

Safety Manual

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Personal Protective Equipment Policy

Policy: This policy applies to industrial, maintenance, construction, and support services operations of North Carolina Agricultural and Technical State University (NC A&T). Personal Protective Equipment (PPE) for researchers and academia are covered in the laboratory safety training provided by NC A&T Environmental Health and Safety (EHS). In compliance with the provisions of the Occupational Safety and Health Act of North Carolina, the University will furnish at no cost to the employee, certain PPE required by the job. PPE for eyes, face, head and extremities shall be provided whenever it is necessary due to the hazards presented by the job. Such hazards include chemical, biological, radiological, and physical hazards encountered in a manner capable of causing injury. PPE is designed to prevent entry into the body through absorption, inhalation or physical contact and includes protective clothing, respiratory devices, and protective shields and barriers.

Responsibilities:

Environment, Health and Safety

It is the responsibility of EHS to ensure all employees are properly protected from workplace hazards through engineering controls, administrative controls, or personal protective equipment. PPE and other hazard controls will be assessed during annual EHS inspections, incident investigations, Job Safety Analysis development, and complaints from university employees.

Supervisor

It is the supervisor's responsibility to properly train their employees in the personal protective equipment they will need for their job specific duties. It is also the supervisor's responsibility to ensure the employee is provided the proper personal protective equipment and that the employee uses their PPE properly while working. If it is determined by the supervisor or EHS that the employee is not using the PPE appropriately, then the employee must be retrained by the supervisor in the use of the PPE. If an employee is injured on the job because of not wearing the appropriate PPE, then the employee must be retrained by the supervisor in the use of the PPE. Supervisors should inspect all PPE at least once a month to ensure that it is safe to use.

Employees

Employees are responsible for using the appropriately issued personal protective equipment for the job they are doing. Different PPE may be required for different jobs. Employees are responsible for inspecting their PPE before and after each use. If the PPE is used infrequently, then it should be inspected at least once a month as well as before each use. Employees are also required to be properly trained in using PPE initially upon employment.

General OSHA requirements:

Purchase and payment of PPE

When PPE is Required

NC A&T will provide, at no cost to the employee, all personal protective equipment which the employee does not wear off the job site or use off the job. OSHA 1910.132 (h) (1) states that payment is required for any PPE used by an employer to comply with one of the PPE requirements in OSHA's standards. If the PPE is not required, then the employer is not required to pay for it. However, when an employer selects a specific type of PPE to be used at the workplace to comply with a standard, the employer is required to pay for it.

Safety-Toe Footwear and Prescription Safety Eyewear

OSHA 1910.132 (h) (2) states that the employer is not required to pay for non-specialty safety-toe protective footwear, and non-specialty prescription safety eyewear if the employer permits the items to be worn off the job-site. This includes steel-toe shoes or steel-toe boots. If the employer requires employees to keep non-specialty safety-toe protective footwear, and non-specialty prescription safety eyewear at the workplace, then the employer must pay for the items. If the safety-toe protective footwear, and prescription safety eyewear are non-standard "SPECIALTY" items, the employer must pay for them. This includes steel-toe shoes and steel-toe boots. (Examples of "specialty" items – Prescription eyeglass inserts for full-facepiece respirators, or non-skid shoes for floor strippers.)

Everyday Clothing and Weather/Temperature Issues

Under OSHA 1910.132 (h) (4), the employer is not required to pay for everyday clothing, such as long-sleeve shirts, long pants, street shoes, and normal work boots. This also applies even when the employer requires employees to use these items, and the clothing provides protection from a workplace hazard. (OSHA 1910.132(h) (4)) Under OSHA 1910.132 (h) (4), the employer is not required to pay for ordinary clothing, skin creams, or other items, used solely for protection from weather, such as winter coats, jackets gloves, parkas, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen. If ordinary weather gear is not sufficient to protect the employee, and special equipment or extraordinary clothing is needed to protect the employee from unusually severe weather conditions, the employer is required to pay for the protection. Clothing used to protect employees from artificial heat or cold is not part of this exception. (Example: Employees working in a freezer warehouse may need heavy coats. In this situation, the employer is required to pay for the PPE.)

Replacement of PPE

OSHA 1910.132 (h) (5) states that the employer must pay for replacement PPE, except when the employee has lost or intentionally damaged the PPE. (Replacement of PPE is determined by each standard that requires PPE to be used.)

Employee-Owned PPE

Where an employee provides adequate protective equipment which he or she owns and brings to the worksite, the employer may allow the employee to use it and is not required to reimburse the employee for that equipment. However, the employer shall not require an employee to provide or pay for his or her own PPE, unless the PPE is excluded by another paragraph. In the event an employee brings their own PPE it must be under the following conditions:

- The employee's use of their own PPE must be completely voluntary.
- The employee can withdraw use of their own PPE at any time.
- If the employer allows an employee to use PPE they already own, the employer is still held responsible for making sure the PPE is adequate, properly maintained, and sanitary under the applicable PPE standard.

Hazard assessment and equipment selection: The department, in consultation with the EHS Office, will assess the workplace to determine if hazards are present, or likely to be present, and require the use of specific PPE. If such hazards are present, or likely to be present, NC A&T will:

- Select and have each affected employee use the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment;
- Communicate selection decisions to each employee;
- Select PPE that properly fits each affected employee;
- Verify that the required workplace hazard assessment has been performed through a written certification that identifies the workplace evaluated, the person certifying that the evaluation has been performed, and the dates of the hazard assessment. (Refer to “Certificate for Personal Protective Equipment”.)

Training: The University will provide training to each employee who is required to use PPE. Each affected employee shall demonstrate an understanding of the training and the ability to use the PPE properly. This must be completed before the employee can perform work requiring the use of PPE. The training program must verify that each affected employee has received and understood the required training through a written certification that contains the name of each trained employee, the date(s) of the training, and identifies the subject of the certification.

Each employee must be trained to know the following information:

- When PPE is necessary
- What PPE is necessary
- How to properly don, doff, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life and disposal of the PPE

Retraining is required when there are changes in the workplace and in the type of PPE to be used. Retraining is also required when an affected employee’s knowledge or use of the assigned PPE indicates that the employee has not retained the understanding or skill needed to use the PPE properly.

Head protection: The basic head protection for consideration is the hard hat. A hard hat can reduce the force of a 570-lb. impact to a 127-lb. shock to the neck and spine. It is mandatory to wear a hard hat in all construction areas which also includes the following: roads, shops, and outlying work areas. It is estimated that over 90 percent of work-incurred head injuries could have been avoided with hard hats. To satisfy the general requirements for heavy construction, a hard hat must meet the specifications of ANSI Z89.2 – 1971 Class B. A bump cap is not an acceptable hard hat.

Hard hat protection is effective only if the hat is adjusted to fit properly and is worn squarely on top of the head and not cocked at an angle or perched on the back of the head. Severe lacerations from relatively light blows have been incurred by workers wearing hard hats in unusual positions.

The hair shall be protected against being caught on moving machinery, subjected to sparks or snagging objects. Long hair should be protected by compacting it into the hard hat shell or by use of hair nets or ties so that it is not loose.

The hard hat protects in five basic ways:

- The hard shell is the basic impact protection against falling and flying objects and walking into objects.
- The curved shell allows an object to ricochet or slide off, reducing the force of impact.
- The space maintained between the shell and the head (minimum of 1 1/4 inch) by the suspension within the helmet minimizes the shock and prevents the shell from striking the head solidly upon impact.
- The space between the suspension and the shell on the side of the head softens the effect of lateral blows. This space should also be sufficiently ventilated.
- The bill protects the face and the outwardly curved bottom edge allows for the protection of the ears and the nape of the neck.

Supplementary hard hat equipment includes winter liners for cold, sweat bands for heat, chin straps for high wind, and sloth caps for radiation exposure. When using a face shield, welding hood or sandblasting hood, the type, which combines with the hard hat, is recommended. If work must be done in small areas and the hard hat will not fit, a soft cap will be an acceptable substitute, i.e., a welding sock hood. These must have prior approval from the Environment, Health and Safety Office. If a worker must work in an inverted position subject to falling or flying particles, ear protectors and a chin strap should be used. Do not modify hard hats without the approval of the Environment, Health and Safety Office. (ex. Holes should never be drilled into the hard hat. This weakens the structure and reduces the protectiveness of the hard hat.)

Hand protection: Proper protective gloves should be worn whenever there is the potential for contact with corrosive or toxic materials, sharp objects, and/or very hot or very cold materials. Gloves should be selected based on the material being handled, the particular hazards involved, and their suitability for the operation being conducted. Glove materials are eventually permeated by chemicals. However, they can be used safely for limited time periods if specific use, glove characteristics (i.e., thickness and permeation rate), and time are known. Common glove materials include neoprene, polyvinyl chloride, nitrile, butyl, and natural rubbers. These materials differ in their resistance to various substances.

Foot protection: Employees are expected to wear shoes that are appropriate for the duties of their employment. Sandals or other open-toe style shoes are not permitted to be worn in laboratories, shops, or other job locations where glass, caustic or corrosive chemicals, or hot materials are used or handled. The University policy is that anyone lifting more than 15 pounds repeatedly throughout the day is required to wear safety shoes. The University will pay up to \$100 for safety shoes in accordance with the Office of State Personnel.

Protective clothing: The purpose of protective clothing is to prevent harm to the body from potential exposures associated with work, as well as to protect personal clothing.

When working with or around acids or alkalis, a full acid suit may be needed. However, the degree of exposure may permit use of rubber two-piece suits or a rubber apron with rubber sleeves. In some cases, rubber boots may be sufficient.

Fluorescent vests are to be worn to by personnel working in close to roads, regardless of the task being performed.

Eye and face protection:

(OSHA 1910.133) (ANSI Z87.1-2003, ANSI Z87.1-1989, ANSI Z87.1-1968)

University employees are required to use appropriate eye or face protection when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids,

chemical gases or vapors, or potentially hazardous light radiation. Employees are required to wear eye protection that provides side protection when there is a hazard from flying objects. Detachable side protectors (i.e. clip-on or slide-on side shields) meeting the requirements of this section are acceptable. When applicable, secondary protective devices such as face shields are required in conjunction with primary protective devices during severe exposure to impact hazards, heat, and chemicals. When an employee is working in a dusty area, either eyecup or cover-type safety goggles should be worn in the area.

It is the university's responsibility to ensure that each affected employee who wears prescription lenses while engaged in operations that involve eye hazards wears eye protection that incorporates the prescription in its design, or ensures the employee wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses.

Eye and face PPE must be distinctly marked to facilitate the identification of the manufacturer of the PPE.

It is the responsibility of the university to ensure that each affected employee uses equipment with filter lenses that have a shade number that is appropriate for the work being performed for protection from injurious light radiation.

The following tables list appropriate shade numbers for a variety of operations:

Filter Lenses for Protection Against Radiant Energy

Operations	Electrode Size 1/32 in.	Arc Current	Minimum (*) Protective Shade
Shielded metal arc welding	Less than 3	Less than 60	7
	3 to 5	60-160	8
	5 to 8	160-250	10
	More than 8	250-550	11
Gas metal arc welding and flux cored arc welding		Less than 60	7
		60-160	10
		160-250	10
		250-550	10
Gas Tungsten arc welding		less than 50	8
		50-150	8
		150-500	10
Air carbon	(Light)	less than 500	10
Arc cutting	(Heavy)	500-1000	11
Plasma arc welding		less than 20	6
		20-100	8
		100-400	10

		400-800	11
Plasma arc cutting	(light)(**)	less than 300	8
	(medium)(**)	300-400	9
	(heavy)(**)	400-800	10
Torch brazing			3
Torch soldering			2
Carbon arc welding			14

Filter Lenses for Protection Against Radiant Energy

Operations	Plate thickness: in	Plate thickness: mm	Minimum(*) Protective Shade
Gas Welding:	Under 1/8	Under 3.2	4
Light	1/8 to 1/2	3.2 to 12.7	5
Medium	Over 1/2	Over 12.7	6
Heavy			
Oxygen Cutting:	Under 1	Under 25	3
Light	1 to 6	25 to 150	4
Medium	Over 6	Over 150	5
Heavy			

**As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum. In oxy fuel gas welding or cutting where the torch produces a high yellow light, it is desirable to use a filter lens that absorbs the yellow or sodium line in the visible light of the (spectrum) operation.

***These values apply where the actual arc is clearly seen. Experience has shown that lighter filters may be used when the arc is hidden by the workpiece.

Eye Protection Criteria

ANSI Z87.1-2003 sets forth criteria related to the description, general requirements, testing, marking, selection, care, and use of protectors to minimize or prevent injuries, from such hazards as impact, non-ionizing radiation, and chemical type injuries, in occupational and educational environments including, but not limited to, machinery operations, material welding and cutting, chemical handling, and assembly operations.

Protective eye and face devices purchased after July 5, 1994 shall comply with ANSI Z87.1-1989, "American National Standard Practice for Occupational and Educational Eye and Face Protection," which is incorporated by reference as specified in Sec. 1910.6.

Prescription safety glasses:

Fitted glasses: Safety glasses which are professionally measured and fitted to the individual are recommended for permanent employees whose job duties require frequent eye protection.

These specially fitted glasses are available through the Eye Care Center and the North Carolina Department of Corrections.

Description of procedure: Arrangements have been made with local opticians to provide fitting services for prescription and non-prescription safety glasses. These services are requested and coordinated by the EHS Office. Requests SHOULD NOT be made directly with the optician.

Steps/procedure: Notify your departmental contact to set up an appointment for your fitted glasses. This departmental contact would call EHS to set up the appointment for the employee and process the account adjustment to reimburse EHS for the cost associated with the fitted glasses.

If prescription glasses are required, the employee will need a current prescription (less than one year). Prescriptions cannot be copied from current prescription eyewear. Scheduling and payment of eye examinations are the employee's responsibility.

When the departmental contact calls for service, the EHS Office will determine the availability of appointment times.

Arrival time: Prescription and non-prescription safety glasses must be ordered, and will usually be available about 4-6 weeks after the fitting. Non-prescription safety glasses, goggles and shields may be obtained at Grainger.

Charge payment: Upon receipt of the monthly statements from the Eye Care Center and the North Carolina Department of Corrections, EHS will create a journal entry of charges to be routed to departments electronically.

Foot protection:

Safety shoes: Safety shoes are used to protect the feet against injuries from heavy falling objects, against crushing by rolling objects, or against lacerations from sharp edges, and against electrical hazards. Employees shall be provided one pair of safety shoes per year. If the shoes become damaged within that one-year timeframe due to the on the job work the employee is performing, or due to an accident, then the shoes shall be compensated for and replaced by the employer. If the safety shoes become damaged or worn due to personal usage away from the employee's job (ex. At home, another job, etc.), the employee shall not be compensated for the replacement of their safety shoes.

When foot protection is required: Safety shoes are required for employees (Permanent or Temporary) whose routine job duties require the lifting, carrying, or moving, etc., of objects weighing more than fifteen pounds, which, if dropped, would likely result in foot or toe injury. Examples of job classifications likely to require safety shoes or boots include, but are not limited to, carpenters, welders, electricians, plumbers, maintenance mechanics, laborers, grounds workers operating power machinery or tools, and power plant maintenance workers.

Specialized footwear: Specialized footwear that would not customarily be worn off-the-job must be provided without cost to employees by their department. Examples of such specialized footwear include slip-on rubber shoes, Gators (shoes worn when stripping floors), and calf-length and knee-length rubber boots.

Cost reimbursement: When safety shoes are required, the university will pay up to \$100.00. If a shoe is more than \$100.00, then the employee is not reimbursed for the difference. Employees

are to purchase the shoes and submit receipt to their department for reimbursement. (Also see “Purchase and Payment of PPE” under General Requirements for PPE).

Standard: Safety footwear shall comply with ANSI Z41.1-1991 “American National Standard for Personal Protection-Protective Footwear”. Employees are expected to wear footwear appropriate for the duties of their employment. Sandals or other open-toe style shoes are not permitted to be worn in laboratories, shops, or other job locations where glass, caustic or corrosive chemicals, or hot materials are used or handled.

ANSI standard: The protective identification ANSI code will be legible (printed, stitched, etc.) on one shoe of each pair. The following is an example of an ANSI code on a piece of protective footwear:

ANSI Z41 PT 91
FI/75 C/75 MT/75
Cd 1 EH
PR

Line #1

ANSI Z41 PT91. This line identifies the ANSI Z41 standard. The letters PT indicates the protective section of the standard. This is followed by the last two digits of the year of the standard with which the footwear meets compliance (1991)

Line #2

FI/75 C/75 MT/75. This line identifies the applicable gender (M or F) for which the footwear is intended. It also identifies the existence of impact resistance (I), the impact resistance rating (75, 50, or 30 foot-pounds). This line can also include a metatarsal protection designation (MT) and rating (75, 50, or 30 foot-pounds).

Lines #3 and 4

Cd 1 EH; PR. Line 3 and 4 are designated for conductive properties (Cd) and type (1 or 2), electrical hazard (EH) and puncture resistance (PR), if applicable.

Enforcement: Once a job has been designated as requiring safety shoes, employees will not be allowed to work without the required foot protection.

Employees are expected to wear footwear appropriate for the duties of their employment. Sandals or other open-toe style shoes are not permitted to be worn in laboratories, shops, or other job locations where glass, caustic or corrosive chemicals, or hot materials are used or handled.

New employees will be required to obtain safety shoes before starting employment if their duties require them to wear safety shoes.

Students are expected to wear appropriate footwear while participating in laboratory exercises, or other instructional activities involving the use of glass, caustic or corrosive chemicals, or hot materials. Generally, sandals or other open-toe style shoes should not be worn in laboratories or during activities which would require the use of eye protection devices.

Insole protection: Flexible steel mid-soles are required for employees who are likely to step on sharp objects. These objects include but are not limited to: Nails in boards, or stakes that could possibly penetrate normal shoe soles.

Ankle protection: Six or eight-inch safety shoes are recommended for employees involved in activities where ankle abrasions are likely. These activities include, but are not limited to, climbing, crawling, construction, and demolition.

Wet locations: Over-the-shoe rubber footwear to be worn over standard (or safety) footwear or boots is required in wet locations. The rubbers or boots are required in addition to the safety footwear recommendations listed above. Rubber boots with toe and metatarsal protection are recommended for employees working in flooded trenches or other locations where ordinary over-the-shoe protection would be inadequate to ensure that the employee's shoes would remain dry.