SEMI S1-0701[E]
SAFETY GUIDELINE FOR EQUIPMENT SAFETY LABELS

This safety guideline was technically approved by the Global Environmental Health and Safety Committee and is the direct responsibility of the North American Environmental Health and Safety Committee. Current edition approved by the North American Regional Standards Committee on April 30, 2001. Initially available at www.semi.org May 2001; to be published July 2001. Originally published in 1986; previously published in 1990.

This document replaces S1-90 in its entirety.

[E] This standard was editorially modified in January 2005 to correct a spelling error. Changes were made to Appendix 2.

1 Purpose

1.1 This guideline provides guidance for the content and format of equipment safety labels and gives examples of symbols to use.

1.2 This guideline is intended for use by equipment manufacturers to create safety labels that alert persons to hazards associated with the equipment.

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

2 Scope

2.1 This guideline is intended to assist in developing safety labels for manufacturing equipment used in the semiconductor industry.

NOTE 1: This guideline may also be used for the design of safety signs for the facilities where semiconductor manufacturing equipment is installed.

NOTE 2: The guidance provided in this document may also be adapted to help communicate safety information in installation instructions, operation and maintenance manuals, and other similar written communication relating to a product.

NOTE 3: This guideline may also be adapted for the design of computerized user interfaces on equipment.

NOTE 4: In order to present a more consistent user interface, it is recommended that the use of the words DANGER, WARNING, and CAUTION, in such interfaces be limited to the meanings and uses given for them in this guideline.

2.2 This document contains the following sections:

1. Purpose

2. Scope

3. Limitations

4. Referenced Standards

5. Terminology

6. General Provisions

7. Formats

8. Signal Words

9. Symbols

10. Word Messages

11. Lettering

12. Colors

13. Placement

14. Translation

15. Related Documents

Appendix 1 — Safety Symbols

Appendix 2 — Translations of Signal Words

2.3 This safety guideline does not purport to address all of the safety issues associated with its use. It is the responsibility of the users of this guideline to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

3 Limitations

3.1 Various components or assemblies used in semiconductor manufacturing equipment may carry safety labels that are designed and affixed in accordance with other international standards. It is not the intent of this guideline to replace or supersede such labeling requirements.

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 guideline to replace or supersede such labeling requirements.

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

4 Referenced Standards

NOTE 5: Unless otherwise indicated, all documents cited shall be the latest published versions.

4.1 *SEMI Standards*

SEMI S10 — Safety Guideline for Risk Assessment

4.2 *ANSI Standards*[1]

ANSI Z535.1 — Safety Color Code

ANSI Z535.3 — Criteria for Safety Symbols

ANSI Z535.4 — Product Safety Signs and Labels

4.3 *ISO Standards*[2]

ISO 3864 — Safety Colours and Safety Signs

4.4 *IEC Standards*[3]

IEC 61310-1 — Safety of Machinery - Indication, Marking and Actuation - Part 1: Requirements for Visual, Auditory and Tactile Signals

5 Terminology

5.1 *hazard* — a condition that is a prerequisite to a mishap.

5.2 *mishap* — an unplanned event or series of events that results in death, injury, occupational illness, damage to or loss of equipment or property, or environmental damage.

5.3 *panel* — area of a safety label having a distinctive background color which is different from other areas, or which is delineated by a line, border, or margin. See Figures 3 and 4 for examples of panel placement.

5.4 *safety alert symbol* — a specific symbol (see Figure 1) that indicates a potential personal injury hazard.

1 American National Standards Institute, 11 West 42nd Street, New York, New York 10036, USA, http://www.ansi.org

2 International Organization for Standardization, C.P.56, CH-1211 Geneva 20, Switzerland, http://www.iso.ch

3 International Electrotechnical Commission, 1 rue de Varembe, Geneva, Switzerland, http://www.iec.ch

(Left: For DANGER, Right: For WARNING and CAUTION)

Figure 1
Safety Alert Symbols for Signal Word Panel Use

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

5.6 *signal word* — the word that calls attention to the safety label and designates a degree or level of hazard seriousness.

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

5.8 *symbol* — a graphical representation, either abstract or representational, of a hazard, a consequence of engaging a hazard, or a method to avoid a hazard, or some combination of these ideas.

NOTE 6: Some label design standards use the term “pictorial” in the same sense as this guideline uses the term “symbol.”

5.9 *target audience* — the audience to be advised of the hazard.

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 *Content* — Safety labels should communicate:

6.2.1 the seriousness of the hazard (indicated by the signal word);

6.2.2 the nature of the hazard (e.g., type of hazard) or the probable consequence of engaging the hazard; and

6.2.3 how the hazard can be avoided.

6.3 See Figure 2 for examples of how this information can be communicated on a safety label.

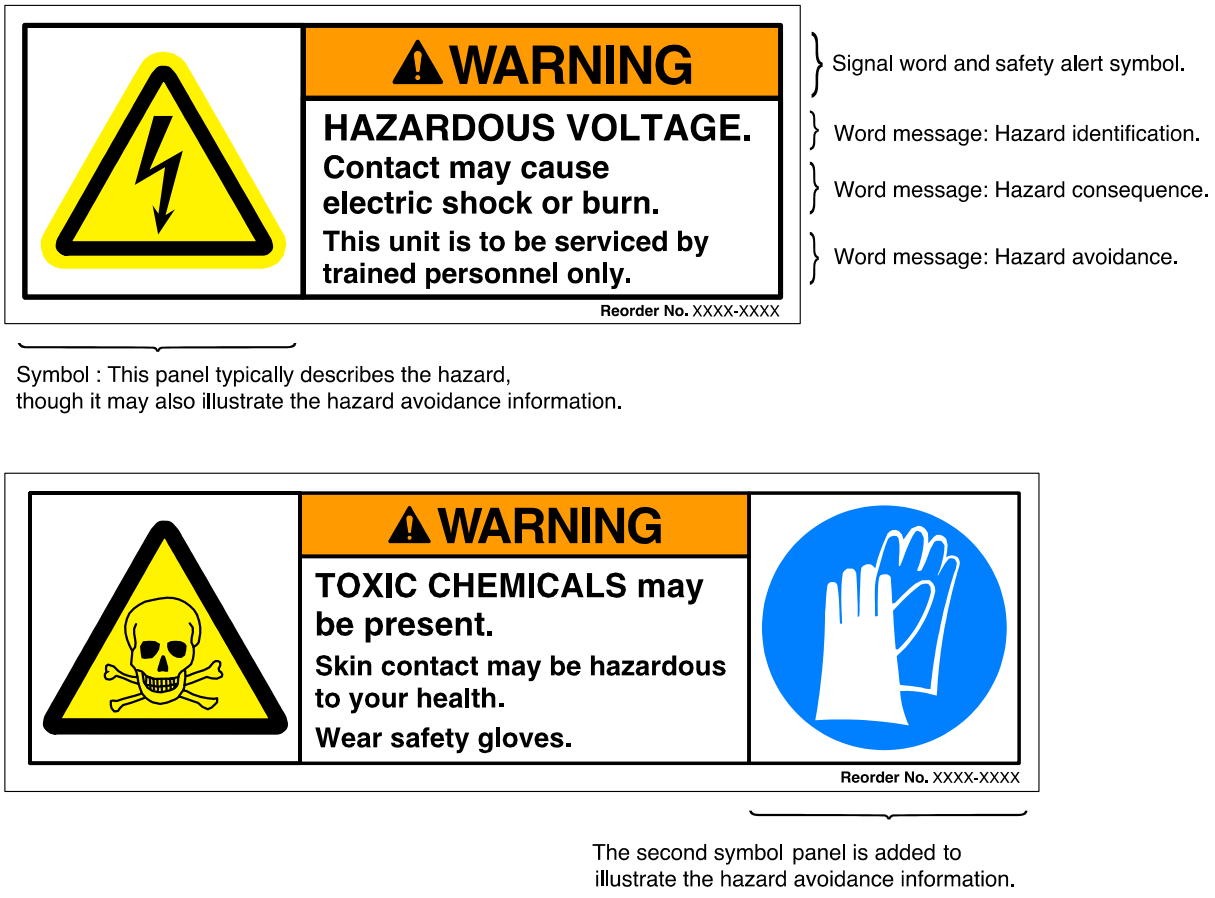


Figure 2
Examples of How Product Safety Labels Communicate Content

(Note that the order and content of the word message is flexible).

6.4 *Identifier* — Safety labels 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 may want to replace it.

6.5 *Durability* — Safety labels should 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.

NOTE 8: Two factors that may be used for judging useful life are color stability and legibility when viewed at a safe viewing distance. Legibility is affected by letter height.

7 Formats

7.1 Safety labels should consist of at least three panels: signal word panel, word message panel, and symbol panel. Figure 3 provides examples of some possible horizontal and vertical formats incorporating these panels.

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

EXCEPTION 2: When space limitations exist, such as under guards or on small parts, for safety labels whose target audience is maintenance or service personnel, symbol-only formats with surround shapes (i.e., no signal word, word message, or symbol panels; see Figures 7, 8, and 9) may be used. In this case, borders around the surround shapes should be used. 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.

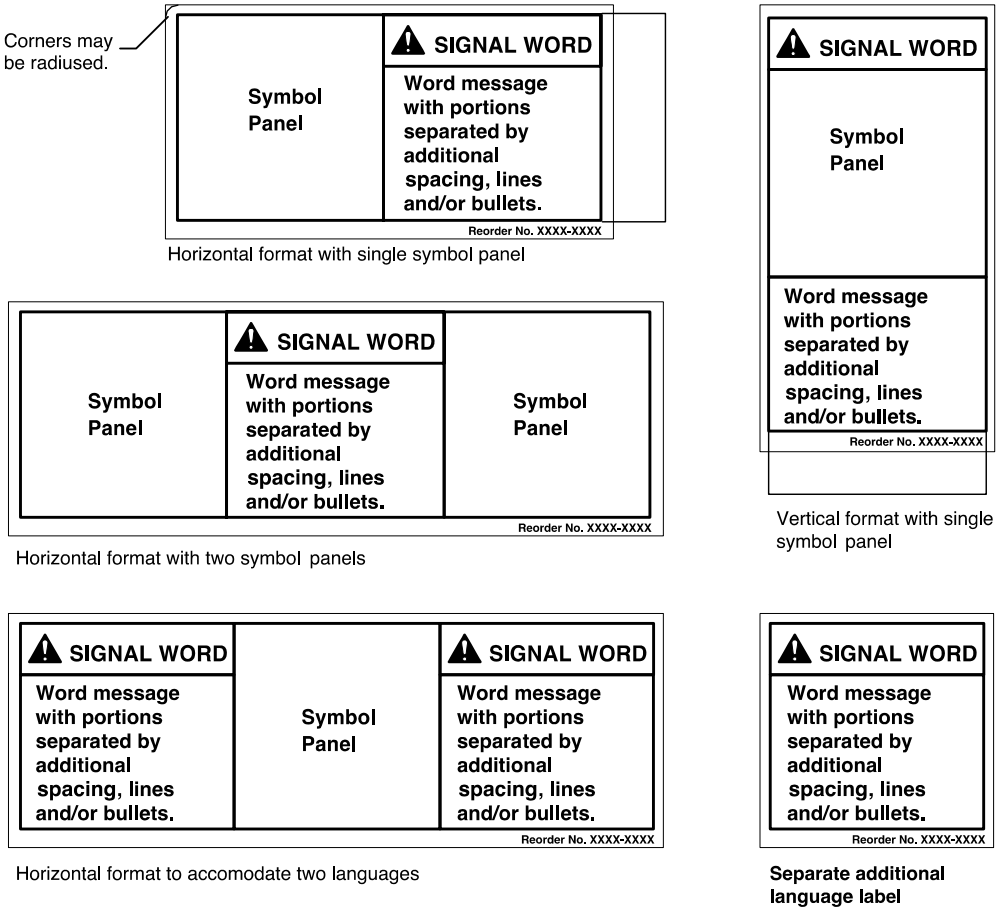


Figure 3
Examples of Format Options for Product Safety Labels

7.2 *Multiple Hazard Formats* — More than one hazard may be conveyed on a single safety label (see Figure 4 for examples).

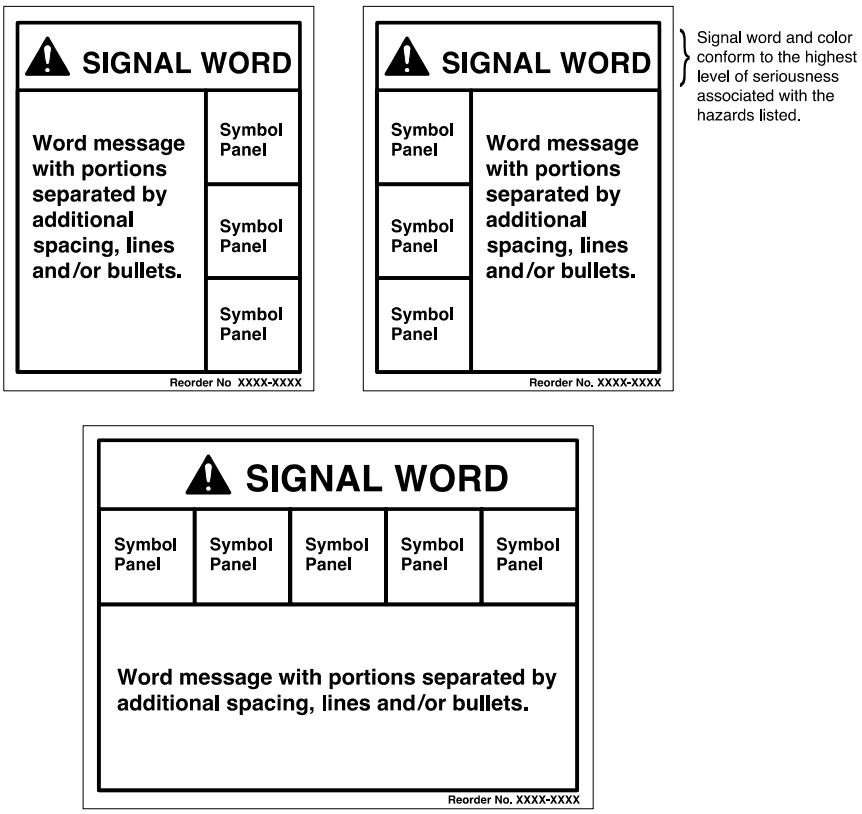


Figure 4
Examples of Multi-Hazard Safety Label Formats

8 Signal Words

8.1 The signal words for safety labels are DANGER, WARNING, and CAUTION.

8.1.1 DANGER is the signal word used to indicate an imminently hazardous situation that, if not avoided, will result in death or severe injury. This signal word is to be limited to the most extreme situations.

8.1.2 WARNING is the signal word used to indicate a potentially hazardous situation which, if not avoided, could result in death or severe injury.

8.1.3 CAUTION is the signal word used to indicate a potentially hazardous situation which, if not avoided, could result in moderate or minor injury. It may also be used to alert against unsafe practices.

NOTE 9: CAUTION without the safety alert symbol may be used as a signal word to indicate a potentially hazardous situation which, if not avoided, could result in property damage.

NOTE 10: SEMI S10 contains examples of ways to categorize severe, moderate, and minor injuries.

8.2 The signal word is placed in the signal word panel.

8.2.1 For DANGER, WARNING, and CAUTION signal words, the safety alert symbol (see Figure 1) is located immediately to the left of and on the same level as the signal word (see Figure 5).

Figure 5
Signal Word Panels

8.2.2 The safety alert symbol should not be used to alert persons to property-damage-only hazards.

8.2.3 When multiple hazard situations are addressed on one safety label, and the hazards are classified at different levels of seriousness, the signal word corresponding to the greatest hazard level should be used.

9 Symbols

9.1 Symbols are graphic representations chosen to convey specific safety messages.

9.2 The symbol panel should contain the safety label's symbol(s).

9.2.1 More than one symbol panel may be used on a safety label.

NOTE 11: See also Section 7.2.

9.2.2 More than one symbol may be used in each symbol panel.

9.3 Symbols may be used to clarify or supplement a portion of a safety label's word message.

NOTE 12: In some cases, symbols may replace the word message. See the exception to Section 10.2.

9.4 A symbol should represent the nature of the hazard, or the potential consequence of engaging the hazard, or actions to be taken to avoid the hazard.

9.5 Symbols should be compatible with the safety label's word message.

NOTE 13: It is preferable to use the symbols shown in Appendix 1.

NOTE 14: For additional information on symbol design, see Annex A of ANSI Z535.3.

9.6 Symbols should be shown in their appropriate surround shape as defined in Section 9.10.

9.7 When an effective symbol does not exist or cannot be created to illustrate the specific hazard or specific avoidance information, the ISO 3864 general warning symbol should be used with a text message that conveys specific information about the hazard (see Figure 6).

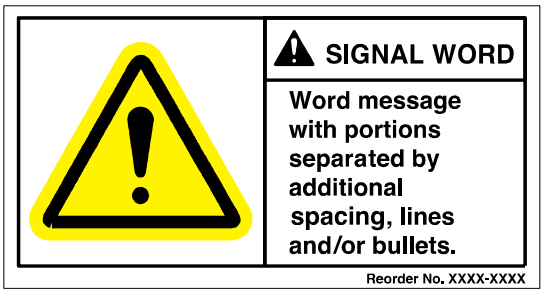


Figure 6
Safety Label with General Warning Symbol

9.8 *Location* — Symbols should be located on safety labels in the areas designated in the examples in Figures 2, 3, and 4, or located in a similar manner. If multiple symbols are used on a multi-hazard safety label, the symbols should appear in the same order as the safety information described in the word message.

EXCEPTION: Location of the safety alert symbol is governed by section 8.2.1.

9.9 *Safety Alert Symbol* — The safety alert symbol is composed of an equilateral triangle surrounding an exclamation mark.

NOTE 15: See Figures 1 and 5 and Section 12.3.4 for format and color information.

9.10 *Symbol Surround Shapes* — Safety symbols should be shown in their appropriate surround shapes (see Figures 7, 8, and 9).

NOTE 16: This is for purposes of international harmonization. The surround shapes have been taken from ISO 3864 and IEC 61310-1.

9.10.1 *Hazard Identification Surround Shape (see Figure 7)* — A symbol located inside a hazard identification surround shape should be used to indicate a personal injury hazard.

9.10.1.1 *Format and Color* — The background color should be yellow. The triangular band should be black. The symbol or pictorial representing the hazard should be black. The border should be yellow; the border is optional if the surrounding background is yellow or white. See Figure 7 for more information.

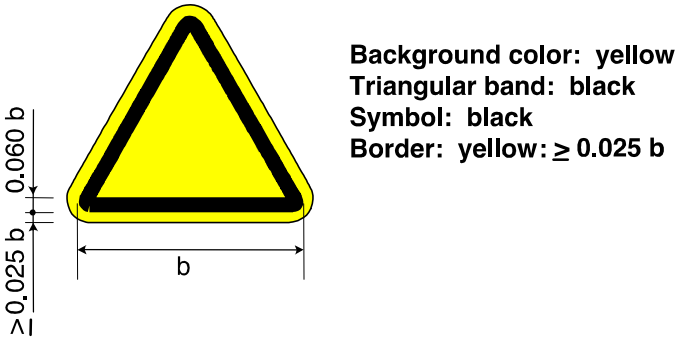


Figure 7
Hazard Identification Symbol Surround Shape

9.10.2 *Prohibition Surround Shape (see Figure 8)* — A symbol located inside a prohibition surround shape should be used to indicate that an action should not be taken or should be stopped.

9.10.2.1 *Format and Color* — The prohibition surround shape should be a circular band with a diagonal bar. The background color should be white. The circular band and diagonal bar should be red. The symbol representing the prohibited action should be black and is preferably shown behind the red slash. The border should be white; the border is optional if the surrounding background is white or yellow. See Figure 8 for more information.

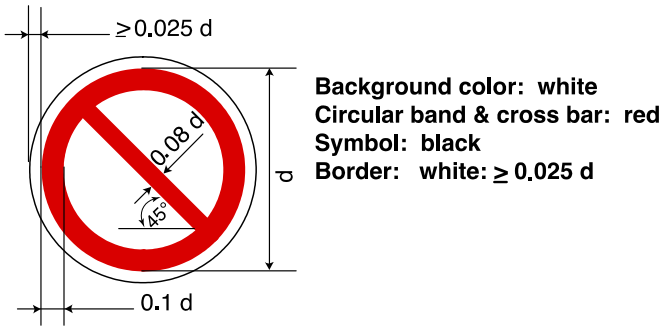


Figure 8
Prohibition Symbol Surround Shape

9.10.3 *Mandatory Action Surround Shape (see Figure 9)* — A symbol located inside a mandatory action surround shape should be used to indicate that an action should be taken to avoid a hazard.

9.10.3.1 *Format and Color* — The background color should be blue. The symbol representing the mandatory action should be white. The border should be white; the border is optional if the surrounding background is white. See Figure 9 for more information.

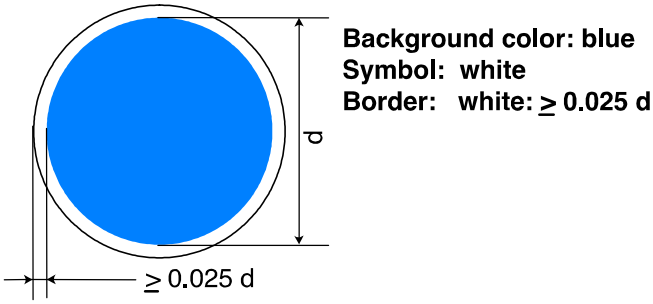


Figure 9
Mandatory Action Symbol Surround Shape

10 Word Message

10.1 The word message is placed in the word message panel.

10.2 The word message preferably contains a description of the hazard, the consequence of engaging the hazard, and how to avoid the hazard. The ordering of this content in the word message is flexible.

EXCEPTION: Parts or all of the word message may be omitted, depending on such factors as whether the message can be inferred from a symbol, other text messages, user training, or the context in which the safety label is used.

10.3 The word message on a safety label should be concise and readily understood.

10.4 Messages on the same safety label that warn of different hazards should be formatted, when feasible, to prevent them from visually blending together. Bullets, lines, and extra line spacing are examples of such formatting.

10.5 When detailed instructions, precautions, or consequences would require a lengthy message, the message may alternatively refer the reader to another source for additional safety information. Examples of such sources include safety instructions, operation and maintenance manuals, service manuals, operating procedures, and safety bulletins.

11 Lettering

11.1 Signal words should be in the lettering style shown in Appendix 2.

11.2 For languages using the "Roman" alphabet, such as the official languages used in the Americas and in much of the European Union, the lettering should be a combination of upper- and lowercase sans serif letters. Uppercase only lettering may be used for short messages or for emphasis of individual words.

NOTE 17: Preferred Roman sans serif lettering styles include those named Arial, Arial Bold, Folio Medium, Franklin Gothic, Helvetica, Helvetica Bold, and Univers.

11.3 Lettering should be of a size that enables a person with normal vision, including corrected vision, to read the safety label at a safe viewing distance from the hazard.

NOTE 18: Related Information 1 provides an example of a method of calculating minimum letter heights.

NOTE 19: The proportions and spacing of individual letters also affect readability.

12 Colors

12.1 *Color Specifications* — Colors should conform to those colors specified in ISO 3864.

NOTE 20: For purposes of reproduction, the closest PANTONE® color match for opaque safety colors is:

- Red – PANTONE 485
- Orange – PANTONE 152
- Yellow – PANTONE 109
- Blue – PANTONE 2945

(PANTONE® is a registered trademark of Pantone, Inc.).

NOTE 21: Perceived color will be different under colored light (e.g., "yellow room") conditions. The committee knows of no current technical solution.

12.2 *Symbol and Surround Shape Color Specifications* — See section 9.10 for symbol and surround shape color criteria.

12.3 *Signal Word Panel* — The three signal words should be colored as follows (see Figure 5):

12.3.1 The word DANGER should be in white letters on a red background.

12.3.2 The word WARNING should be in black letters on an orange background.

12.3.3 The word CAUTION should be in black letters on a yellow background.

12.3.4 *Safety Alert Symbol* — The solid triangle portion should be the same color as the signal word lettering, and the exclamation mark portion should be the same color as the signal word panel background.

12.4 *Optional Use of Red* — The color red may be used in a symbol to indicate heat or fire.

13 Placement

13.1 *Location of Safety Labels* — Safety labels should be permanently attached to the equipment and, when possible, located near the hazard.

13.2 *Safe Viewing Distance* — Safety labels should be placed to allow the viewer enough time to:

- be informed by the safety label; and
- have sufficient time to avoid the hazard or take appropriate evasive action to reduce the potential harm from the hazard.

13.3 *Placement* — Safety labels should be placed so that they are legible, non-distracting, and not hazardous in themselves.

13.4 *Inadvertent Removal, Visual Blockage* — Safety labels should not be located in areas where they may be removed by the motion of equipment or rendered ineffective by situational conditions.

13.4.1 Safety labels should not be blocked from view by moveable panels such as doors, windows, and racks where this would limit the effectiveness of the blocked label.

14 Translation

14.1 This guideline is not intended to suggest that safety labels be written in or translated into any particular language.

NOTE 22: National laws may require that safety label information be provided in one or more particular languages.

15 Related Documents

15.1 *ANSI Standards*[1]

ANSI C95.2 — Radio-Frequency Warning Symbol

ANSI N2.1 — Radiation Symbol

ANSI N12.1 — Fissile Material Symbol

ANSI Z136.1 — Safe Use of Lasers

ANSI Z535.2 — Environmental and Facility Safety Signs

ANSI Z535.5 — Accident Prevention Tags

15.2 *NEMA Standard*[4]

NEMA 77 — Standards for Warning Labels

15.3 *NFPA Standards*[5]

NFPA 70 — National Electrical Code

NFPA 178 — Standard Symbols for Fire Fighting Operations

15.4 *NIST Documents*[6]

NBSIR 80-2003 — Workplace Safety Symbols

NBSIR 80-2088 — The Assessment of Safety Symbol Understandability by Different Testing Methods

NBSIR 82-2485 — Symbols for Industrial Safety

15.5 *United States of America Government Document*[7]

21 CFR Part 1040 — Performance Standards for Light-Emitting Products

15.6 *IEC Standards*[8]

IEC 60825-1 — Safety of Laser Products - Part 1: Equipment Classification, Requirements and User's Guide

15.7 *ISO Standards*[9]

ISO 9186 — Comprehension Testing of Graphical Symbols

4 National Electrical Manufacturers Association, 2101 L Street, N.W., #300, Washington, D.C. 20037, USA, http://www.nema.org

5 National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, USA, http://www.nfpa.org

6 U.S. Department of Commerce, National Institute of Standards and Technology, Center for Building Technology, Washington, D.C., USA, http://www.nist.gov/public_affairs/faqs/qpubs.htm

7 U.S. Government Printing Office, Washington, D.C., USA, http://bookstore.gpo.gov/prf/ordinfo.html

8 International Electrotechnical Commission, 1 rue de Varembe, Geneva, Switzerland, http://www.iec.ch

9 International Organization for Standardization, C.P.56, CH-1211 Geneva 20, Switzerland, http://www.iso.ch

APPENDIX 1
SAFETY SYMBOLS

NOTE: The material in this appendix is an official part of SEMI S1 and was approved by full letter ballot procedures on April 30, 2001 by the North American Regional Standards Committee.

This appendix illustrates symbols used on safety labels for hazards commonly found in the semiconductor manufacturing industry. Additional symbols may need to be developed for other hazards (see *ANSI Z535.3-1998 Informative Annex A* for an example of symbol development guidelines).

To determine what symbol should be used on a safety label, it is first necessary to determine what message is to be communicated. Symbols may enhance a safety label's meaning and may be useful to communicate across many languages.

When appropriate, the following symbols should be used.

NOTE A1-1: Some symbols (e.g., laser, biohazard, and radiation) are required by law or regulation in some jurisictions.

Table A1-1 Hazard Identification Symbols

#	*Referent*	*Source*	*Symbol*	*Description*
1	**Flammable Material**	**IEC 61310**		Flames
2	**Explosive Material, Explosion Hazard**	**IEC 61310**		Object exploding
3	**Danger: Electricity, Electrical Hazard**	**IEC 61310, ISO 3864**		Lightning bolt
4	**Corrosive Material, Corrosion**	**IEC 61310**		Test tube, hand, drops
5	**Toxic Material, Poison**	**IEC 61310**		Skull and crossbones
6	**Slip Hazard**	**ANSI Z535.3**		Person falling on surface
7	**Trip Hazard**	**ANSI Z535.3**		Person tripping over object

#	*Referent*	*Source*	*Symbol*	*Description*
8	**Drop,** **Fall Hazard**	**IEC 61310**		Person falling
9	**Lifting Hazard,** **Heavy Object**			Person bent over weight, strain flare above back
10	**Tipover**			Person with object tipping over and arrow
11	**Entanglement Hazard** **(hand in gears)**	**ANSI Z535.3**		Hand in gears Note: other body parts or orientations may be substituted as necessary
12	**Pinch point** **(hand in rollers)**	**ANSI Z535.4**		Hand in rollers Note: other body parts or orientations may be substituted as necessary
13	**Cut/Sever** **(hand and sharp object)**	**ANSI Z535.3**		Hand and sharp object Note: other body parts or orientations may be substituted as necessary
14	**Crush Hazard**			Hand between two surfaces, arrow Note: other body parts or orientations may be substituted as necessary
15	**Heat,** **Hot Surface**	**ISO 3864, ISO 7000**		Heat waves
16	**Cold**			Snow flake
17	**Strong Magnetic Field**			Horseshoe magnet

#	*Referent*	*Source*	*Symbol*	*Description*
18	**Radioactive Material, Radiation Hazard**	**IEC 61310**		Abstract three blades
19	**Laser Beam**	**IEC 60825-1**		Radiating sunburst, line
20	**Biological Risk, Biohazard**	**IEC 61310**		Abstraction
21	**Non-Ionizing Radiation, Radio Frequency**	**IEC 61310**		Abstract radiation transmitter
22	**UV Light Hazard**			The letters “UV” inside a sunburst
23	**Inhalation Hazard (e.g., toxic gas, asphyxiation hazard)**			Human figure breathing in particles
24	**General Warning (should be supplemented with words)**	**ISO 3864**		Exclamation point (See Figure 6 for an example of a safety label using the General Warning symbol)

Table A1-2 Mandatory Action Symbols

#	*Referent*	*Source*	*Symbol*	*Description*
1	**Wear Eye Protection**	**IEC 61310**		Head with eyeglasses
2	**Wear Ear Protection**	**IEC 61310**		Head with ear protection

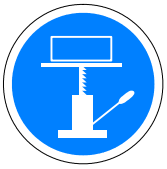
#	*Referent*	*Source*	*Symbol*	*Description*
3	**Wear Head Protection**	**IEC 61310**		Head with hard hat
4	**Wear Respiratory Protection**	**IEC 61310**		Head with respirator
5	**Wear Safety Boots**	**IEC 61310**		Shoes (one with metal plate shown)
6	**Wear Safety Gloves**	**IEC 61310**		Two gloves
7	**Lift with Mechanical Assistance**			Mechanical jack supporting object
8	**Lift with Two Persons**			Two persons grasping object
9	**Read Manual**			Person reading open book
10	**Lock Out in De-Energized State**			ON and OFF symbols next to locked clasp

Table A1-3 Prohibition Symbols

#	*Referent*	*Source*	*Symbol*	*Description*
1	**No Smoking**	**ANSI Z535.3**		Lighted cigarette
2	**No Open Flame**	**IEC 61310**		Lighted match
3	**No Access For Unauthorized Persons**	**IEC 61310**		Person shouting with outstretched hand
4	**No Portable Transmitters**			Wireless telephone
5	**No Pacemakers**			Ball and line attached to heart
6	**General Prohibited Action (should be supplemented with words)**	**ISO 3864**		Prohibition surround shape

APPENDIX 2
TRANSLATIONS OF SIGNAL WORDS

NOTE: The material in this appendix is an official part of SEMI S1 and was approved by full letter ballot procedures on April 30, 2001 by the North American Regional Standards Committee.

Translation of the signal words and word message are optional considerations. If the signal word of a safety label is to be translated, the following translations should be used.

Language	DANGER	WARNING	CAUTION
Chinese:	危険	警告	注意
Danish:	FARE	ADVARSEL	FORSIGTIG
Dutch:	GEVAAR	WAARSCHUWING	VOORZICHTIG
English:	DANGER	WARNING	CAUTION
Finnish	VAARA	VAROITUS	HUOMIO
French:	DANGER	AVERTISSEMENT	ATTENTION
German:	GEFAHR	WARNUNG	VORSICHT
Greek:	ΚΙΝΔΥΝΟΣ	ΠΡΟΕΙΔΟΠΟΙΗΑΣΗ	ΠΡΟΣΟΧΗ
Italian:	PERICOLO	AVVERTENZA	ATTENZIONE
Japanese:	危険	警告	注意
Korean:	위험	경고	주의
Norwegian:	FARE	ADVARSEL	FORSIKTIG
Portuguese:	PERIGRO	ATENÇÃO	CUIDADO
Russian:	ОПАСНО	ОСТОРОЖНО	ВНИМАНИЕ
Spanish:	PELIGRO	ADVERTENCIA	ATENCIÓN
Swedish:	FARA	VARNING	OBSERVERA
Turkish:	TEHLİKE	UYARI	DİKKAT

NOTICE:

Paragraphs entitled “NOTE” are not an official part of this safety guideline and are not intended to modify or supersede the official safety guideline. These have been supplied by the committee to enhance the usage of the safety guideline.

SEMI makes no warranties or representations as to the suitability of the guidelines set forth herein for any particular application. The determination of the suitability of the guideline is solely the responsibility of the user. Users are cautioned to refer to manufacturer’s instructions, product labels, product data sheets, and other relevant literature respecting any materials or equipment mentioned herein. These guidelines are subject to change without notice.

The user’s attention is called to the possibility that compliance with this guideline may require use of copyrighted material or of an invention covered by patent rights. By publication of this guideline, SEMI takes no position respecting the validity of any patent rights or copyrights asserted in connection with any item mentioned in this guideline. Users of this guideline are expressly advised that determination of any such patent rights or copyrights, and the risk of infringement of such rights, are entirely their own responsibility.

RELATED INFORMATION 1
MINIMUM LETTER HEIGHT CALCULATIONS

NOTE: This related information is not an official part of SEMI S1 and is not intended to modify or supersede the official guideline. It has been derived from the informative Annex B of ANSI Z535.4-1998. Publication is authorized by vote of the responsible committee. Determination of the suitability of this material is solely the responsibility of the user.

R1-1 A common concern when designing safety labels is determining the minimum letter height of text. This Related Information describes one method that may be used to determine a minimum letter height.

Table R1-1 Examples of Word Message Uppercase Letter Heights at Various Viewing Distances

Viewing Distance	***Minimum** Letter Height for FAVORABLE Reading Conditions*	***Recommended** Letter Height for FAVORABLE Reading Conditions*	***Recommended** Letter Height for UNFAVORABLE Reading Conditions*
300 mm (12 in.) or less*	2 mm (0.08 in)	2 mm (0.08 in)	2 mm (0.08 in)
600 mm (24 in.)	2.5 mm (0.10 in)	4 mm (0.16 in)	4 mm (0.16 in)
900 mm (35 in.)	3 mm (0.12 in)	4.75 mm (0.19 in)	6 mm (0.24 in)
1.2 m (47 in.)	3.5 mm (0.14 in)	5.5 mm (0.22 in)	8 mm (0.31 in)
1.5 m (59 in.)	4 mm (0.16 in)	6.25 mm (0.25 in)	10 mm (0.39 in)
1.8 m (71 in.)	4.5 mm (0.18 in)	7 mm (0.28 in)	12 mm (0.47 in)
2.1 m (83 in.)	5 mm (0.20 in)	7.75 mm (0.31 in)	14 mm (0.55 in)
2.4 m (94 in.)	5.5 mm (0.22 in)	8.5 mm (0.33 in)	16 mm (0.63 in)

* 2 mm (0.079 in.) is the suggested minimum type size for use on safety labels.

Calculations for **Recommended** Letter Heights (in mm) for FAVORABLE Reading Conditions:

600 mm or less: (viewing distance in mm) / 150

>600 mm to 6 m: [(viewing distance in mm - 600) x .0025] + 4

Calculation for **Recommended** Letter Heights for UNFAVORABLE Reading Conditions (all distances):

(viewing distance) / 150

NOTICE:

Paragraphs entitled “NOTE” are not an official part of this safety guideline and are not intended to modify or supersede the official safety guideline. These have been supplied by the committee to enhance the usage of the safety guideline.

SEMI makes no warranties or representations as to the suitability of the guidelines set forth herein for any particular application. The determination of the suitability of the guideline is solely the responsibility of the user. Users are cautioned to refer to manufacturer’s instructions, product labels, product data sheets, and other relevant literature respecting any materials or equipment mentioned herein. These guidelines are subject to change without notice.

The user’s attention is called to the possibility that compliance with this guideline may require use of copyrighted material or of an invention covered by patent rights. By publication of this guideline, SEMI takes no position respecting the validity of any patent rights or copyrights asserted in connection with any item mentioned in this guideline. Users of this guideline are expressly advised that determination of any such patent rights or copyrights, and the risk of infringement of such rights, are entirely their own responsibility.