

# AIC NEWS

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## Selection of Personal Protective Equipment The most effective methods for minimizing hazards in conservation work are substituting less toxic chemicals, implementing safer work methods, and installing permanent

engineering controls, such as local exhaust ventilation systems. The next line of defense becomes the use of personal protective equipment (PPE), particularly in conservation tasks for which suitable substitute methods have not been established, or when the only hope for engineering controls depends upon long-term budget planning. As an interim measure, properly chosen and conscientiously worn PPE can serve as an effective safety barrier.

Hazards remain, however, and safety depends on how adequately your PPE protects against your specific work hazards, how well the PPE is maintained, and its level of acceptance among its users. This article briefly outlines selection criteria for commonly used PPE that protect eyes and face, head, feet, hearing, and skin. Gloves and other clothing are emphasized. Respiratory protection is not addressed in this article, as the subject was thoroughly discussed in a previous *AIC News* (Colton 1995).

### *New OSHA Standard*

To emphasize the importance of proper PPE selection and use, the Occupational Safety and Health Administration (OSHA) expanded

its PPE standards (*Code of Federal Regulations* 1994) to include employer requirements for hazard assessments, adequate selection, and staff training. Maintain a written record of your hazard evaluations, chemical inventories, PPE selections, and a list of who has received PPE and what type of training was provided. This task should not be viewed as additional paperwork, but as a useful way for you and your staff to learn more about the hazards inherent in your job and to facilitate future reviews of PPE effectiveness. You probably have already gathered most of this information if your conservation shop/lab is covered by the OSHA Hazard

Communication Standard (29CFR1910.1200) or the OSHA "Lab" Standard (29CFR1910.1450), which requires a Chemical Hygiene Plan.

### *Hazard Identification*

Before you open a safety supply catalog, clearly understand exactly what type of work hazards you might encounter. In many instances, PPE is highly specific and cannot easily be interchanged between tasks or workers (such as respirators, which require individual fitting). Review your facility's "OSHA 200 Form—Log of Illness and Injury" or other first aid logs for an idea of hazardous tasks. Conduct an inventory of your chemical supplies and review their Material Safety Data Sheet. Observe work tasks (particularly nonroutine movements) and seek staff input into tasks that they believe are unsafe. Which parts of this task are risky, and what is the possibility of injuries occurring? Can these risks be eliminated through more permanent controls or by altering the task? Will PPE be needed, and what limits PPE use in these tasks? (Keep in mind that PPE can be uncomfortable when worn for long periods of time. It can

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restrict movement and limit the tactile sensitivity that is so important in conservation work.)

Recommended sources for easy, well-organized Job Hazard Analysis forms include Lab Safety Supply Company and Arts, Crafts, and Theater Safety (see Resources listed below).

### General Selection Guidelines

Helpful references for matching PPE to hazard and work limitations include OSHA PPE standards and OSHA consultation offices (see reference below), your insurance carrier's risk management and safety group, safety suppliers, and the manufacturers themselves. A reputable safety supplier or equipment manufacturer should not only be interested in your hazard assessments, but also familiar with OSHA requirements and standards set by the American National Standards Institute (ANSI) and knowledgeable about manufacturer test data on its products (particularly for gloves). Consider individual size

requirements when ordering to assure proper fit. Also rely on the experiences of colleagues in other facilities.

### Acceptance and Use

The ultimate success of PPE depends on its user who needs to feel comfortable wearing it. He or she must be informed of its proper use and care, the hazards against which it is designed to protect, and its limitations, particularly its life expectancy under specific work conditions. Encourage staff feedback on whether the devices actually work properly. Select from models that meet at least the minimum criteria soliciting employee input into the purchase process will greatly enhance wearer acceptance.

### Skin Protection

Gloves, lab coats, aprons, and other chemical protective clothing (CPC) are necessary when skin is exposed to harmful substances, chemical or thermal burns, lacerations, abrasions, punctures, and harmful temperature extremes. Select hot/cold gloves to match the range of temperature extremes to which you are exposed, and depending on task needs include special grips for fingers and palms. (If you already have thermal gloves, check with the manufacturer on whether they were constructed of asbestos fibers. If so, carefully bag them and properly dispose of them according to local code.)

The degree of chemical protection afforded by a certain material is a function of chemical type, the task length, and the level of activity. Among the questions to ask are: How long will this glove be in contact with the chemical? Will tasks lead to puncture, abrasion, or tearing of the glove (i.e., will palms or fingers need to be lined with abrasion-resistant material)? Will tactile sensitivity or extra grip be needed? Will the weight of heavy gloves impair work or lead to fatigue and other related safety hazards? (If so, you may need to alter the task or institute frequent breaks.) Will there be extreme conditions of temperature or humidity? (If so, check with manufacturer on what effect this may have.)

The barrier effectiveness of CPC

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against a particular chemical is rated (and advertised) in terms of each chemical's permeation rate, break-through time, and degradation potential of that material. Permeation rate is the amount of chemical that diffuses through a given area of clothing per unit time ("break-through"). Thus, the thicker the glove, the slower the permeation rate for a given chemical. Likewise, potential exposure to a chemical increases if you immerse your entire hand in a chemical as opposed to just handling a contaminated surface with your fingertips. Once again, know your task. Units of break-through time are usually expressed in minutes, with a typical test taking up to eight hours. If no measurable break-through is detected after eight hours, the result might be reported as a break-through time of ">8 hours." Evidence of degradation (and loss of elasticity) includes swelling, shrinking, stretching, and dissolving.

Refer to safety catalogs for a wide variety of CPC manufacturers, and then review each manufacturer's charts for specific chemicals. Do not rely on charts that indicate the protective ability of a certain material against an entire class of chemicals, such as "acids." Reputable manufacturers will list at least permeation data, which should have been measured using a standard test method (F739-85), and a standard battery of chemicals (F1001-86) from the American Society for Testing and Materials (ASTM).

You should also consider these factors: Since no one clothing material will serve as a barrier to all chemicals, it may be more efficient to purchase different gloves for distinct purposes than to search for a "wonder" glove. The chemical resistance of a certain material may vary widely from manufacturer to manufacturer depending on construction methods, so check with a specific manufacturer on the match (i.e., not everyone's nitrile glove protects equally) (Schwope et al. 1987).

Note that once a chemical has begun to diffuse into a plastic/rubber material, it will continue to diffuse toward the interior (a phenomenon known as "persistent permeation") even after the surface has been wiped clean with soap and water. By the next work day some of the absorbed chemical may have reached the inside of the

glove. This amount should be insignificant through a glove made of highly resistant material. It may be a critical factor, however, if purchasing gloves for highly toxic or carcinogenic materials (of which any amount inside a glove is undesirable) or highly viscous materials (which are difficult to remove). Instead of trying to decontaminate and reuse a better quality glove, it may be wiser to purchase less expensive gloves with sufficient protection for the course of a work day and dispose of them after each day's use.

Check new gloves periodically for pinhole leaks (fill with water or air), especially where fingers connect, and examine stitched areas of seams. (Quality gloves will have stitched seams overlaid with tape or sealed with a coating.) Likewise, pay attention to button and zipper areas on CPC; multiple layers of fabric overlap should be present to avoid chemical penetration.

A special note on latex gloves: If using surgical-type barrier gloves for handling objects, they should be of vinyl material, not latex. Latex gloves, particularly when powdered, can cause a mild-to-severe allergic reaction in sensitive individuals. Using and disposing of vinyl barrier gloves is highly recommended when handling objects that are potentially contaminated with residual particulate preservatives and pesticides. If cotton gloves are desired for tactile reasons, they should be worn in addition to vinyl gloves for full dermal protection. (Cotton alone will act as a contaminant "wick" to the skin, especially if moistened by perspiration.)

### *Eye and Face Protection*

Eye and face protection is required when conservators are exposed to flying particles or sparks (side shields are also required in these cases), molten metal, splashes from hazardous liquids (acids, caustics, and other chemicals), chemical gases, vapors, fumes, and hazardous light radiation (ultraviolet or infrared). Eye and face devices purchased after May 5, 1994, must comply with ANSI Z97.1-1989 or be equally effective (o.b.e.e). Devices purchased before May 5, 1994, must comply with ANSI Z97.1-1968 (o.b.e.e.). Eye protection for operations that produce

harmful light radiation (i.e., welding) must have filter lenses. The degree (number) of shading must follow that listed in OSHA Standard 29 CFR 1910.133 (*Code of Federal Regulations* 1994).

### *Head Protection*

Protective helmets are required when working in areas where potential exists for injury to the head from falling objects. Helmets specifically designed to reduce electrical shocks are necessary where heads could come in contact with exposed electrical conductors. Protective helmets purchased after May 5, 1994, must comply with ANSI Z89.1-1986 (o.b.e.e). Devices purchased before May 5, 1994, must comply with ANSI Z89.1-1969 (o.b.e.e.).

### *Foot Protection*

Protective footwear is required when working in areas where there is a danger of foot injuries due to falling or rolling objects, and where feet are exposed to electrical hazards, or where objects might pierce the sole of the shoe. Protective footwear purchased after May 5, 1994, must comply with ANSI Z41-1991 (o.b.e.e). Devices purchased before May 5, 1994, must comply with ANSI Z41.1-1967 (o.b.e.e.).

### *Hearing Protection*

Hearing protection may be required during tasks that produce noise (generally in excess of 85 decibel) such as woodworking, forging, machining, hammering, drilling, pneumatic chipping, or using compressed air. Sound level measurements first may be necessary to assure that the type of protection chosen reduces exposures to noise to safe levels. Properly fitted ear plugs can reduce noise levels by 25 to 30 db (manufacturers include a noise reduction rating on their products as a guide) and are useful for protecting against the higher frequencies. They are made from a variety of materials, such as plastic, pliable rubber, and compressible foam (which is often the most effective and easiest to use).

Foam models can be cleaned, but it may be more cost-efficient (and more sanitary) to purchase bulk supplies of disposable ones. Cotton is not effective and may cause ear infections. Ear muffs are generally more effective than plugs, are easier to fit, and with basic cleaning and care, should last for years.—Kathryn A. Makos, MPH, Certified Industrial Hygienist, Smithsonian Institution

### Technical Assistance Resources

American National Standards Institute (ANSI), 1430 Broadway, New York, NY 10018; (212) 642-4900. Source of referenced PPE standards.

Arts, Crafts, and Theater Safety (ACTS); Monona Rossol, 181 Thompson St., Ste. 23, New York, NY 10012; (212) 777-0062; e-mail: 75054.2542@compuserve.com. Offers technical advice, training, and publishes monthly *ACTS Facts*, which updates information on health and safety regulations and research affecting the arts.

*Art Hazards News*, Center for Safety in the Arts, available from New York Foundation for the Arts, 155-6th Ave., 14th fl., New York, NY 10013. Quarterly newsletter on health and safety in the arts; annual special resources issue lists occupational clinics, OSHA offices, and other agencies.

Lab Safety Supply, P.O. Box 1368, Janesville, WI 53547-1368; Safety TechLine: (800) 356-2501.

OSHA Publications Office, 200 Constitution Ave., NW, Rm. N3101, Washington, DC 20210; (202) 219-4667.

OSHA On-Site Consultation Program offers free, confidential safety and health services to small businesses, including museums, on a hazard-priority basis. Call [redacted] for local project office.

### References

*Best's Safety Directory*. 1994 (or current edition). 2 volumes. Oldwick, NJ: A.M. Best Co. 2220 pp.

Center for Safety in the Arts. 1995. Health and safety resources for the arts. *Art Hazards News* 18(2):9-17.

*Code of Federal Regulations*. 1994. Title 29 CFR 1910 Subpart I, *Federal Register* 59(66):16360-64.

Colton, C. 1995. A conservator's guide to respiratory protection. *AIC News* 20(2):1-6.

Forsberg, K. and L.H. Keith. 1989. *Chemical Protective Clothing Performance Index Book*. NJ: Wiley and Sons. 305 pp.

McCann, M. 1992. *Artist Beware*. 2d ed. New York: Lyons and Burford. 564 pp.

Rossol, M. 1994. *The Artist's Complete Health and Safety Guide*. New York: Allworth Press. 345 pp.

Schwoppe, A. D., P. P. Costas, J. O. Jackson, J. O. Stull, and D. J. Weitzman. 1987. *Guidelines for the Selection of Chemical Protective Clothing*. 3d ed. Prepared for American Conference of Governmental Industrial Hygienists, Cincinnati, OH. Cambridge, MA: Arthur D. Little, Inc. 330 pp.

Wortham, S. D. 1995. Learn the ABCs of PPE. *Safety+Health* 151(2).

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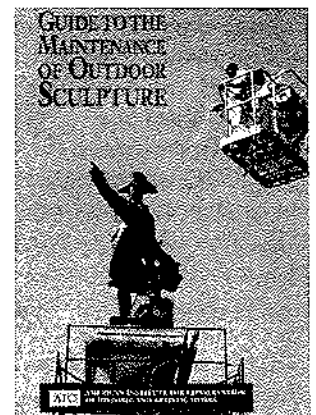
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