, OR by adding a contrasting lining to the product safety label.

Product safety labels shall be of a size and legibility, that ensures sufficient legibility, at safe viewing distances from potential hazards.

### **E.6 Placement of product safety labels**

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