

# SEMI S1-0923a

## SAFETY GUIDELINE FOR EQUIPMENT SAFETY LABELS

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**NOTICE:** Conformance to the ‘should’ provisions of this Safety Guideline is necessary to declare conformance to this Document. Conformance to ‘may’, ‘suggested’, ‘preferred’, ‘recommended’, ‘NOTE’, or ‘Related Information’ provisions is not necessary to declare conformance.

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## 1 Purpose

1.1 This Safety Guideline provides guidance for the content, format, and placement of equipment safety labels and gives symbols to use for several dozen hazards, prohibitions, and mandatory actions.

1.2 This Safety Guideline is intended for use by equipment manufacturers to create safety labels that alert people to hazards (to people, property, and the environment) associated with the equipment.

1.3 This Safety Guideline is intended to provide a unified, international, semiconductor-industry-specific safety labeling format.

## 2 Scope

2.1 This Safety Guideline is intended for use in developing safety labels for manufacturing equipment used in the semiconductor industry.

2.2 This Safety Guideline may also be used for the design of safety signs for the facilities where semiconductor manufacturing equipment is installed.

2.3 The guidance provided in this Safety Guideline may also be used to help communicate safety information in installation instructions, operation and maintenance manuals, and similar written communication relating to equipment.

NOTE 1: ANSI Z535.6 provides information on such uses.

2.4 This Safety Guideline may also be used for the design of computerized user interfaces on equipment.

**NOTICE:** SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

## 3 Limitations

3.1 Various components or assemblies used in semiconductor manufacturing equipment can carry safety labels that are designed and affixed in accordance with international standards or legal or regulatory requirements. This Safety Guideline does not suggest the concealment or removal of such a label on the basis of it not being in compliance with SEMI S1. However, this Safety Guideline does pertain to any label provided by the SME supplier that is in addition to the label that was provided to the SME supplier on the component or assembly.

3.2 Some safety label formats and content are dictated by other applicable standards and guidelines or by law (e.g., laser labeling and chemical hazard communication labeling in certain countries of use). It is not the intent of this Safety Guideline to replace such labeling requirements in cases in which providing a safety label conforming to this Safety Guideline is appropriate and it is not possible to have a safety label that complies with both the regulatory criteria and this Safety Guideline.

NOTE 2: In the cases of which the task force that prepared this Safety Guideline is aware, it is possible for a safety label to conform to this Safety Guideline and to comply with regulatory requirements. The task force also did not find any international standards that appeared relevant to SME safety labels and that conflicted with SEMI S1.

NOTE 3: This Safety Guideline does not address hazard communication labels required by the UN Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Regulations typically require such labels for chemical containers and shipping containers in which chemical containers have been packed. Labelling in accordance with GHS is independent of labelling in accordance with SEMI S1.

3.3 New safety labels and safety labels that are significantly redesigned should conform to the latest version of SEMI S1. This Safety Guideline is not intended to be applied retroactively.

3.4 Existing safety labels may continue to meet the provisions of SEMI S1 that were in effect at the time of their design, even if used on new or redesigned manufacturing equipment. For example, an existing safety label conforming with SEMI S1-1015 and used with equipment designed after publication of SEMI S1-0923 are not subject to the provisions of the latest version.

## 4 Referenced Standards and Documents

### 4.1 SEMI Standards and Safety Guidelines

SEMI S10 — Safety Guideline for Risk Assessment and Risk Evaluation Process

### 4.2 ANSI® Standards<sup>1</sup>

ANSI Z535.3 — Criteria for Safety Symbols

ANSI Z535.4 — Product Safety Signs and Labels

ANSI Z535.6 — Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials

### 4.3 ISO® Standards<sup>2</sup>

ISO 3864-1 — Graphical Symbols – Safety Colours and Safety Signs – Part 1: Design Principles for Safety Signs and Safety Markings

ISO 3864-3 — Graphical Symbols – Safety Colours and Safety Signs – Part 3: Design Principles for Graphical Symbols for Use in Safety Signs

ISO 7010 — Graphical Symbols – Safety Colours and Safety Signs – Registered Safety Signs

### 4.4 UL® Standards<sup>3</sup>

UL 969 — Standard for Marking and Labeling Systems

**NOTICE:** Unless otherwise indicated, all documents cited shall be the latest published versions.

## 5 Terminology

**NOTICE: § 5 will be revised upon the July 2024 publication as shown in Delayed Revisions Section 1. The Environmental, Health & Safety Global Technical Committee has voted that the change is OPTIONAL before the Effective Date.**

### 5.1 Definitions

5.1.1 *exclusion zone* — an area of a surround shape from which a pictogram is excluded, so that the background color separates the pictogram from the border.

5.1.2 *harm* — physical injury or damage to health of people, or damage to equipment, buildings, or environment. [SEMI S10]

5.1.3 *hazard* — condition that has the potential to cause harm. [SEMI S10]

5.1.4 *panel* — an area of a safety label which is delineated by a line, border, or margin.

NOTE 4: Figures 2 and 3 contain examples of panel placement.

5.1.5 *pictogram* — a graphical representation, either abstract or representational, of a hazard, a consequence of engaging a hazard, a method of avoiding or reducing harm, or some combination of these ideas.

5.1.6 *property-damage-only* — refers to damage to only equipment or buildings.

NOTE 5: The term ‘property-damage-only’ is used in order to align with ANSI Z535.4.

5.1.7 *safety alert symbol* — a specific symbol that indicates a personal injury hazard.

5.1.8 *safety label* — a sign, label, or decal that provides safety information.

<sup>1</sup> American National Standards Institute, 25 West 43<sup>rd</sup> Street, New York, NY 10036, USA; Telephone: +1.212.642.4900, Fax: +1.212.398.0023, <http://www.ansi.org>. ANSI trademark is owned by American National Standards Institute.

<sup>2</sup> International Organization for Standardization, ISO Central Secretariat, Chemin de Blandonnet 8, CP 401-1214 Vernier, Geneva, Switzerland; Telephone: +41.22.749.01.11, Fax: +41.22.733.34.30, <http://www.iso.org>. ISO trademark is owned by International Organization for Standardization.

<sup>3</sup> Underwriters Laboratory, 333 Pfingsten Road Northbrook Illinois, 60062, USA; Telephone: +1.847.272.8800, <http://www.ul.com>. UL trademark is owned by Underwriters Laboratory.

5.1.9 *signal word* — the word that calls attention to the safety label and designates a degree or level of risk.

NOTE 6: § 9 contains information on risk categorization and the assignment of signal words.

5.1.10 *surround shape* — a geometric configuration that is placed around a pictogram and which conveys additional safety information.

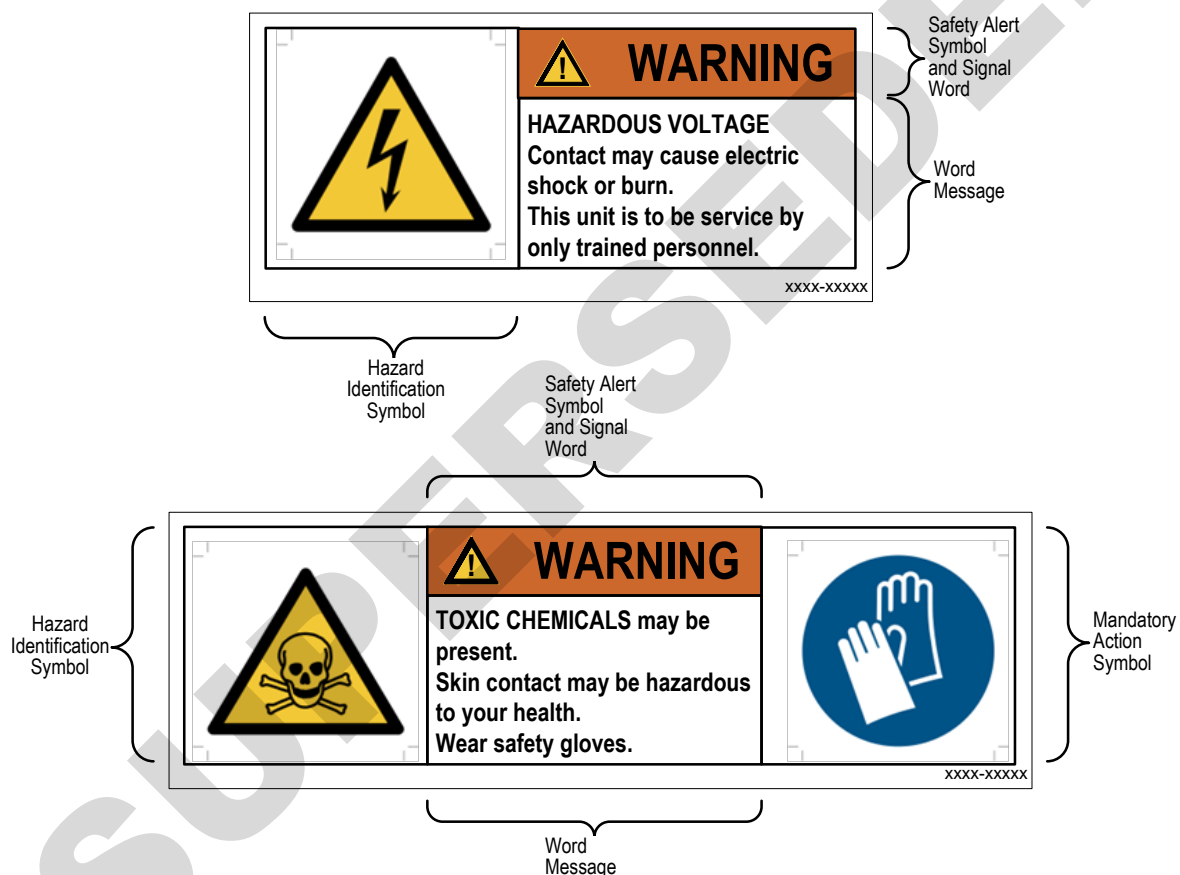
5.1.11 *symbol* — a pictogram within a surround shape.

5.1.12 *target audience* — the audience to be advised of the hazard and risk and how to avoid or reduce the harm.

## 6 General Provisions

6.1 Safety labels should communicate information about specific hazards. Safety labels should be simple, direct, and understandable by the target audience.

6.2 Refer to Figure 1 for examples of how this information may be communicated on a safety label.



#1 In the lower example, a second symbol panel is provided to illustrate the means of reducing the risk of harm.

**Figure 1**  
**Examples of How Product Safety Labels Communicate Content**

6.3 *Identifier* — Each different safety label should have a unique identifier (e.g., a part number) printed on the label, to facilitate ordering replacement labels from the equipment manufacturer.

NOTE 7: If a safety label becomes illegible, the user can want to replace it.

6.4 *Durability* — Safety labels should be durable and have a reasonable useful life. Determination of reasonable useful life should take into consideration the expected life of the product and the intended environment of use,

including foreseen degradation. The durability of a safety label depends on the label remaining in place and on the integrity of the images on the label.

NOTE 8: Two factors that can be used for judging useful life are color stability and legibility when viewed at a safe viewing distance. Legibility is affected by character size (height and width).

6.4.1 Conformance with ¶ 6.4 may be demonstrated by testing in accordance with ¶ 6.4.2 and compliance with a relevant standard, such as UL 969, with testing conducted in consideration of the intended environment of use.

6.4.2 There should be no visible degradation when the label is exposed to cleaning by subjecting the label to each cleaning method prescribed for the surface on which the label is located in the documentation provided to the user and by rubbing the label:

- for 30 seconds,
- with a cleanroom wipe saturated with 70% isopropanol/water solution,
- applying  $5 \pm 1$  N of force perpendicular to the label surface,
- with a finger.

NOTE 9: If a label is certified as complying with a labelling standard that includes the testing in ¶ 6.4.2, that paragraph is not intended to impose redundant testing.

NOTE 10: The intent is that each set of label materials (e.g., base material, coating, adhesive, ink) and method of label manufacture be tested in the manner in the bulleted list and for each 'cleaning method prescribed in the documentation' to which labels of those materials and manufacturing method are foreseen to be exposed. It is not the intent that labels that differ only in images or words need to be tested separately.

6.4.3 Possible causes of label degradation include:

- temperature,
- radiation (including light),
- mechanical stress (including abrasion), and
- chemical exposure.

## 7 Formats and Panels

7.1 Each safety label should consist of at least a signal word panel, a word message panel, and a symbol panel. Figure 2 provides examples of some possible horizontal and vertical formats incorporating these panels.

EXCEPTION 1: A symbol panel is not necessary for labels that indicate property-damage-only hazards.

EXCEPTION 2: When space limitations exist, such as under guards or on small parts, for safety labels whose target audience is only maintenance or service personnel, symbol-only formats (i.e., no signal word panel, word message panel, or symbol panel) may be used. (Refer to Appendix 1 for tables of symbols.) In this case, outer borders around the surround shapes should be used and there is no upper limit to the width of those outer borders. For convenience, the shape of the outer border may be different than the shape of its surround shape. Alternatively, for the same situations, a safety label may be used that has a signal word panel and a word message panel but does not have a symbol panel.

EXCEPTION 3: A duplicate symbol panel need not be provided on a separate additional language label if the separate additional language label is abutting the safety label the translation of which it provides.

|              |                    |
|--------------|--------------------|
| Symbol Panel | Signal Word Panel  |
|              | Word Message Panel |

Horizontal format with single signal word, symbol, and word message panels

|              |                    |              |
|--------------|--------------------|--------------|
| Symbol Panel | Signal Word Panel  | Symbol Panel |
|              | Word Message Panel |              |

Horizontal format with single signal word and word message panel and two symbol panels

|                                    |              |                                    |
|------------------------------------|--------------|------------------------------------|
| Signal Word Panel<br>(language 1)  | Symbol Panel | Signal Word Panel<br>(language 2)  |
| Word Message Panel<br>(language 1) |              | Word Message Panel<br>(language 2) |

Horizontal format with a single symbol panel, two signal word panels, and two word message panels

|                    |
|--------------------|
| Signal Word Panel  |
| Symbol Panel       |
| Word Message Panel |

Vertical format with single symbol and word message panels

|                                    |
|------------------------------------|
| Signal Word Panel<br>(language 2)  |
| Word Message Panel<br>(language 2) |

Separate label  
(used abutting one of the other layouts)

**Figure 2**  
**Examples of Formats for Product Safety Labels**

**7.2 Multiple Hazard Formats** — Information about more than one hazard may be conveyed on a single safety label. (Refer to Figure 3 for examples.)

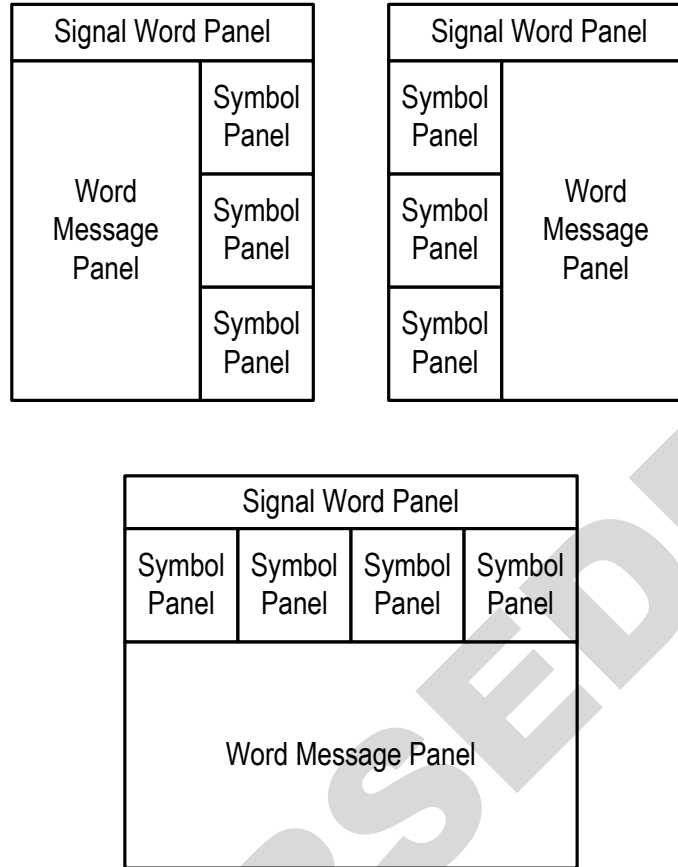


**Figure 3**  
**Examples of Multi-Hazard Safety Label Formats**

## 8 Color Palette

8.1 Colors should conform to those colors specified in ISO 3864-1.

NOTE 11: For purposes of reproduction, the closest PANTONE®<sup>4</sup> color matches for printing opaque safety colors and the RGB codes for displays are:

| <i>Color</i> | <i>PANTONE</i> | <i>R</i> | <i>G</i> | <i>B</i> |
|--------------|----------------|----------|----------|----------|
| Red          | 485            | 183      | 31       | 46       |
| Orange       | 152            | 204      | 104      | 43       |
| Yellow       | 109            | 243      | 200      | 54       |
| Blue         | 2945           | 0        | 83       | 135      |
| White        | —              | 255      | 255      | 255      |
| Black        | —              | 0        | 0        | 0        |

The RGB values are those used by ISO in the examples on its web site. ‘Process black’ is typically used as the black in safety labels. ‘White’ is typically the color of the stock material on which labels are printed, not an ink color.

<sup>4</sup> PANTONE® is a trademark of Pantone, Inc.