

Protective Eyewear Considerations

Protective eyewear works. It's a simple statement but it is backed up by countless real-life experiences on this campus and elsewhere. Protective eyewear can protect against chemicals, projectiles, kicked-up particles and dust, damaging light sources, and other hazards. But eyewear can only protect you if you choose the appropriate type and actually use it. This article will briefly discuss some of the common options.

A Quick Word on Policy

As with all types of personal protective equipment (PPE) supervisors and laboratory managers need to perform a risk assessment to determine the best type of eyewear and then make it a mandatory requirement to use it – and it needs to be enforced! The [University of Wisconsin Madison Campus Chemical Hygiene Plan and Compliance Guide](#) states “close-toed shoes and safety glasses are the minimum PPE requirements for all laboratories containing hazardous chemicals.” Yes, it is a blanket policy requiring eyewear to be worn throughout the laboratories but your eyes are probably your most vulnerable organ and accidents happen when you don't expect them.

What are the different types of protective eyewear?

A quick look through any safety vendor's catalogue will show a large array of choices. Here are the common types found in work places.



Left: Safety Glasses; Center: Chemical Splash Goggles; Right: Face Shield over Safety Glasses.

Safety Glasses:

These are what most people envision when they think of eye protection since these appear similar to regular glasses. Safety glasses are mainly designed to be resistant to impacts and must meet a standard set by the American National Standards Institute (ANSI) which requires safety glasses to withstand the impact of a quarter-inch steel ball traveling 150 feet per second. If you wonder whether your glasses meet this standard you can check the frames where "Z87" should be imprinted.

What are these good for? Safety glasses are very effective for eye protection from particles one might encounter in a shop (flying wood or metal particles). In laboratories these can protect against glass shards from exploding glassware. Most of these will wrap around to provide protection from side impacts, though some will have removable side shields. These are not appropriate for many laboratory operations. For instance, these won't adequately protect against splashes of caustic chemicals or fumes. And these will not protect the rest of the face from impacts so these are not the best choice for activities which are known to pose a risk of explosion. For these operations there are better choices.

You should be aware of a couple more quick points on safety glasses.

- Safety glasses are the minimum requirement when present in any lab with hazardous chemicals.
- Prescription safety glasses can be filled at EH&S – and in many instances this is free to the user. Go to <http://www.ehs.wisc.edu/ehs-safetyglasses.htm> for more info.
- If you don't want to get prescription safety glasses you can readily find safety glasses that are designed to fit over your prescription eyewear.

Safety Goggles:

Safety goggles also provide impact protection but fit more tightly around the eyes so they provide a greater degree of protection from all angles. These are also referred to as "chemical splash goggles" but beware – not all safety goggles are the same. Most are designed with vents to prevent fogging but if you are looking for splash protection from liquid chemicals, such as acids and bases or other solutions, make sure that you get those with indirect vents. Alternatively you can get unvented goggles which will also provide greater protection against fumes, but you will want to be sure to get fog-free lenses. A chemical fume hood should be used for any process when hazardous chemical fumes can be generated.



Left: Chemical Splash Goggles; Right: Impact Goggles

Face Shields:

Face shields are probably the most under-utilized protective eye equipment. These are inexpensive, lightweight, and surprisingly comfortable. Most can flip up and are quickly adjustable so they can be easily used by many people. They have applications in most shops or work areas but these should be a fixture in any lab handling hazardous chemicals. While safety glasses and goggles provide protection to the eyes they provide limited protection to the rest of the face. Face shields are most appropriate for operations that have a high splash hazard, such as working around acid baths, or for work where a

explosions are possible which includes many chemical reactions. If an explosion hazard exists there should be other engineering and administrative controls put in place. Safety glasses should always be worn when using a face shield

UV and Wavelength Specific Eyewear:



Wavelength-specific eye protection needs to be used whenever there is a potential for eye damage from any light source. Typical examples include laser use, working around high temperature furnaces, long-time exposure to sun, exposure to UV lights, or working with welding torches.

Final Thoughts

Modern medicine has made great strides but there is still no way to replace a damaged eye. Complete a hazard assessment of all your work procedures and wear the eye protection until the task is completed. Many eye injuries have occurred after the worker has “temporarily” removed their eye protection.

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