



Standard Practice for Labeling Ceramic Art Materials for Chronic Adverse Health Hazards¹

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INTRODUCTION

Uninformed or careless use of some ceramic art material products can give rise to health hazards, either acute or chronic, or both. Specific and readily available warnings are needed to help protect users. One way to disseminate such information is to provide appropriate precautionary labeling on ceramic art material products.

Labeling for acute health hazards, including those associated with ceramic art materials, are presently being addressed by such requirements as the U.S. Consumer Product Safety Act, the Federal Hazardous Substances Act, and the like. There are presently no specific national standards for labeling ceramic art materials with respect to chronic adverse health hazards.

This practice is intended to provide a standard for developing precautionary labels concerning chronic adverse health hazards related to the use of ceramic art materials. It is further intended to have the adaptability necessary to keep labels current with existing scientific and medical knowledge, as well as in conformity with other precautionary labeling requirements, both acute and chronic, thereby avoiding unnecessary confusion by users with respect to other precautionary labeling.

1. Scope

1.1 This practice describes a procedure for developing precautionary labels for ceramic art materials and provides hazard and precautionary statements based upon knowledge that exists in the scientific and medical communities. This practice concerns those chronic adverse health hazards known to be associated with a product or product component(s), when the component(s) is present in a physical form, volume, or concentration that in the opinion of a toxicologist has the potential to produce a chronic adverse health effect(s).

1.2 This practice is intended to apply exclusively to ceramic art materials which are packaged in sizes intended for use by artists or crafts people, either individually, or in a small group or class.

1.3 This practice applies to developing precautionary labeling for ceramic art materials intended for adult usage. Conformance to this practice does not imply that ceramic art materials

will necessarily be labeled adequately or safe for use by children. Labeling determinations should consider reasonably foreseeable use or misuse by children and include as appropriate, in such instances, warnings to keep out of reach, or other specific precautionary statements. The responsibility for precautionary labeling rests with the ceramic producer or repackager who markets the material for art or craft use.

1.4 This practice does not specify test methods for determining whether a substance or product presents chronic adverse health hazards.

1.5 This practice does not apply to products appropriately labeled for known chronic adverse health hazards according to chemical substances labeling standards and practices, such as another national consensus standard, existing labeling statutes, regulations, or guidelines.

1.6 Since knowledge about chronic adverse health hazards is incomplete and warning cannot cover all uses of any product, it is not possible for precautionary labeling to assure completely safe use of an art product.

1.7 Manufacturers or repackagers may wish to determine individually or collectively precautionary labeling for ceramic art materials in accordance with this practice. Compliance may

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be certified by a certifying organization. Guidelines for a certifying organization are given in [Appendix X1](#).

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Definitions of Terms Specific to This Standard

2.1 *analytical laboratory*—a laboratory having personnel and apparatus capable of performing quantitative or qualitative analysis of ceramic art materials, which may yield information that is used by a toxicologist for evaluation of potentially hazardous materials.

2.2 *artists or crafts people*—individuals who create, or recreate in a limited number, largely by hand, works that may or may not have a practical use, but in which aesthetic considerations are paramount.

2.3 *bioavailability*—the extent to which a substance can be absorbed in a biologically active form.

2.4 *ceramic art material or ceramic art material product*—any raw or processed material, or manufactured product, marketed or represented by a ceramic producer or repackager as intended for and suitable for use in a fired product produced by artists or crafts people.

2.5 *ceramic producer*—the person or entity who manufactures, processes, or imports a ceramic art material.

2.6 *chronic adverse health effect(s)*—a persistent toxic effect(s) that develops over time from a single, prolonged, or repeated exposure to a substance which can, in humans, cause sterility, birth defects, harm to a developing fetus or to a nursing infant, cancer, allergic sensitization, damage to the nervous system, or a persistent adverse effect to any other organ system.

2.7 *chronic adverse health hazard(s)*—hereafter referred to as “chronic hazard”—a health risk to humans, resultant from exposure to a substance that may cause a chronic adverse health effect.

2.8 *label*—a display of written, printed, or graphic matter upon the immediate container of any ceramic art material product. When the product is unpackaged, or is not packaged in an immediate container intended or suitable for delivery to artists or crafts people, the label can be a display of such matter directly upon the ceramic art material or upon a tag or other suitable labeling device attached to the ceramic art material.

2.9 *repackager*—the person or entity who obtains materials from ceramic producers and, without making changes in such materials, puts them in containers intended for sale as ceramic art materials to artists or crafts people.

2.10 *sensitizer*—a substance that is known to cause, through an allergic process, a chronic adverse health effect which becomes evident in a significant number of people on re-exposure to the same substance.

2.11 *toxic*—applies to any substance that is likely to produce personal injury or illness to humans through ingestion, inhalation, or skin contact.

2.12 *toxicologist*—an individual who through education, training and experience has expertise in the field of toxicology, as it relates to human exposure, and is either a toxicologist or physician certified by a nationally recognized certification board.

3. Requirements

3.1 To conform to this voluntary practice, the ceramic producer or repackager of ceramic art materials shall submit ceramic art material product formulation(s) or reformulation(s) to a toxicologist for review, such review to be in accordance with Section 4 of this practice. The toxicologist shall be required to keep product formulation(s) confidential.

3.1.1 Unless otherwise agreed in writing by the ceramic producer or repackager, no one other than the toxicologist shall have access to the formulation(s); except that the toxicologist shall furnish a patient’s physician, on a confidential basis, the information necessary to diagnose or treat cases of exposure or accidental ingestion.

3.2 To conform to this practice, the ceramic producer or repackager, upon advice given by a toxicologist in accordance with Section 4 of this practice, shall adopt precautionary labeling in accordance with Section 5 of this practice and based upon generally accepted, well-established evidence that a component substance(s) is known to cause chronic adverse health effects.

3.3 To conform to this practice, labeling shall be parallel to, conform to, and minimally include any labeling practices prescribed by U.S. federal and state statutes or regulations and shall not diminish the effect of required acute toxicity warnings.

3.4 To conform to this practice, the ceramic producer or repackager shall supply a poison exposure management information source,² the generic formulation information required for dissemination to poison control centers or provide a 24-h cost-free number to poison control centers.

3.5 To conform to this practice, the ceramic producer or repackager shall have a toxicologist review as necessary, but at least every five years, ceramic art material product formulation(s) and associated label(s) based upon the then current, generally accepted, well-established scientific knowledge.

4. Determination of Labeling

4.1 A ceramic art material is considered to have the potential for producing chronic adverse health effects if any customary or reasonably foreseeable use can result in a chronic hazard.

4.2 In making his determination a toxicologist(s) shall take into account the following:

4.2.1 Current chemical composition of the ceramic art material, supplied by an analytical laboratory or by an industrial chemist on behalf of a manufacturer or repackager.

² Two of the larger poison control centers are: The Rocky Mountain Poison Control Center, W. 8th and Cherokee, Denver, CO 80204; and the National Poison Control Center Network, 125 De Soto St., Pittsburgh, PA 15213.

4.2.2 Current generally accepted, well-established scientific knowledge of the chronic toxic potential of each component(s) and the total formulation.

4.2.3 Specific physical and chemical form of the ceramic art material product, bioavailability, concentration, and the amount of each potential chronic toxic component found in the formulation.

4.2.4 Reasonably foreseeable uses of the ceramic art material product as determined by consultation with users and other individuals, who are experienced in use of the material(s), such as teachers, or by market studies, unless such use information has previously been determined with respect to the specific ceramic art material(s) under review.

4.2.5 Potential for known synergism and antagonism of the various components of the formulation.

4.2.6 Potential chronic adverse health effects of decomposition or combustion products, if known, from any reasonably foreseeable use of the hazardous ceramic art material product, and

4.2.7 Opinions of various medical, regulatory, and scientific bodies³ on the potential for chronic adverse health effects of the various components of the formulation.

4.3 Based upon the conclusion reached in conformance with review determinations set forth herein the toxicologist(s) shall recommend precautionary labeling consistent with Section 5 of this practice.

5. Labeling Practices

5.1 Signal Word:

5.1.1 When a signal word for an acute hazard(s) is mandated and a chronic hazard(s) exists, the signal word shall be that for the acute hazard.

5.1.2 When only a chronic hazard(s) exists, the signal word WARNING shall be used.

5.1.3 The signal word shall be prominently visible and set in bold capitals in a size *equal to or greater* than the statement of potential chronic hazards.

5.2 *List of Potential Chronic Hazards*—Potential chronic hazards, as determined under the procedures of Section 4, shall be stated substantially in accordance with the statements listed in **Annex A1** of this practice. Potential chronic hazards noted

shall be those that are clinically significant and that might be expected with any reasonably foreseeable use of the ceramic art material. The hazards should be grouped in the order of relative descending severity.

5.3 *Name of Chronic Hazardous Component(s)*—All components and known decomposition products of the formulation with a potential for chronic hazards, as determined under the procedures of Section 4, shall be listed prominently. Generically equivalent names may be used.

5.4 *Safe Handling Instructions*—Appropriate precautionary statements as to work practices, personal protection, and ventilation requirements shall be used substantially conforming with those listed in **Annex A2** of this practice.

5.5 *List of Sensitizing Components*—To protect artists or crafts people from known sensitizers found within ceramic art materials, each label shall contain a list of those sensitizers present in sufficient amounts to contribute significantly to a known skin or respiratory sensitization.

5.6 *Combined Statements*—If a ceramic art material contains more than one component capable of causing a chronic adverse health effect, or if a single chemical can cause several different chronic adverse effects, the potential effects may be combined into one statement.

5.7 *Information Sources*—The precautionary label shall contain a statement identifying a source for additional health information substantially in conformance with one of the phrases listed below:

FOR MORE HEALTH INFORMATION—(24-HOUR COST FREE NUMBER).

CONTACT A PHYSICIAN FOR MORE HEALTH INFORMATION.

CALL YOUR LOCAL POISON CONTROL CENTER FOR MORE HEALTH INFORMATION.

5.8 *Supplemental Information*—Where appropriate, more detailed technical information that relates to chronic hazard(s), such as physical properties, decomposition products, detailed safety instructions or disposal recommendations, shall be included in supplemental documents, such as Material Safety Data Sheets, technical brochures, technical data sheets, and the like.

6. Keywords

6.1 ceramic art materials; chronic adverse health hazards; labeling

³ Such as: International Agency for Research on Cancer, National Cancer Institute, World Health Organization, American Lung Association, and the International Lead Zinc Research Organization.



ANNEXES

(Mandatory Information)

A1. CHRONIC ADVERSE HAZARD STATEMENTS

May cause sterility.
May be harmful by breathing vapors/dust.
May be harmful if swallowed.
May be harmful by skin contact.
May produce birth defects in the developing fetus.
May be excreted in human milk.
May cause harm to the nursing infant.
Cancer agent! Exposure may produce cancer.

Cancer agent based on tests with laboratory animals.
Possible cancer agent based on tests with laboratory animals.
May produce allergic reaction by ingestion/inhalation/skin contact.
May produce numbness or weakness in the extremities.
Exposure may cause (specify the organ(s)) damage.
Heating/combustion may cause hazardous decomposition products.

A2. PRECAUTIONARY STATEMENTS

Keep out of reach of children.
When using do not eat, drink or smoke.
Wash hands immediately after use.
Avoid inhalation/ingestion/skin contact.
Avoid fumes from combustion.
Keep container tightly closed when not in use.
Store in well-ventilated area.
Wear protective clothing (specify type).
Wear NIOSH⁴-certified mask for dusts/mists/fumes.

Wear NIOSH-certified respiratory with an appropriate cartridge for (specify).
Use window exhaust fan to remove vapors and assure adequate cross ventilation. (Specify explosion-proof if necessary.)
Do not heat above (specify degree) without adequate ventilation.
Use (specify type) local exhausting hood.
Do not use/mix with (specify material).
Wear NIOSH-certified supplied-air respirator.

⁴ National Institute of Occupational Safety and Health.

APPENDIXES

(Nonmandatory Information)

X1. GUIDELINES FOR CERTIFYING ORGANIZATION

X1.1 The term-certifying organization, as used in these guidelines, refers to an organization or an institute which, after assuring that all provisions are met, certifies that a ceramic art material does conform to the labeling requirements of this practice.

X1.2 The certifying body may be funded by member manufacturers, but should include users or their representatives, as well as company chemists, on its technical and certifying committees.

X1.3 Representative samples of ceramic art materials, labeled as conforming to this practice and bought at retail, should be analyzed at random and from time to time by an analytical laboratory to assure they are the same as the formulation used by the toxicologist(s) for determination of labeling requirements.

X1.4 The methods used by this toxicologist(s) in review and determination of the need and content of precautionary labeling for potential chronic adverse health effects should be periodically reviewed by an advisory board composed of not less than three or more than five toxicologists at least one of which is certified in toxicology by a nationally recognized certification board.

X1.5 In cases in which there is disagreement by participating producers or participating users, with the determination of the toxicologist, there should be a method whereby the toxicologist's decision can be applied to the advisory board of toxicologists for arbitration.

X2. GUIDELINES FOR THE SAFE USE OF HOBBY CERAMIC ART MATERIALS

X2.1 The term “hobby ceramics” refers to an activity done by non-professionals using prepackaged, preformulated ceramic art materials which include clays, glazes, slips, and other materials used in the production of hobby ceramics.

X2.1.1 The term contemporary ceramics refers to a process in which bisqueware is decorated using lead-free under glazes, glazes, or acrylic paint.

X2.2 *Housekeeping*—Commonsense cleanup and maintenance of the work area is a must for people working with ceramics. It is strongly recommended that the following rules be observed:

X2.2.1 Keep working surfaces and shelves clean by wiping down with a wet sponge, rinsing the sponge frequently.

X2.2.2 Clean jar rims before closing to eliminate buildup of dried product.

X2.2.3 Clean up spills when they occur.

X2.2.4 Wet-mop floors to control dust; do not sweep.

X2.2.5 Work on newspaper or a paper towel for easy cleanup and disposal.

X2.2.6 Do all spraying or airbrushing of ceramic products in a spray booth equipped with an exhaust fan vented to the outside.

X2.2.7 Keep dust under control.

X2.3 *Personal Hygiene*—Ceramic products and materials can be handled very safely if it is kept in mind that materials should not be ingested or dust inhaled. Smoking, eating, and drinking should not be combined with working on ceramics. Besides being poor hygiene, such practices can leave substances such as salt and oil on the work surfaces and therefore ruin your glazes.

X2.3.1 Always wash hands thoroughly when you are through and be sure to put away materials where small children cannot reach them. Do not use any utensils that will later be used in the kitchen. If there is an accidental ingestion, call a doctor or your local poison control center, listed with emergency numbers in the front of many telephone books.

X2.3.2 Materials used to produce hobby ceramics should not be handled when you have any cuts or open wounds.

X2.4 *Personal Protective Equipment*—For some areas of ceramics, simple forms of personal protective equipment are recommended. Remove jewelry and use vinyl or lined rubber work gloves when glaze dipping or loading kilns. If ventilation is not sufficient to prevent exposure, wear a NIOSH approved dust mask for the specific application when handling dry ceramic powders.

X2.4.1 Dark-shaded glasses from a safety supply house (shade number 1.7 to 3.0) are recommended when looking into kiln peepholes. Normal sunglasses are inadequate for this

purpose. Using the proper glasses not only helps protect your eyes from the radiating heat but also allows you to see witness cones more clearly.

X2.4.2 Insulating gloves should be worn when opening a kiln after the venting period as the handle on the door will be hot.

X2.4.3 In order to avoid tracking ceramic contaminants into areas where they do not belong, such as vehicles, homes, and eating areas, wear protective clothing such as a smock or apron and leave the clothing in the work area. Either launder regularly or use a disposable apron.

X2.4.4 To prevent home contamination, a smock or apron should be worn when working with hobby ceramic materials. The smock or apron should then be left in the work area and should be laundered regularly.

X2.4.5 The wearing of contact lenses is not recommended when working in dusty environments. Dust particles may become trapped between the lens and the surface of the eye, and these small particles can scratch the eye.

X2.4.6 Respirators are recommended for glaze-spraying operations that are not adequately ventilated. Inexpensive disposable-type respirators that have been approved by the National Institute of Occupational Safety and Health (NIOSH) are commonly available. For water-based glazes use a NIOSH-approved mask for mists and dusts. For solvent-based materials use a NIOSH-approved respiratory.

X2.5 *Protection Against Dust and Mist Exposures:*

X2.5.1 When local ventilation is not available, respirators can be used for protection against dusts or glaze-spraying mists. Before wearing a mask or respirator, ascertain that wearers have no health problems that would be made worse by breathing stress (medical certification) and that the mask or cartridge respirator seals to their face (fit test). Choose the right respirator for each task with expert advice, such as from reputable safety equipment manufacturers or suppliers, occupational medical clinics, or industrial hygienists. Learn about respirator care and maintenance from manufacturers and OSHA and NIOSH websites.

X2.5.2 For work with low levels of hazardous particulates; such as dusts and spray mists, there are inexpensive NIOSH approved masks. Most masks (the N and R series) have an 8-h use time limit. If lead is present in dust (lead glazes should not be sprayed), only high efficiency filters (that is, the N100, R100, or P100) can be used. Higher concentrations of contaminants in the air will require a respirator matched to the concentrations, such as cartridge respirators or an air-supplied respirator. Solvent-containing sprays require chemical cartridges rated for both particles and organic vapors. Discard most cartridges after 8 h of use.

X2.6 *Kiln Safety*—Electric hobby kilns should be installed in accordance with local electrical and fire safety codes and in

accordance with manufacturers' suggested installation instructions.

X2.6.1 For used kilns, contact manufacturers for installation instructions.

X2.6.2 Hobby kilns are electrical appliances used to heat the pieces to a very high temperature. It is possible to receive a shock or to be burned if the kiln is misused or abused. Do not operate a kiln in a wet area. Do not allow children near the kiln.

X2.6.3 Do not plug in or unplug the kiln unless the circuit is off. Turn all switches to OFF before loading or unloading the kiln. Do not open the lid with the kiln turned on.

X2.6.4 Do not leave papers or combustibles around the kiln or place objects on the kiln while firing. Always unplug the kiln while making any repairs.

X2.6.5 Do not try to unload the kiln until the outside of the kiln is cool to the touch and the pieces can be easily touched by the bare hand.

X2.6.6 When unloading a kiln, be careful of the stilt marks on glazed ceramic pieces. They can be sharp and should be smoothed as soon as possible with a grinding wheel or stone. Be sure to wear safety glasses while grinding off stilt marks.

X2.6.7 Electric hobby kilns should be properly ventilated (see X2.11.2).

X2.7 *Food-Safe Glazes*—Many glazes are formulated to be safely used on surfaces that come in contact with food or drink. These glazes are labeled food safe. The jar directions should be followed closely.

X2.7.1 Proper firing of food-safe glazes is critical. Pyrometric cones should be used on the kiln shelves to ensure that the pieces are fired hot enough. Always fire in accordance with manufacturer's instructions. If crazed or underfired, these glazes may not be food safe.

X2.7.2 Proper firing of food-safe glazes is critical. Pyrometric cones should be used on the kiln shelves to ensure that the pieces are fired hot enough. Always fire in accordance with manufacturer's instructions. If crazed or underfired, these glazes may not be food safe.

X2.8 *Lead or Cadmium, or Both, Containing Glazes*—Lead and cadmium are used in many ceramic glazes. While perfectly adequate hobby and professional ceramic programs can be provided without using lead or cadmium glazes, cadmium is necessary to produce especially brilliant reds and yellows. Lead gives a brilliance to the glaze and allows the glazes to mature in the hobby firing range. The lead and cadmium used in these glazes are chemically combined in a glass to reduce their solubility. Such reduced solubility decreases the health risk in using glazes containing lead and cadmium.

X2.8.1 **Warning**—Cadmium is a human cancer agent and can also cause damage to kidneys, lungs, testes, and the developing fetus. Consult relevant Material Safety Data Sheets.

X2.8.2 Lead absorption may result in damage to the nervous system with weakness and difficulty in thinking, kidney damage, or risk to the developing fetus. Children are particu-

larly susceptible to absorbing lead and to adverse effects associated with lead absorption, and they should not use lead glazes. Lead is an experimental cancer-causing agent. All people who regularly use lead-containing glazes should inform their doctors and get regular blood lead tests.

X2.9 *Sprays, Solvents, and Overglazes*—These products are easy to use safely and will present no problems as long as these three important rules are observed: Keep out of reach of children, use in a well-ventilated area, and clean up after use.

X2.9.1 These products should not be used near a heat source or open flame or close to the kiln. Containers shall be kept closed when not in use. Rags and paper towels or tissues used with these products should be placed in the trash for immediate disposal.

X2.10 *Dry Powdered Materials*—As with any finely ground substance, dust control is the primary safety factor to be remembered by those who customarily make slip. Ceramic bodies consist of clay minerals and porcelain slip contains quartz dust. When making slip, a NIOSH mask should be used. The work area should be well ventilated. It is best if the area can easily be washed down to clean the dust from the surfaces. The slip-making area should be away from the glazing area to prevent contamination of the ware by exposure to dust.

X2.10.1 Excessive inhalation of quartz dust may result in chronic lung damage. When making porcelain slip, use a NIOSH-approved mask for mists and dusts and a locally exhausting hood in the area where dust is generated.

X2.11 *Ventilation* —Adequate ventilation is a necessary precaution when spraying glazes. Ideally, spraying of water-based glazes should be done in a spray booth; however, if a spray booth is not practical, spraying should be done near an open window with an exhaust fan. At the very minimum, a NIOSH-approved mask for mists and dust should be used.

X2.11.1 Aerosol sprays, solvents, and solvent-based overglazes should be used with a window exhaust fan to ensure adequate cross ventilation. If the solvents are known to be flammable, an explosion-proof fan should be used.

X2.11.2 *Ventilating an Electric Kiln Area*—Ventilation is recommended when firing an electric kiln. Adequate ventilation may be achieved by means of air exchange through the use of cross ventilation, exhaust hoods, or self-contained air-handling systems. To determine the appropriate ventilation, it is recommended that a local, licensed heating, ventilation and air-conditioning contractor be consulted. (**Warning**—Fossil fuel kilns (oil, gas, coal, wood, and so forth) must have outside ventilation. These kilns are not covered under X2.11.2, and the user should contact the kiln manufacturer and a local, licensed heating, ventilation and air-conditioning contractor for proper installation.)

X2.12 *Read Labels with Care*—In ceramics, as in all areas of human activity, proper usage of products ensures safety. Misuse of products may expose the ceramist to potentially harmful substances. Care should be taken to read all label instructions before using a product.

X2.13 Medical Supervision—If glaze spraying is a major portion of the ceramic work, regular blood lead-level testing may be advisable. Pregnant women or women contemplating pregnancy, people with respiratory problems, and those with other medical issues that may be exacerbated by dust or ceramic materials should consult their doctors before engaging in ceramic work or classes. Anyone who works regularly with lead-containing glazes or leading kilns should have blood lead tests. Subsequent tests should be done at intervals with a doctor familiar with occupational lead hazards and who can consider appropriate levels for the lead found in the blood. Pregnant women or women contemplating pregnancy who are active ceramicists or whose income is dependent on ceramic work should notify their physician of their work with ceramic products.

X2.13.1 Keep these commonsense safety rules in mind and remember to observe them. Make sure students, clients, and employees read this booklet and provide them with any

necessary safety equipment. Post a simple list of safety rules in classrooms and work areas. Hobby ceramics is an enjoyable activity with a fine safety record. Let's keep it that way.

X2.14 Suggestions :

X2.14.1 If pregnant or contemplating pregnancy, consider postponing ceramic activities if possible, and tell your physician about your ceramic work.

X2.14.2 When using solvent-containing ceramic materials, work out of doors or in a proper explosion-proof local exhaust system.

X2.14.3 When work generates ceramic dust, work in a locally exhausting hood, if available, or use an appropriate NIOSH-approved respirator.

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