TerranearPMC Safety Share

Week of May 23, 2016– Face Shields

Face Shields; quite possibly the forgotten PPE. While wearing safety glasses is becoming a "no brainer," outside of specific hot work activities, face shields seem to be an extraneous piece of equipment that is only considered when one wants to be extra cautious, however, never really mandatory. After all, with all the latest technological advances and designs for safety glasses and goggles, one can see how face shields can be forgotten and quite possibly, ignored.

The OSHA regulations for face protection is shared with eye protection and can be found at 29 CFR 1910.133 (General Industry) and 29 CFR 1926.102 (General Construction). While both regulations are titled, "Eye and Face Protection," they lack specificity when it comes to selection of the appropriate PPE. Both regulations state:

"*The employer shall ensure 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*."

OSHA requires that the ability of safety glasses and face shields shall meet performance criteria specified by either the International Safety Equipment Association (ISEA) or the American National Standards Institute (ANSI), thereby ensuring that each piece of equipment can provide protection from flying projectiles. Meanwhile, OSHA places the responsibility of ensuring that the right type of PPE is selected and properly worn on the shoulders of the employer; whether it is safety glasses, goggles or face shields.

The current ANSI standard, ANSI Z87.1-2015 defines a face shield as "a protector intended to shield the wearer's face, or portions thereof from certain hazards, as indicated by the face shield's markings." The term, *protector* is defined a complete device. That is, a product with all of its components in their configuration of intended use. The previous ANSI standard (ANSI Z87.1-2010) actually specifies that face shields need to be used in conjunction with safety glasses/goggles.

When selecting face shields, it is important to understand the importance of comfort, fit and ease of use. Face shields should fit snugly (the primary way to ensure a snug fit is through the headgear suspension). Headgear is usually adjustable for circumference and depth. When worn properly, the face shield should be centered for optimal balance and the suspension should sit between half an inch and one inch above the eyebrows.

The fact is, not all face shields are created equally as they can be constructed of various types of materials. These materials include polycarbonate, propionate, acetate, polyethylene terephthalate glycol (PETG) and steel or nylon mesh.

Polycarbonate provides the best impact and heat resistance of all visor materials. Polycarbonate also provides chemical splash protection and holds up well in extremely cold temperatures. Polycarbonate is generally more expensive than other visor materials.

Acetate provides the best clarity of all the visor materials and tends to be more scratch resistant. It also offers chemical splash protection and may be rated for impact protection.

Propionate material provides better impact protection than acetate while also offering chemical splash protection. Propionate material tends to be a lower price point than both acetate and polycarbonate.

Polyethylene terephthalate glycol (PETG) offers chemical splash protection and may provide impact protection. PETG tends to be the most economical option for face shield choices.

Steel or nylon mesh visors provide good airflow for worker comfort and are typically used in the logging and landscaping industry to help protect the face from flying debris when cutting wood or shrubbery.

ANSI Z87.1-2015 categorizes face shields as either impact or non-impact, using a "+" symbol stamped on the face shield (meaning impact rated). Testing has shown that polycarbonate offers the best impact protection and PETG offers the least. Nevertheless, face shield parts made from either material have been successfully applied, meeting ANSI's strict testing standards for impact (polycarbonate is generally the most expensive visor material). OSHA states that "the employer must provide PPE to workers that give sufficient protection from the hazard." Therefore, even though PETG materials may successfully pass ANSI tests, the employer may decide to err on the conservative and choose the more expensive polycarbonate when the task hazard identification process classifies an activity as high impact work.

In addition to the materials used to make face shields, there are different types of face shields based on the intended work activity. For instance, there are face shields designed for protection against an arc flash. The requirements for arc flash protection are given in the National Fire Protection Association (NFPA) 70E standard. In addition, there are face shields that provide protection against heat and radiation. These face shields prevent burns by filtering out intense ultraviolet (UV) and infrared (IR) radiation. They are made from polycarbonate with special coatings. An example of this would be adding a thin layer of gold film to increase reflectivity. And of course, there are face shields specifically designed for welding which provide protection from UV and IR radiation generated when working with molten metal. The shades usually range from Shade 2 to14, with Shade 14 being the darkest shade.

Since face shields are used in conjunction with other PPE, the interaction among the PPE needs to be seamless. When selecting a face shield or any other PPE, OSHA suggests conducting a worksite hazard assessment. OSHA provides guidelines in 29 CFR 1910 Subpart I Appendix B on how to evaluate worksite hazards and how to select the proper PPE. After selecting the proper PPE, employers must provide training to workers on the correct use and maintenance of their PPE. Proper hazard assessment, PPE selection and training can significantly reduce worker injuries and help to ensure a safe work environment.

Man is least himself when he talks in his own person. Give him a mask, and he will tell you the truth. Oscar Wilde