



On Your Mark is a monthly column written by Geoffrey Peckham, CEO of Clarion Safety Systems. Mr. Peckham is chair of both the ANSI Z535 Committee for Safety Signs and Colors and the U.S. Technical Advisory Group to ISO Technical Committee 145 - Graphical Symbols, and member of the U.S. Technical Advisory Group to ISO Project Committee 283 - Occupational Health and Safety Management Systems. Over the past two decades, he has played a pivotal role in the harmonization of U.S. and international standards dealing with safety signs, colors, formats and symbols. This article is courtesy of Clarion Safety Systems © 2014. All rights reserved.

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## Designing Effective Product Safety Labels: How to Convey Risk Severity Levels

BY GEOFFREY PECKHAM

Designing product safety labels that help to prevent injuries and save lives is a multi-faceted task. This month, we'll focus on another key element: communicating risk using signal words.

In this year's series of *On Your Mark* columns, I've explored fundamental topics related to effective product safety labeling, including overall best practices, symbols and content. This brings us to our final topic: risk severity levels. If you're making a product that has one or more risks associated with it at any point in its lifecycle, you need to either eliminate those risks, guard them or communicate them so people can effectively avoid them. Visually communicating degrees of risk on your product safety labels can be a complex task. But here, once again, it's standards to the rescue!

### SIGNAL WORDS – ACCORDING TO ANSI AND ISO

When it comes to hazard alerting labels – labels that communicate potential personal injury hazards and how to avoid them – the color-coded signal

words "DANGER," "WARNING" and "CAUTION" are used identically by the ANSI Z535.4 and ISO 3864-2 product safety label standards to indicate varying degrees or levels of risk severity (see Figure 1).

Both of these standards carefully define the use of these signal words as follows:

- DANGER is used to indicate a hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.
- WARNING is used to indicate a hazardous situation which, if not

avoided, could result in death or serious injury.

- CAUTION is used to indicate a hazardous situation which, if not avoided, could result in minor or moderate injury.



Figure 1: ANSI Z535 signal word panels for hazard alerting labels

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There are two additional signal words in the ANSI Z535 standards. One is "NOTICE." It's used to address safety-related practices not related to physical injury (for example, maintenance information that, if not followed, might result in equipment damage). The second is "SAFETY INSTRUCTIONS." This signal word can actually be changed; you can substitute a more specific name for an instructional message, like "SAFE BOILER SHUT-DOWN PROCEDURE." This category of signal word is used to communicate a set of detailed safety-related instructions or procedures. The main idea behind the relatively new "SAFETY INSTRUCTIONS" signal word (2011 ANSI Z535 edition) is that separating out safety instruction information will help keep your "DANGER," "WARNING" and "CAUTION" labels messages short and concise so they can be more easily read.

As you can see by the definitions, each of the three hazard alerting signal words communicates a different level of risk – with risk being defined as a combination of **severity** of injury and **probability** of the accident or injury occurring if the sign's message is ignored. The ANSI Z535 and ISO 3864-2 system of using "DANGER," "WARNING" and "CAUTION" signal words to convey various levels of risk matches today's best practice methodologies for risk assessment and risk reduction.

## YOUR FOUNDATION: RISK ASSESSMENT

In order to choose the right signal word, your first step – your foundation – is to perform a risk assessment. At its most basic level, risk assessment involves considering the probability and severity of outcomes that can result from a hazardous situation, and then

considering various strategies to either eliminate or reduce the risk.

The risk assessment scoring matrix shown in Figure 2 is one way to rank a risk's severity as either high, medium or low. Defining the **terms** of the grid – defining the likelihood of the accident happening and the severity of harm or physical injury – is not always a straightforward task. You must ask: What is the probability of a person being injured or killed by this hazard? What is the worst credible injury that will or could result if an accident occurs? What, in your opinion, distinguishes a serious injury from a minor or moderate injury? These are questions and decisions that your company needs to discuss and define.

As you go through the risk assessment process, I highly suggest that you make use of the recent ANSI and ISO standards written on this topic,



Risk Assessment Scoring Matrix				
(Circle One)	Severity of Injury or Illness Consequence			
Likelihood	Negligible	Marginal	Critical	Catastrophic
Frequent →	Medium	Serious	High	High
Probable →	Medium	Serious	High	High
Occasional →	Low	Medium	Serious	High
Remote →	Low	Medium	Medium	Serious
Improbable →	Low	Medium	Medium	Medium

Source: MILSTD 882

Figure 2: Risk assessment grid

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as they can be immensely helpful. ANSI Z10, ISO 31000 and ISO 31010 have annexes or appendixes that can serve as important guides for your company when it comes to defining the “likelihood” and “severity” terms related to your products’ potential risks. I also suggest that you meet with your insurance carrier and legal counsel to utilize their expertise and industry experience related to risk reduction, from both a safety and liability perspective.

## CHOOSING YOUR SIGNAL WORD

Once the risk presented by your product’s potentially hazardous situation has been determined and

you have chosen to use a safety label as a means to lessen the risk, then the task becomes one of choosing the right signal word to convey the severity of risk involved. When you use a risk assessment that defines the likelihood and severity of injury related to each one of your product’s potential hazards, you will find it’s a relatively easy task to choose the right ANSI Z535/ISO 3864-2 signal word.

Annex E in the *ANSI Z535.4 Standard for Product Safety Signs and Labels* clearly lays out the decision tree for choosing the right signal word based on your risk assessment’s decisions concerning a particular hazard’s likelihood and degree of potential injury. See the illustration in Figure 3.

It should be noted that the level of content (meaning the amount of information that needs to be conveyed on a product safety label, including the decision to use signal words) can vary depending on many factors. There is no single right way to do things. Many factors must be considered when designing product safety labels, including the characteristics of your intended audience and the markets where your products are sold. Added to these two overarching considerations are the specific details related to the complexity of your industry, the complexity of your product and the hazards associated with its entire lifecycle – from installation, use and maintenance to disassembly and disposal. Combine all of these factors and you have the ingredients needed to design effective product safety labels. The use of signal words to communicate risk is one safety label component that can be used to accomplish the job of better protecting people from harm.

I hope this series of articles on symbols, content and risk severity levels – the core elements of today’s best practices for product safety labels – has been helpful. I look forward to continuing these columns in the coming year by honing in on additional topics related to safety labeling to give you the guidance you need to achieve the goal: effective hazard communication that helps prevent accidents and save lives from tragedy. **IN**

*For more information on the product risk assessment process and communicating risk through warnings, watch a short, educational video produced by Clarion Safety Systems.*



Figure 3: ANSI Z535.4 Annex E signal word selection process illustration

