

**NORTH CAROLINA DEPARTMENT OF LABOR  
OFFICE OF OCCUPATIONAL SAFETY AND HEALTH  
RALEIGH, NORTH CAROLINA**

Standards Notice 38

TO: All Supervisors, Consultants, Safety Officers, Industrial Hygienists and Staff.

SUBJECT: Eye and Face Protection in Chemical Operations

29 CFR 1910.132(a) and (c); 29 CFR 1910.133(a)(1) and (2)(i); 29 CFR 1910.133(a)(6); 29 CFR 1926.28(a); and 29 CFR 1926.102(a)(1), (2), and (5).

**A. Standards**

1. 29 CFR 1910.132(a) Application. Protective equipment including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, physical contact.
2. 29 CFR 1910.132(c) Design. All personal protective equipment shall be of safe design and construction for the work to be performed.
3. 29 CFR, 1910.133(a)(1). Protective eye and face equipment shall be required where there is a reasonable probability of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors. No unprotected person shall knowingly be subjected to a hazardous environmental condition. Suitable eye protectors shall be provided where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.
4. 29 CFR 1910.133(a)(2)(i). They shall provide adequate protection against the particular hazards for which they are designed.
5. 29 CFR 1910.133(a)(6). Design, construction, testing, and use of devices for eye and face protection shall be in accordance with American National Standard for Occupational and Educational Eye and Face Protection, Z87.1-1960.
6. 29 CFR 1926.28(a). The employer is responsible for requiring the wearing of appropriate personal protective equipment in all operations where there is an exposure to hazardous conditions or where this part

indicates the need for using such equipment to reduce the hazards to the employees.

7. 29 CFR 1926.102(a)(1). Employees shall be provided with eye and face protection equipment when machines or operations present possible eye or face injury from physical, chemical, or radiation agents.
8. 29 CFR 1926.102(a)(2). Eye and face protection equipment required by this Part shall meet the requirements specified in American National Standards Institute Z87.1–1968, Practice for Occupational and Educational Eye and Face Protection.
9. 29 CFR 1926.102(a)(5). [Table E-1](#) shall be used as a guide in the selection of face and eye protection for the hazards and operations noted.

**B. Discussion**

Significant uncertainty and concern has been expressed regarding what is considered acceptable personal protective equipment for the eyes and/or face of personnel working with chemicals. Chemical usage may occur in almost any work environment either general industry or construction, and usually involve hot or corrosive liquids, vapors, gases, and in some cases, solids. The hazards associated with these operations are physical or chemical burns to eyes or skin, eye or skin irritation, and/or distraction or temporary blindness resulting in other physical injury from operations or equipment involved. Specific operations are too numerous to be considered individually, therefore, some general guidelines must be established for the type of eye and face protection required.

**C. Interpretation**

Based on the standards listed in A above, the specific requirements of ANSI Z87.1–1968, and the hazards involved; the determination of eye and face protective equipment required in chemical operations will be based on the following:

1. Highly corrosive or toxic by eye or skin absorption, liquids, vapors, gases, or airborne particles will require ventilated acid hood, full face respirator, or special protective suits.
2. Hot, strongly irritative, and/or corrosive liquids, vapors, gases, or airborne particles require both chemical goggles and face shield, or special chemical hood.
3. Moderate irritants will require chemical goggles and face shield.
4. Slight irritants require chemical goggles or face shield used with safety glasses with side shields.

Degrees of irritation likely to result from exposure to chemicals may be determined by label information, manufacturer's data sheets, chemical dictionaries, and injury records. Factors that must be considered are exposure

time, concentration, characteristic, and temperature. Mixtures of hazardous chemicals may increase or reduce the overall hazard, but the hazard should be assumed to be at least that of the most hazardous component. Professional judgment guided by knowledgeable inquiry and evaluation is a most important factor in determining the hazard and deciding the level of protection required.

Where inadequate protection is provided or adequate protection is not used, a citation for violation of the appropriate standard shall normally be recommended by the Safety Officer or Industrial Hygienist.

NOTE: This interpretation is addressed to the problem of eye and face protection only. Other protective equipment may be required for other exposures.

D. Inquiries

1. Questions on the application or content of this standards notice should be directed to the Safety and Health Engineering Section of the Office of Occupational Safety and Health, North Carolina Department of Labor.
2. Questions regarding the specific hazard classification of chemicals should be directed to the Department of Labor, Industrial Hygienist, The Occupational Health Branch, Division of Health Services, Department of Human Resources; or local physicians.

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TABLE E-1—EYE AND FACE PROTECTOR SELECTION GUIDE

- 1. GOGGLES, Flexible Fitting, Regular Ventilation
- 2. GOGGLES, Flexible Fitting, Hooded Ventilation
- 3. GOGGLES, Cushioned Fitting, Rigid Body
- \* 4. SPECTACLES, Metal Frame, with Sideshields
- \* 5. SPECTACLES, Plastic Frame, with Sideshields
- \* 6. SPECTACLES, Metal-Plastic Frame, with Sideshields
- \*\* 7. WELDING GOGGLES, Eyecup Type, Tinted Lenses (Illustrated)
- 7A. CHIPPING GOGGLES, Eyecup Type, Clear Safety Lenses (Not Illustrated)
- \*\* 8. WELDING GOGGLES, Coverspec Type, Tinted Lenses (Illustrated)
- 8A. CHIPPING GOGGLES, Coverspec Type, Clear Safety Lenses (Not Illustrated)
- \*\* WELDING GOGGLES, Coverspec Type, Tinted Plate Lens
- FACE SHIELD (Available with Plastic or Mesh Window)
- \*\* WELDING HELMETS

\* Non-side shield spectacles are available for limited hazard use requiring only frontal protection.

\*\* See Table E-2, in paragraph (b) of this section, Filter Lens Shade Numbers for Protection Against Radiant Energy.

APPLICATIONS		
OPERATION	HAZARDS	RECOMMENDED PROTECTORS: <b>Bold Type Numbers Signify Preferred Protection</b>
ACETYLENE— BURNING ACETYLENE— CUTTING ACETYLENE— WELDING	SPARKS, HARMFUL RAYS, MOLTEN METAL FLYING PARTICLES	<b>7, 8, 9</b>

CHEMICAL HANDLING	SPLASH, ACID BURNS, FUMES	<b>2, 10 (For severe exposure add 10 over 2)</b>
CHIPPING	FLYING PARTICLES	<b>1, 3, 4, 5, 6, 7A, 8A</b>
ELECTRIC (ARC) WELDING	SPARKS, INTENSE RAYS, MOLTEN METAL	<b>9, 11 (11 in combination with 4, 5, 6 in tinted lenses, advisable)</b>
FURNACE OPERATIONS	GLARE, HEAT, MOLTEN METAL	<b>7, 8, 9 (For severe exposure add 10)</b>
GRINDING—LIGHT	FLYING PARTICLES	<b>1, 3, 4, 5, 6, 10</b>
GRINDING—HEAVY	FLYING PARTICLES	<b>1, 3, 7A, 8A (For severe exposure add 10)</b>
LABORATORY	CHEMICAL SPLASH, GLASS BREAKAGE	<b>2 (10 when in combination with 4, 5, 6)</b>
MACHINING	FLYING PARTICLES	<b>1, 3, 4, 5, 6, 10</b>
MOLTEN METALS	HEAT, GLARE, SPARKS, SPLASH	<b>7, 8 (10 in combination with 4, 5, 6 in tinted lenses)</b>
SPOT WELDING	FLYING PARTICLES, SPARKS	<b>1, 3, 4, 5, 6, 10</b>

NOTE: In ANSI Z87.1–1968, under Face Shields "S.2.1 Function" the specific statement is made, "Such devices should be worn over suitable basic eye protection devices."