

PPE – THE LAST LINE OF PROTECTION

Know how and when to use Personal Protective Equipment.

By Gustavo A. Gonzalez

Personal Protective Equipment, or PPE, includes a variety of equipment or protective devices used to create a safety barrier between the employee and a potential hazard. Gloves, hard hats, safety glasses, safety shoes and hearing protection are among the most common types of PPE. Other types are more specialized, such as air purifier masks, harnesses and respirators.

Since PPE is designed to provide a level of protection for specific applications, U.S. and Canadian safety regulations require that each employee be trained and understands the proper use, care and maintenance of the equipment before wearing it.

Before providing employees with any kind of PPE, the employer must conduct a hazard assessment of the workplace in order to identify physical hazards and the nature of the threats they pose to the workers. The employer must also have a written program in place. If the employees handle hazardous chemicals or skin irritants, such as concrete, the employer must consult the Material Safety Data Sheets for those products in order to provide the required PPE.

Once the hazard assessment is complete, the employer may decide to use other methods to eliminate the hazards, such as engineering and administrative controls. These methods are more effective than PPE, because they eliminate the hazards. However, if the hazards cannot be eliminated, then the use of PPE is required. Remember, PPE does not eliminate the hazard; it is designed to protect the employee from the hazard.

Once the PPE is issued, the employee must wear it whenever requested to do so. In most companies, refusal to wear PPE may result in administrative action or even dismissal.

The following paragraphs describe the most common PPE used in the precast concrete industry and the proper usage of each.

Hard hats

Hard hats are designed to offer some head protection. OSHA regulations require hard hats “when working in areas where there is a potential for injury to the head from falling objects or exposure to electrical contact.” They are also recommended for protecting the head whenever there is a danger of bumping it against fixed objects, such as exposed pipes or beams.

Hard hats must comply with ANSI Standard Z-89.1 and must be marked as such. They must not be painted or drilled with holes for ventilation. They must be adjusted correctly so that the top of the shell hangs about an inch or so from the top of the head. Do not wear baseball caps under the hard hat, and do not turn the visor to the rear.

Protect your hard hat; do not sit or stand on it, and keep it away from heat sources. Inspect it daily for cracks, dents and broken plastic suspension parts, and replace it if necessary.

Eye and face protection

Eye and face protection is a requirement in every precast plant due to the potential for eye injuries. OSHA requires that “each affected employee uses 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 injurious light radiation,” such as in welding and torch cutting. Safety glasses must comply with ANSI Standard Z.87.1, and they must be stamped as such.

There are different types of eye and face protection according to the hazards encountered at the workplace. The most common are impact-resistant or safety glasses, which protect you from particles produced by grinding, cutting wood, cleaning molds, tying rebar, etc.

Goggles protect the eyes and eye sockets from impact, dust and splashes, because they fit tightly to the face. Face shields protect the face from dust, splashes or sprays, but they do not protect against impacts. Therefore it is recommended that you wear safety glasses under the face shield to protect against impact hazards. Use face shields while pouring and vibrating concrete.

Welding shields protect your eyes against dangerous radiation caused by welding or torch cutting. Welding masks also protect your face against flying sparks and molten metal particles.

Inspect your eye protection equipment frequently and replace if there are any signs of cracked or scratched lenses, loss of elasticity in the band, loose fitting or any other type of wear. Clean your eyewear as needed, and wash it off right away if any concrete splashes onto it.

Foot protection

According to OSHA standards, foot protection must be worn when "working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards." Protective footwear must meet ANSI Standard Z41.1.

Leather boots with steel toes are the most common form of foot protection in the precast industry, but you can also find boots with metatarsal protection, which are special guards that run from the ankle to the toes and protect the upper part of the feet. Some shoes also have reinforced soles to protect against punctures.

Work shoes should be oil-resistant with antiskid rubber soles, and they should be insulated. The shoe must grip the heel firmly, and the forepart must allow freedom of movement for the toes. When it's time to buy work shoes, follow these simple rules:

- Do not accept footwear that is too tight to stretch with wear.
- Measure both feet, as they normally differ in size.
- Buy shoes to fit the larger foot.
- Buy shoes late in the afternoon when the feet are likely to be swollen to their maximum size.

Take care of your footwear. Inspect it before you use it. Look for holes and cracks that might leak. Replace footwear that is worn or torn. After working with chemicals, hose your footwear with water to rinse away any chemicals or dirt before removing your footwear. Remember, improper footwear can cause or aggravate foot problems.

Hand protection

OSHA requires that employers select and require employees to use appropriate hand protection when employees' hands are exposed to hazards such as those from skin absorption of harmful substances; severe cuts or lacerations; severe abrasions; punctures; chemical burns; thermal burns; and harmful temperature extremes."

There is quite a variety of hand protection for different work hazards. Cotton work gloves protect against dirt, abrasions and small cuts. Leather gloves protect against sparks, heat and rough objects. Welders and torch operators must wear leather gloves.

Rubber gloves protect workers from burns, irritation and skin injuries caused by contact with oils, greases, solvents and other hazardous chemicals. Since rubber gloves are made from different materials for different applications, it is important to review the MSDS or ask the supplier for the right kind of glove material for each application. Not all types of rubber material can be used with all chemicals.

Another point to consider is that certain machines and power tools become more hazardous when using gloves because of the danger of the gloves getting caught in moving or rotational parts, pulling your hand into the equipment. Examples are table saws, drills and grinders. If you do not know which kind of gloves to wear, ask your supervisor.

Hearing protection

Hearing protection must be used when noise levels are consistently above 85 decibels (dB) for eight hours or in accordance with the following OSHA table.

OSHA TABLE G-16 – PERMISSIBLE NOISE EXPOSURES

| Hours per day | Sound level dB |
|---------------|----------------|
| 8 | 90 |
| 6 | 92 |
| 4 | 95 |
| 3 | 97 |
| 2 | 100 |
| 1 1/2 | 102 |
| 1 | 105 |
| 1/2 | 110 |
| 1/4 or less | 115 |

One rule of thumb is that if you have to yell to be heard by another person about 3 feet away from you, the noise level is too high and you must use hearing protection. Employees using hearing protection must be trained in the selection, limitation, care and proper use of hearing protectors. Employees must also be tested regularly by qualified professionals to see if the hearing protection is effective. There are different types of hearing protection and with different noise attenuation ratings. Cotton is not an approved material for hearing protection. Consult with your supervisor regarding the required hearing protection equipment in your plant or work area. As with all other PPE, hearing protection equipment should be inspected daily and used properly in order to protect your hearing. Keep your hearing protectors clean at all times, wash your hands before inserting plugs in your ears, and do not leave them lying around collecting dust. If they are the disposable type, throw them away after use. Do not use any other employee's hearing protection equipment. **Respiratory protection** Respiratory protection must be used when an employee is exposed to a given concentration of

contaminants in the air. Dust masks are not considered respirators and cannot be used if there is exposure to a harmful contaminant. Exposure to silica requires the use of respirators. The use of respirators is too complicated an issue to be fully discussed in this article. OSHA has strict guidelines in reference to the use of respirators, and no employer should issue a respirator to an employee if those guidelines have not been followed. In order to use a respirator, the employee must receive a medical evaluation, be tested on the respirator to be used and be properly trained in the use, care, maintenance and storage of the equipment. They should always be worn on a clean-shaven face. There are many different types of respirators for many different contaminants. Respirators are certified by the National Institute of Occupational Safety and Health (NIOSH) and must be used in compliance with their certification. Employees with certain medical conditions or respiratory problems may not be allowed to use respirators. Also, individuals with a lot of facial hair may be required to shave in order to obtain a tight seal between the face piece and the face. Do not use a respirator if you have not received the required training and evaluations. Remember, your Personal Protective Equipment will not eliminate a hazard, but rather it is the last line of defense. Inspect all your PPE daily and report any problems to your supervisor. Do not use any defective PPE and keep it in a clean and sanitary condition. Your health and safety depend on them.

Back Belts are Not Considered PPE According to NIOSH, “ Employers relying on back belts to prevent injury should be aware of the lack of scientific evidence supporting their use.” After a review of the scientific literature, NIOSH has concluded that, because of limitations of the studies that have analyzed workplace use of back belts, the results cannot be used to either support or refute the effectiveness of back belts in injury reduction. NIOSH is not alone in questioning the effectiveness of back belts. Other institutions issuing similar statements include the American Industrial Hygiene Association, the Bureau of Mines, the Army Office of the Surgeon General, the State of Washington Department of Labor and Industries, the Alberta Ministry of Occupational Health and Safety (Canada), the United Brotherhood of Carpenters, and the Construction Safety Association of Ontario. (DHHS (NIOSH) Publication No. 94-127 October 1996). In the largest study of its kind ever conducted, NIOSH announced Dec. 5, 2000, that it had found no evidence back belts reduce back injury or back pain for retail workers who lift or move merchandise. The study, conducted over a two-year period, found no significant difference in workers' compensation claims between employees using back belts and those who don't. For more information go to www.cdc.gov/niosh/updates/beltinj.html.

OSHA Issues New Rule

The Occupational Safety and Health Administration has issued a new rule to clarify employer-issued Personal Protective Equipment. A previous rule stated that OSHA required employers to issue PPE to protect employees from job-related injuries and illnesses. The rule did not specifically state that the employer is to provide PPE at no cost to the employee. The new rule, which becomes effective Feb. 13, 2008, specifically requires employers to pay for PPE issued to employees. The requirements generally cover a wide range of PPE, including hard hats, gloves, goggles, safety shoes, safety glasses, welding helmets and goggles, face shields, chemical protective equipment and fall protection equipment. The rule does not require employers to provide PPE where none has been required before. Instead, the rule merely stipulates that the employer must pay for the required PPE, except in limited cases specified in the standard. For more information, visit www.osha.gov and search the term PPE 2007.

Gustavo Gonzalez has nearly 20 years of experience in the precast concrete industry. He has a bachelor's degree in Industrial Engineering Technology from Florida International University and is a former precast concrete plant manager. He currently serves as an instructor for the National Safety Council and the National Precast Concrete Association.