

EN 166: 2001
Personal Eye Protection

European Standard, applying to all types of individual protection of the eye which protects from hazards likely to damage the eye, except for nuclear radiation, x-rays, laser emissions and infrared emitted by low-temperature sources. Does not apply to eye protection for which separate standards exist (E.g. anti-laser eye protection, sunglasses for general use).

EN 170: 2002
UV Rays Protection

European Standard for Ultraviolet Filters
 Specifications of level numbers and of requirements relating to the transmittance of the filters for protection against ultraviolet radiation.

EN 172: 1995
Specification For Sunglare Filters Used In Personal Eye-Protection For Industrial Use
 Specification of level numbers and requirements relating to the transmittance of filters for protection against solar radiation, industrial use.

EN 175: 1997
Welding Eyes and Face Protectors
European Standard for equipment for eye and face protection during welding and allied processes

Specifications for the safety requirements for eye and face protection equipment used to protect the operator's eyes and face against harmful optical radiation and other specific risks or hazards in usual welding, cutting or similar operations.

EN 169: 2002
Personal Eye Protection - Filters for Welding
European Standard for Filters for Welding and Related Techniques — Transmittance requirements and recommended use.

Specifications of level numbers and requirements relating to the transmittance of filters to protect operators for welding and related techniques. Specification of requirements for welding filters with double dial number of levels.

EN 379: 2009
Automatic Welding Filters
 Harmonised European standard for automatic welding filters which switch their luminous transmittance to a lower predetermined value when an arc is ignited.

NOTE: It is possible to have surface treatments which are not marked on the lens. These are non-certified treatments, which give the same protection to the lens for an extended period of use:

AS K - AS = Anti-Scratch treatment (corresponds to K); **AF N** - AF = Anti-Fog treatment (corresponds to N).



ANSI/ISEA Z87.1: 2010
American National Standard - Personal Eye and Face Protective Devices

This standard provides minimum general requirements, test method, selection, use and maintenance of eye and face protection devices.

2 levels of protection:
 Z87 marking = "Basic Impact"
 Z87+ marking = "High Impact"

Lens Shade / Applications

- Clear:**
General purpose lens for use in good visibility conditions, especially indoor.
- Amber/Yellow:**
Enhanced contrast. Ideal for low light environments, artificially lit areas, foggy and cloudy weather.
- Smoke/Grey:**
Ideal for sunlight and outdoor.
- Polarized:**
Stops horizontal reflections, eliminating glare. Ideal for outdoor, driving and around water.

If the lens is also tested according to EN 170 (UV FILTERS) or EN 172 (SUN FILTERS FOR INDUSTRIAL USE) it is also marked with a code-scale nr. Example: clear lens (EN 170) are normally marked with 2C-1.2; Smoke lens (EN 172) are mostly marked with code-scale nr 5-3.1. These nr indicate the % of visible light which can pass through the lens, so how clear/smoke is the lens.

RISKS TO THE EYE FROM HARMFUL RADIATIONS			
Zone	Wave Length	Environment	Eyesight damage
UV-A	215 - 380 nm	Outdoor work	Eye fatigue, partial blindness, Cataract, Sunshine
UV-B	280 - 315 nm	Sunlight, Industrial environment,	Cataract, Welder flash, Arc flash
UV-C	100 - 280 nm	Industrial environment, Arc welding	Cornea or crystalline lesions, Loss of eyesight
Blue light	400 - 480 nm	Industrial environment Computer work, Outdoor work	Retinal lesions, Loss of eyesight, Blurring degeneration (age), Retinitis pigmentosis
Infra-red	780 - 1400 nm 1400 - 2000 nm	Electric welding, Molten work: glassmaking, steel production Micro-wave processes, Sunlight	Retinal lesions, Blurring degeneration (age), Retinitis pigmentosis Cornea or crystalline lesions

