



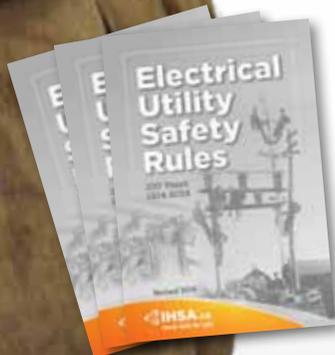
Electrical injuries can happen **IN A FLASH**

Can safety glasses protect you from arc flash?

Although safety glasses can prevent debris from flying into the eyes, workers in the electrical trades may also need to protect their eyes from electrical hazards such as arc flash. But is it safe to use only safety glasses to protect against this hazard?

When safety glasses were first adopted by the high-voltage electrical industry, they were promoted as “flash glasses”. This implied that they protected against arc flash. Even today, manufacturers may say glasses protect against this hazard.

In the electrical community, however, there is some debate about whether safety glasses protect workers from arc flash. Most often, safety glasses alone are NOT the best means of protection. To find the best solution, a risk assessment or safety analysis needs to be done about the specific type of work the electrical workers do and the kind of arc flash hazards they face.



Arc flash hazards

The *Electrical Utility Safety Rules* (EUSR) defines arc flash as “a dangerous condition associated with the release of energy caused by an electric arc”.

The flash causes an explosive expansion of air and metal.

This can lead to the following hazards:

- Extreme heat
- Flying debris or shrapnel (e.g., molten slag and super-heated metal fragments)
- Concussive force or pressure wave
- Hot gases and vapour
- Dangerous sound waves
- Burst of ultraviolet light (UVA/UVB).

The development of national electrical safety standards such as **CSA Z462-15: Workplace Electrical Safety** and **CAN/ULC-S801-10: Standard for Electric Utility Workplace Electrical Safety for Generation, Transmission, and Distribution** has led to a greater understanding of arc flash hazards. And understanding these hazards is the key to finding the equipment that is best suited to protect against them.

Protective equipment

There are many types of safety glasses and sunglasses, but none of them have been given an arc rating. Therefore, the wearer can't know what protection they offer against arc flash.

Even if safety glasses meet **CSA Z94.3-07: Eye and Face Protectors** or a standard that is based on comprehensive assessments of arc flash risk, it doesn't mean that they offer protection against all electrical hazards equally. For example, only an arc-rated face shield or hood can protect against the heat from an electric arc.

Rule 113 of the EUSR states:

When workers are required to perform work on exposed energized apparatus or where exposure to an arc flash hazard exists, all practical measures shall be taken to protect workers against the effects of electric arc flash.

This rule requires employers to assess the risks of arc flash hazards to workers and to ensure that workers are adequately protected against them.

Much of the arc flash protective equipment is intended to protect against the heat generated during an unplanned arc flash. However, other factors must be considered when performing arc flash hazard assessments.

Arc flash protective clothing must meet an industry standard, such as **ASTM F1506-15: Standard Performance Specification for Flame Resistant and Arc Rated Textile Materials**. It must also have a label that gives the ATPV (Arc Thermal Protective Value) of the clothing, and it must reduce the risk of injuries from hazards identified by an arc flash risk assessment.



Face protective products (as defined by **ASTM F2178**) are intended to protect against heat. Therefore, face protection has ATPV values based on thermal energy values. It also provides protection from UVA/UVB depending on the design of the face protection. (See the manufacturer's instructions and recommendations for more details.)

But even when workers are wearing face protection, they still need to wear safety glasses to reduce the risk of injury from flying debris, provide UVA/UVB protection, and prevent concussive injury to the eyes. The difficulty is that safety glasses do not have ATPV values and do not protect specifically against heat.

As technology advances, the industry may see safety glasses with ATPV values. But as yet, there are no testing standards and no manufacturing standards for safety glasses that provide ATPV values.

Safety glasses are an essential part of the safety equipment worn by electrical workers when they do electrical work or are exposed to arc flash hazards. However, they are not the only protective equipment needed. A comprehensive arc flash risk assessment based on the tasks workers perform is the best way to know what safety clothes, including eye, face, and skin protection, are needed for workers who are exposed to the danger of electrical arc flashes. It will certainly show when something more than safety glasses is required.

How IHSA can help

IHSA offers a half-day *Arc Flash Risk Assessment* course at our training facilities throughout the year. IHSA staff can also travel to your facility, anywhere in Ontario, to deliver training.

