

Keeping an eye on OSHA

By David Roll and Ken Duffie

On the job, accidents and injuries are often a result of negligence and unsafe working conditions. In an effort to protect workers, the Occupational Safety and Health Administration (OSHA), created standards 1910.132 and 1910.133 to address requirements for providing personal protective equipment (PPE) and eye protection in the workplace. However, most employers find it hard to sort through the standards and get to the heart of what they really mean for everyday life; here we offer a straightforward explanation.

OSHA standards 1910.132 and 1910.133

OSHA Standard 1910.132 (Personal Protective Equipment) states that, "Protective equipment...shall be provided, used and maintained [by the employer] in a sanitary and reliable condition wherever it is necessary by reason of hazards...encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact."

The standard goes on to stress that if an employee owns their own protective equipment, the employer is responsible for making sure it is adequate in substance and design for the

work performed, including maintenance and cleaning. OSHA also requires that all employers "assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment" (PPE). If such hazards exist, the employer must, "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 affected employee; and, select PPE that properly fits each affected employee." According to this standard, defective or damaged personal protective equipment shall not be issued or used in the workplace.

The employer is also responsible for documenting the required workplace hazard assessment in a written certification that states the workplace evaluated, a witness to the evaluation, and the dates of the assessment, as well as providing training to each employee who is required to use PPE. Each such employee shall be trained to know at least the following: when and what PPE is necessary; how to properly "don, doff, adjust and wear PPE"; the limitations, proper care, maintenance, useful life and disposal of the PPE.

Each employee needs to demonstrate his understanding of the training and the ability to use PPE properly before being allowed to perform work requiring it. If an employer has reason to believe that any trained employee is not yet familiar and skilled enough to use the PPE, that

employee must be retrained. Just as certification is necessary in conducting a workplace hazard analysis, employers also need to verify that each affected employee has received and understood the required training. This certification must include, "the name of each employee trained and the date(s) of training."

OSHA Standard 1910.133 (Eye and Face Protection) states, "Employers shall ensure that each affected employee uses appropriate eye or face protection when exposed to eye or face hazards." This standard also conveys that employers are responsible for making sure that eye-wear with side protectors are issued when danger of flying particles exists and that the correct filter lenses are used when the employee is in danger of "injurious light radiation" (refer to sidebar, "Filter Lenses for Protection against Radiant Energy").

This standard goes on to state that employees who wear prescriptive lenses while performing tasks that involve eye hazards are issued eye protection that, "incorporates the prescription in its design, or wears eye protection that can be worn over the prescription lenses without disturbing the proper position of the prescription lenses or the protective lenses."

Other items in the standard for Eye and Face Protection include: the necessity of eye and face PPE to be clearly marked in order to identify the manufacturer; the stipulation that any protective eye and face devices purchased after July 5, 1994 conform with ANSI Z87.1-1989 stan-

AISC's new "General Safety Rules for Structural Steel Fabricators" will be available Dec. 1. See www.aisc.org for more information or call 800/644-2400 to order a copy.

dard; and eye and face protective devices purchased prior to July 5, 1994 conform with or be equivalent to the ANSI Z87.1-1968 standard.

Breaking the Language Barrier

Understanding OSHA's Standards 1910.132 and 1910.133 can be broken down into four easy steps: hazard assessment and equipment selection; employee training; equipment maintenance; and record keeping/administration.

Hazard Assessment and Equipment Selection

By conducting a walk-through survey of the workplace, employers will determine present hazards (impact, light radiation, and liquid splash) requiring the use of PPE (see sidebar, Eye Hazard Assessment). Since the employer on a regular basis may not perform many jobs in the workplace, employee input can be critical to completing this survey correctly.

Also keep in mind that in the workplace the possibility of multiple and simultaneous exposures to a variety of hazards always exists; an adequate protection against the highest level of each of the hazards should be provided.

Impact

The hazard of impact involves debris from flying objects or particles. For this, side protection is recommended. There is a wide selection of safety eyewear available designed specifically for impact hazards to help the employer comply with OSHA standards. These include dual and single lens spectacles, goggles and faceshields. A safety spectacle with a strong lens, optically correct side shields and an ANSI compliant frame with a brow bar will protect eyes in all three directions.

Light Radiation (LR)

Without the proper protection from ultraviolet (UV) light and infrared radiation, damage can occur

to the eyes without knowledge. For protection against UV rays, specially designed polycarbonate lenses are recommended. Polycarbonate filters 100% of harmful UV radiation regardless of whether the lens is tinted or not. For IR protection, it's necessary to select the proper IR lens shade for a specific task. Matching IR sideshields will block out rays peripherally. If the task involves light and radiation, welding helmets or welding shields and spectacles with shaded or special purpose lenses are required.

Liquid Splash

This includes harmful chemicals and bodily fluids. Again, adequate

protection depends on the type of substances involved and varying working conditions. When goggles alone will not protect against splashes of gasoline, solvents or infected blood, faceshields in combination with spectacles make up the best line of defense.

Next, the employer must choose the right protective eyewear for each job. From impact, dust and particles to heat, intense light, liquids and gases, spectacles or goggles can adequately protect eyes from injury. Once this is determined, protective eyewear should be purchased for employees based on the following:

- Quality - the better the design, the

Eye Hazard Assessment Survey Checklist

Plant Name: _____
 Location: _____
 Products/Industry: _____
 # of Employees: _____

Departments or Areas Where Eye Protection is Currently Worn

1. Fabrication	Yes	No
2. Pouring-Liquid Splash	Yes	No
3. Maintenance Dept.	Yes	No
4. Warehouse	Yes	No
5. Other (List)	Yes	No

Potential Eye Hazards

1. Hand Tool/Power Tool Areas	Yes	No
2. Grinding Machinery	Yes	No
3. Liquid Splash (Chemical Processing)	Yes	No
4. Welding	Yes	No
5. Lasers in Use	Yes	No
6. Electrical Operations	Yes	No
7. New Equipment & Processes (added in past 12 months)	Yes	No

Identify Sources of Eye Hazards in Areas For:

1. Impact	Done
2. Penetration	Done
3. Compression (roll over)	Done
4. Chemical/Liquid Gas	Done
5. Heat	Done
6. Harmful Dust	Done
7. Light (Optical Radiation)	Done
8. Impact Direction:	
Above	Done
Side	Done
Frontal	Done

Employee Training Checklist

Walk-Through Survey

Company: _____

Department: _____

Possible Hazards to Note:

Impact hazards	Falling objects
Flying objects	Sharp objects
Sources of motion	Rolling or pinching objects
High temperature	Electrical hazards
Types of chemical exposures	Location of co-workers
Harmful dust	Other hazards
Light radiation	Review of injury data

Employee Training

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

Safety Officer _____ Date _____

Employee _____ Date _____

- longer and better the protection;
- Fit - proper fit gives the best protection;
- Style - should encourage use and policy compliance;
- Comfort - constant adjusting will inhibit job performance;
- Lens options - choose from prescription lenses, over-the-glass safety eyewear, anti-fog, anti-glare and indoor/outdoor lenses; and
- Employee feedback - makes compliance to mandatory rules easier.

One of the most significant factors in choosing safety eyewear is size. Size depends on the individual wearer's face. While a pair of spectacles may fit well on the average man or woman, they may not fit correctly on a larger person. This variance, a gap, would most likely be evident in the lower outside corners of the eyewear. If a pencil can be inserted into any side of the eyewear, so can particles, heat or chemicals. These seemingly minuscule gaps can and do lead to serious eye injuries.

If employees wear eyeglasses with prescription lenses, employers should not consider these eye protection. Eyeglasses designed for ordinary use will not provide sufficient protection against hazards. Instead, there are a number of options in protection: prescriptive spectacles with side shields and protective lenses that both meet ANSI standards and correct the vision of the employee; goggles that can comfortably fit over corrective eye glasses without disturbing the alignment of the glasses and goggles that incorporate corrective lenses mounted behind protective lenses.

Protective eyewear must also be provided to employees wearing contact lenses that are exposed to potential eye injury. Eye protection provided to these employees should also incorporate corrective lenses in the event the employee has taken out or lost his or her contact lenses.

Employee Training

The issuance of safety eyewear to employees requires more than a

handout. The employer is required to communicate and educate his employees (see sidebar, Employee Training Checklist). Employees need to know why it is important to wear protective eyewear, and they need the employer to make it easy for them to do so effectively.

Concise easy-to-read guidelines should clearly state the policies about when protective eyewear should be worn, by whom, etc. Employers will also need to educate employees about job hazards and how they can be avoided through proper use and care of safety eyewear and workplace equipment.

Management needs to set an example by following policies and sticking with the safety program. Employers need to make a point to correct unsafe behavior in all employees and visitors. Safety eyewear should be issued consistently to everyone in the work area, including management, visitors and delivery personnel.

Equipment Maintenance

According to OSHA, defective or damaged eyewear should not be used in the workplace. The best way to ensure that eye protection equipment stays in good shape is to instill in employees the proper use and storage of it.

First of all, when an employer issues eye protection equipment to his or her employees, he or she should also issue free cases, holders and/or straps - these items serve to protect eyewear from the hazards of the workplace when they are not being worn.

Next, employers must impart to their employees the importance of keeping their safety eyewear clean. As an employer, make sure there are available cleaning stations/materials in a convenient location in each work area so workers won't have to stray too far to clean their eyewear.

This saves time and makes it easy for the worker to comply.

Inspect eyewear frequently. Cracks in lenses, loose frames and missing nosepieces can often contribute to accidents causing eye

injuries. In addition, if a worker is having trouble seeing what they are doing or is spending lots of time adjusting broken eyewear, they are very apt to remove it altogether.

Record Keeping and Administration

OSHA mandates employers must verify that hazard assessment and employee training of PPE has been completed. Making these two necessary processes official by terms of documentation enforces them further. Once an assessment of the workplace has been completed and documented it should be hung in a public location so that it will serve as a reminder to both management, employees and visitors what hazards exist and what protective equipment is needed for their safety. Having a public list will also help to remind employers that assessments need to be done on a regular basis, especially after new equipment or processes have been implemented in the workplace.

Documentation of employee training in PPE serves to enforce the importance of wearing PPE in hazardous conditions. The official nature of the documentation will help to remind workers that there are no excuses for negligence in wearing PPE around equipment and hazards.

Once employers understand exactly what OSHA standards 1910.132 and 1910.133 really convey, it will be easy to see that they were truly put in place for the safety of all workers in a hazardous environment. It is the employer's responsibility to make sure he is up to date on all of the current OSHA and ANSI standards to better provide for his employees and ensure a safe workplace.

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Filter Lenses for Protection against Radiant Energy				
Operations	Electrode Size (no. of 1/32 in.)	Arc Current	Protective Shade	Min. Suggested Shade*
SMAW	Less than 3	Less than 60	7	-
	3 to 5	60 to 160	8	10
	5 to 8	160 to 250	10	12
	More than 8	250 to 550	11	14
GMAW and FCAW		Less than 60	7	-
		60 to 160	10	11
		160 to 250	10	12
		250 to 500	10	14
Gas Tungsten Arc Welding		Less than 50	8	10
		50 to 150	8	12
		150 to 500	10	14
Air Carbon Light		Less than 500	10	12
Air Cutting Heavy		500 to 1000	11	14
Plasma Arc Welding		Less than 20	6	6 to 8
		20 to 100	8	10
		100 to 400	10	12
		400 to 800	11	14
Plasma Arc Cutting				
	Light**	Less than 300	8	9
	Medium**	300 to 400	9	12
Heavy**	400 to 800	10	14	
Torch Brazing		-	-	4
Torch Soldering		-	-	2
Carbon Arc Welding		-	-	14
Operations	Plate Thick. (in.)	Plate Thick. (mm)	Suggested* Shade	
Gas Welding:				
Light	Under 1/8	Under 3.2	4 or 5	
Medium	1/8 to 1/2	3.2 to 12.7	5 or 6	
Heavy	Over 1/2	Over 12.7	6 to 8	
Oxygen Cutting:				
Light	Under 1	Under 25	3 or 4	
Medium	1 to 6	25 to 150	4 or 5	
Heavy	Over 6	Over 150	5 or 6	
* As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade that gives sufficient view of the weld zone without going below the minimum. In oxyfuel 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.				