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Product Warning Labels

The end user of a product must be provided with adequate warnings and instructions in order to avoid unsafe use of the product. The preferred treatment of product hazards is to design the product in such a way that these hazards are eliminated. When the hazards cannot be eliminated, the manufacturer of the product has a duty to warn the user of the remaining hazards. For some products a warning label affixed to the product is all that is needed whereas other products require extensive instruction manuals together with several illustrations and warnings. The manufacturer may also need to provide training for his clients' personnel to ensure safe use of the product. This article deals only with the product warning labels themselves.

Warning Labels should conform to ANSI Z535.4 - *Product Safety Signs and Labels*. This standard requires each product safety sign or label communicate the following critical pieces of information:

- The type of hazard encountered.
- The seriousness of the hazard.
- How to avoid the hazard.
- The consequences of not avoiding the hazard.

FORMAT

The basic ANSI Z535.4 sign format consists of two panels: a signal word panel and a message panel. An optional third panel may be used if a symbol is desired to communicate hazard information. The panels can be arranged in various vertical or horizontal arrangements.

1. Signal Word Panel

The signal word panel calls attention to the label and communicates the level of hazard seriousness. The panel will contain one of the following signal words: DANGER, WARNING, and CAUTION. The standard defines these words to mean:

- DANGER indicates that an imminently hazardous situation exists, which, if not avoided, will result in death or serious injury.

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- **WARNING** indicates a potentially hazardous situation that could cause death or serious injury.
- **CAUTION** indicates a potentially hazardous situation that could result in minor or moderate injury. It may also be used to alert against unsafe practices.

The French equivalents of the signal words are as follows: *DANGER*, *AVERTISSEMENT*, and *ATTENTION*.

The signal word panel may contain a safety alert symbol in addition to the signal word. This symbol consists of an equilateral triangle surrounding an exclamation point. It is used to indicate that a potential personal injury hazard exists. It will appear on all **DANGER** or **WARNING** signs, and on most **CAUTION** signs. When the symbol is used as part of the label, it should immediately precede the signal word and be at least the same size as the signal word.

The colour of the signal word panel will vary depending upon the signal word used and the characteristics of the product being labelled. In general, the word **DANGER** should be in white letters on a safety red background, the word **WARNING** should be in black letters on a safety orange background, and the word **CAUTION** should be in black letters on a safety yellow background. The exclamation point of the safety alert symbol should be the same colour as the signal word panel background.

2. Message Panel

The message panel contains word messages that identify the type of hazard, indicate how to avoid the hazard, and advise on the probable consequences of not avoiding the hazard. The text of the word message and the order of the information are left to the discretion of the labeller. The basic requirement is that the message be concise and readily understood. If detailed instructions are required, the standard allows the labeller to refer to another source, such as a manual or safety instruction label, for this information.

The message panel should have either black lettering on white background or white lettering on black background.

3. Symbol Panel

Symbols may be added to the basic label to clarify, supplement, or substitute for a portion of or the entire word message. Presenting safety information in this manner can often communicate important hazard information more quickly than text. Also, it is useful for communicating hazard information to those not literate in English.

The symbol panel should have a black pictorial on white background unless other colours may be necessary for emphasis or where only two colours are used.

HAZARD CLASSIFICATION

The standard establishes a set of conditions for determining which signal word should be used. If the product is capable of causing a serious injury or death if the sign is ignored, then the product may carry either a **DANGER** or **WARNING** signal word; otherwise it would carry the **CAUTION** signal word. Products capable of causing serious injury or death must then be evaluated to determine the likelihood that the injury will occur. If the injury will occur, then **DANGER** is the appropriate signal word. If the injury could occur, then **WARNING** is more appropriate. The designer must also determine whether a personal injury may occur or whether only property damage would result. If personal injury may occur, the safety alert symbol should be used.

Determining whether an injury is serious or likely is frequently a subjective decision. This cannot be avoided by simply placing a DANGER label on all products. Over-warning of a hazard is not appropriate because it dilutes the meaning of the signal word for other situations. Also, under-warning is inappropriate because the label provides inadequate information to the user about the hazards of the product. Persons determining hazard classification should base their decisions on the results of product hazard assessments and should document the rationale for their decision.

WORD MESSAGES

The ANSI standard does not provide standard hazard warning messages that can be used by a label designer. Many factors affect the effectiveness of a product warning label, including the degree of knowledge of the intended user, and generic hazard statements may not adequately warn of the hazards in a particular circumstance.

There has been a large amount of research performed to determine methods for effectively communicating hazard information on product safety labels. Although there is no one formula that will work in all situations, it is generally accepted that safety warnings should be:

- Written in active voice
- Accurate
- Concise
- Direct
- Specific
- Written in wording which may be understood by the target audience

In addition, steps can be taken to increase the readability of the text by choice of type font, size, and spacing; avoiding the use of centered or justified text; selectively using upper case to provide emphasis; and separating multiple warning statements.

TESTING

Draft labels should be tested to determine whether the label is effective. Proposed designs should be shown to groups of likely users to determine whether the user can successfully identify the product hazard, explain what they must do to avoid the hazard, and advise on the probable consequences of the not avoiding the hazard. Responses should also be evaluated to determine whether persons are identifying the wrong hazard. An 85 percent correct response level is the typical benchmark used to determine minimum acceptability.

REVISION

It is good practice to review product safety signs on a regular basis. At this time, the hazard classification should be assessed to determine whether the signal word is still appropriate and the message text assessed to determine whether the sign identifies known hazards and provides avoidance and consequence information. The label should be changed if necessary and retested to validate the new label.