

## **Ceramics Division Personal Protective Equipment Policy**

It is the policy of the Ceramics Division (CD) that all work be conducted in a safe manner, with a goal of no accidents, injuries, or illnesses. To that end, CD requires all work or work-related activities to be conducted in a manner consistent with the NIST Personal Protective Equipment (PPE) Policy (<http://safety.nist.gov/ppe-policy.htm>) and the CD PPE policy (contained herein).

Personal protective equipment is intended to reduce the risk of injury by creating a barrier against workplace hazards. PPE must be used when the eyes, face, hands, extremities, or other parts of the body are exposed to workplace hazards that cannot be controlled by other means. PPE is not a substitute for good engineering controls, administrative controls, or good work practices, but, rather, should be used in conjunction with those controls to ensure the safety and health of employees, associates, and visitors.

### *Scope*

The NIST Ceramics Division (NIST/852) policy on personal protective equipment (PPE) is intended to help protect employees from exposure to workplace hazards. The program applies to all activities and work areas assigned to Division personnel at the NIST Gaithersburg site. In addition, those employed outside the Division (guest scientists, visitors, etc.) are expected to follow these policies when using Division facilities and work areas.

This program specifically addresses eye, face, foot, and hand protection. Laser PPE is specifically excluded, and is covered in the Ceramics Division Laser Safety Policy.

This program complies with the requirements of the Occupational Safety and Health Administration regulations 29 CFR 1910.132 and 29 CFR 192.28

### *What to do in the event of an injury or accident*

In the event of an emergency and/or when an injury or accident occurs after hours, call the NIST-Gaithersburg emergency number, extension 2222 (“four deuces”). If you believe an urgent response is needed, request an ambulance; otherwise, assistance may be delayed until police or health unit staff arrive on the scene to make this determination.

Further, if an injury occurs, or is suspected, the individual, or someone acting on behalf of the individual, should contact the Health Unit. The Health Unit (Building 101/Administration Building, Room C-33) maintains normal business hours of 8:30 am to 5:30 pm, Monday through Friday, and can be reached at phone number (301) 975-5131.

CD adheres to NIST injury response/reporting policies as specified in the NIST Administrative Manual, Subchapter 12.02; an electronic copy of this policy can be found on the web at <http://www-i.nist.gov/admin/mo/adman/1202.htm>. As soon as possible after a reportable incident, submit Commerce Department Form CD-137, Report of Accident/Incident, to your

supervisor; this form is available on the web at <http://www-i.nist.gov/pdfprntfrms/cd137po.pdf>. “Near misses” also should be reported to your supervisor and the Division Safety Representative (DSR) so that appropriate information can be shared with Division personnel to help avoid injury to others in similar circumstances.

### *For more information*

Assistance in selecting PPE, installing engineering controls, and planning activities can be obtained from the NIST Safety Office (phone: 301-975-5818), your supervisor, or the DSR.

### *Responsibilities*

Safety is a responsibility shared by all staff, associates, and guests.

#### Employee

Individuals are the first line of defense in preventing accidents. All employees are responsible for using appropriate PPE when performing potentially hazardous activities. It is the responsibility of all employees to ensure that their activities do not pose a hazard to other individuals nearby. Staff shall work in accordance with this policy at all times and shall ensure that all PPE requirements, as delineated in this policy, are met.

Individuals shall ensure that their work spaces meet safety requirements, that guest researchers and associates working with them are informed of the Division’s PPE policy, and that all appropriate PPE and safety supplies required for their work are available and accessible.

All staff are expected to notify safety representatives and management whenever an unsafe situation is encountered, whenever an unsafe practice is observed, and whenever necessary PPE are missing or inoperative. Such notification shall be given as soon as practicable. As appropriate, hazard review shall be initiated by submission of form CD-137.

If any hazardous situation not covered by this policy is encountered, or if an individual requires clarification of any portion of the policy, the individual is responsible for seeking guidance from the Division Safety Representative or the appropriate supervisor.

#### Project Leader

A Project Leader shall ensure that project work spaces meet safety requirements, project team members are informed of the Division’s PPE policy, and all appropriate PPE and safety supplies required for project work are available and accessible to the staff. A Project Leader shall participate in any hazard review that pertains to the Project’s work or work space.

### Group Leader / Supervisor

Group Leaders are responsible for ensuring the safety of Group staff and associates who work in Division facilities. Group Leaders shall ensure that appropriate PPE and safety supplies are available and accessible, that staff and associates take any required PPE training, and that all work is undertaken using PPE according to the Division's policy. When any incident of noncompliance with Division policy is observed, the Group Leader shall pursue corrective action to ensure compliance. Corrective actions may include (but are not limited to) acquisition of new or alternate PPE, modifications of work spaces, and training of staff. The Group Leader shall participate in any hazard review that pertains to a Group's work or work space.

### Division Chief

The Division Chief is responsible for ensuring the safety of all Division staff and associates. Accordingly, the Division Chief is responsible for ensuring that all staff are aware of the Division's PPE policy, that adequate PPE and safety supplies are available, and that PPE are used in Division work in accordance with this policy.

The Division Chief appoints a Division Safety Representative, participates (in person or by delegate) in safety inspections, and conducts an annual review of the Division's PPE policy. The Division Chief seeks and obtains advice, guidance, and status reports from the Division Safety Representative, and others, and takes corrective action to ensure compliance with this policy. At the request of safety representatives, the Division Chief (in person or by delegate) participates in hazard reviews.

The responsibilities defined for Group Leaders, Project Leaders, and Employees assume that those individuals fully understand the hazards associated with the tasks encountered in their Groups/Projects/Tasks. If any activity requires PPE for which no appropriate expertise exists within the Division, the Division Chief shall ensure that the appropriate individuals or a suitable representative from the Division receives the appropriate training. In all matters regarding PPE within the Division, the Division Chief may designate specific responsibilities to specific individuals, regardless of Group or Project affiliation, to best utilize the expertise within the Division.

### Division Safety Representative (DSR)

The Division Safety Representative (DSR) is responsible for guidance, oversight, and administration necessary to ensure compliance with general safety policies. The DSR is also responsible for interacting with safety-related organizations within NIST. The DSR will assist with the review of PPE requirements for new and altered laboratory installations, coordinate safety inspections, and initiate the annual review of this policy. At least annually, the safety inspection will include verification that laboratory signage appropriately describes PPE

requirements. The DSR is expected to bring any potential safety issues to the attention of appropriate parties and to inform the Division Chief of any unresolved issues.

### *Hazard Assessment and Signage*

PPE requirements most commonly are determined by the nature of the tasks that need to be performed. Specific PPE requirements for a laboratory module must be posted at the entrance(s) to the module. Where reasonable, each apparatus requiring specific PPE for its operation should have labels prominently displayed on or near the apparatus describing the required PPE.

Signs should be kept up to date by laboratory occupants. Current lab signs, templates, and instruction for signs, are available from the DSR.

The determination of PPE requirements to be included in laboratory signs is guided by a hazard assessment that evaluates the hazards of using specific tools, equipment, or other hazardous operations. Engineering safety controls such as machine guards, impact screens, automatic power cutoff switches, and pressure release valves should be included whenever feasible. Hazard assessment will identify what PPE is required for performing specific tasks.

A hazard assessment must be performed:

- upon installation of any new laboratory module
- upon renovation or modification of an existing module
- at least annually by the designated responsible occupants or users of the module
- at least every two years by the DSR

A standard hazard assessment form can be obtained from the DSR. The hazard assessment must include:

- description of task or equipment
- description of possible hazardous conditions and injuries
- description of all required PPE; inclusion of optional PPE is also encouraged
- signature of the reviewer(s) and date of review

A copy of each assessment must be given to the DSR who will maintain a file for inspection. As appropriate, the DSR and/or supervisor can conduct a review of any task, apparatus, or facility deemed hazardous. As a result of any hazard assessment, the DSR can recommend, and the Division Chief can require, additional engineering and/or administrative controls, PPE training, and PPE usage requirements.

### *PPE Training*

Supervisors shall ensure that all employees who perform tasks requiring PPE receive appropriate training on the applicable PPE. Training may be provided individually, such as during the safety training of new employees, or collectively, such as by training sessions. Supervisors will

document training administered individually. The DSR will document training administered collectively. Training will describe (as applicable):

- what PPE is necessary
- when PPE is to be worn
- how to properly put on (don), take off (doff), adjust, and wear PPE
- the limitations of PPE
- the proper care, maintenance, useful life, and disposal of PPE

### *PPE Use Requirements*

In all cases, staff and associates conducting work in Division facilities or on Division projects shall exercise reasonable and due caution in all activities. PPE designated as “mandatory” in workplace signage shall be used without exception. PPE designated as “optional” in workplace signage shall be available and accessible in the workplace and should be utilized as prudence dictates.

### Protective eyewear

Protective eyewear does not provide unlimited protection and is not a substitute for engineering controls (machine guards, for example). Every effort should be made to eliminate or minimize eye hazards in the laboratory by either enclosing or shielding all areas that pose continuous or long-term hazards.

Activities that present impact, dust, or splash hazards require the use of appropriate protective eyewear. For impact and splash protection, spectacle-style safety glasses with side shields are required. For applications that create high levels of airborne particulates (“nuisance dust”) or expose one to significant chemical hazards, safety goggles, preferably indirectly vented or nonvented, are favored. If large quantities of material may be splashed, use of a face shield along with primary protective eyewear is recommended. A fume hood sash does not replace the need for safety glasses.

Activities for which protective eyewear must be worn include (but are not limited to):

- operating machine tools, such as a drill press, lathe, bandsaw, or grinder
- hammering
- handling chemicals in open containers (pouring, stirring, mixing, heating, etc.)
- pouring or transferring cryogenic liquids
- changing regulators or valves on pressurized gas cylinders
- moving or modifying pressurized or evacuated lines (including water lines)
- handling pressurized glass tubes or bulbs (e.g. laser flashlamps)
- operating motorized polishing equipment
- solder removal
- welding (special requirements apply: see the DSR first)

- overhead work
- any other activity that poses a reasonable risk of injecting foreign matter into the eye

Special consideration applies to employees who wear prescription corrective lenses. In this case, the protective eyewear must either incorporate the prescription in its design or enable the user to wear prescription lenses without disturbing the proper position of either the prescription lenses or the protective eyewear. For contact lens wearers, dusty and/or chemical environments may represent additional hazards; the wearing of contact lenses is discouraged in such cases. Consult your supervisor if you wish to purchase prescription safety eyewear.

Protective eyewear requirements for laser hazards are described separately in the Division Laser Safety Policy, which references the separate ANSI laser standard and other federal laser regulations. The Division Laser Safety Representative can provide guidance.

#### Protective gloves

It is good practice to assume that all chemicals are hazardous and that protective gloves may be desirable. Appropriate chemically resistant gloves must be worn when handling hazardous chemicals regardless of quantity. Different glove materials resist different chemicals differently. If you are not sure of what gloves are best or appropriate for your purpose, consult the DSR or NIST Safety Office for guidance.

Insulating gloves must be worn when transferring cryogenic liquids or when handling cryogenic transfer lines that are not insulated.

Protective gloves should be worn when assembling glassware. Protective gloves are mandatory when fitting glass tubing and when handling pressurized glass tubes or bulbs (e.g. laser flashlamps).

Protective work gloves are required when performing tasks that typically eject sparks or heated objects (e.g., welding or grinding). Protective gloves are recommended when performing machining tasks that result in sharps or splinters.

#### Protective footwear

Division activities typically do not require specialized footwear. However, in all Division laboratories, sturdy shoes that protect the feet and minimize slipping and tripping must be worn. Open-toe shoes, sandals, clogs, soft fabric slippers, and similar footwear are not considered sturdy shoes. Employees who work in non-laboratory environments are encouraged to wear sturdy shoes while on the job.

## Respiratory protection

Whenever a reasonable probability for the inhalation of harmful air contaminants and/or oxygen-deficient atmospheres exists, respiratory protection shall be required. However, activities that expose an individual to hazardous vapors in Division laboratories may only be performed in a fume hood. If this engineering control provides adequate protection, respiratory PPE is not required. If a fume hood does not provide adequate protection, see the DSR for protection alternatives.

Dust masks must be worn when performing activities that create high levels of airborne particulates (“nuisance dust”).

## Hearing Protection

Hearing protection is required in areas where ambient noise exceeds 85 dBA. Consult the DSR or the NIST Safety Office to arrange sound-level measurements if you suspect a work area may have hazardous noise levels.

## Additional Considerations

### Acid or base solutions:

Whenever there is a reasonable likelihood or risk for injury from handling acid or base solutions (particularly in concentrated form), adequate protection (such as face shields, full length rubber aprons or smocks, acid resistant gloves, and nonporous shoes) should be worn. In such cases, special temporary signage should be posted at the laboratory work site to alert other people that the use of acid or alkaline materials is in process. The temporary signage should be posted before the process begins and should be removed when the process has concluded and the risk of exposure has been removed. When transporting a large capacity bottle containing a concentrated acid or base, one should always use a rubber acid/solvent bottle carrier, or equivalent carrying device, capable of containing the liquid in the event that the bottle is ruptured during transport (such as might occur if the bottle is dropped).

### Highly flammable and energetic materials:

Before working with flammable materials, ensure that the work site has sufficient ventilation to prevent the accumulation of excessive amounts of vapors. When needed, use a respirator to provide protection from airborne vapors at concentrations exceeding occupational exposure limits. Fire retardant clothing and protective gloves may also be needed. If there is a notable risk of explosion, a plastic face mask should be worn and a safety glass shield should be placed between the person and the high risk substance. Special signage should be posted to alert other people that the use of flammable or energetic materials is in process. The temporary signage should be posted before the process begins and should be removed when the process has concluded and the risk of exposure has been removed.

*Policy Changes / Reviews*

The PPE policy can be modified as needed, at any time, upon approval of the Division Chief.

The DSR is responsible for initiating an annual review of the PPE policy. The initiation of a review should include an announcement to staff that the policy is under review to solicit recommendations for changes. Upon modification, the change of the policy should be announced to the staff and, whenever feasible, a comment period of not less than two weeks should be provided for staff comments.

Upon final approval of the Division Chief, an electronic version of the approved PPE policy shall be posted on the Division's web site.

*Informative References*

OSHA Occupational Safety and Health Standards:

[http://www.osha.gov/pls/oshaweb/owastand.display\\_standard\\_group?p\\_toc\\_level=1&p\\_part\\_number=1910](http://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1910)

NIST Health and Safety Instructions: <http://www-i.nist.gov/admin/ohsd/hsinstrc.htm>