MILLER ENGINEERING, INC.

EXPERTISE AREA:

*Designing a Warning Label

*ANSI Z535 Standards

*Product Information Development

*Determining Warnings Adequacy

Main Office: 2392 Fuller Ct. Ann Arbor, MI 48105

<u>Principals:</u> James M. Miller, PE, PhD Mark R. Lehto, EIT, PhD

Managing Engineer: Bradley Cook, PE, BSME

Staff Engineers: Katie Lyons, PE, BSChE Kelley Mullins, MSE David N. Lehto, BSEAg

Affiliates:

- Timothy Trokey, PE - Structural Engineer
- Warren Wagner, Ph.D.
 Materials Engineer
- Toll Free: 888-206-4394

Main: 734-662-6822 Fax: 734-747-9712

E-mail: miller@ millerengineering.com

FIP

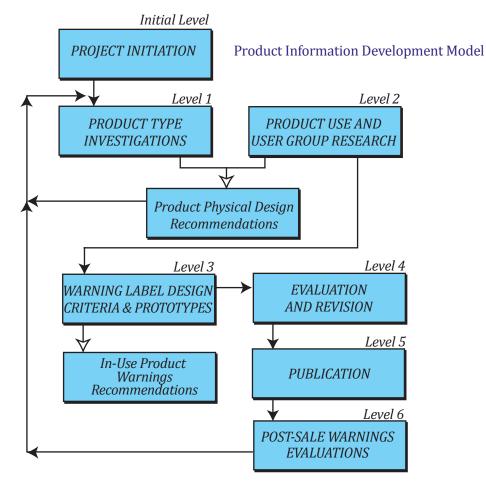
Fuller Technical Publishing Ann Arbor, MI 734-669-9953

TECHNICAL BULLETIN: How to Design a Warning Label

Designing Warning Labels

A number of models & numerous publications have been developed by Dr. Miller and Dr. Lehto to describe an orderly and reasonably rigorous methodology for researching, designing, & testing warnings & other product information. Several of these appear in the books written & edited by current & recent Miller Engineering staff. The first model is the Linear Sequence Determining Warnings Adequacy (reverse). It comes from our first Warnings book:

Lehto, M.R. and Miller, J.M. (1986). Warnings: Volume 1: Fundamentals, Design and Evaluation Methodologies. Ann Arbor, MI: Fuller Technical Publishing. A second model, which can be chosen, was developed & first presented at a Human Factors & Ergonomics meeting by Dr. Miller and is called "Product Information Development Model" (abbreviated, below). Lehto, Mark R. & James R. Buck. (2008). Introduction to Human Factors and Ergonomics for Engineers. New York: NY. Lawrence Erlbaum Associates.



www.millerengineering.com

Page 2

ANSI Z535.6 - Product Safety Information Guidelines

The ANSI Z535 Standards series has become a set of systematic guidelines for designing any type of wordbased hazard communication, whether signs, labels, tags, tapes, manuals, or instructions. Miller Engineering has been analyzing &creating warning labels according to these standards since their inception in 1998.

The most recent Standard in the series, ANSI Z535.6: "American National Standard for Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials," was first published in 2006.

Miller Engineering has since developed a protocol for analyzing product information based on ANSI Z535.6, for which numerous review have been done on products ranging from relief valves to pressure washers to self defense products.

Figure 3.2 From Lehto/Miller Warnings I The Linear Sequence **Determining Warnings** Adequacy

> **Exposure** to Warning Stimulus

Attend to **Stimulus**

Active Processing

Comprehend and Agree with Message

Store and Agree with Message

Select Appropriate Response

Perform Response

WARNING

Improper use of ATVs can cause SEVERE INJURY OR DEATH.



NEVER USF





ALWAYS USE AN APPROVED ON PUBLIC HELMET AND ROADS **PROTECTIVE GEAR**

NEVER CARRY PASSENGERS

NEVER USE WITH DRUGS OR ALCOHOL

NEVER operate:

- · without proper training or instruction
- · at speeds too fast for your skills or the conditions
- · on public roads a collision can occur with another vehicle
- · with a passenger passengers affect balance and stering and increase risk of losing control

- · use proper riding techniques to avoid vehicle overturns on hills and rough terrain and in turns.
- avoid paved surfaces pavement may seriously affect handling and control

LOCATE AND READ OWNER'S MANUAL. FOLLOW ALL INSTRUCTIONS AND WARNINGS. Excavator Label: This label (below) was designed for use on an excavator. The icons were selected from or based on hazard description pictorials found in Annex A of ISO 9244:1995(E): Earth Moving Machinery - Safety Signs & Hazard Pictorials -General Principles.

ATV Label: This label (left) appears on All Terrain Vehicles

Consumer Product Safety

Commission (CPSC).

sold in the USA in the past few

years. It was designed & tested at Miller Engineering through the cooperation of Honda, Yamaha, Polaris, Suzuki, & the

AWARNING

Entanglement and Dismemberment Hazard

Keep hands and feet away from track when machine is in motion.

