

Art & Science of

NUPOLAR[®]

polarized lenses



www.nupolar.com

World Market Leader In Polarized Lenses

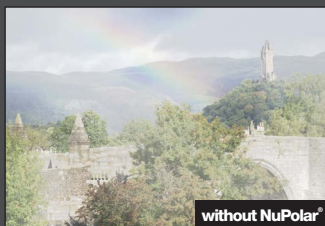
This brochure explains how NuPolar® became a worldwide, market leading, polarised lens brand and what that means for you and what that means for your clients. NuPolar® lenses will maximize visual comfort by eliminating distracting glare. This will improve depth perception, colour recognition and the overall appreciation of the product you recommend.

Glare is simply scattered light and is all around us, it is created naturally by flat, shiny, reflective surfaces, it is distracting, uncomfortable and more importantly, unavoidable if you are not wearing a polarised sunglass lens. Everyone who has driven a car, spent time walking in the hills, mountains and countryside, taken their holidays in a sunny climate, or by the sea, on the river, or taken a short city break, will be familiar with the harsh effects of glare.

Younger optics offer optical practices worldwide a unique product: NuPolar® ophthalmic polarized lenses. These lenses are available in great choice of materials, colors and optical designs. Never before has there been so much choice. You will be able to offer polarized lenses for virtually any prescription power, any frame whether it is sports or fashion and for the widest selection of lifestyles of your clients. We guarantee that by actively offering NuPolar®, your practice will benefit economically and your clients will experience unprecedented satisfaction from using these lenses.

Glare Is Everywhere

NuPolar® lenses act like a “visual filter” for the eyes making every situation where the sun is present look clearer and richer by blocking blinding glare. Camera enthusiasts have known for years that a polarized filter makes their pictures look better... Why not give the same benefits to the eyes through NuPolar® lenses?



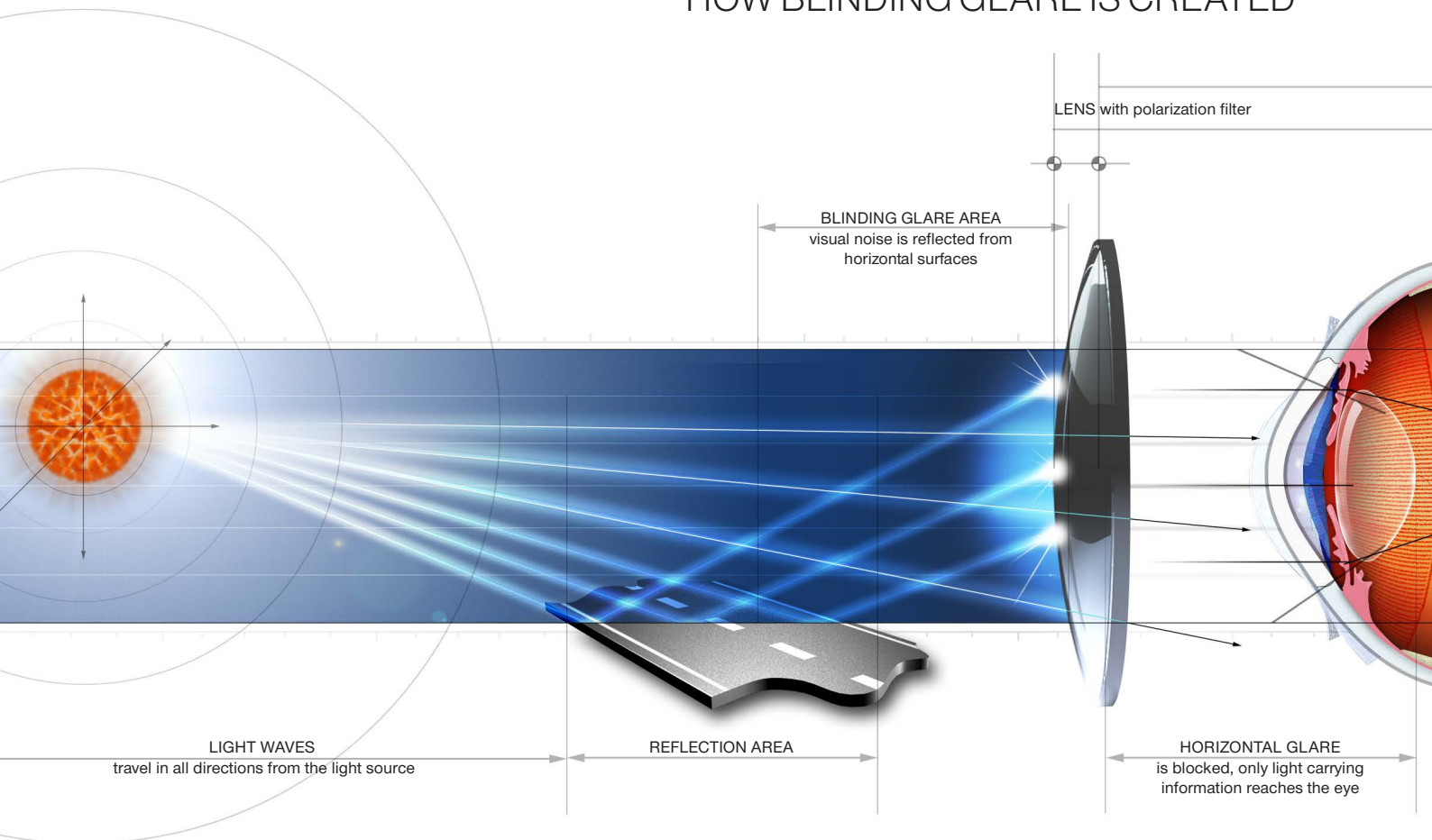
Glare Demonstrator

The best way to explain the potential customer the benefits of polarized lenses is to use Younger glare demonstrator. It dramatically demonstrates what glare is and how it can be eliminated by NuPolar® lenses.



Photonics Science

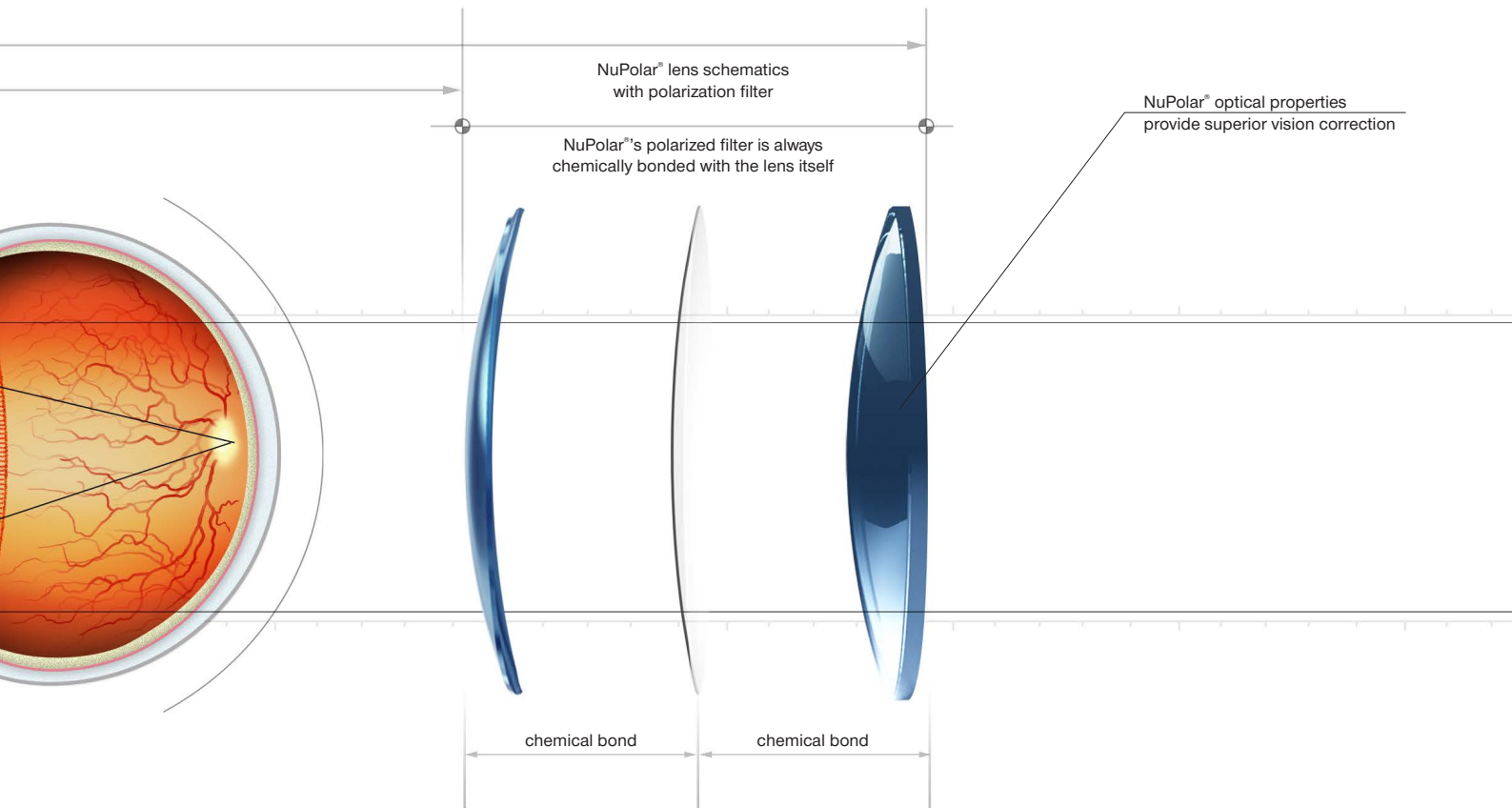
HOW BLINDING GLARE IS CREATED



Light travels from the sun in the form of waves to our Earth. Once these waves hit a reflective surface these waves change their energy and become scattered. This is the true nature of light. Due to this reflection we can sense colours as well as intensity of light. But from

the moment of reflection, light also may become polarized and form visual noise - blinding glare that interferes with the real image. The only way to eliminate this glare is to place a polarized lens in its path. This fundamental principle gave birth to polarized eyewear.

AND HOW IT IS ELIMINATED BY POLARIZED LENS



PICTURE BEFORE POLARIZING FILTER

PICTURE AFTER POLARIZING FILTER

POLARIZER

POLARIZED FILM MOLECULAR STRUCTURE

DICHRONIC DYE MOLECULE

The Art & Science Behind NuPolar[®] Lenses & Thin Film

NuPolar[®]'s advanced polarising filter – the most important element of a NuPolar[®] lens.

1

OPTICS

NuPolar[®] lenses will eliminate blinding glare, but as in any lens, strict optical power standards must be maintained. The prescriptions have been carefully assessed and the lens will accurately reflect that.

2

COLOUR UNIFORMITY

The colour of NuPolar[®] lenses will be consistent, irrespective of the prescription and will not fade over time. If, for some reason, one of the lenses must be replaced, the new lens will always match the original.

3

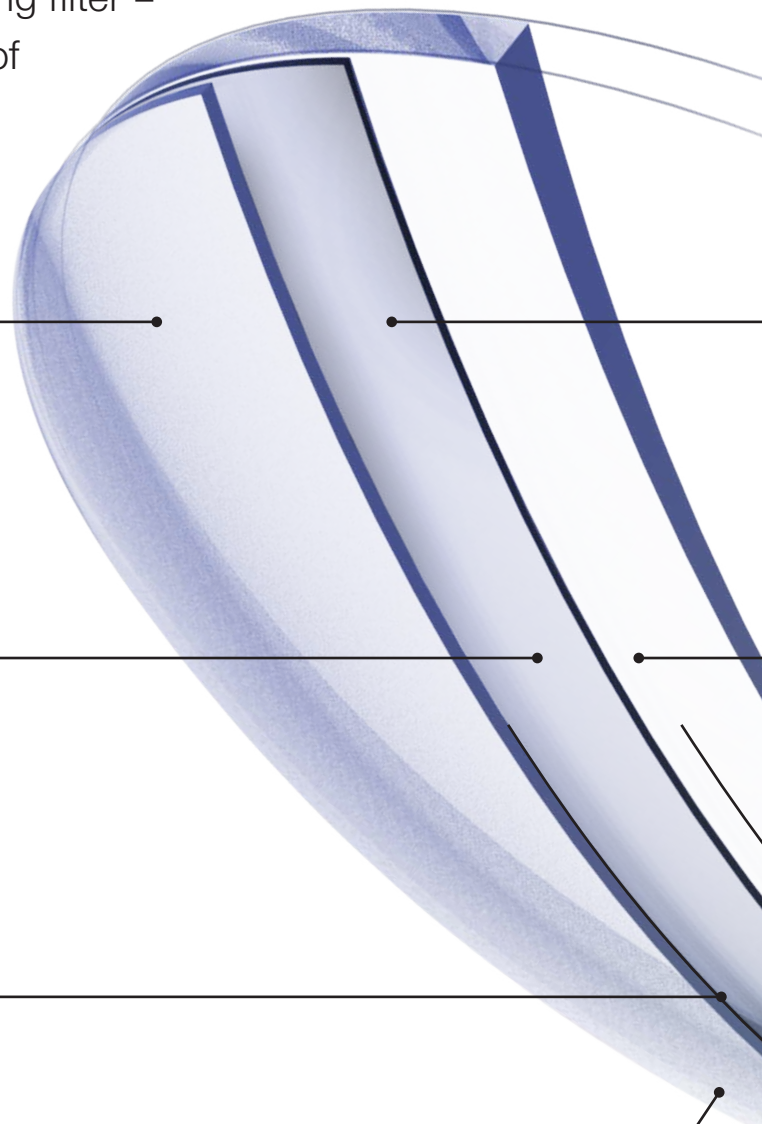
AXIS ALIGNMENT

Axis alignment is crucially important to the polarized eyewear performance. To produce maximum efficiency, the filter must be aligned accurately along the 0-180 axis. Younger Optics reject any lens that is more than 1 degree out. We believe this is one of the highest standards currently available.

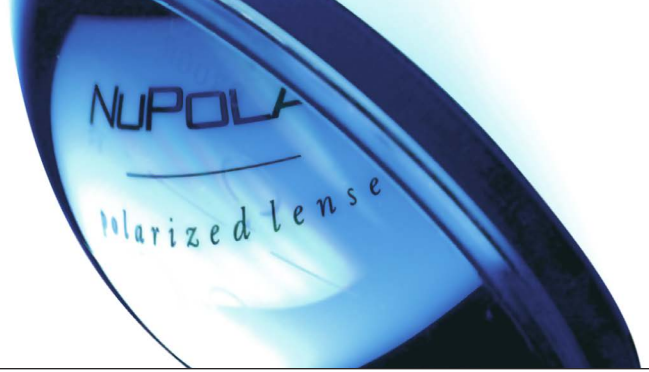
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TRANSMITTANCE

NuPolar[®] lenses are premium quality sun lenses, which meet international standards, for daylight driving, block glare efficiently and offer 100% UV protection against potentially harmful UVA & UVB. They are available in six different colours, and the visible light transmittance varies slightly for each colour.



Technology



This is the unique thin film technology incorporated within a clear lens. NuPolar® sunlenses consistently undergo strict quality checks which guarantee high performance and premium quality.

POLARIZING EFFICIENCY

5

To achieve maximum performance a polarising lens must maintain 99% polarising filter efficiency. NuPolar® lenses are among the most efficient on the market, eliminating reflected glare and maximising the useful light.

ADHESION

6

NuPolar® thin polarising film has a unique proprietary chemical link to the lens material and thanks to the specialised casting process will not delaminate during the edging like many other polarized lenses do.

THIN FILM PLACEMENT

7

Placing the polarising filter accurately and consistently approximately 0.5mm from the front surface of the lens is essential for producing the thinnest polarized lenses in any prescription. The film must be aligned accurately across the whole front surface of the lens to avoid the damage to it during the surfacing.

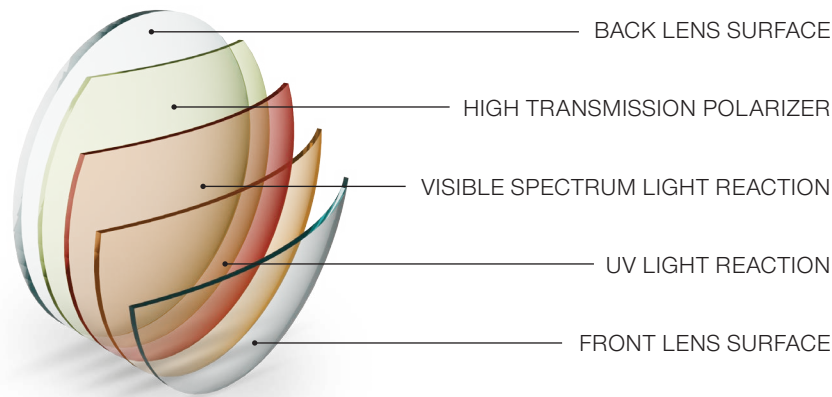
HEAT STABILITY

8

Heat stability of polarized lenses is very important because all lenses have to go through application of scratch-resistant and AR coatings during which they are subjected to high temperatures. NuPolar® lenses have been specially designed to perform consistently well under these adverse conditions. By carefully measuring the colour of the lens before and after the essential thermo curing process our proprietary HT film technology enables us to reduce 'colour shift' and consistently produce one of the most colour stable polarised lenses available today.

TRANSITIONS® DRIVWEAR®

is the world's first intelligent polarized photochromic prescription sunglass lens for drivers



Transitions® Drivewear® lenses were developed because clients and eyecare professionals asked specifically for a resin photochromic lens that darkens in car.

Ordinary plastic photochromic lenses only darken when exposed directly to UV light. Any car windscreen will block UV, preventing it from reaching the lens and so it will 'behave' just like a clear lens. Transitions® Drivewear® lenses are activated by both UV and visible light and so will darken behind the windscreen. Transitions® Drivewear® lenses will also block blinding glare because they are polarized as well.

Transitions® Drivewear® benefits which no other lens can deliver

- Effectively blocks blinding glare in any weather
- Only lets information carrying light to reach the eyes
- Intelligently and quickly adapts (darken or fade) depending on the available light
- Enhances colour contrast
- Guarantees that traffic signal recognition (and brake lights) is not impaired
- Improves clarity of vision and depth perception
- Convenience. Your clients no longer have to keep changing glasses every time the light conditions change
- Safety. The drivers vision will not be impaired by blinding glare

WHY DEVELOP A DRIVING LENS?

The need to own an additional pair of 'driving glasses' is not yet the law in some countries, but it is in others. Drivers are in charge of a complex machine travelling at 50-70 mph (90-120 km/h) and their eyes must receive a lot of important information.

It is essential to have them working as efficiently as possible. Today's cars are sleek, very aero-dynamic and efficient, but the steeply sloped angle necessitates a long dashboard and in bright light this creates glare which is reflected onto the

windscreen, right in the line of sight. Until now, fixed tint prescription sunglasses have to be constantly taken off and put back on as the light varies. Transitions® Drivewear® unique photochromic technology works inside the car.

The driving task



In today's world many adults have to drive. Commuters in particular will be familiar with 'low winter sunshine', which combined with frequent rains create ideal conditions for blinding reflective glare.

This is in addition to a more common summer bright sunshine when everyone understands the

need for good sunwear. Anybody who spends 8 hours a week or more in the car, will benefit from using Transitions® Drivewear® lenses.

Transitions® Drivewear® is also a great sunglass lens for all other non-driving activities like sports or sunbathing.



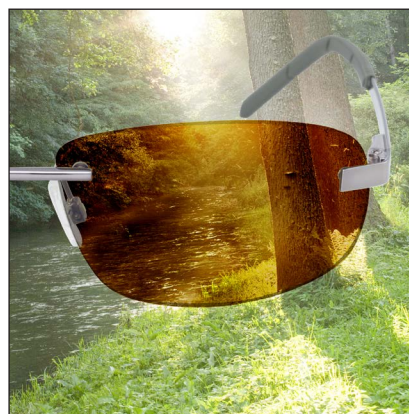
OVERCAST
LOW LIGHT CONDITIONS
HIGH CONTRAST GREEN/YELLOW COLOUR



DAYLIGHT
DRIVING CONDITIONS
COPPER COLOUR



BRIGHT LIGHT
OUTSIDE CONDITIONS
DARK REDDISH BROWN COLOUR



CLINICAL APPLICATIONS

The cataract and refractive surgery patients especially suffer from reflective glare. Some clients may be sensitive to light (photophobic), either frustratingly naturally or as a side effect of some medications. Contact lens wearers may be

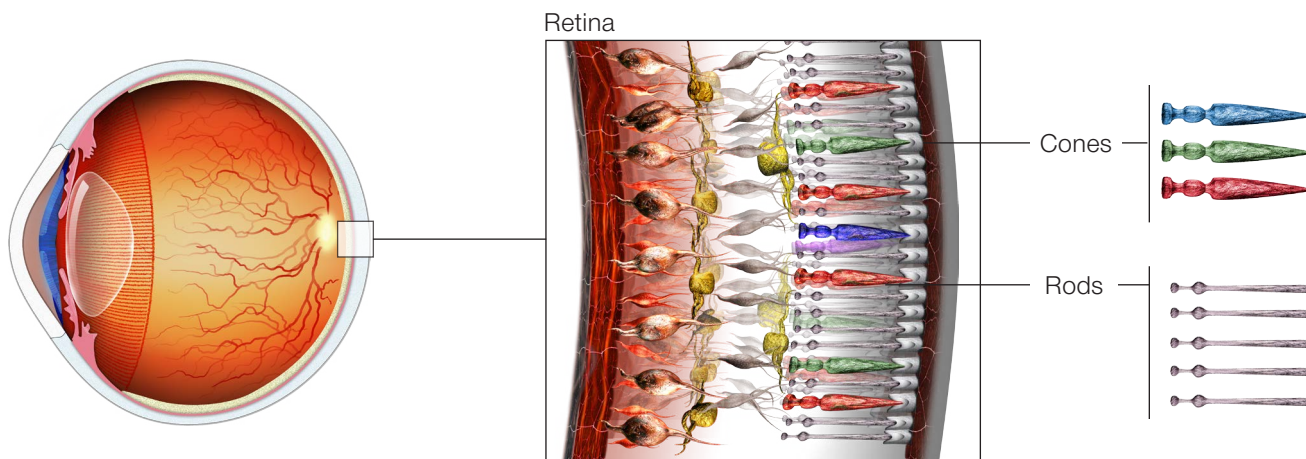
familiar with the uncomfortable effects of 'edge flair'. Transitions® Drivewear® lenses are photochromic and polarized and so may alleviate these symptoms. With the free form technology Transitions® Drivewear® can be offered in great variety of

progressive designs as well as bi-focal and variety of single vision configurations.



How, Why And Where Transitions® Drivewear® Works

Transitions® Drivewear® lenses function in harmony with the complex human eye and we see colours thanks to visual sensors or receptors, known simply as 'rods' and 'cones'. Rods work best in low light, (overcast driving conditions) and are less involved in color vision, however we still need to see colours. There are many more rods than cones and they are concentrated around the edge of the eye.



Drivers do not wear the ordinary sunglasses in overcast weather because they are too dark. Transitions® Drivewear® lenses are now in their high contrast, olive green colour designed to block glare and maximize the available light.

Cones are involved with color vision and do not work very well in the dark, or at night, but without them we would only see in black and white. Most of the cone response is located in the fovea (in the centre of the eye) and deliver high visual acuity and tend to respond to reds, blues and greens. As the light brightens rods play less of a part and cones become more active, Transitions® Drivewear® lenses

alter to a copper colour and this transition is 'automatic'. Copper coloured lenses are often regarded as the optimum colour for driving.

Outside and in bright light conditions, Transitions® Drivewear® darkens to a warm dark brown colour and performs exactly as a premium polarised sun lens. Now the rods play almost no part because the light is so bright, but the cones are delivering maximum visual information and are fully activated. Because ordinary tinted sun lenses are not polarized, the eyes are exposed to the excessive light and blinding reflected glare.

Since the rods are bleached out by excessive exposure to sunlight over

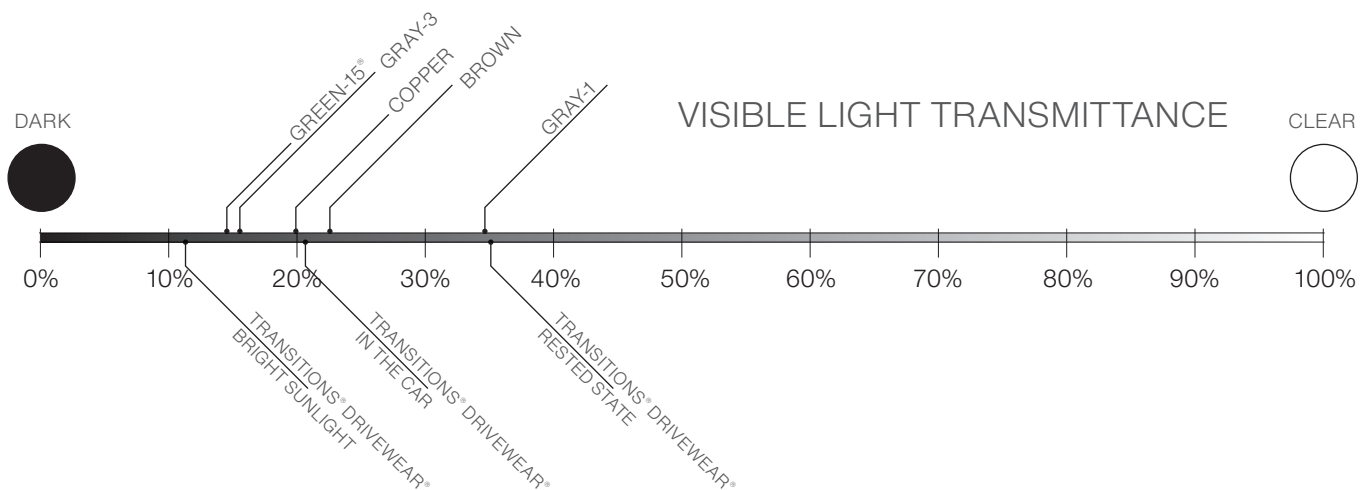
time, protecting the eyes from bright light during the day is important for the night vision as well.

Transitions® Drivewear® lenses are the only sun lenses to have been specifically designed to optimize the performance of the rods and cones in response in varying UV and visible light conditions.

Transitions® Drivewear® intelligently adapts the lens colour and light transmittance while blocking glare so your clients will experience uniform lighting environment throughout the day without noticing the actual changes in the lens itself.

The Science of Colour

Full UVA/UVB protection, highly efficient polarising filters which block blinding glare regardless of their colour and Internationally recognised traffic light signal recognition standards are met with all NuPolar® colours. This ensures excellent visual acuity and relaxed vision, so the eyes are under less strain and become less tired, particularly after long periods in bright sunlight.



GRAY-1

34% Transmittance.

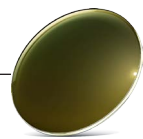
Great for overcast conditions but still with bright reflected glare. Can be over-tinted to a variety of fashion colours without affecting polarization efficiency.



GREEN-15®

15% Transmittance.

This colour is extremely popular among sunglass lovers because of Ray-Ban. NuPolar® Green-15® lens is a good option to offer your client prescription Ray-Bans with advanced polarization technology.



Drivewear® is an olive green colour at 35% transmittance, which guarantees maximum relaxed vision and high contrast in low light, overcast driving conditions. In the car Transitions® Drivewear® very quickly and very subtly darkens to a copper colour, approximately 22% transmittance, offering full sunglass performance. When the journey is finished and step outside into bright sunlight, Transitions® Drivewear® will continue to darken to a warm brown colour and 12% transmittance. A Transitions® Drivewear® lens passes the international traffic light signal recognition standards in all three phases. Transitions® Drivewear® lenses can do this because they react to visible light in the car & UV light when outdoors. These benefits are unique to Transitions® Drivewear® lenses.

GRAY-3

16% Transmittance

(dark). One of the most popular sunwear colours, particularly suitable for the brightest sunlight.



COPPER

20% Transmittance.

Widely regarded as the ideal colour for driving because of it's ability to cut through blue light, which we often see as a faint 'haze'. The result is clearer & sharper vision.



BROWN

22% Transmittance.

A true rich warm deep colour and equally as popular as grey 3, especially in lush green areas.



TRANSITIONS® DRIVEWEAR®

Variable transmittance is essential and ensures the Transitions® Drivewear® lens is right in any light. In the rested state Transitions®



Lens Materials & Availability

OPTICAL QUALITY AND CONSISTENCY
BUILT INTO EVERY LENS

STYLES AND AVAILABILITY

NuPolar® product line offers unmatched variety of materials and lens styles. Whether it is plano, multifocal or progressive, most prescriptions can be fulfilled using NuPolar®. NuPolar® is also made in more progressive designs than any other polarized lens on the market.



1.67 MATERIAL

Brings all the built-in quality and features you have come to expect from NuPolar® to the 1.67 market. It is manufactured from MR-10™ to ensure good processing and stability characteristics while maintaining a 99% polarization efficiency!

1.5 MATERIAL

1.5 Hard Resin NuPolar® has been a standard for polarized lenses for many years. Excellent optical performance combined with affordability make it the most popular polarized lens in the world.

TRILOGY (TRIVEX®)

This product combines a great strength, extreme light weight with the great optics. It took over 5 years to develop this patented polarized Trivex ophthalmic lens. It provides the ultimate balance of lens features for the most demanding customers. Trilogy NuPolar® is also perfect for children.

POLYCARBONATE

NuPolar® polycarbonate provides the impact resistance and protection desired for every activity under the sun.



NuPolar[®] Polarized Lens Summary

UNIQUE HEAT RESISTANT POLARIZER

Maintains polarization efficiency and color consistency after the heat treatments necessary for application of the coatings.

THINNESS

All NuPolar[®] lenses are designed to minimize both centre and edge thickness of the lens.

AVAILABILITY

Wide range of materials, styles and colours.

HIGH EFFICIENCY POLARIZER

All colours provide maximum glare reduction.

FILM PLACEMENT TECHNOLOGY

The polarized film must be aligned accurately with the front and back surfaces of all lens types including complex progressive lenses.

ONE PIECE CONSTRUCTION

Film and lens form an integral bond to eliminate delamination.

Conclusion

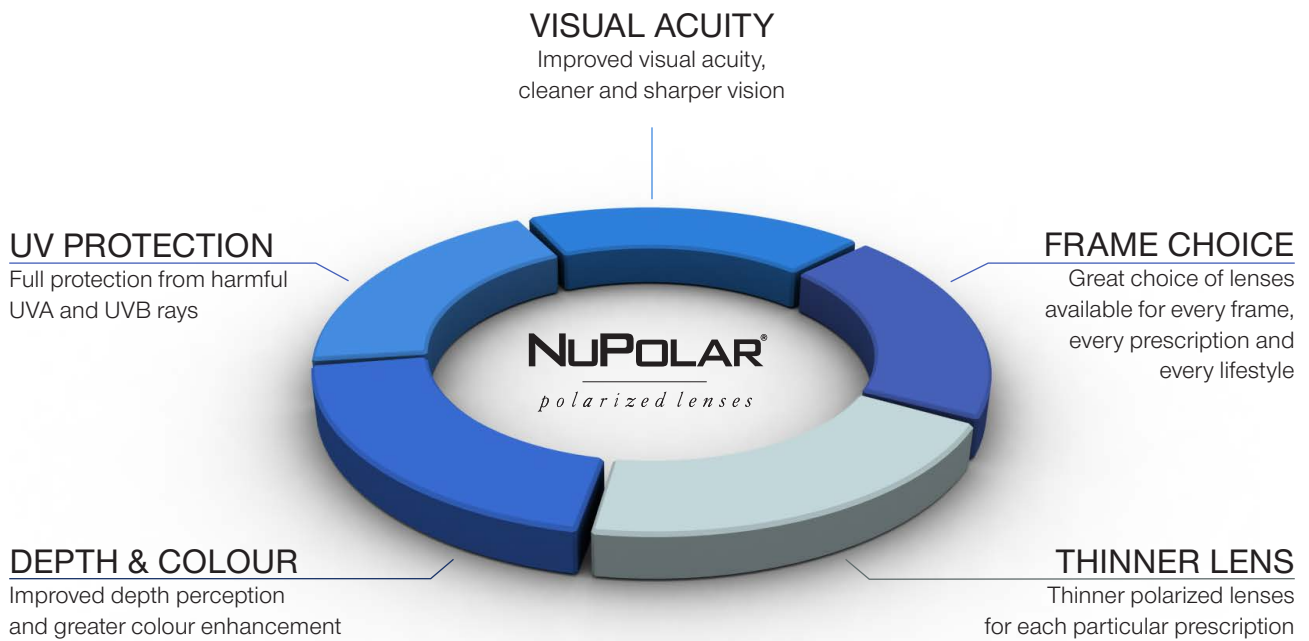
NuPolar[®] lenses define the world standard in prescription sunwear. It features the most advanced polarizing filter in wide selection of materials, colors and lens styles. NuPolar[®] is also optimized for virtually every design available through the latest free-form technologies. Because of that it is suitable for all customers from

kids to seniors. The most important benefit is that NuPolar[®] lenses help those who wear fixed tint prescription sunglasses see much better.

NuPolar[®] is extremely efficient in blocking the blinding glare, improving the contrast, color and depth perception and overall visual acuity.

Once the client starts wearing NuPolar[®] polarized lenses, it is virtually certain that he or she will never go back to the non-polarized lenses. It is a fact that NuPolar[®] offers significant economical advantages to opticians by providing amazing premium lens qualities in ophthalmic sunwear.

NuPolar[®] Unique Benefits



Comparison table

The testing reveals significant differences in the performance of many polarizing lenses available today. From the table below it is possible to see that NuPolar[®] significantly outperforms its competitors in most of important performance related criteria.

NuPolar [®] Versus Other Leading Brands									
Polarized Product	Optics	Compliance with standards	Colour Uniformity	Polarization Efficiency	Heat Stability Colour	Heat Stability Polarization	Film Adhesion	Film Placement At Center	Film Placement Across Lens
Brand A	3	5	3	5	3	4	2	3	4
Brand B	5	5	4	3	3	4	1	3	4
Brand C	5	5	4	5	1	5	4	5	3
Brand D	3	5	4	5	3	4	4	2	4
Brand X	4	5	4	5	1	5	3	4	3
NuPolar [®]	5	5	4	5	5	4	4	5	5

5 Excellent
 4 Very Good
 3 Satisfactory
 2 Poor
 1 Unacceptable

Frequently Asked Questions

Question: Can I tint NuPolar®?

Answer: Yes, it is possible in 1.5 Hard resin lenses. Grey 1 lens will offer maximum tinting options.

Question: Can I have a clear polarised lens?

Answer: No, by the laws of physics polarized lenses must absorb 50% of visible light.

Question: What makes them different from ordinary sunglasses?

Answer: They block blinding reflective glare, enhance colours, improve depth perception and improve overall visibility.

Question: How to demonstrate the benefits of NuPolar® to a client?

Answer: Use NuPolar® glare demonstrator available from most NuPolar® dispensing laboratories. Your clients will be able to see the benefits immediately.

Question: Can I have a reflection free coating applied?

Answer: Yes. We recommend it is applied to the inside surface of the lens to reduce internal reflections and sunlight reaching your NuPolar® lens from behind you.

Question: Can mirror coating be used?

Answer: Yes. But we do not recommend it on Transitions® Drivewear® lenses since the mirror coating affects light transmittance performance of the lens.



NuPolar® Glare Demonstrator

NUPOLAR®

polarized lenses



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