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Precautionary Labeling for Arc-Welding and Cutting Products

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Foreword

This version of the NEMA AW 10002 standard replaces the one previously designated as NEMA EW 6. This is consistent with NEMA's new standard designation scheme of alphanumerical designations (two letters representing section, followed by a five-digit number).

This technical publication is intended to provide a basis of common understanding within the electric welding and cutting industry regarding precautionary labeling of arc welding and cutting products. To this end, this publication provides precautionary labeling guidelines in order to promote uniformity of manufacturers' labeling practices so that the message is more easily recognized and understood by the user. In welding and cutting, as in most jobs, exposure to certain hazards occurs. Users must be alert to these hazards using their experience, training, education, and common sense. Precautionary labeling is not intended for the training of operators, but rather as a means to quickly remind and alert them of the basic product hazards each time the equipment is used.

This publication describes three alternative precautionary labeling methods for arc welding and plasma arc cutting products: (1) text-based precautionary labeling; (2) a list of standardized symbols for optional use on precautionary labels or instructions, together with information regarding the color and size of these symbols; and (3) wordless labels for optional use, along with definitions for each of the symbol blocks.

This version of NEMA AW 10002 introduces the use of wordless precautionary labels. Wordless labels are an extension of the symbols introduced in the previous version of EW 6. These labels have been developed in recognition of an increasingly diverse international welding audience. It cannot be assumed that this audience can read the language used in a label. Symbols are becoming more commonplace in everyday life, from computers to highway signs to toys for children. Wordless (symbol-only) labels avoid the need to be able to read the words on the label. Language and literacy level become non-factors in communication.

To validate the wordless precautionary labels, a questionnaire was sent to approximately 10,000 experienced and inexperienced welders as well as other individuals and organizations in the U.S. and abroad having an interest in arc welding and cutting products. The questionnaire was designed to comply with ANSI Z535.3 survey methods to test user comprehension. The results were received and tabulated by NEMA. Although a minimum comprehension rate of 85% was established by ANSI Z535.3 for the acceptance of a symbol, nearly all symbols achieved rates in the 95%-100% range. Where comprehension rates were lower, the symbols were appropriately modified and the revised symbols were retested and validated.

User needs were considered throughout the development of this publication. As revisions are made to this document, NEMA intends to continue to involve users in these changes through surveys or other means.

Suggestions for the improvement of this standard are welcome and should be submitted to the Secretariat of Accredited Standards Committee W1 as follows:

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This standard was processed and approved by the Accredited Standards Committee W1. Committee approval does not necessarily imply that all committee members voted for its approval. At the time this standard was published, Accredited Standards Committee W1 consisted of the following members:

Greg Corban, Chair
Mike Madsen, Vice-Chair
Khaled Masri, Secretary

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Andrew	Davis	American Welding Society	Alt. Voting	ANSI - GEN INTEREST
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Michael	Madsen	Miller Electric Mfg. LLC An ITW Welding Company	Voting	ANSI - PRODUCER
Joe	Krueger	Miller Electric Mfg. LLC An ITW Welding Company	Alt. Voting	ANSI - PRODUCER
Christopher	Doty	UL LLC	Voting	ANSI - USER

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Section 1
GENERAL

1.1 Scope

This publication specifies the wording, format, and symbols for precautionary labeling used on arc welding and cutting products. This publication also includes factors to be considered in deciding whether precautionary labeling is necessary.

1.2 Definition of Precautionary Labeling

Precautionary labeling, as used in this publication, is an informative marking attached to or marked on a product or its package, intended to be read or viewed at close range, which calls attention to the basic hazards and their consequences to persons or property. Precautionary labeling gives information on how such hazards may be avoided and may also list other sources of information for more complete details.

1.3 References

The following standards are available from the organizations shown. It is recommended that the latest edition be requested when ordering these standards.

American National Standards Institute
25 West 43rd Street
New York, NY 10036

ANSI Z129.1 *Hazardous Industrial Chemicals - Precautionary Labeling*

American Welding Society
8669 NW 36th Street, # 130
Miami, FL 33166-6672

ANSI Z49.1 *Safety in Welding, Cutting and Allied Processes*

International Electrotechnical Commission
3, rue de Varembé
Geneva, Switzerland

IEC 60417 *Graphical symbols for use on equipment*

International Organization for Standardization
CP 401 - 1214 Vernier
Geneva, Switzerland

ISO 7000 *Graphical symbols for use on equipment*

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EW 1 *Graphic Symbols for Arc Welding and Cutting Apparatus*
ANSI Z535.1 *Safety Colors*
ANSI Z535.2 *Environmental and Facility Safety Signs*
ANSI Z535.3 *Criteria for Safety Symbols*
ANSI Z535.4 *Product Safety Signs and Labels*

ANSI Z535.5	*Safety Tags and Barricade Tapes (for Temporary Hazards)*
ANSI Z535.6	*Product Safety Information in Product Manuals, Instructions, and Other Collateral Materials*
ANSI/NEMA/IEC 60974-1	*Arc Welding Equipment – Part 1: Welding Power Sources*

Section 2
GUIDELINES FOR PRECAUTIONARY LABELS

2.1 Types of Labels

Precautionary labels for use in arc welding and cutting may be completely text-based, a combination of text and symbols, or completely composed of symbols (i.e., wordless). When using symbols in conjunction with text, the symbols shall be equivalent to those shown in Table 4-1. When using wordless labels, the labels shall be equivalent to those shown in Section 5.

2.2 General Requirements

2.2.1 Uniformity

The effectiveness of precautionary labeling can be improved by uniformity of wording and symbols. A chief consideration is understandability by the users. Therefore, any wording or symbols used shall be as brief and clear as possible.

2.2.2 Labeling

The labeling shall be highly visible and in a conspicuous place on the product or its package. Label placement shall be chosen considering the available space on a product and visibility by the operator during normal use. If such space is not available, a reference note may appear in a conspicuous place identifying the location of the precautionary labeling.

Precautionary labeling shall meet existing durability requirements for labels (see ANSI/NEMA/IEC 60974-1).

The size and legibility of the labeling shall be such that it is easily seen, read, and understood by users with normal vision before they are likely to encounter the hazards.

> Note: If words are used on a label, translation into other languages may be required by some countries.

2.3 Text-Based Precautionary Labels

The elements to be considered in precautionary labeling and their suggested order of listing is as follows:

a. safety alert symbol,
b. color (red, orange, yellow);
c. signal word (i.e., **DANGER**, **WARNING**, **CAUTION**);
d. statements of hazards and their consequences;
e. precautionary information;
f. additional information.

Precautionary labeling for a given product may not require all of the above elements. The included elements depend upon the product, the process, and the hazards. However, the labeling shall alert and remind the user of the basic hazards.

2.4 Precautionary Label Elements

2.4.1 Safety Alert Symbol

To call attention to the hazard information, the safety alert symbol (see ANSI Z535.4, Annex A) shall be used in the heading of all precautionary labels in combination with the: