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NEMA STANDARDS PUBLICATION NO. CB 5

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Guidelines for the Preparation of Warning Labels for Carbon and Graphite Electrical Products

NEMA

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION ■ 2101 L STREET, N.W., WASHINGTON, D.C. 20037

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NEMA CB 5-1990

CB 5

GUIDELINES FOR THE PREPARATION OF WARNING LABELS FOR CARBON AND GRAPHITE ELECTRICAL PRODUCTS

Published by:

National Electrical Manufacturers Association
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CAUTION NOTICE

This guideline is organized to present concepts and guidance to a label preparer. The whole guideline should be read and understood because many labeling sections are interrelated. A complete, logical and internally consistent label is more likely to result from the orderly approach presented in this guideline. This guideline is designed as an aid to the label preparer and should be used along with the professional judgement and common sense of the experts who provide all the information included on the label. This guideline cannot be considered to be a resource for providing all information necessary for full compliance with rules, regulations or laws. Each company and label preparer must diligently remain aware of all legal requirements relating to labeling, both current and evolving future ones.

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Foreword

This standards publication is a guideline intended to help manufacturers of carbon and graphite electrical products not defined as articles under the Occupational Safety and Health Administration (OSHA) to develop appropriate hazard warning labels for such products. By "appropriate" is meant adequate indication of the nature of the hazard to customers for the products. Warning labels should provide an immediate hazard warning to downstream users in the form of an initial eye-catching warning of hazards that may be associated with a product. Over time with repeated shipments, the labels serve as a constant reminder of the potential hazards. More specific and detailed information about these products is provided by manufacturers to customers in the respective material safety data sheets (MSDSs) for use by customers in their own employee training and protection plans.

The Carbon and Graphite industry is classified under SIC Code 3624 and manufactures a range of products including carbon, graphite, and metal-graphite brushes and brush stock; carbon or graphite electrodes for thermal and electrolytic uses; carbon and graphite fibers; and other carbon, graphite, and metal-graphite products.

The labeling guidelines have been developed as Authorized Engineering Information. The mandatory instructions are excerpted from the referenced OSHA Hazard communication Standard. Inquiries, comments and proposed revisions are welcomed and should be submitted to:

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Scope

This document sets forth guidelines for the preparation of warning labels for typical electrical products manufactured by member companies of the National Electrical Manufacturers Association's Carbon and Manufactured Graphite Sections. These guidelines are based upon current federal regulations promulgated by [OSHA] of the Department of Labor and by the Department of Transportation. Requirements for labeling of hazardous materials are specified under the OSHA Hazard Communication Standard [29 CFR 1910.1200 (f)] and under the Department of Transportation [49 CFR 172, Subpart E].

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SECTION 1
REFERENCES

1.1 REFERENCE STANDARDS

In this publication, reference is made to the standards listed below. Copies are available from the indicated sources:

Occupational Safety and Health Administration
U.S. Department of Labor
2000 Constitution Ave., NW
Washington, DC 20210

29 CFR 1910.1200 (R1988)	*Hazard Communication Standard*
29 CFR 1910.145 (R1986)	*Specifications for Accident Prevention Signs and Tags*
Instruction CPL 2-2.38C - 1991	*Inspection Procedure or the Hazard Communication Standard, 29 CFR 1910.1200, 1915.99, 1917.28, 1918.90, 1926.59 and 1928.2111, Occupational Safety and Health Administration, U.S. Department of Labor.*

U.S. Department of Transportation
400 7th Street, SW
Washington, DC 20590

49 CFR 172 (R1988)	*Hazardous Materials Transportation*

American National Standards Institute, Inc.
1430 Broadway
New York, NY 10018

Z129.1 - 1988	*American National Standard for the Precautionary Labeling of Hazardous Industrial Chemicals*

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SECTION 2
THE FEDERAL LAW

2.1 GENERAL

It is essential that a manufacturer clearly understand his responsibilities under the law. Accordingly, manufacturers are urged to consult all applicable federal, state and local laws governing hazard warning labels for carbon graphite products. The single most important of these laws is the OSHA Hazard Communication Standard given in the Code of Federal Regulations (CFR) of 29 CFR Part 1910.1200 (f), the section entitled "Labels and Other Forms of Warning" is excerpted from the July 1, 1988 issue of the Code. Manufacturers are encouraged to become familiar with the entire standard.

2.2 EXCERPTS OF OSHA HAZARD COMMUNICATION STANDARD 29 CFR PART 1910.1200(f)

(f) *Labels and other Forms of Warning*

(1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:
  (i) Identity of the hazardous chemical(s)
  (ii) Appropriate hazard warnings; and
  (iii) Name and address of the chemical manufacturer, importer, or other responsible party.

(2) For solid metal (such as a steel beam or a metal casting) that is not exempted as an article due to its downstream use, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes. The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment. This exception to requiring labels on every container of hazardous chemicals is only for the solid metal itself and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the metal and to which employees handling the metal may be exposed (for example, cutting fluids or lubricants).

(3) Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act (49 U.S.C. 1801 et seq.) and regulations issued under the act by the Department of Transportation (49 CFR 172).

(4) If the hazardous chemical is regulated by OSHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
  (i) Identity of the hazardous chemical(s) contained therein; and,
  (ii) Appropriate hazard warnings

(6) The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

(7) The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer.

(8) The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

(9) The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented in English as well.

(10) The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

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SECTION 3
OSHA DIRECTIVE TO INSPECTORS

3.1 GENERAL

For the guidance of its field inspectors in regard to the Hazard Communication Standard, OSHA has issued Instruction CPL 2-2.38C dated October 22, 1990. Appendix A of that document is keyed to the appropriate sections of the Standard and the following is excerpted:

3.2 EXCERPT OF INSTRUCTION CPL 2-2.38C

Labels and other Forms of Warning.

(f)(1) and (f)(5)

The purpose for labels under the standard is clear. Labels provide an immediate warning to employees of the hazards they may be exposed to and, through the chemical identity, labels provide a link to more detailed information available through MSDSs and other sources. Labels must contain the identity of the chemical, an appropriate hazard warning, and the name and address of the responsible party.

OSHA recognizes that the degree of detail on a label needed to convey a hazard may be different within a workplace where other information is readily available, compared to labels required on shipped containers, where the label may be the only information available.

The standard's preamble recognizes the existence of numerous labeling systems that are currently in use in industry. Examples include the HMIS (Hazardous Materials Information System), NFPA (National Fire Protection Association) and ANSI (American National Standards Institute) systems. Some of these systems rely on a numerical and/or alphabetic codes to convey the hazards. Although these labeling systems may not convey the target organ effects, the intent of the standard is to permit the use of these systems for *inplant* labeling as long as the written Hazard Communication Program adequately addresses the issue.

Paragraph (e)(1) of the HCS requires employers to include in their written hazard communication program a description of how the training requirements of paragraph (h) will be met, and subparagraph (e)(2)(ii) requires employees to be trained on the physical and health hazards of the chemicals they work with. OSHA has interpreted this to include being apprised of the target organ effects of the hazardous chemicals employees are or may be exposed to while working. The training program must therefore explicitly instruct employees on how to use and understand the plant's alternative labeling systems to ensure that employees are aware of the effects *(including* target organ effects) of the hazardous chemicals to which they are potentially exposed.

CSHOs must carefully review the overall hazard communication program to ensure its effectiveness in meeting all the requirements of the HCS. One way for CSHOs to determine the effectiveness of the training program, including employee understanding of target organ effects, especially when numerical or other systems are used for in-plant labeling, is through employee interviews. An employer relying on one of the above-mentioned labeling systems may therefore have to augment his hazard communication training program to specifically address the target organ effects that may not be easily discernable from a numerical warning system.

However, for *shipped containers* the hazard warning must be included on the label and must specifically convey the hazards of the chemical. OSHA has consistently maintained that this includes target organ effects. Casarett and Doull's *Toxicology, the Basic Science of Poisons* discusses target organs:

> Most chemicals that produce systemic toxicity do not cause a similar degree of toxicity in all organs but usually produce the major toxicity to one or two organs. These are referred to as target organs of toxicity for that chemical.

Appendix A of the HCS clearly states that employees exposed to health hazards must be apprised of *both* changes in body functions and the signs and symptoms that may occur to signal the changes. A label incorporating a rating system is not permitted for shipped containers unless additional label information is affixed to the container. The specific hazards indicated in the standard's definitions for "physical" and "health" hazards are applicable. Phrases such as "caution," "danger," or "harmful if inhaled," are precautionary statements, not hazard warnings. The definition of "hazard warning" states that the warning must convey the hazards of the chemical and is intended to include the target organ effects. If, when inhaled, the chemical causes lung damage, then that is the appropriate warning. Lung damage is the hazard, not inhalation.

There are some situations where the specific target organ effect is not known. Where this is the case, the more general warning statement would be permitted. For example, if the only information available is an LC50 test result, "harmful if inhaled" may be appropriate.

It will not necessarily be appropriate to warn on the label about every hazard listed in the MSDSs. The data sheet is to address essentially everything that is known about the chemical. The selection of hazards to be highlighted on the label will involve some assessment of the weight of the evidence regarding each hazard reported on the data sheet. Assessing the weight of the evidence prior to including a hazard on a label will also necessarily mean consideration of exposures to the chemical that will occur to workers

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under normal conditions of use, or in foreseeable emergencies. However, this does not mean that only acute hazards are to be covered on the label, or that well substantiated hazards can be left off the label because they appear on the data sheet.

An example of a situation where it may not be necessary to include the presence of a hazardous ingredient in a formulation when developing the product's label follows: Recently, IARC published monograph no. 44, entitled, "Alcohol Drinking." IARC's determination on the carcinogenicity of ethanol is based on chronic exposure to ethanol through human consumption via the *drinking* of alcoholic beverages, over time. In performing the hazard determination on a product mixture which contains ethanol as one of the hazardous ingredients, a chemical manufacturer must, under the HCS, include mention of ethanol as a hazardous ingredient on the MSDSs, along with the findings as published in the IARC monograph. As part of the hazard determination, manufacturers must consider exposures to the chemical product that would occur under normal conditions of use or in foreseeable emergencies, and toxicity associated with all routes of entry. If a chemical manufacturer were to formulate a product which contained ethanol as part of the mixture, but the product's intended use did not involve exposure through ingestion of the ethanol, the manufacturer could document the intended use and resultant exposure scenarios on the MSDSs but *not* label the product as a "carcinogen." Again, the information about the carcinogenicity of ethanol would need to appear on the MSDSs, but since exposure under normal conditions of use, etc., would not involve ingestion and since the only evidence calling ethanol a human carcinogen comes from studies involving chronic alcoholic beverage ingestion, the weight of the evidence would preclude the requirement to warn of carcinogenic hazards on the label of the product.

Exposure calculations are not permitted in determining whether a hazard must appear on a label. If there is a potential for exposure other than in minute, trace or very small quantities, the hazard must be included when substantiated as required by the HCS. Suppliers may not exclude hazards based on presumed levels of exposure downstream (i.e., omitting a carcinogenic hazard warning because, in the supplier's estimate, presumed exposures will not be high enough to cause the effect). The hazard is an intrinsic property of the chemical. Exposure determines degree of risk and should be addressed in training programs by the downstream employer.

The labeling requirements for shipped containers leaving the workplace apply regardless of whether the intended destination is interstate or intrastate. If the shipment is to another establishment, even within the same company, the shipped labeling provisions apply. Even sealed containers intended for export must comply with the labeling provisions if these containers leave the workplace and if downstream employees such as dock workers may be exposed to the hazardous chemical(s).

Containers must be labeled as soon as practicable before leaving the workplace. If the container is a tank truck, rail car, or other vehicle carrying a hazardous chemical(s) not already in a labeled container(s), the appropriate label or label information may either be posted on the tank or vehicle, or attached to the accompanying shipping papers or bill of lading. Employers purchasing hazardous chemicals must ensure that their employees are aware of the label warning before potential exposure to incoming chemicals occur. A label may not be shipped separately, even if it is prior to shipment of the hazardous chemical since to do so defeats the intended purpose which is to provide an immediate hazard warning. Mailing labels directly to purchasers will bypass those employees involved in transporting the hazardous chemical. [Note the exception in (f)(2) for solid metals. Containers of solid metals not otherwise meeting the definition of an article need to be labeled only with the initial shipment (unless the information on the label changes).]

Although no explicit requirement exists regarding the updating of labels when new information becomes available, the warning would no longer be appropriate if the MSDSs contained new hazard information that needed to be included on the label. Since the MSDSs must be updated within three months of receipt of new information, the label must be, too, in order to accurately reflect the MSDSs information. Note that distributors have no affirmative obligation to create the container labeling information for hazardous chemicals which they merely send unchanged to their customers, but they do have the responsibility to obtain missing labels from the chemical manufacturer/importer. Distributors must duplicate label information on chemicals which they repackage.

(f)(5)

An employer's obligation to label in-plant and containers of hazardous chemicals requires that all (f)(6) appropriate hazard warnings appear on the label pursuant to (f)(5)(ii). For example, an employer who elects to label only some of the health hazard warnings associated with the chemical while omitting other recognized hazards, such as carcinogenicity, selectively deprives his employees of critical hazard information and shall be cited under (f)(5)(ii). However, if the downstream employer has relied in good faith on the adequacy of the label as prepared by the chemical manufacturer and the label contains an inadequate hazard warning(s), the CSHO shall follow the referral procedures outlined in K.7.a.(7) of this instruction.

For purposes of reviewing alternative in-plant labeling methods under (f)(6), the CSHO shall note that this provision allows alternative means of identification only in the event that an employer chooses to forego labeling an

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in-plant container under (f)(5). Thus, an employer may not claim that it supplemented its partial compliance with (f)(5)(ii); i.e., labeling only some of the chemical's health hazard warnings, with one of the alternative means of identification enumerated in (f)(6). The key to evaluating the effectiveness of any alternative labeling method is to determine whether it provides an immediate visual warning of the chemical hazards of the workplace, identifies the applicable chemical and container, and conveys the appropriate hazard warnings. The alternative labeling system must also be readily accessible to all employees in their work area throughout each workshift. For purposes of this provision, the term "other such written materials" does not include material safety data sheets used in lieu of labels.

Carcinogen Labeling.

As specified in the rule, chemicals which have been indicated as positive or suspect carcinogens by either OSHA, the International Agency for Research on Cancer (IARC) or the National Toxicology Program (NTP) will be considered to be carcinogenic for purposes of the HCS.

Those chemicals identified as being "known to be carcinogenic" and those substances that may "reasonably be anticipated to be carcinogenic" by NTP must have carcinogen warnings on the label and information on the MSDSs. For NTP, appearing on the annual listing constitutes a positive finding of suspect or confirmed carcinogenicity.

OSHA's comprehensive substance specific regulations in Subpart Z of 1910 contain provisions for labeling. Therefore, containers of hazardous chemicals labeled in accordance with the substance specific standard will be deemed to be in compliance with the health effects labeling requirements of the standard. An exception to this is OSHA's Formaldehyde Standard, for which an administrative stay of the hazard communication provisions [sections (m)(1)(i) and (m)(1)(ii)] is in effect. The HCS is enforceable for these provisions of the formaldehyde standard.

It should be noted that in many instances the labeling requirements of the comprehensive substance specific standard address only carcinogenicity and do not address acute health hazards or physical hazards. Those chemicals regulated by OSHA as carcinogens in substance specific standards that include labeling requirements are listed below:

Asbestos
4-Nitrobyphenyl
Alpha-Napthylamine
Methyl Chloromethyl Ether
3,3' Dichlorobenzidine (and its salts)
Bis-Chloromethyl Ether
Beta-Naphthylamine
Benzidine
4-Aminodiphenyl
Ethyleneimine
Beta-Propiolactone
2-Acetylaminofluorene
4-Dimethylaminoazobenzene
N-Nitrosodimethylamine
Vinyl Chloride (and Polyvinyl Chloride)
Inorganic Arsenic
1,2 Dibromo-3-Chloropropane
Acrylonitrile
Ethylene Oxide
Formaldehyde
Benzene

In addition to those chemicals for which OSHA has substance specific standards, OSHA has set new permissible exposure limits for several substances based on avoidance of cancer. These substances are specified in the preamble to the Air Contaminants Rule published January 19, 1989. (See Table C15-1 on pages 2669-71 of the *Federal Register* notice of that date.)

IARC evaluates chemicals, manufacturing processes, and occupational exposures as to their carcinogenic potential. The IARC criteria for judging the adequacy of available data and for evaluating carcinogenic risk to humans were established in 1971 (Volumes 1-16) and revised in 1977 (Volumes 17 and following).

The individual monographs contain evaluations on specific chemicals or processes. At the conclusion of each evaluation, IARC provides a summary evaluation for the individual chemical. Periodically, IARC publishes Supplements in which chemicals that have already been evaluated in previous monographs are reevaluated. In cases where a chemical has been reevaluated; the most recent IARC evaluation shall be relied upon.

IARC provides a summary in Supplement 7 of the chemicals which have been evaluated in Volumes 1-42. Table I of Supplement 7 provides a summary evaluation of all chemicals for which human and animal data were considered. Table I of Supplement 7 also provides a summary classification of a chemical's carcinogenic risk:

Group 1	The agent is carcinogenic to humans.
Group 2A	The agent is probably carcinogenic to humans.
Group 2B	The agent is possibly carcinogenic to humans.
Group 3	The agent is not classifiable as to its carcinogenicity to humans.
Group 4	The agent is probably not carcinogenic to humans.

All IARC listed chemicals in Groups 1 and 2A must include appropriate entries on both the MSDSs *and* on the label. Group 2B chemicals need be noted only on the MSDSs.

Individual monographs have been published subsequent to Supplement 7. For purposes of compliance with the MSDSs and labeling requirements, the IARC monograph's summary evaluation for the chemical can generally

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be relied upon but it may be necessary to review the actual evaluations. In some cases, a group of compounds may be listed in the summary as carcinogenic but closer examination of the appropriate monograph will reveal that IARC had data to support the carcinogenicity of only certain compounds. Those compounds are the only ones covered by the HCS. IARC also evaluates specific industrial processes or occupations for evidence of increased carcinogenicity. Findings that an occupation is at increased risk of carcinogenicity, without identification of specific causative agents, do not affect label or MSDSs requirements.

In addition, the existence of one valid, positive study indicating carcinogenic potential in either animals or humans is sufficient basis for a notation on the MSDSs. Further, if such studies include positive human evidence, then the label must contain carcinogen hazard warnings.

Table 1, below, represents a general guide regarding the labeling and MSDSs requirements under the HCS. The existence of positive human evidence on carcinogenicity always requires carcinogen warnings on the label. In addition, there may be instances where a carcinogen warning may be required for a chemical that is not listed by IARC or NTP but multiple animal studies indicate carcinogenicity. Such cases shall be reviewed by the Regional Administrator and coordinated by the Directors of Compliance and Health Standards Programs.

TABLE 1
GUIDANCE FOR MSDS AND LABEL NOTATIONS FOR CARCINOGENS

Source	MSDS	Label
Regulated by OSHA as a carcinogen	X	X
Listed on NTP Carcinogen Report	X	X
IARC—Group 1	X	X
IARC—Group 2A	X	X
IARC—Group 2B	X	Not Required
IARC—Group 3	Not Required	Not Required
IARC—Group 4	Not Required	Not Required
One Positive Study-Animal Only	X	Not Required
Multiple Animal Studies	X	Depends on weight of evidence; N.O. review needed.
One Positive Study-Some Human Evidence	X	X

Given the above criteria, benzene, which is regulated by OSHA as a carcinogen and for which several valid, positive human studies exist, would require both MSDSs and label notations whereas a substance for which only some animal data exist does not. Polyvinyl resin must be labeled as a carcinogen but final molded and extruded products do not need to be (as per 29 CFR 1910.1017). [See also the discussion on IARC's determination on the carcinogenicity of "Alcohol Drinking," IARC Monograph No. 44, as it pertains to labeling requirements (page A-15).]

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SECTION 4
THE EXPOSURE HAZARD

4.1 GENERAL

In its instructions to inspectors cited in Section IV, OSHA recognizes that not all hazards associated with a product need be addressed on a warning label. A manufacturer is allowed to determine which hazards are to be considered the principal issues for the label.

The primary hazards associated with carbon and graphite products are the effects of airborne dust particles that could be generated by shipping, handling, and by any customer machining of the product. The two factors to be considered are the health hazard to humans and the physical hazard within a facility.

4.1.1 Health Hazard

Inhalation is the most probable route of entry. Factors associated with such possible secondary exposure as ingestion (by transfer of particles from unwashed hands to food), irritation from the dust entering the eye and the dermal effects of any acidic or caustic impregnants can and should be addressed in the MSDS. If the product contains a carcinogen, this fact must appear on the label in accordance with Table 1 of the OSHA instructions cited in Section 3.

4.1.2 Physical Hazard

If generated in sufficient quantities, and/or for prolonged periods, accumulated dust may pose an electrical and/or fire hazard due to sufficient air concentrations of fine dust particles which may be explosive when exposed to an ignition such as may occur with short circuits. The generally shared characteristic that nearly all fine dust can be explosive if ignited can be addressed in the MSDS and not on the label.

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SECTION 5
ELEMENTS OF HAZARD WARNING LABELS

5.1 GENERAL COMMENTS

Although a large number of different commercial carbon and graphite products produced by industry will require a hazard warning label, most can bear the same or very similar warnings since they:

1. Are concerned with dust coming off the item.
2. Share the same ingredients; i.e., proportional variations basically have no effect on the hazard.
3. Share the same routes of exposure and hazard.

For simplification purposes in this document, carbon and graphite brushes will be the type of product used as the guideline example for development of a hazard warning label. Specific products may require additional information; e.g., powders, etc. See American National Standards Institute Standard, ANSI-Z129.1 (1988).

5.2 MANDATORY LABEL ELEMENTS

As stated in Section 2 of this document (The Federal Law), the three elements of a warning label for a hazardous chemical leaving the workplace (inplant labeling, see (f)(5) of the Hazard Communication Standard) must have are:

1. Identity of the hazardous chemical(s);
2. Appropriate hazard warnings; and,
3. Name and address of the manufacturer, importer, or other responsible party.

5.3 RECOMMENDED LABEL ELEMENTS

The following items normally associated with warning labels are not specifically required by the law, but are recommended:

1. Signal Words
2. References to Material Safety Data Sheets (MSDS)

A manufacturer may also want to consider other options not addressed herein such as the use of color labels and borders.

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SECTION 6
COMPOSING THE LABEL

6.1 IDENTITY OF THE HAZARDOUS CHEMICAL(S) – MANDATORY

The information for this portion of the warning statement can be taken directly from the hazardous component list of the material's MSDS. Any component listed therein can be assumed to be in the dust. Percentage compositions of these ingredients need not be listed on the label and the same regulations concerning proprietary information on MSDS also applies to warning labels.

Examples of material identifications on a warning label are:

"..."contains graphite and copper ... "

"..."contains graphite, copper, and lead ... "

"..."contains coal tar pitch ... "

For those products that may contain carcinogenic components of Coal Tar Pitch or any other carcinogens, OSHA requires notification of the presence on the label. (See Table 3-1)

6.2 APPROPRIATE HAZARD WARNING – MANDATORY

6.2.1. Health Hazard

The potential exists for bodily damage primarily from continuous or long term overexposure through breathing of the dust, example:

graphite = "inhalation may cause respiratory irritation and lung damage."

copper = "inhalation may cause irritation of mucous membranes, blood disorders and damage to lungs, kidneys and liver."

lead = "inhalation may cause blood disor ders, damage to nervous, urinary, and reproductive systems."

coal tar pitch = "inhalation may cause respiratory irritation and lung damage. Prolonged contact may cause dermatitis or cancer."

6.2.2. Physical Hazard

The potential exists for the creation of short circuits in electrical devices due to the conductivity of the material; that is, the material is:

"... electrically conductive ..."

6.3 NAME AND ADDRESS – MANDATORY

This information needs no explanation - it is simply the manufacturer of the brush on the MSDS for the material.

If the brush is, or can be, produced at several plants, the address of the main headquarters where the specific, detailed information on the material is readily available is usually specified.

6.4 SIGNAL WORDS – RECOMMENDED

Neither the Regulation cited in Section 2 nor the OSHA Instructions cited in Section 3 directly require the use of any precautionary or signal words such as "Danger", "Warning", or "Caution". The OSHA Instructions do state that these words are not considered to be an adequate hazard message when used alone. Target organ effects must be on the label — i.e., "causes lung damage".

6.5 MATERIAL SAFETY DATA SHEETS (MSDSs) REFERENCES – RECOMMENDED

Reference to the appropriate Material Safety Data Sheets for the hazardous ingredients or components is recommended to provide additional health and physical hazard information.

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SECTION 7
LABEL EXAMPLES

7.1 GENERAL

The following are examples of label messages constructed according to the guidelines of this communique and, except for products containing coal tar pitch, assumes inhalation as the route of entry/exposure of primary concern.

7.2 LABEL MESSAGES

7.2.1 GRAPHITE BRUSHES/ELECTRODES

"Electrically conductive graphite dust may be present or generated during handling and machining. Inhalation may cause respiratory irritation and lung damage." For further information, consult product MSDS.

"XYZ Company - City, State"

7.2.2 GRAPHITE/COPPER BRUSHES

"Electrically conductive graphite and copper dust may be present or generated during handling and machining. Inhalation nay cause irritation of mucous membranes, blood disorders, and damage to lung, kidneys and liver." Refer to MSDS No. .

"XYZ Company - City, State"

7.2.3 GRAPHITE/COPPER/LEAD BRUSHES

"Electrically conductive graphite, copper and lead dust may be present or generated during handling and machining. Inhalation may cause irritation of mucous membranes, blood disorders and damage to lung, kidneys, liver, urinary and reproductive systems." Refer to MSDS for additional information.

"XYZ Company - City, State"

7.2.4 PITCH PLUG NIPPLES

"Electrically conductive graphite and coal tar pitch dust and fumes may be present or generated during handling, machining or joining. Inhalation may cause respiratory irritation and lung damage. Prolonged contact may cause dermatitis or cancer." Consult appropriate MSDS.

"XYZ Company - City, State"

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7.3 EXAMPLE OF LABELS

7.3.1 Graphite Brushes/Electrodes

CAUTION

"Electrically conductive graphite dust may be present or generated during handling and machining. Inhalation may cause respiratory irritation and lung damage." For further information, consult product MSDS.

"XYZ Company - City, State"

7.3.2 Graphite/Copper Brushes

CAUTION

"Electrically conductive graphite copper and dust may be present or generated during handling and machining. Inhalation may cause irritation of mucous membranes, blood disorders, and damage to lung, kidneys, and liver." Refer to MSDS No. _____.

"XYZ Company - City, State"

7.3.3 Graphite/Copper/Lead Brushes

Caution

"Electrically conductive graphite copper and lead dust may be present or generated during handling and machining. Inhalation may cause disorders and damage to lung, kidneys, liver, urinary and reproductive systems." Refer to MSDS for additional information.

"XYZ Company - City, State"

7.3.4 Pitch Plug Nipples

CAUTION

"Electrically conductive graphite and coal tar pitch dust and fumes may be present or generated during handling, machining or joining. Inhalation may cause respiratory irration and lung damage. Prolonged contact may cause dermatitis or cancer." Consult appropriate MSDS.

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NEMA STANDARDIZATION

The purpose of NEMA Standards, their classification and status are set forth in certain clauses of the NEMA *Standardization Policies and Procedures* manual and are referenced below:

Purpose of Standards

National Electrical Manufacturers Association Standards are adopted in the public interest and are designed to eliminate misunderstandings between the manufacturer and the purchaser and to assist the purchaser in selecting and obtaining the proper product for their particular needs. Existence of a National Electrical Manufacturers Association Standard does not in any respect preclude any member or nonmember from manufacturing or selling products not conforming to the standard.

(Standardization Policies and Procedures, p. 1)

Definition of a Standard

A standard of the National Electrical Manufacturers Association defines a product, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, rating, testing, and the service for which they are designed.

(Standardization Policies and Procedures, p. 2)

Dimensions

Where dimensions are given for interchangeability purposes, alternate dimensions satisfying the other provisions of the Standards Publication may be capable of otherwise equivalent performance.

(Standardization Policies and Procedures, p. 8)

Categories of Standards

National Electrical Manufacturers Association Standards are of three classes:

1. NEMA Standard, which relates to a product, process or procedure commercially standardized and subject to repetitive manufacture, which standard has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon;
2. Suggested Standard for Future Design, which may not have been regularly applied to a commercial product, but which suggests a sound engineering approach to future development, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote thereon.
3. Adoptive Standard, which is adopted in whole or in part from the standards of another organization, either domestic, regional, or international.

(Standardization Policies and Procedures, pp 7 & 16)

Authorized Engineering Information

Authorized Engineering Information consists of explanatory data and other engineering information of an informative character not falling within the classification of NEMA Standard or Suggested Standard for Future Design, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote on the standard.

(Standardization Policies and Procedures, pp. 7 & 16)

Official Standards Proposal

An Official Standards Proposal is an official draft of a proposed standard which is formally recommended to an outside organization(s) for consideration, comment and/or approval, and which has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon. *(Standardization Policies and Procedures, pp 7 & 16)*

Identification of Status

Standards in NEMA Standards Publications are identified in the foreword or following each standard as "NEMA Standard" or "Suggested Standard for Future Design." These indicate the status of the standard. These words are followed by a date which indicates when the standard was adopted in its present form by the Association.

The material identified as "Authorized Engineering Information" and "Official Standards Proposal" is designated similarly.

July 17, 1990

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CARBON/MANUFACTURED GRAPHITE SECTION OF THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

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