

NEMA EW 6-2006

Guidelines for Precautionary Labeling for Arc-Welding and Cutting Products



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Guidelines for Precautionary Labeling of Arc-Welding and Cutting Products

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FOREWORD

In arc welding and cutting, as in other jobs, there is a risk of exposure to certain hazards. Manufacturers and suppliers of arc welding and cutting products need to determine these hazards and create appropriate precautionary labels that quickly remind and alert product users of hazards each time the product is used. In addition to precautionary labels, product users must also draw upon their experience, training, education, common sense, and other sources of information to recognize and avoid hazards.

This NEMA Standards Publication provides precautionary labeling guidelines for manufacturers and suppliers to assist them in the preparation of their precautionary labels for arc welding and cutting products. Development of this publication first began in 1979, leading to publication in 1983. The purpose of the publication was, and remains, to promote label consistency by providing general principles regarding the design and type of information to be included in precautionary labels for arc welding and cutting products, and the format of those labels. These general principles include the use of the safety alert symbol, signal words, a statement of hazards and their consequences, a statement of precautions to be taken, and any additional information the manufacturer or supplier deemed appropriate. The general principles in the 1983 edition anticipated the work of the ANSI Z535 Committee on Safety Signs and Labels, which also began its work in 1979, but did not publish its standard incorporating similar principles until 1991. Since 1983, new editions of this publication have incorporated developments in the ANSI Z535 series of standards, other domestic and international standards, as well as other informative information.

The 1994 edition took 38 hazard alerting symbols from other standards and authoritative sources, and standardized them for optional use on precautionary labels or instructions. The 38 hazard alerting symbols were selected to show the arc welding process or equipment hazards in the context of the welding environment. Some of the symbols were revised to better illustrate hazard avoidance while retaining clear identification of the basic hazard. The 1994 edition also included color and size recommendations for these symbols, as well as guidelines for the precautionary labeling of plasma arc cutting equipment. The selected symbols were distributed to a broad, sizeable target audience and were tested according to ANSI Z535 methods for comprehension. Although a comprehension rate of 85% was established by ANSI Z535.3, the results of nearly all symbols tested were significantly in excess of that figure, with most in the range of 95-100%. Where comprehension rates were lower, the symbols were modified and the revised symbols were retested and validated.

The 1998 edition introduced wordless labels, which are an extension of the symbols introduced in the 1994 edition. These wordless labels were developed in recognition of an increasingly diverse international welding and cutting audience. It cannot be assumed that this audience can read the language used in a label. Wordless (symbols-only) labels avoid the need to be able to read the words on the label. Where symbols are well recognized, language and literacy level can become non-factors in communication. Wordless label elements were tested and validated in the same manner as the symbols were for the 1994 edition, but with an increased emphasis on the international audience.

This 2006 edition adds examples of multi-language precautionary labels. Further, this edition was prepared taking into account NEMA-acceptable drafting principles for ISO/IEC standards. Lastly, this edition considered both ISO 17846 standard, as well as the latest editions of ISO 1864 and ANSI Z535.

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. Recommendations for any revisions to EW 6 should be submitted to:

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This Standards Publication was approved by the NEMA Arc Welding Section. However, Section approval of this standard does not imply that all Section members voted for its approval or participated in its development. At the time this standard was approved, the Arc Welding Section consisted of the following members:

ESAB Welding & Cutting Products - Florence, SC / Hanover, PA
Hypertherm Inc. - Hanover, NH
The Lincoln Electric Company - Cleveland, OH
Miller Electric Manufacturing Company - Appleton, WI
Systematics - West Chester, PA

The artwork for the graphic symbols and wordless labels (see clauses 6 and 7, respectively) is stored in electronic files at NEMA. Users who wish to obtain this artwork can download these files, which are accessible from the NEMA Arc Welding Section's web page at <http://forums.nema.org:443/~1ew>.

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1 Scope

This publication provides guidelines for the content, format, and placement of text-only, text-and-symbols, symbols-only, and multi-language precautionary labels for arc welding and cutting products.

2 References

The documents listed below are either referred to elsewhere in this publication or can be helpful references in the design of precautionary labels. Each document has a corresponding footnote identifying the publisher and providing document ordering information, where available. It is recommended that the latest edition be requested when ordering.

ANSI 49.1, *Safety in Welding, Cutting and Allied Processes*¹

ANSI Z129.1, *American National Standard for the Precautionary Labeling of Hazardous Industrial Chemicals*²

ANSI Z535.1, *Safety Color Code*²

ANSI Z535.2, *Environment and Facility Safety Signs*²

ANSI Z535.3, *Criteria for Safety Symbols*²

ANSI Z535.4, *Product Safety Signs and Labels*²

ANSI Z535.5, *Safety Tags and Barricade Tapes (for Temporary Hazards)*²

CSA C22.2 No. 60, *Arc Welding Equipment*³

DIN 30 600, *Graphic Symbols (Bildzeichen Übersicht)*⁴

EW 4, *Graphic Symbols for Arc Welding Apparatus*⁵

FMC, *Product Safety Sign and Label System*⁶

IEC 60417, *Graphic symbols for use on equipment — Index, survey and compilation of the single sheets*⁷

IEC 60974-1, *Arc welding equipment — Part 1: Welding power sources*⁷

¹ Published by, and available from, American Welding Society, 550 N.W. LeJeune Road, Miami, FL 33126, phone 1-800-443-2333; also available via free download from www.aws.org

² Published by, and available from, American National Standards Institute, 11 West 42nd Street, New York, NY 10036; website: www.ansi.org; phone: 1-212-642-4980

³ Published by, and available from, Canadian Standards Association, 5060 Spectrum Way, Mississauga, Ontario L4V 5N2, Canada; website: www.csa.ca; phone: 1-800-463-6727

⁴ Published by Deutsche Institut für Normung and available from Beuth Verlag GmbH, Burggrafenstraße 6, Berlin, Germany; website: www.beuth.de

⁵ Published by National Electrical Manufacturers Association and available from Global Engineering Documents; website: global.ihs.com; phone: 1-877-413-5184

⁶ Published by FMC Corporation, Corporate Technology Center, P.O. Box 580, Santa Clara, CA 95052

⁷ Published by, and available from, International Electrotechnical Commission, 3 rue de Varembé, Geneva 1120, Switzerland; website: www.iec.ch