







# TECHNICAL INFO

## LENS CATEGORY

All relevant information about sunglasses is written in the INFORMATIVE NOTE sent to the opticians together with the order. The INFORMATIVE NOTE must be given to the end-consumer as required by law.

TRANSMITTANCE	LENS (FILTER) CATEGORY	DESCRIPTION AND USE	
	EN ISO 12312-1	DESCRIPTION	USAGE
3% - 8%	4	Very dark special purpose sunglasses very high sun glare reduction	 Very high protection against extreme sunglare, e.g. at sea, over snowfields, on high mountains, or in the desert. Not suitable for driving and road use 
8% - 18%	3	General purpose sunglasses	 High protection against sun glare
18% - 40% 40% - 43%	2		 Good protection against sunglare
43% - 80%	1	Light tint sunglasses	 Limited protection against sunglare
80% - 100%	0		 Very limited reduction of sunglare

SAFILO EYEWEAR MANUAL

The last number *inside the right temple* corresponds to the LENS category, as defined by European standard EN ISO 12312-1.

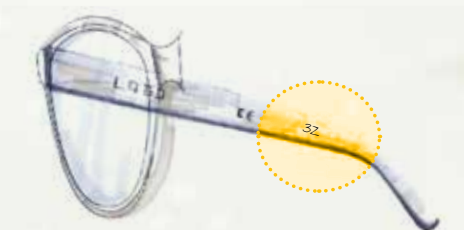
Examples:

"3" indicates that the lens guarantees "High protection against sun glare"

"3Z" -> the presence of the letter "Z" after the filter category indicates that the lens is polarizing.

"13" -> the presence of two numbers indicates that the lens is photochromic; these numbers identify the lens category in its lightest and darkest state (i.e. "1"= limited protection against sun glare and "3" "high protection against sun glare")

"23Z" -> photochromic lens (from "2" good protection to "3" high protection) with additional polarization treatment.



# TECHNICAL INFO

## LENS MATERIALS

### PLASTIC

The most common lens material due to its lightness, robustness and possibility of obtaining different color combinations. Obtained through a casting or injection moulding process. The lens can be colored during this phase or it can be neutral and then tinted.

### GLASS

Made of silica and other inorganic oxides fused together, real glass is the best material to be used for lenses from a vision point of view. Glass lenses have excellent optical qualities but they are heavy and fragile. The color is obtained from the addition of metal oxides when melting. Given their fragility, glass lenses are usually hardened. Safilo uses only glass lenses that are treated to increase impact resistance



Most lenses are produced and/or controlled by Safilo in their own factories, especially for Made-in-Italy products

**CR 39:** Also known as “organic glass” or “hard resin”, CR 39 represents an excellent alternative to glass for good quality sun lenses as the lenses are much lighter and more resistant to impact. Made from a casting process like Optyl, CR 39 can also be easily tinted and it maintains stable colouration.

**PC - polycarbonate:** It's a thermoplastic material and lenses are produced by injection moulding. The colour is added at the mix stage (for solid colours) or to the surface (for shaded colours). Originally used primarily for industrial safety glasses they are now recommended for children, athletes, and anyone requesting excellent impact resistance in their lenses with anti-scratch treatment and excellent UV protection.

**Nylon:** Similar to PC in terms of process and treatments, with additional usage on glasant or half-rim or models with lens holes. This material is lighter than NXT, ensures protection against the UVA/UVB rays, it is resistant against shocks and static deformations.

**Polaroid UltraSight™:** Exclusively developed for Polaroid polarized sunglasses - the inventor of the polarized technology. The lenses are made by 9 functional layers, thanks to the proprietary manufacturing process called ThermoFusion™. The core element is the polarizing light filter granting glare free vision. Other key benefit is 100% UV protection.

**NXT:** It is a thermosetting material, similar to CR39 in terms of technology. It offers high performance techniques and is therefore maximally appreciated in the market from a technical sporty audience. Advantages: excellent optical quality, protection against UVA/UVB rays, shock resistance (more than the polycarbonate); 50-70% lighter than glass and 10% lighter than polycarbonate; 2 times greater scratch resistance than polycarbonate and 4-5 times compared to CR39.

LENS TIPOLOGY	GLASS	CR39	PC	NYLON	POLAROID ULTRASIGHT™	NXT
MECHANICAL RESISTANCE	basic performance	basic performance	good performance	good performance	good performance	good performance
CHEMICAL RESISTANCE	good performance	basic performance	basic performance	basic performance	basic performance	basic performance
IMPACT RESISTANT SPORT ACTIVITIES	basic performance	basic performance	good performance	basic performance	basic performance	good performance
OPTICAL QUALITY	good performance	basic performance	basic performance	basic performance	basic performance	basic performance

basic performance

good performance

excellent performance

## LENS COLORS AND TREATMENTS

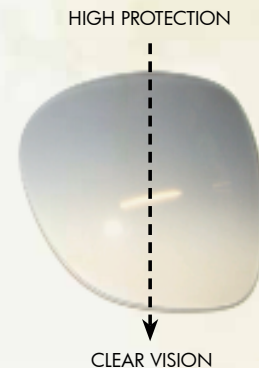
Materials used as well as the treatments applied to the lenses guarantee the highest quality and eye protection. There are a variety of coating treatments applicable to the surface of the lenses giving additional properties:

### SOLID TINT LENSES

Historical lenses for excellence

### SHADED or GRADIENT LENSES

Shading is realized through a colouring technique for either aesthetical or functional purpose. The protection from sky glare is always guaranteed, while maintaining an optimal level of luminance toward the ground and in the front direction. One of the best conditions for these lenses is when driving: the filters attenuate a considerable amount of sunlight coming from above, whilst offering a good level of light on the road and optimal visibility of the dashboard.



**S** Shaded lenses represent an important % of Safilo lens offer

### UV FILTER

UV Protection blocks in most cases 100% of Harmful UVA/UVB Rays preventing any damage to the eye. Cumulative damage from prolonged exposure to sunlight causes 3.2 million people to go blind every year.

### MIRRORING

A very thin, almost transparent, metallic layer is deposited on the lens surface. It has mainly an aesthetic function, apart from a certain degree of UV protection on every type of lenses.

### MULTILAYER COATING

Advanced treatment on already colored lenses to get special effect lenses with a color coating applied to the outside of the lens. Some multilayer coatings are able to reduce the IR transmission.

### PHOTOCROMIC LENSES

Lenses automatically darken and lighten due to a chemical reaction when the light changes, or with the presence of ultraviolet light. When the sunlight is not strong, the lenses becomes lighter while they becomes darker when exposed to intense sunlight. The use of a photochromic filter offers protection in different lighting conditions, always ensuring optimum visibility with only one pair of sunglasses.

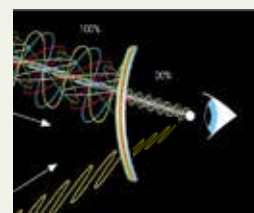
### ANTI-REFLEX

Coating that reduces reflection caused by the inner surface of lens. The models with anti-reflex treatment reduce sunglare and improve optical comfort in specific conditions such as driving with lateral/back sunlight.

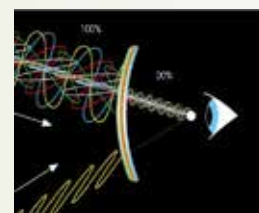
### POLARIZING

Polarized lenses contain a special filter that improve visual comfort blocking the glare caused by a ray of light that hits a shiny surface such as water, snow, ice etc.. being oriented in a more horizontal way. Polarized lenses are therefore particularly suitable in the brightest conditions and can help to see more clean and to reach a higher level of detail.

Sun light arrives with no direction whatsoever and is reduced by the lenses' filter. When the same light reflects from a horizontal shiny surface such as water it creates glare that can be blocked with polarized lenses.



Lens category 2 without polarization



Lens category 2 with polarization

**S** Most of the lenses used by Safilo are the result of a combination of these treatments