

## PFI: Testing of Protective Eyewear

# Focus on Good Vision

*Situations exist in which our highly sensitive eyes can only survive undamaged thanks to the additional level of protection afforded by special purpose spectacles: protective eyewear makes an inestimably important contribution to the maintenance of eye health. This article outlines what PFI has to offer in the testing and certification of protective eyewear.*

### Anatomy of the Eye

The human eye is a complex device consisting of:

- The *cornea*, i.e. the transparent front part of the eye which permits the passage of light through the iris onto the lens in the interior of the eye.
- The *iris*, which controls the amount of light entering the eye by changing its diameter in response to the intensity of the incident light, in order to protect the eye against glare
- The *lens*, which focuses the incident light by refraction onto the retina and thus produces a sharp image
- The *retina* consists of tissue on the interior rear wall of the eyeball. It is spiked with light-sensitive nerve cells and transmits the image information to the optic nerve
- The *optic nerve*, which connects the eye to the visual cortex (part of the cerebral cortex which is responsible for visual perception and saves and processes the image information supplied)



The retina reacts very sensitively to light stimuli and can suffer irreparable damage on exposure to intense radiation. To prevent such damage, the iris controls the amount of light by contracting in response to brightness and thus protects the retina. However, the mechanism can only go so far. Protective eyewear becomes essential above a certain level of light intensity.



### Kinds of Protective Eyewear

- Sun glasses: Their tinted lenses protect against glare and filter out UV light to prevent harmful ultraviolet radiation from reaching the eye
- Sports goggles: These generally have tinted lenses providing protection

against UV radiation and glare; those with clear lenses merely protect against splinters and wind

- Safety goggles: are produced for specific work situations (UV radiation, splinter protection, etc.) and comply with PPE guidelines

### How Sun Glasses are Tested

The most popular forms of protective eyewear are sunglasses or sports goggles, which are worn by very many people. They are tested according to DIN EN ISO 12312-1 and have to fulfill numerous physical and optical test criteria and also comply with legal labelling requirements.

The physical testing procedures include tests for the stability of the frames under the usual levels of stress expected, for perspiration resistance, as well as for the mechanical strength of the lenses towards pressure and splinters. In the optical tests, the properties transmittance/homogeneity (uniform tinting of lenses and transmittance of radiation), refractive power of the lenses, and prism imbalance (leading to dispersion and blurring) are determined and evaluated.

In addition, the labelling and the instructions for use are examined for required content in order to assure that the end consumer is correctly informed about the protective effect and the intended use and handling of the eyewear.



### Customer Benefits of the PFI Label

Eyewear manufacturers who choose to have their protective eyewear tested by PFI and marked with the PFI label kill two birds with one stone: On the one hand, PFI as an independent institute confirms compliance with legal requirements concerning quality and properties and compliance with DIN standards; on the other hand, the PFI label underscores product quality for the end consumer.

Do not hesitate to contact us if you have any further questions

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