EYEWEAR MANUAL

Safilo GROUP

FROM SKETCHES TO PIECES OF ART

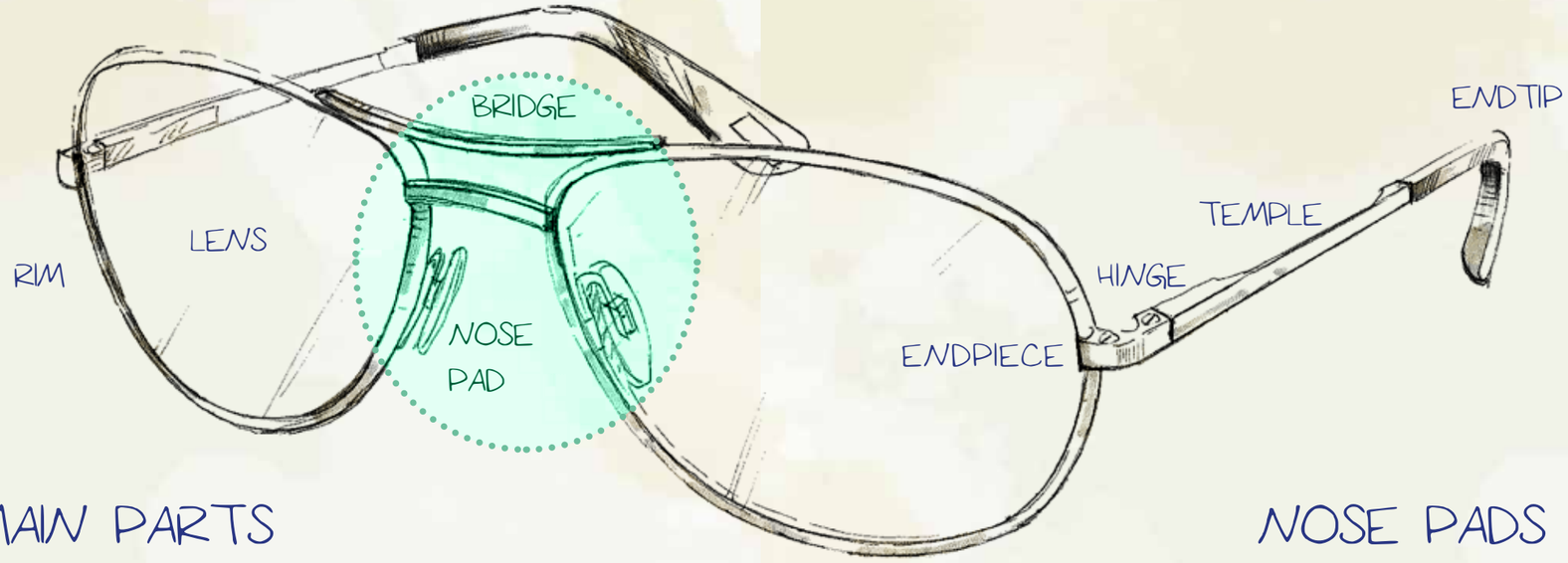
PRODUCT

ANATOMY

TYPES

SHAPES

PRODUCT



MAIN PARTS

FRONT

Part of the eyeglass frame that holds the lenses in place and bridges the top of the nose

LENS

It helps the vision against sunlight and provides protection against UV rays

ENDPIECE or LUG

Extension of frame front to which the temples are attached

END TIP

Part of the frame placed behind the ear to guarantee stability to the frame

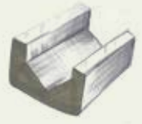
RIM or EYE WIRE

The part of the frame surrounding and holding the lenses inserted in the internal groove

GROOVE
for lens insertion

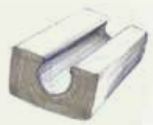
V GROOVE

On metal/plastic frames



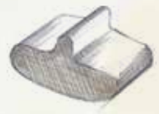
UV GROOVE

On plastic frames



NYLON GROOVE

On metal frames with an additional nylon profile



REVERSE GROOVE

On metal frames

NOSE PADS

Soft small silicone or vinyl pieces placed under the bridge beneath either side.
They help to keep the frame in its proper position and distribute the weight for a comfortable fit.

TRADITIONAL

The most used typology of nose pads, with pad arms that can be fixed by a “screw system” or a “click system”.
Moreover, the pad arms can have a «regular» shape (also called «with reduced curvature») or a «special» shape (also called «goose neck shape») which usually provides the best fitting to asian consumers.

Regular

Pad arm with reduced curvature

Special

Pad arm with goose neck shape

ANATOMICAL

Designed for peculiar shapes

TWINNED

Flexible and designed for metal shapes

BRIDGE

Section that arches up between the lenses over the nose and supports 90% of the eyewear weight

SINGLE BRIDGE

DOUBLE BRIDGE

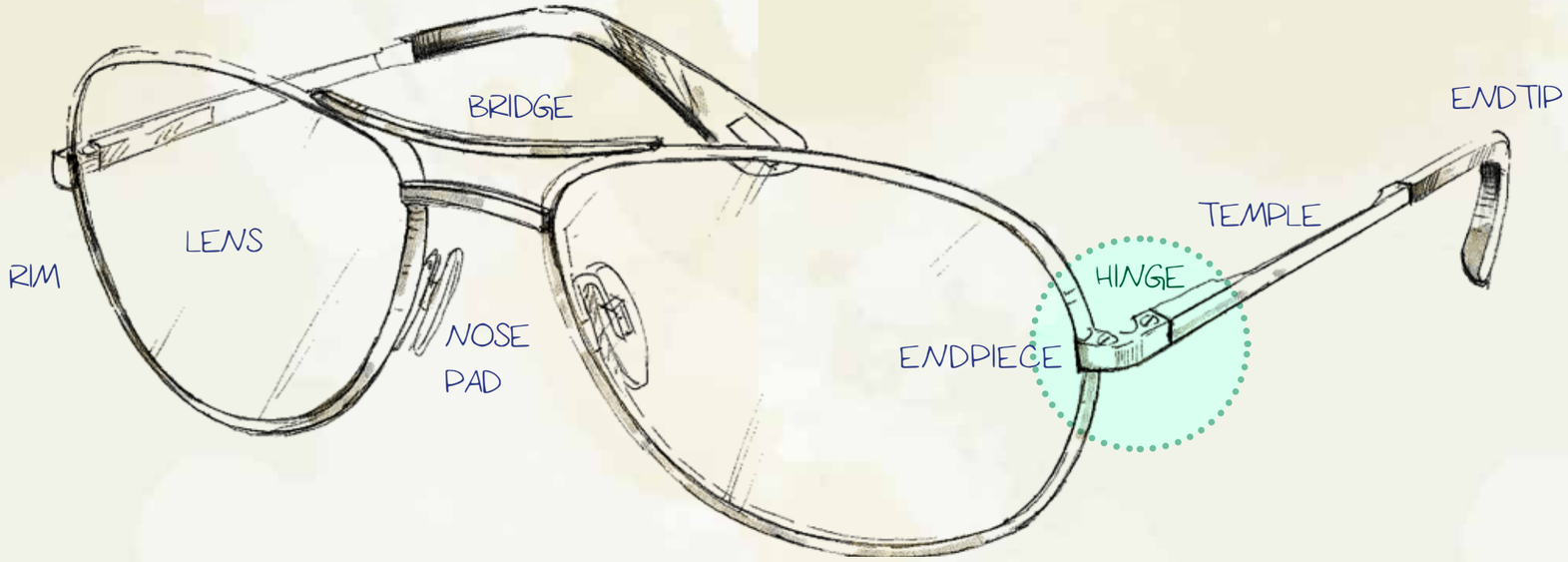
With a reinforcing top bar or “browbar lug” above the bridge that crosses between the two lenses on some metal and sporty styles

FOLDABLE BRIDGE

With a flexible mechanism to guarantee that the frame takes up less space

KEYHOLE BRIDGE

Shaped like an old-fashioned keyhole, it fits only on the face sides without touching the top. This design element is created by a milling technique



HINGE

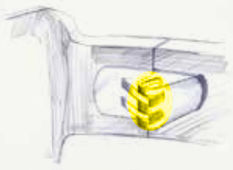
Also called “joint”, it’s the folding metal part of the frame that connects the rim to the temple and allows the temple to lay flat and fold inward. The best hinge doesn’t exist, but the perfect hinge for each model.

REGULAR (or TRADITIONAL) HINGE

Mainly used for sunglasses, it allows the temple to open to a **maximum of 90°** and no further.

RIVETED

It can be either functional or aesthetical



STOP

Regular hinge with a stop mechanism to prevent short temples from touching the lenses and thus scratching

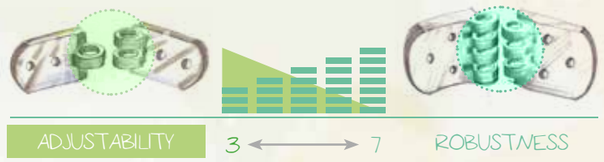
90° HINGE

90° is the opening angle of the hinge, typical of styles with regular flat end-piece

180° HINGE

180° is the opening angle of the hinge, typical of styles with curved end-piece and wrap-around shapes

How many ring hinges?



FLEX (or SPRING) HINGE

Mainly used for optical frames, it flexes thanks to a spring tension which allows the temples to open **more than 90°**. It makes the frame more resistant to breakage and more durable keeping it in proper alignment without frequent adjustment. It guarantees also a more comfortable fitting for the user.

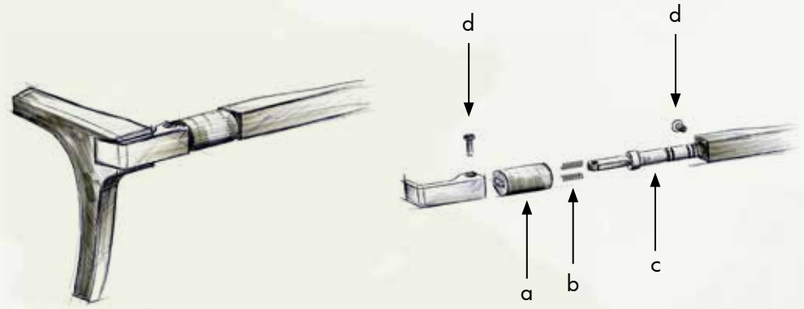
INTERLOCKING (OR INTEGRATED)

It is molded into the frame without separate hinge pieces that hold the frame together

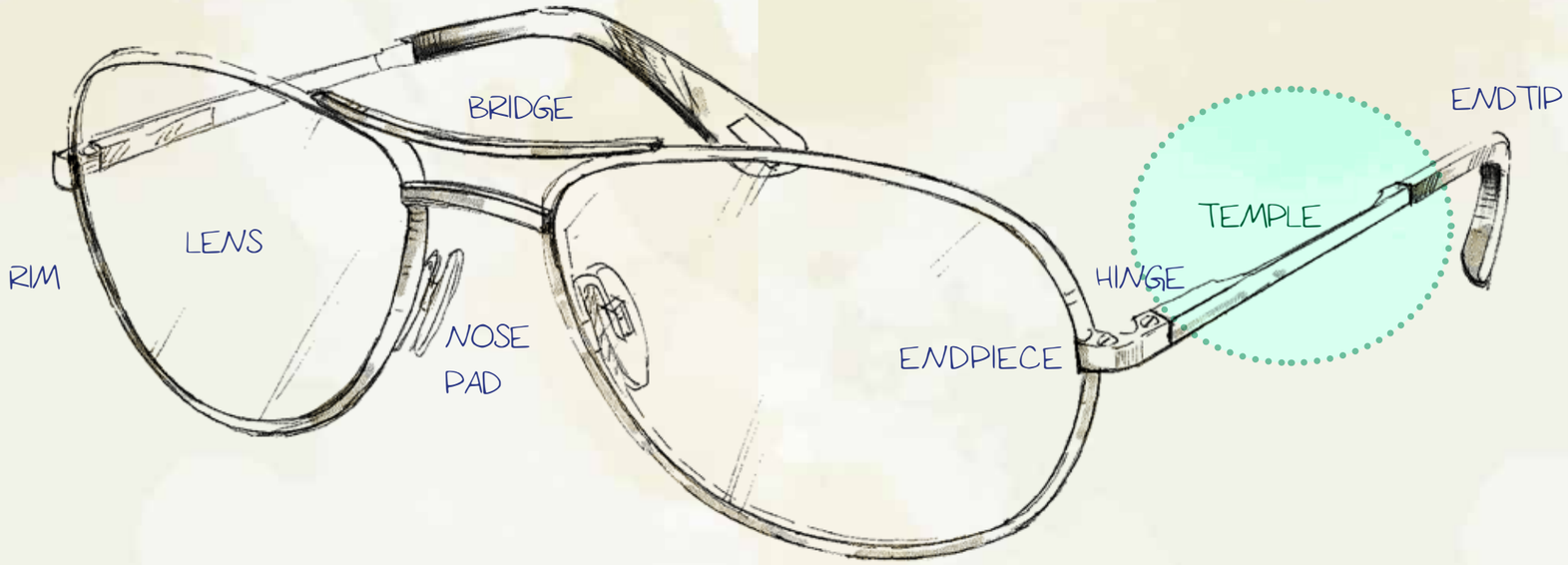
MINIMAL HINGE

The minimal hinge is a hybrid hinge, rubbed with snap closure as a flex one but with a traditional opening of the temples of **90°**. It is characterized by attention to construction and profund stylistic research. All components have been realized without solderings, substituting all screws with a special h-shaped component connecting the front to the temple, ispired by the world of premium watches. Because of precise laser cutting technique of the stainless steel components, the flex movement is obtained.

SAFILO E-HINGE



The new exclusive E-HINGE has an innovative double springs system that takes the performance of flex hinges to the next level: 200.000 cycles against a market standard of 20-30.000. In other terms: 15 years of impeccable performance. The mechanism involves 6 components: a seamless cylindrical titanium body (a), 2 miniaturized harmonic steel springs (b), a stem (c), and 2 anti-cam-out Teflon-coated screws (d). This new Safilo hinge is, simply, a technologically unsurpassed solution that allows the temples to adapt to the unique shape of every face. The diagonal cut of the tubular section of the structure is a distinctive trait that at the same time enhances the flexibility of the temples. All the elements are conceived to be easily assembled and disassembled in a way that quickly allows any optician to repair or change the parts on site.



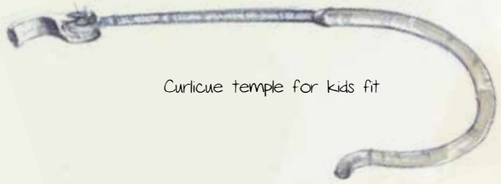
TEMPLE

Also called "side", it's the "arm" of a pair of glasses connecting the front of the frame to the temple tip, extending over the ear. It fits in the front thanks to the hinge and the endpiece.

Straight plastic temple with light bend

Straight temple for sporty styles (no bend)

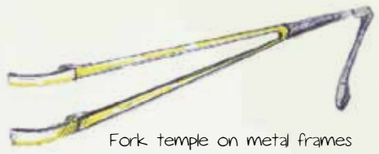
Straight metal temple with plastic endtip



Curlicue temple for kids fit

Long endtip

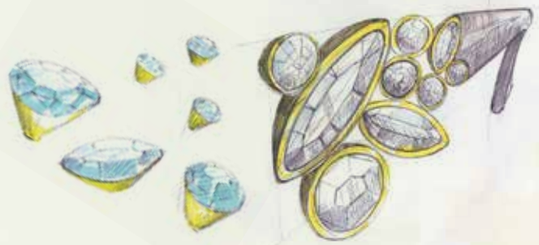
SAFILO EYEWEAR MANUAL



Fork temple on metal frames

It can be made in many different and special materials and can be embellished by **decorative elements** with a strong and valuable craftmanship

Fork endpiece on plastic temple



Upon request, Safilo can shorten and lengthen certain types of temples

ADJUSTABLE TEMPLES

They are usually preferred because they guarantee a perfect customized fitting for the customer, especially the optycal frames

Examples of adjustable temples:

METAL TEMPLES
at room temperature
Acetate and
Cellulose Propionate:
at room temperature
unless otherwise stated

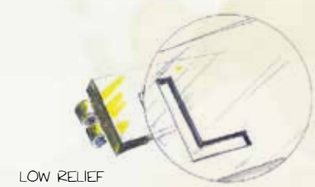
PLASTIC TEMPLES
WITH WIRECORE

OPTYL TEMPLES WITH OR
WITHOUT WIRECORE
heated at 100°-130°C
(210°-265°F)

Temples in special materials i.e wood, bamboo and horn are not adjustable

HOW THE LOGO CAN BE PLACED ON A TEMPLE

Safilo invests in extensive studies to have a qualitative well defined logo and ensure its resistance over time



The choice of logo treatment depends on different factors, such as product material, target/positioning, Fashion House indications.
Main processes managed by Safilo:

	ACETATE	PROPIONATE/ INJECTED	OPTYL	METAL	RUBBER	LEATHER
INLET (self-adhesive letters in low relief)						
Under varnish	✓	✓	✓			
PRINTING						
Hot printing	✓	✓		✓		
Pad printing		✓	✓	✓		✓
METAL TRIM (metal elements in high relief)						
Application under pressure	✓	✓	✓	✓	✓	✓
LASERING						
	✓	✓	✓	✓		✓
UNDER-LACQUER						
	✓	✓	✓			

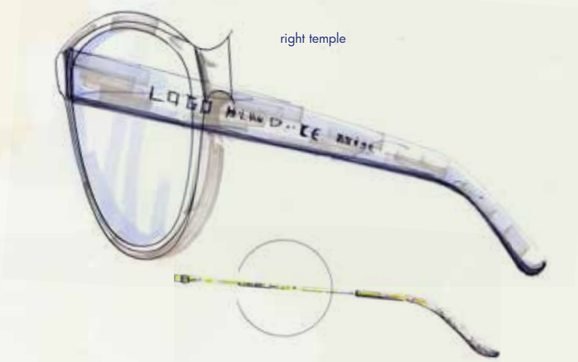
Logo can be also engraved on hinge structures/metal elements

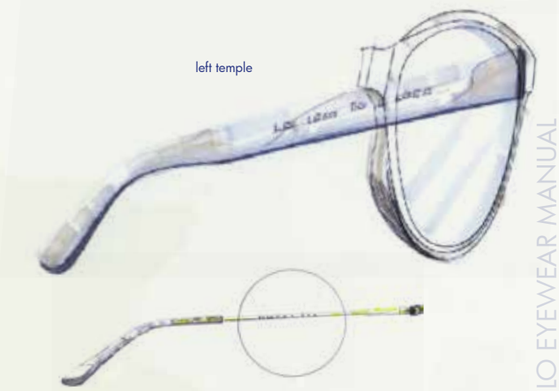
FRAME MARKING:

WHAT IS THE MEANING OF THE NUMBERS AND LETTERS ON FRAMES?

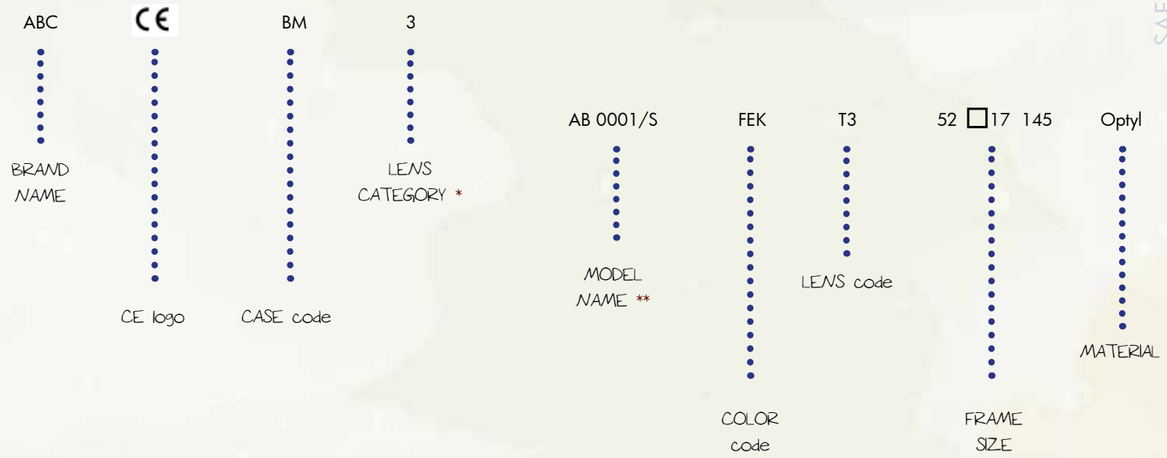
Information is provided on the inside of both temples to help opticians and customers, whilst also complying with legal requirements:

- TECHNICAL/LEGAL INFO e.g. brand, frame size, boxing, CE logo, model name, frame and lens color, lens category (sunglasses)
- EXTRA INFORMATION (only for specific models): e.g. materials (Optyl, Titanium), temple adjustement temperature (polyamide), case code





Example:



* See focus on pg. 37

** Asian fitting styles are marked with "/F" (Ex. AB0001/F/S), while korean fitting ones are marked with "/K" (Ex. AB0001/K/S). See focus on pg. 16.

WHAT IS "FRAME SIZE" AND "BOXING"?

Frame size = Lens size + DBL + Temple length

LENS SIZE (38-68 mm)
Indicated by "a" in the diagram

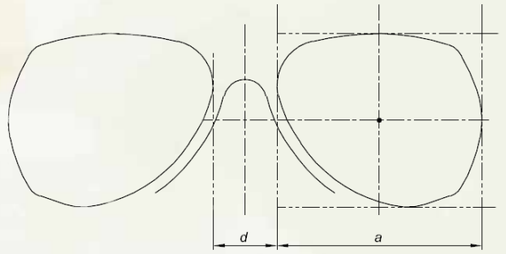
the horizontal measurement, given by the length of the base of the rectangle that circumscribes the lens.

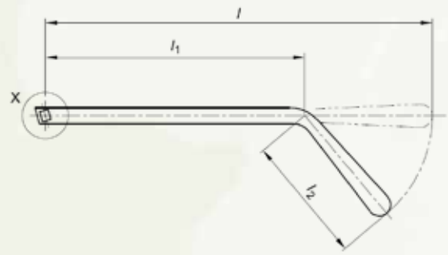
BRIDGE SIZE or DBL (Distance Between Lenses) (10-25 mm)
Indicated by "d" in the diagram

the width between the eyeglass lenses.

TEMPLE LENGTH (110-166 mm)
Indicated by "l" in the diagram ($l=l_1+l_2$)

the length of the temple from hinge hole to end tip. This information is placed inside the temple (usually the left one) both for optical frames and sunglasses.

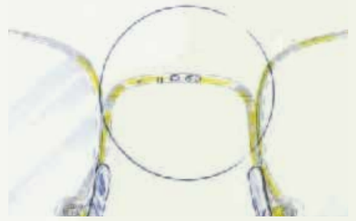




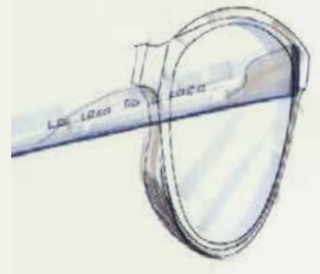
Boxing (marked by "□") = Lens size + DBL
i.e. 52 □17 means: 52mm Lens size and 17mm DBL

PLACEMENT OF BOXING INFO

Along the nose pad in spectacle plastic frames



Behind the bridge in spectacle metal frames



Inside the temple (usually the left one) on sunglasses

ETNO FITTING

Safilo develops unexpected and innovative eyewear with the aim of delivering both the comfort and aesthetical values consumers all over the world seek. Therefore, different ethnicities have been studied and this brought to life three main fittings aimed at covering all consumers' needs:

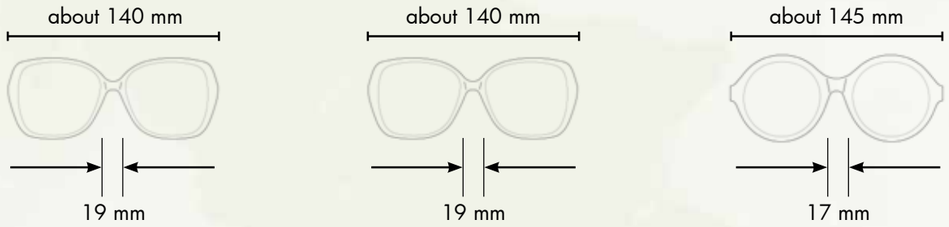
INTERNATIONAL - Fitting developed using the features of the Indo-European ethnic.

GLOBAL - Designed with the same taste of international ones, global fitting styles have been introduced with the aim of improving the asian consumers' fitting thanks to choices both in the area of the nose and in the bending of the temples which stay in the middle between international and asian fittings. In particular, the **nosepads are deeper compared to international fitting styles, such as the bending of the temples.**

ASIAN - Designed according to asian features and taste. In particular, **asian people usually have a broader head**, with **flatter and smaller nose** and **more prominent cheeks**. Asian fitting styles are therefore designed with a **larger and lower front**, a **narrower bridge** and a **reduced curvature of the front (compared to international and global fitting styles)**, in order to prevent the frame from touching the cheeks.
The fitting around the nose area is then improved thanks to deeper and more inclined **nosepads**, that let the frame to sit higher and stay comfortable in place without sliding down. Finally, the bending of the temples is wider to better match the larger shape of the head and avoid squeezing it.

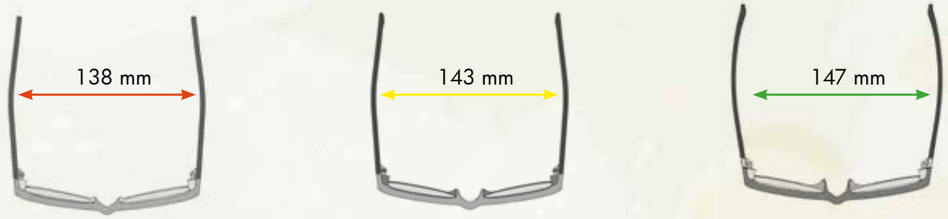
DESIGN AND DIMENSION OF THE FRONT

INTERNATIONAL FITTING	GLOBAL FITTING	ASIAN FITTING
EX:AB0001/S	**EX:AB0001/G/S**	**EX:AB0001/F/S**



DIMENSION AND INCLINATION OF THE NOSE PADS

BENDING OF THE TEMPLES



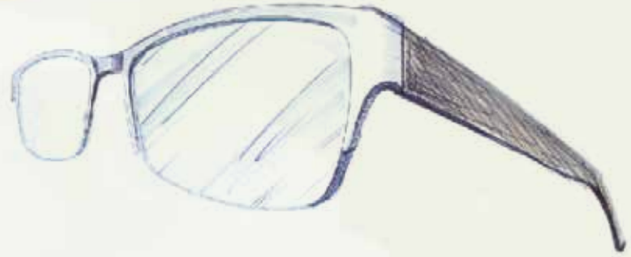
RIM TYPES

FULLRIM

Frames with an complete-round front, in which lenses are fixed

CLIP ON

A small device with sunglass lenses that hooks into prescription eyeglasses. They are handy, convenient and easy to use

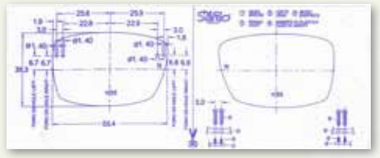


HALF RIM or NYLOR

Frames with an half-round front. The lens is fixed by a nylon or metal thread surrounding half perimeter of each lens

RIMLESS or GLASANT

Frames in which the lenses are mounted directly to the bridge and to temples with different kinds of screws. It's a 3-piece structure: temples, 1 nose-pad fixed on lenses, and lenses.



Each half rim/glasant frame is provided with the "drill chart", a transparent and semi-rigid film in which all the characteristics of the lens are highlighted: shape, dimension, diameter and coordinates of the holes and all the information about the correct lens – frame assembly

SHAPES

Shape refers to the external shape of the frame.
Frame shape is a key aspect as it must complement the consumer's face.

Safilo works among the releases with many different typologies accordingly to Fashion Trends and to Brand Targets.

SQUARE

SPECIAL SHAPE

BROWLINE

CAT EYE/BUTTERFLY

OVAL/ROUND

RECTANGULAR

PILOT

NAVIGATOR

PANTOS

SAFILO EYEWEAR MANUAL

MATERIALS

PLASTICS

METALS

COMBINATIONS

CRAFTMANSHIP

MATERIALS

PLASTICS

Obtained by:

MILLING
of acetate sheets

acetate

INJECTION
of melted materials (liquefied) into a steel mould

polyamide (nylon)

(cellulose) propionate

rubber

CASTING
through vacuum technology into a mould

Optyl

METALS

Obtained by:

SOLDERING
Through advanced soldering equipment

titanium

aluminium

stainless steel

copper-alloys

flexible metal

CASTING
(components)

copper-alloys:
copper-berillium
bronze

PLASTIC BY MILLING PROCESS

KEY STEPS OF A "LONG PROCESS"

Raw material, which arrives from an exclusive supplier as a large acetate sheet, is cut into smaller plaques at our Santa Maria di Sala plant (Italy).

…

The plaque is cut and milled and a shaped front and 2 temples are obtained.

…

Tumbling: temples and fronts are placed inside wooden, polygon-shaped containers called 'buratti'. This is the same «burattatura» process which was used 100 years ago

…

Hinges are inserted manually onto the temples and assembled together with the front.

…

Smoothing with abrasive tape aims to perfectly pair together of the endpiece and temple.

…

The style is finally personalized with decorations (logos, metal plaques, rhinestones, etc.) and then it is ready for quality control.

HOW TO WORK WITH ACETATE

Heat the materials with air warming system at 60°- 70°C (140°-158°F) for glazing (lens insertion), temples and front adjustment.

MAIN OBJECTION

"IT'S HEAVY!"
Acetate can be produced in several thicknesses and used for the production both of front and temples. The thickness normally used for the front is 6-8 mm and for the temples is 4 mm, but each plate is polished to obtain the desired thickness. Remember: there's a minimal weight that guarantees robustness and *each acetate frame is a unique piece of craftmanship!*

Raw materials

Milling

"Burattatura"

Assembly

Smoothing

Decoration insertion

Quality control

The cellulose acetate is obtained from natural elements, flakes of cotton and wood, and it's able to assume a variety of polychromatic colors.

Advantages:

- wide range of color combinations
- wide stylistic variety
- good mechanical and chemical resistance
- easy lens insertion
- great adaptability to consumer needs
- hypoallergenic material: nickel free with great resistance to sweat, detergents and cosmetics.

Bio-acetate

54% natural thanks to cellulose in the material (+9% vs classic acetate with 45% cellulose). It has better technical and chromatic characteristics thanks to a special blend of natural additives and natural plasticizers. Bioacetate is both biodegradable and recyclable

Nb: Bio-acetate is both recyclable and biodegradable. Frames as a whole are not, as composed of different components (ie. metal hinges) that should be differentiated one by one.

Safilo has introduced the use of a new acetate, the «**hard acetate**» also called «**HD acetate**». It is characterized by an intrinsic high density composition, making it exceedingly resistant compared to traditional acetate and allowing Safilo to create styles with thinner sections (3,5 mm vs. regular acetate 5,6mm). Another characteristic is the resistance to higher temperatures compared to traditional acetate, resulting in the need for longer heat exposure for temples adjustment. The new hard acetate, as well as the traditional one, complies with the quality standards required by European, American and Australian laws.

PLASTIC BY INJECTION

INJECTION PROCESS

For most thermoplastic materials, melted material is injected under high–pressure into a steel mould. The final quality of the product depends on the raw material used. The tumbling process is always guaranteed as the final finissage phases.

Safilo guarantees a good resistance to scratches thanks to the varnishing process for injected models

HOW TO WORK WITH INJECTED PLASTICS:

For polyamide the temples are usually without wirecore and thus not adjustable, but in specific situations i.e. thick temples, it can be heated at 130°C (265°F), paying specific attention not to damage the varnishing and the lenses. The cold glazing can be done without heating.
Cellulose propionate is treated in the same way as acetate, with an air warming system at 60°-70°C (140°-158°F).

MAIN OBJECTION

«INJECTED FRAMES ARE OF A LOWER QUALITY WHEN COMPARED TO...»

Injection and milling are 2 different processes but we can also make cellulose-based material frames (propionate) from an injection process. Therefore quality doesn't depend on process but on raw materials used.

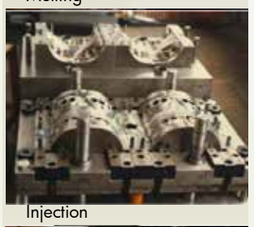
Polyamide (nylon) is a thermoplastic material used in injection molding. Researches in the field of plastic materials have led to the development of a high quality Nylon, particularly resistant to light and weathering. Trogamid and Grilamid all belong to this material.

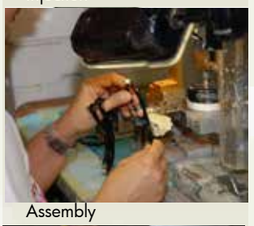
Advantages:

- Resistance to breakage
- Transparency and lightweight
- High resistance to UV rays
- Good resistance to chemical products and to sweat, cosmetics, detergents and weathering
- Possibility to obtain small and thin thicknesses/ sections
- Aesthetic results, both in color and in design


Raw materials


Melting


Injection


Assembly


Finishing

(Cellulose) Propionate is a thermo-plastic material with similar characteristics to acetate, but it's injected and moulded in its final frame shape.

Grilamid XE 4066 is a trasparent polyamide that has superior technical characteristics when compared to Grilamid: it mantains the same degree of transparency with higher resistance to breakage, staying stable even at higher temperatures. Safilo was the first company in the eyewear industry that started to use it, taking advantage of its high performance to develop elegant styles, particularly thin but still robust.

Ultem is characterized by an extremely high mechanical resistance, making it the best material to be used in the production of light and thin styles.
It is also a highly flexible and elastic material: sunglasses and frames can be warped in an evident way without being damaged and recovering the original shape. Temples in ultem cannot be registered, this is possibile only if combined with acetate or propionate end-tip with metal wirecore.

Polyamide (nylon) bio-based

58% derived from castor oil (environmentally sustainable) and 42% from fossil oil. On top of this, bio-injection material used by Safilo does not include the waste of food materials, compared to other Bio materials (eg. derived from corn). During the synthesis phase emissions of carbon dioxide are reduced.

Nb: Polyamide (Nylon) Bio-based is recyclable but not biodegradable. Frames as a whole are not, as composed of different components (ie. metal hinges) that should be differentiated one by one.

Rubber guarantees maximum user comfort. Temples in rubber with a metal core can be cold treated.

Bio-based rubber

With 44%-48% derived from castor oil, the Safilo Kids glasses represent the first application of this material in the sector. The application of this material ensures soft and flexible components that are also safe and hypoallergenic for contact with kids.

PLASTIC BY CASTING: OPTYL

SAFILO OWNS A UNIQUE MATERIAL

Optyl

Initially developed in collaboration with aerospace and computer industries in the '70s, Optyl is a material owned by Safilo and used in the most important eyewear collections.

A UNIQUE PROCESS

A unique worldwide industrial process obtained through the technology of vacuum casting.

1. Creation at 50°C (122°F) of a big Optyl disco («pizza») for each style
2. Insertion of the Optyl disco into a 100°C (210°F) environment where the front and temples are casted
3. Cooling steps and tumbling

HOW TO WORK WITH OPTYL

For a better match between lens and frame, glass lenses must be cut 0,2 mm larger than the frame (0,4 mm for CR39 lenses). Evenly heat the front of the frame, mount the lenses, allow to cool slowly. It is important to hold the frame firmly in the desired shape until the frame is cold. Heat the materials with an air warming system or container with heated small glass beads system at 100°-130°C (210°-265°F) until the area becomes soft and pliable. Do not heat close to metal components (e.g. hinges).

MAIN OBJECTION

"THE FRAME BREAKS VERY EASILY!"

The main issue is not related to the material itself but to the heating process and to the temperatures used during the process. Optyl is a very special material to be worked and if the guidelines on "How to work with Optyl" are not respected, the frame will be easily broken.

Optyl is a thermosetting plastic material based on epoxy resins, with exceptional physical and chemical qualities which guarantee several advantages:

- *lightweight and comfort*: more than 20% lighter than acetate or other thermoplastic materials
- *an excellent surface finish and a resistance higher than the conventional thermoplastic materials (acetate, propionate, etc..)*. Optyl eyewear can be worn in any climatic zone and is also able to endure extreme stress
- *memory effect*: when heated at 80°-120°C (175°-250°F) Optyl can be adapted to any facial anatomy and the subsequent cooling makes the frame shape stay unchanged. Heating again at the "memory temperature" Optyl returns to its original form
- *hypoallergenic and non-irritating*: Optyl is treated with a special surface coating that is resistant to perspiration and cosmetic products
- *ecological*: the Optyl production process requires less material than thermoplastic materials and much less material than acetate
- *3-dimensional design and unique color effects*. No final repolishing is necessary as with acetate, assuring unique brightness and color duration and offering unlimited potential for future development of colors and effects. This is a key feature allowing a fast and flexible reaction to fashion trends, with an extremely high level of quality
- *special treatments*: one of these is the Glitter silk Texture effect on shiny printed silk inside the Optyl frame

METAL BY SOLDERING

THE PROCESS

The first steps of the process are the component selection and the loading of the soldering equipment.
...
Afterwords there's a manual polishing and an accurate check of surfaces.
...
The whole process is finalized by a manual assembly of plastic components and manual coloring of the frame with a syringe, if requested.

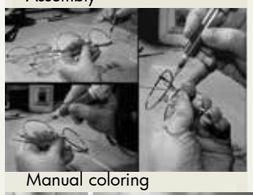

Components selection


Equipment loading


Manual polishing


Surfaces check


Assembly


Manual coloring

HOW TO WORK WITH METAL

Adjustment must be done without heating.
Different systems can be used depending on rim type (full rim, half-rim or rimless). Therefore due to the huge variety of models, each frame is provided with specific instructions.

MAIN OBJECTION

«IS IT HYPOALLERGENIC?»

Pure Titanium is the only hypoallergenic metal. All the other metal parts are treated through galvanization treatments and quality tests are made to avoid damages and allergies.

Safilo uses special copper-alloys for frames such as:

1. nickel silver (alloy of copper, zinc and nickel) with strength and elasticity to guarantee durability and reliability

2. monel (alloy of nickel, copper, iron) that guarantees richness and brightness; it's a durable material, appropriate for creating thick frames and small parts

Stainless steel is one of the most suitable materials for eyewear thanks to its ultra-thin lines, lightness, strength and versatility of the design. Moreover, steel is not a particularly expensive material, offering the advantage of a high quality product at a really affordable price. Usually the frame is not completely made of steel, but mainly the rims. Main advantages:

- ideal solution for people with a high degree of skin acidity; frames are not attacked by sweat, cosmetics and weathering
- resistance over time
- comfort and adaptability to the face shape
- flexibility and strength

Safilo has dedicated an area of its factory in Longarone to stainless steel production and the best quality standards are guaranteed by highly skilled workers and sophisticated control procedures.

Safilo Titanium glasses are synonyms of uniqueness, comfort and biocompatibility with a supreme lightness (48% less than traditional metal alloys) and a high resistance to corrosion. Exclusive frames designed for customers able to recognize and fully appreciate all the advantages and benefits:

- crude-nickel free and completely hypoallergenic frames, this is the ideal solution for people with a high degree of skin acidity as frames are not attacked by sweat, cosmetics and weathering
- high stability, durability and adaptability to the face shape
- corrosion resistance at 100% and resistance to mechanical stress
- flexibility (in particular the beta-titanium)

The cost of titanium frames is higher than other materials due to: expensive raw materials (difficult extraction process), high cost and more rapid wear of the equipment used to process it, use of special procedures for welding, need for high skilled and specialized workers, complex techniques for finishing and coloring.

Aluminium is a very valuable material as it is an excellent barrier to light, it is waterproof and it can be recycled indefinitely without loosing its original quality. In the eyewear industry it has limited use because of the difficulties regarding the surface treatments process, such as the surface polishing. However, the lightness and colours obtainable from aluminium make this material an excellent solution to create temples and fronts. Main advantages:

- good mechanical properties, high stability and durability
- high resistance to corrosion: frames are not attacked by sweat, cosmetics and weathering;
- maximum comfort

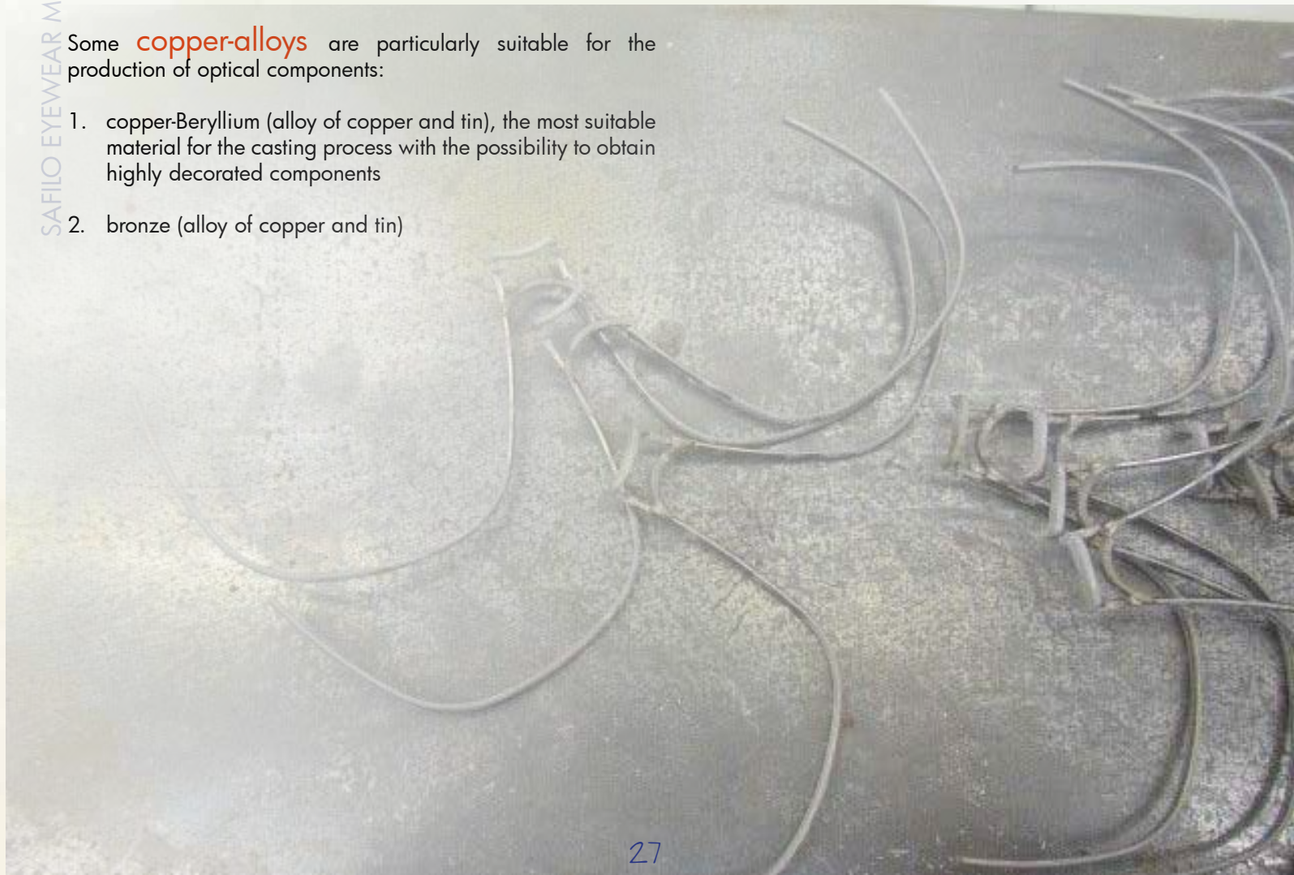
Flexible metal is particularly innovative because it is made in metal with shape memory. This material is characterized by high strength, extreme lightness and absolute comfort. The structure is so flexible that it can be folded and then returned to its original form without alteration and damage.

CASTING FOR METAL COMPONENTS

Some copper-alloys are particularly suitable for the production of optical components:

1. copper-Beryllium (alloy of copper and tin), the most suitable material for the casting process with the possibility to obtain highly decorated components

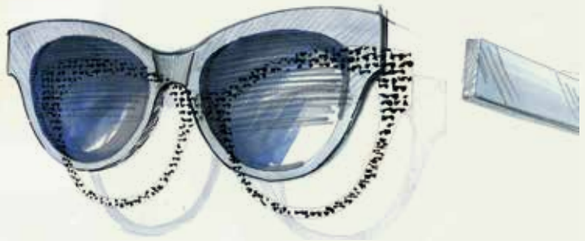
2. bronze (alloy of copper and tin)



COMBINATIONS

In order to create innovative styles from both an aesthetical and functional perspective, the artisanal excellence of Safilo proposes an **endless range of combinations between different materials and elements** from inside and outside the eyewear industry aimed to create strong contrasting effects.

Safilo savoir-fair led the company to play with traditional material such as acetate: many pieces of different sizes, colors and finishing have been put between two crystal acetate sheets, enhancing colors and conveying an outstanding effect.



Thanks to Optyl, the unique material in the eyewear industry, Safilo has also the possibility of inserting real fabrics such as silk or linnen, but also paper or even wood into the frames. The excellent transparency obtained through the vacuum casting process gives a perfect visibility to the inserted materials.

Examples of outstanding combinations:

Metal + acetate/injected:
the most frequent combination

Injected + rubber + carbon fiber

Acetate + aluminium + cork

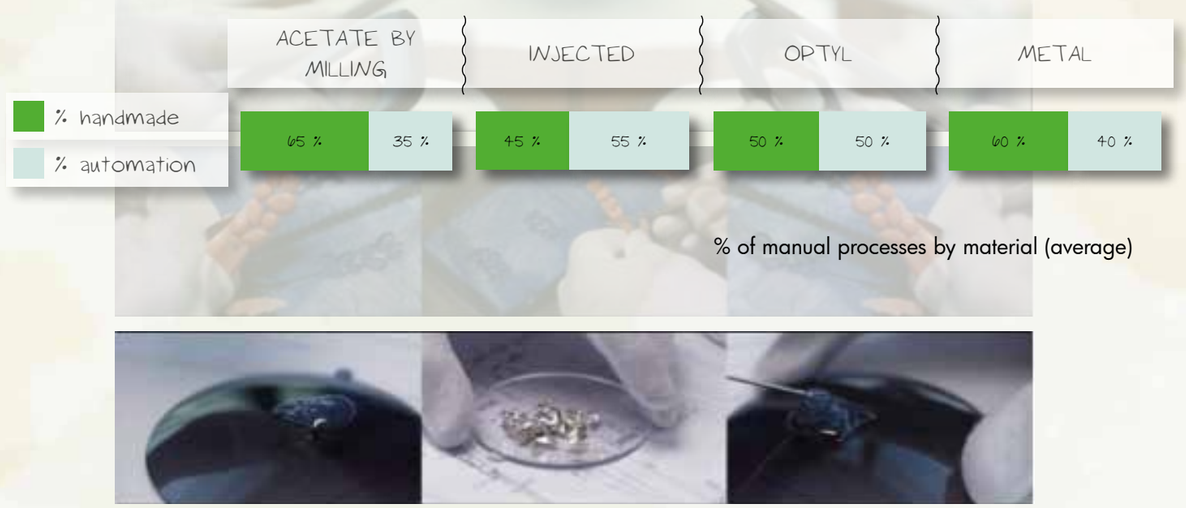
Acetate + rubber + wood

Metal + plexiglass

Injected + leather

SAFILO EYEWEAR MANUAL

CRAFTMANSHIP



% of manual processes by material (average)

The whole manufacturing process can involve **up to 200 production phases**

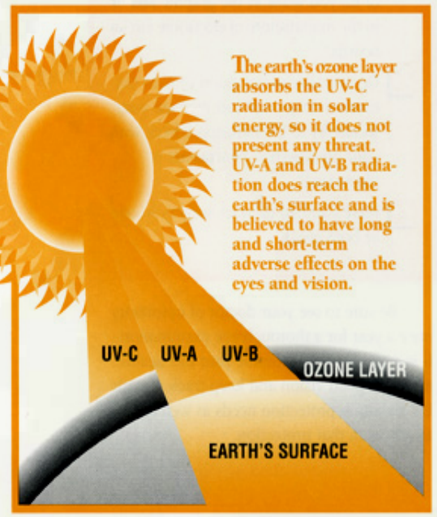
SUN LENSES

WHY WE NEED SUNGLASSES

TECHNICAL INFORMATION

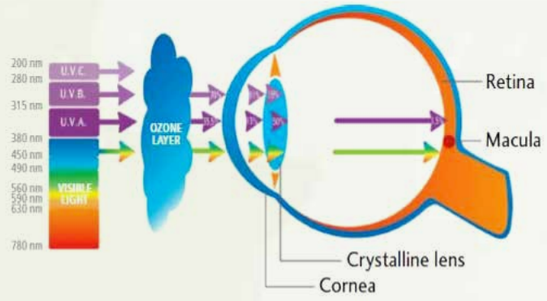
SUN LENSES

WHY WE NEED TO WEAR A PAIR OF SUNGLASSES?



It's well-known that the most damage caused by solar radiation comes from the high energy portion (mainly UV rays).
Part of the UV rays, UVC, are absorbed by the top layer of the atmosphere(e.g. ozone layer).

But UVA and UVB are not blocked and they represent a threat for the anterior portion of the eye (Cornea and Crystalline) and for the interior structure of the eye, the retina.



UV absorption by an adult eye without any sun protection

Damaging UV radiation from sun strikes the Earth surface every day of the year. It has been scientifically proven that it happens also in cloudly weather.

Ultraviolet (UV) Radiation

Invisible to the eye, prolonged exposure to solar UV radiation may result in acute and chronic health effects to the eyes. UV rays are the highest energetic radiation that arrive on the Earth surface.

Visible Light

The part of the light spectrum that the eye recognizes as colors. It's not dangerous for eyes but annoying and the eye with the sunglasses can be protected from excessive sunglare.

Infrared (IR) Radiation

IR radiant energy is not considered harmful.

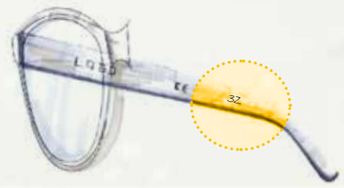
TECHNICAL INFO

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 EN ISO 12312-1	DESCRIPTION	DESCRIPTION AND USE: 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 snowfileds, 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

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" -> photocromic 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 ThermoFusionTM . 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						
CHEMICAL RESISTANCE						
IMPACT RESISTANT SPORT ACTIVITIES						
OPTICAL QUALITY						

basic performance · good performance · excellent performance

TECHNICAL INFO

SUN LENSES

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.

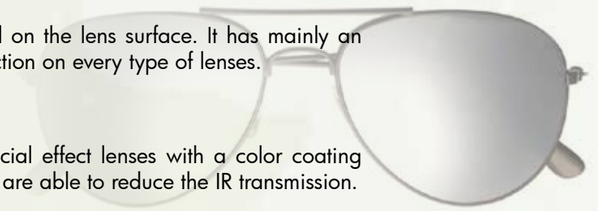
Shaded lenses represent an important % of Safilo lens offer

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.

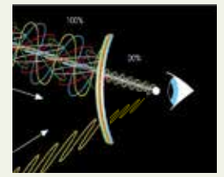
ANTI-REFLEX

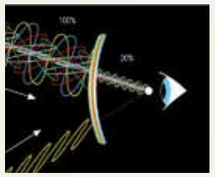
Coating that reduces reflection caused by the inner surface of lens. The models with anti-reflex treatment reduce sunglare and improve optical comfort in specific conditions such as driving with lateral/back sunlight.

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

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

OUSTANDING DESIGN OF THE LENSES «MADE IN SAFILO»

Safilo is a design-inspired company, passionate about creating unexpected and innovative eyewear. The designers' savoir-faire and the artisanal excellence of our manufacturing plants are expressed through innovative and distinctive treatments of the lenses. **New «made in Safilo» technologies are being applied to create unique effects**, keeping all the relevant technical properties, including optical ones and the protective functions.

High quality cutting and coloring processes allow to create precise patterns and graphics on the lenses. The lenses are covered with a multilayer coating, up to 12 different layers on the same lens. As a last step, the lenses are polished to make the graphics jump out. The spectacular colour effects don't affect the optical quality or the protective requirements.

Example of masculine graphics

Example of feminine graphics

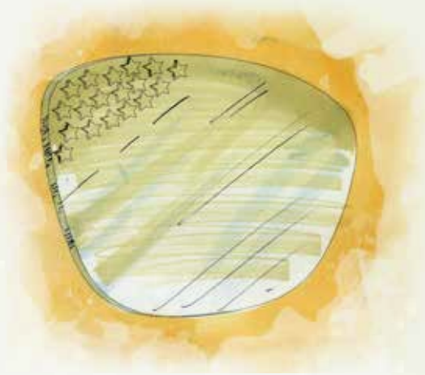
An other effect can be created with injection moulding. With a Safilo proprietary process we have the possibility to play with the surface of plastic lenses creating 3D-effects. For each desired effect a mould in steel is designed, in which the raw material (polyamide) is injected at high temperatures. Once cooled off the lens is released and the original 3D-effects become visible.

Polyamide raw material

Dedicated moulds are used to obtain 3D-effects

Examples of lens with 3D-effects obtained by dedicated mould

Thanks to Safilo savoir-faire also studs have been applied on the lenses: with a laser or milling technique small seats are created in the cutted lens, in which each single stud is applied manually. After cleaning and quality control the lens is ready to be placed on the frame.



TECHNICAL INFO

RX-ABILITY

RX-ABILITY

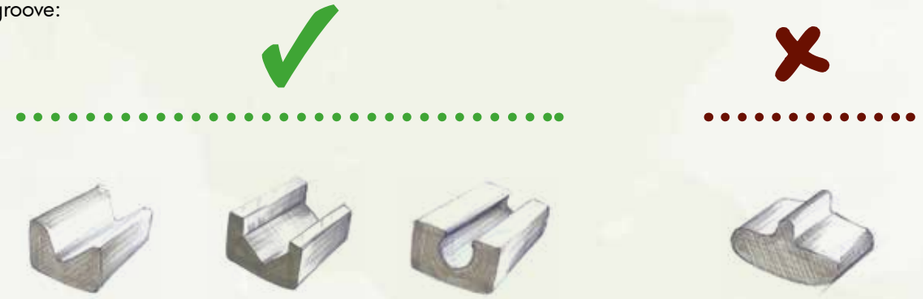
Only for sunglasses, means that the frame can hold prescription lenses (RX – short for prescription).
There are many aspects that affect the rx-ability of a frame, such as:

- Frame curvature/wrap angle/base, that defines the degree of «curving» of the lenses (from 0=flat to 12=maximum curving), referring to the lens material. For example, frames with base 6 or less are most of the time rx-able)

- Specific types of finishing (for example strass, leather, etc..)

- Particular shape of the frame (sport styles)

- Type of groove:



- Lens surface (spheric or toric. Spherical lenses have a constant optical power over the entire surface and they help consumers to correct defects such as myopia and astigmatism. Toric lenses have different optical power and focal length in two orientations perpendicular to each other. One of the lens surfaces is shaped like a "cap" while the other one is usually spherical). This lenses are used to correct astigmatism.

- Optical power of the requested prescription lenses

In any case the final decision on rx-ability lies with the optician's expertise.

A PRODUCT-MINDED PROCESS

FROM DESIGN TO FINAL CONSUMER

A PRODUCT-MINDED PROCESS

A consistent integrated process, that starts with the study of the relevant socio-economical macrotrends and ends with real «pieces of art» in the Point of Sales.The key steps of the creation process are:

1. ***Market analysis & inputs coming from the Fashion House/Brand***

The study of all relevant socio-economical macro trends together with the inspirational elements coming from the Fashion House/Brand are used as key inputs for the development of new collections;

2. ***Briefing and debriefing meetings***

Internal meetings between designers and brand managers are planned to build the collection according to the strategy of each Brand;

3. ***From drawings to prototypes***

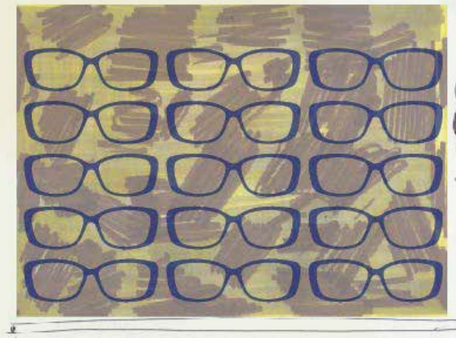
From now on designers can start to express their creativity and develop the new collection. The results are 2D drawings, that are then converted into prototypes thanks to Safilo huge expertise and savoir-faire. These handmade samples are finally approved by the Fashion House/Brand;

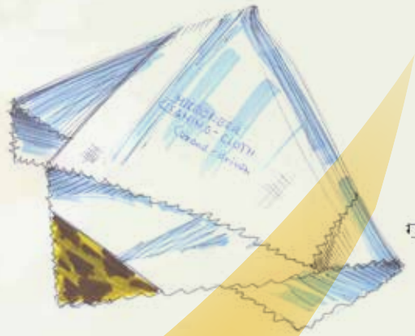
4. ***Industrialization & final products***

After the approval, the Product Dept can proceed with the definition of all the technical aspects (i.e materials, suppliers) to finally launch the production.

The final product is a masterpiece combination of craftsmanship and innovation

SAFILO EYEWEAR MANUAL





TECHNICAL INFO

e.g. base material, adjustment, how to work with Optyl

SUNGLASSES INFORMATIVE NOTE

- lens category (pg.36)
- field of usage (i.e. not for direct sun viewing)
- frame marking (pg.14)
- consumer care guidelines

CONSUMER CARE guidelines

FOR CLEANING

- Use a damp cloth and mild soap to clean the glasses, then dry them with a soft, clean cloth.
- Do not use solvents (e.g. alcohol, acetone) or aggressive detergents which may alter the features of the glasses.

FOR CORRECT STORAGE AND MAINTAINANCE

- Store the SAFILO sunglasses in their case at a temperature between -10°C and +35°C.
- Keep away from direct sunlight and avoid exposure to high temperatures,such as the heat in a car without air conditioning (e.g. car dashboard), because high temperatures may alter the features of the glasses.
- Replace the sun filters if damaged (e.g. scratched, opaque).
- Use only original accessories and spare parts.

"We are the globally leading Italian eyewear creator and trusted partner Brand led, Design inspired

We are passionate about creating unexpected, innovative eyewear brands firmly rooted in our unmatched savoir-faire of craftmanship, selling them across the world reflecting each brand's unique identity, and inspiring people across the world to desire and wear them with pride„

--- PVPC ---