Art & Science of

NuPolar®

polarized lenses

www.nupolar.com

NuPolar®

polarized lenses

World Market Leader In Polarized Lenses

Sun glare is an optical nuisance that can lead to eye discomfort, headaches, and temporary blindness. Polarized lenses selectively absorb glare to allow good optical acuity and comfort, even in bright sunlight.

But not all polarized lenses are equal in quality and performance. Younger Optics invested decades of design and development work to make NuPolar technology the global standard for polarized lenses.

NuPolar lenses, as the market leader, set the benchmark for rigorous performance standards in the areas of optics, polarized film technology, color consistency, material sciences and more.

NuPolar lenses help you grow your business and realize the untapped potential of polarized lenses.

For over 25 years, NuPolar lenses have been and continue to be the global standard from which all other polarized lenses are measured.

Here is why...

NuPolar technology is founded and based on Science; putting it all together properly is NuPolar's Art.

NuPolar®
No. 1 Polarized Lens

Optical Science

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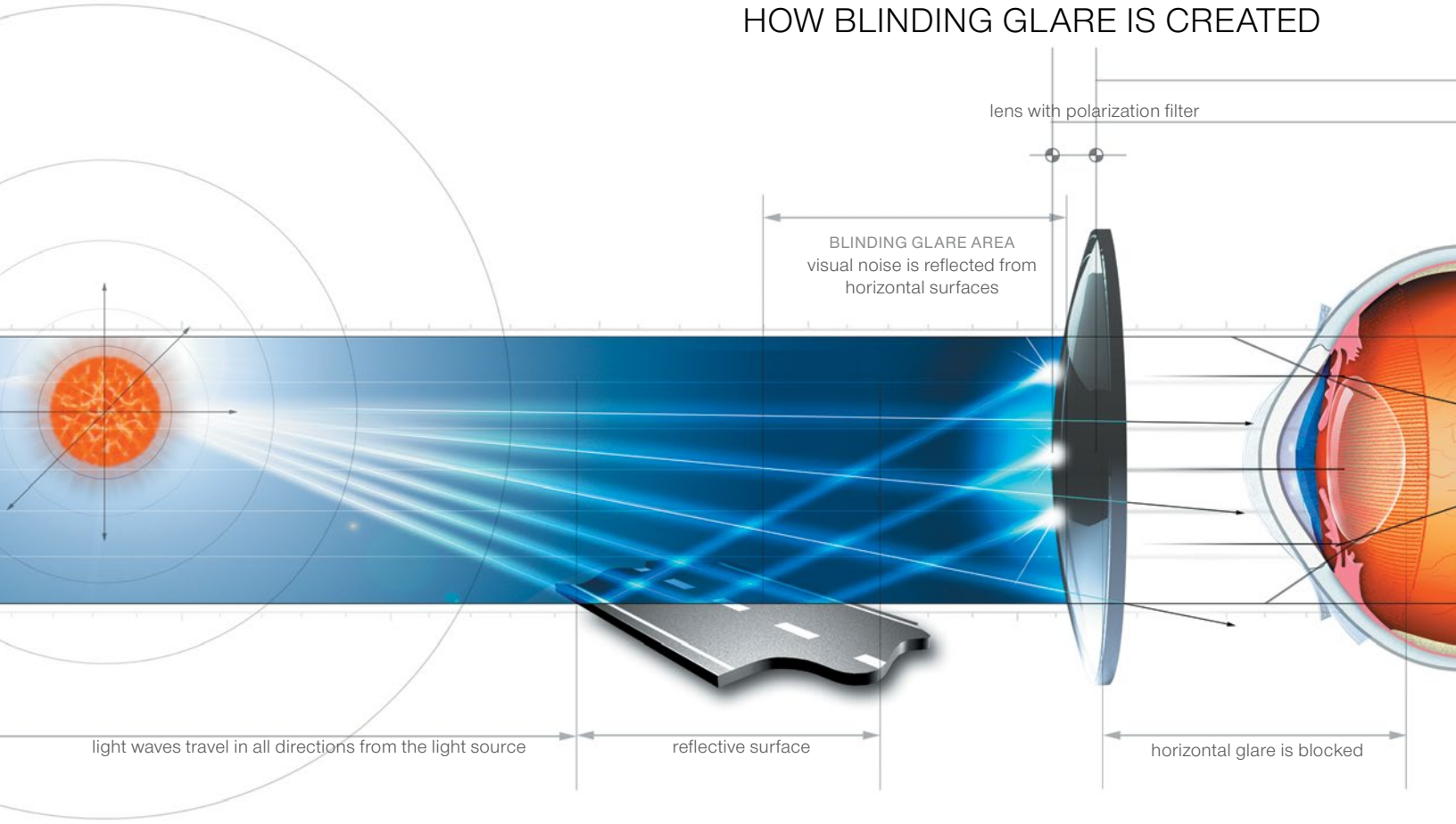
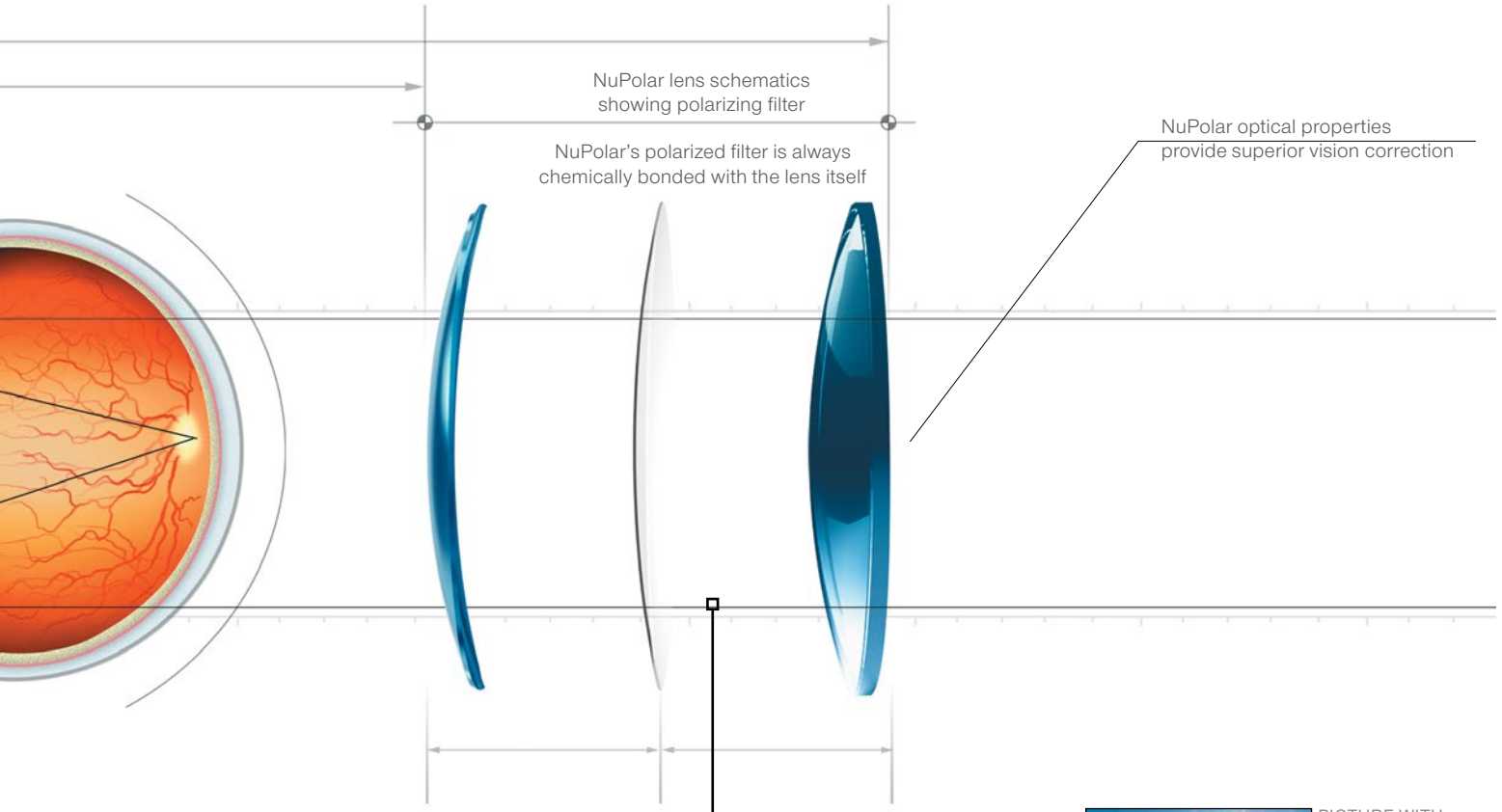
Photonic Science

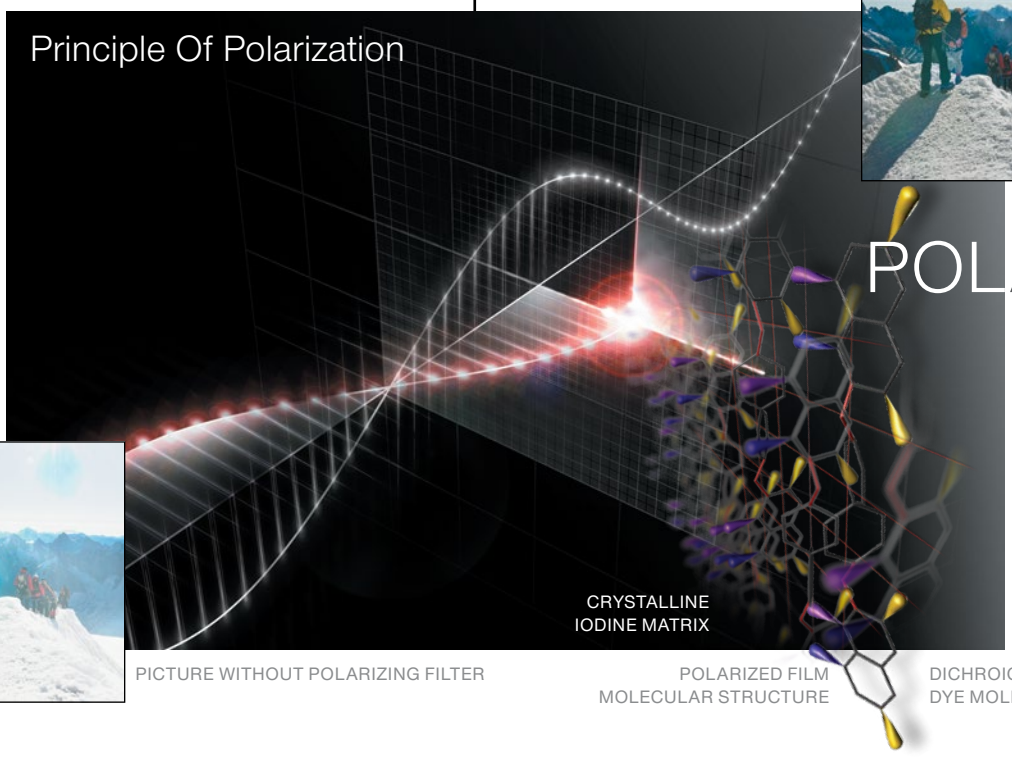
HOW BLINDING GLARE IS CREATED

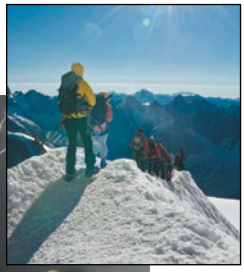


Light travels from the sun in the form of waves to our Earth. Once these waves hit a reflective surface these waves change their energy and become scattered. Due to this reflection we can sense colors as well as intensity of light. However, from the moment of reflection, light also may become polarized 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 that can preferentially absorb the interfering glare. This fundamental principle gave birth to polarized eyewear.

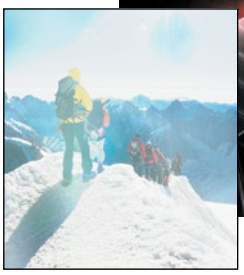
AND HOW IT IS ELIMINATED BY A POLARIZED LENS







PICTURE WITH
POLARIZING FILTER



PICTURE WITHOUT POLARIZING FILTER

POLARIZED FILM
MOLECULAR STRUCTURE

DICHROIC
DYE MOLECULE

Glare Is Everywhere; Reduce It By Wearing NuPolar® Lenses

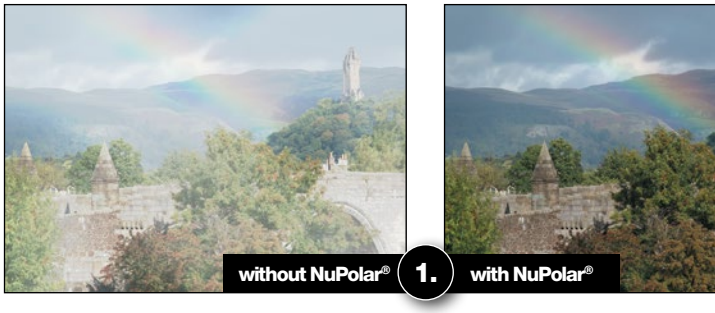
NuPolar acts like a “visual filter” for your eyes making every situation where the sun is present look clearer and richer by blocking blinding glare. Camera enthusiasts have known for years that a polarized filter makes their pictures look better... why not give the same benefits to your eyes through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

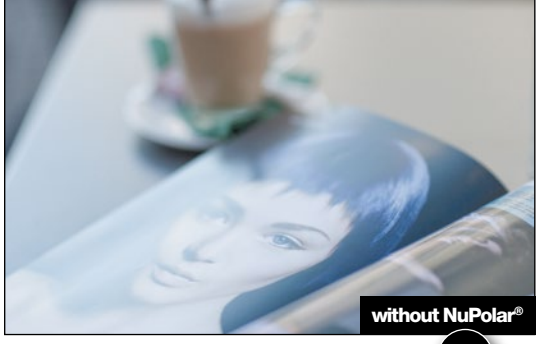
Notice how NuPolar makes the sky bluer and the greens greener in pictures ❶, ❹, and ❼.

Look how the rainbow behind Stirling Bridge in Scotland “comes alive” in picture ❶.

NuPolar can make driving safer by blocking out blinding and harmful glare, as in pictures ❷ and ❸.

Whether in the forest ❹, on a mountain-top ❻, in a grassy field ❼, or just enjoying a coffee in an outdoor café ❺, NuPolar makes the experience richer and more deeply satisfying.





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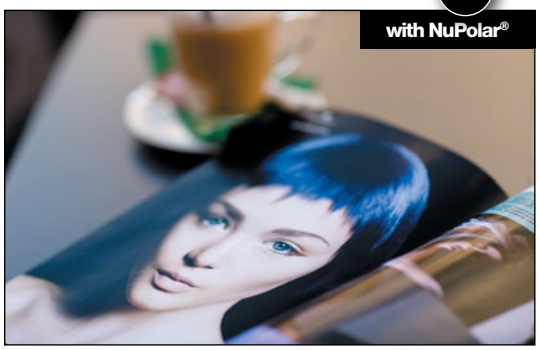


6.

7.

THERE IS NO SUBSTITUTION FOR POLARIZED LENSES.

ONLY POLARIZED LENSES CAN REMOVE BLINDING GLARE.

AND NUPOLAR® DOES IT BEST.

Inadequate Substitutions for NuPolar®

PHOTOCHROMIC LENSES

Variable tint lenses only reduce light transmittance. They do not block blinding glare.

ANTI-REFLECTION COATING

AR coating is a great feature for ophthalmic lenses, removing annoying reflections and ghost images. AR coatings will actually increase light transmittance and reduce the reflections from the back surface of polarized sunwear. However, blinding glare will not be effectively removed by AR coatings alone.

TINTED LENSES

only reduce light transmittance and do not block blinding glare.

CLIP–ONS

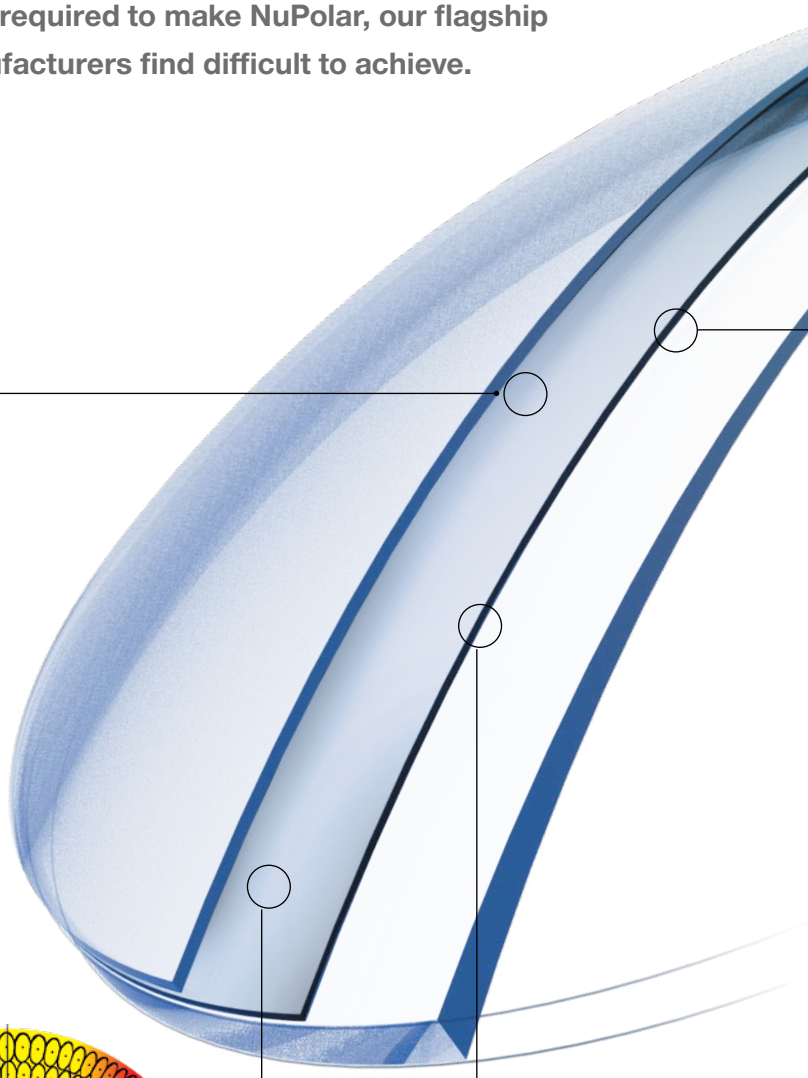
increase the weight of eyewear and may cause scratches on the lens surface. They also decrease optical quality and create additional surface reflections.

OVER–FRAMES

that fit over existing eyewear can be extremely heavy and uncomfortable. They limit peripheral vision, may distort optics and their users look unstylish.

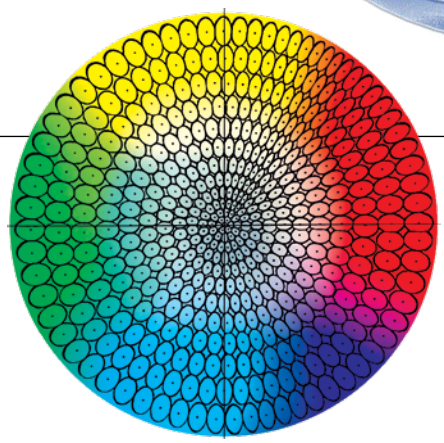
Advanced
Polarizing Film Technology
Helps Make NuPolar® The World Market Leader

The most important element of any polarized lens is the polarizer – a unique thin film incorporated into the lens structure. As a pioneer in the polarized ophthalmic lens market, Younger Optics excels in the special processes required to make NuPolar, our flagship brand, to exacting standards, which other manufacturers find difficult to achieve.



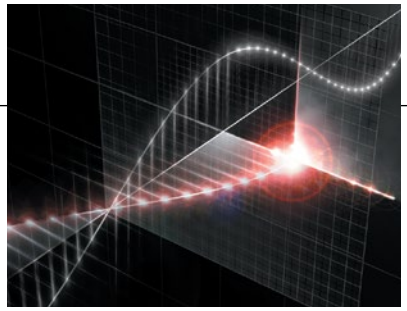
PROPRIETARY FILM TECHNOLOGY

Younger Optics is one of the few lens manufacturers that has film manufacturing capabilities. This has allowed us to achieve unrivaled excellence in the areas of film placement, color stability, heat stability, and advanced film adhesion. Creating a great polarized lens starts with great polarizing film technology, and here NuPolar is unrivaled.



EXCELLENT COLOR UNIFORMITY

NuPolar colors are always “true colors”. The human eye is a superb “color matching instrument” and NuPolar lenses are the best product on the market to satisfy these demanding requirements.



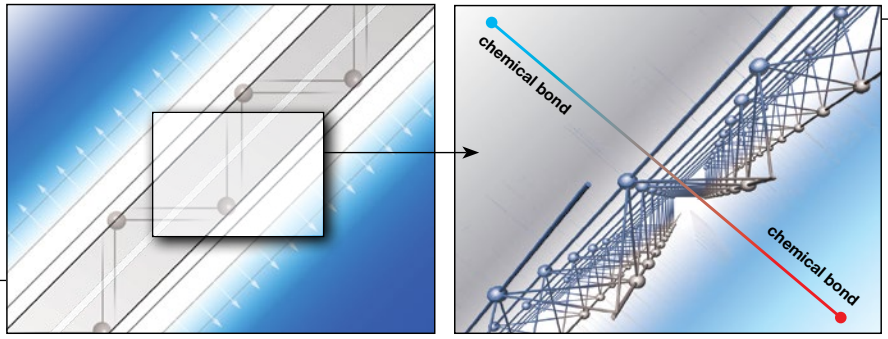
HIGH POLARIZATION EFFICIENCY

NuPolar never compromises on high polarization efficiency. Some polarized films have such low efficiency that they don't even work with a glare demonstrator.

EXCELLENT HEAT STABILITY

NuPolar's colors remain stable in the elevated temperatures often required for hard coating and AR processing.

Other lenses often fade or change their colors completely when subjected to the temperatures required during these processing steps.



SUPERB ADHESION

Before NuPolar, delaminations were an everyday occurrence with polarized lenses.

With NuPolar technology, the film and lens form an integral chemical bond which eliminates the possibility for lens/film delaminations.

The unique chemical composition of the polarizing film facilitates a chemical reaction between the lens material and polarizing film material. As a result, the polarizing film and the lens are linked by a stable chemical bond. This eliminates any chance of film separation.

How To Achieve
A Thin And Optically Stable Lens

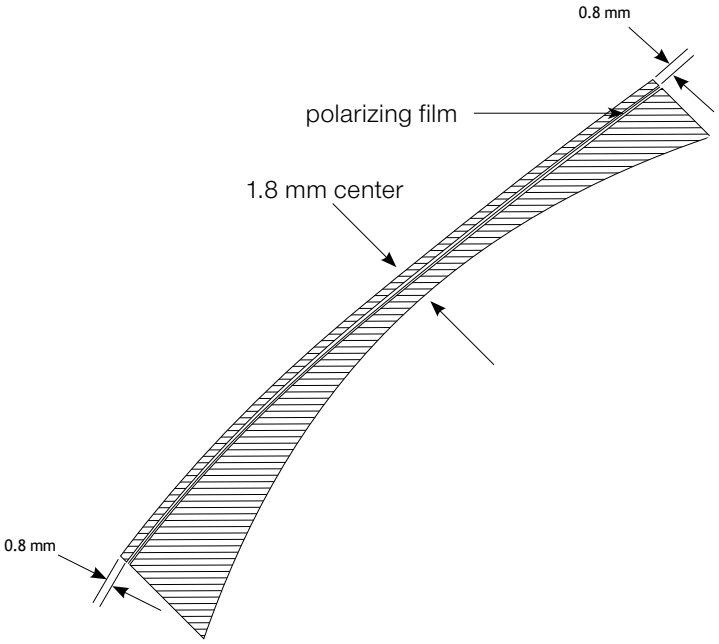
NuPolar® products are always designed to be as thin as possible. This is done by proprietary positioning of the film and by offering the widest possible variety of materials.

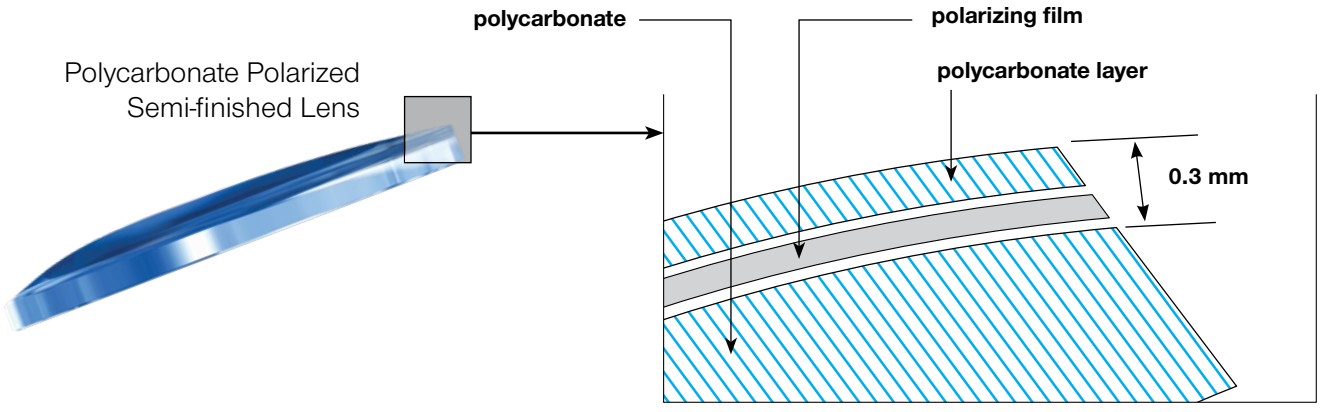
Whatever material is selected, you can be sure that the material and the film have been properly matched to ensure both a thin and an optically correct lens.

So many factors go into making a high quality NuPolar lens. Throughout the manufacturing cycle, from beginning to end, every step must be watched and carefully supervised to ensure that every lens meets the NuPolar standards, regardless of material.

It is very easy to make a mediocre quality polarized lens, yet exceedingly difficult to make a high-quality polarized lens like NuPolar.

HARD RESIN NUPOLAR CONSTRUCTION APPROACH
(CROSS-SECTION)

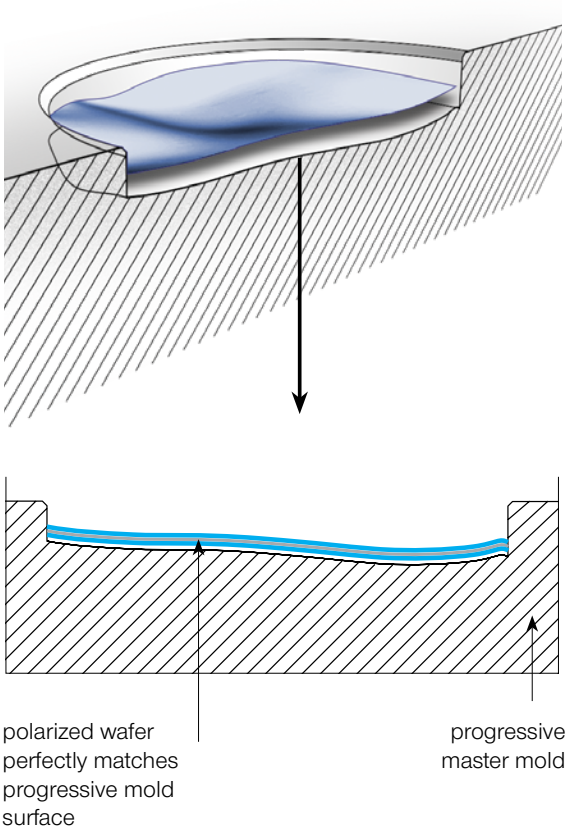




Precise Replication of Progressive Design

Optical designers go to a lot of trouble to try and come up with the best design possible for each patient. However, many polarized lenses do not properly replicate the intended design.

POLARIZED WAFER IN THE INJECTION MOLD



NuPolar progressive designs use patented technology which ensures that the replicated design on the finished lens matches that which the optical designers intended.

Younger's unique film matching technology actually forms the film into nonspherical shapes and often replicates the curvatures of the progressive itself. This allows for the best possible replication of the optical design and insures that the finished lens will have the capability to be processed as thin as possible given the progressive design.

No other polarized lens product takes the care and pride in its film technology as NuPolar does.

NuPolar® Is Perfect for Digital Surfacing

Excellent digital surfacing results start with having precise curve control and optics on the front surface of the lens. This curve control can only be achieved through rigorous adherence to manufacturing standards throughout the manufacturing process. The precision of the front curve of a lens is a result of the care given to it by the manufacturer. NuPolar products are designed to be freeform friendly. The number of base curves in one-diopter steps is maximized to give as thin and flat a finished lens as possible.

NuPolar® Polarized Lenses
Color Options

While many lesser polarized lens brands take the approach to have as many colors as possible, we disagree with this philosophy. It is better to have excellent "true and deeply rich" colors with high glare-blocking efficiency.

Many lens colors on the marketplace are so light and washed out they do not efficiently block blinding glare. Additionally, many of these lenses are not heat stable enough to withstand post-processing without color degradation.

With NuPolar® lenses, feel confident your colors will be deep and satisfying, and they will stay that way!

GRAY-3

Excellent for bright sun conditions while color integrity is maintained. Colors become richer and deeper and maximum blinding glare protection is provided.

BROWN

A true, deep, rich brown that provides for a wearing experience in which the lens enhances colors and especially highlights greens.

GRAY-1

Great for less bright conditions where color integrity should be maintained. Can be over-tinted to a variety of fashion colors without affecting polarization efficiency.

COPPER

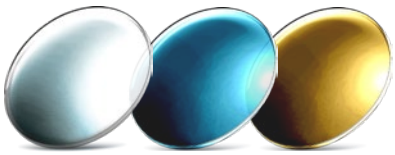
Copper is considered by many an excellent high contrast lens which highlights greens and reds. It is particularly effective in cutting through blue haze.

GREEN

Perfect for those who enjoy a traditional green color. It is preferred for the enhancement of colors.

NUPOLAR GRADIENTS: GRAY/GRAY, BROWN/GRAY & BROWN/BROWN

Style-conscious wearers can get the gradient they want with the polarization they need. With NuPolar's new encapsulated technology the lenses won't fade or discolor, and there is no tinting necessary.

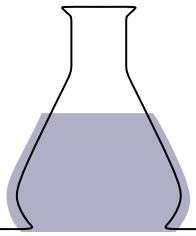


NUPOLAR MIRRORS: SILVER, BLUE & GOLD

Now your patients don't have to be so patient! Eyecare professionals can now provide patients with on-trend mirrorcoated polarized Rx sunwear with a faster turnaround. These popular mirror colors are pre-coated, which reduces lab processing time.

Materials & Styles

NuPolar® Quality in Every Lens



HARD RESIN 1.5

NuPolar in hard resin is consistently seen as the world's standard for all other materials. Optical clarity combined with affordability make this product the "workhorse" of polarized lenses worldwide.

POLYCARBONATE 1.59

NuPolar polycarbonate lenses provide the impact resistance and protection desired for every activity under the sun.

TRILOGY® 1.55

Combining the best in optics, strength, thinness and lightweight, NuPolar Trilogy lenses have it all.
Over five years in development, this patented product provides the ultimate balance of features to the wearer.

HIGH INDEX 1.60

NuPolar 1.60 lenses are manufactured from MR-8™, a high index material with good impact resistance and thermal resistance. MR-8™ lenses are sometimes preferred over lenses of similar refractive index due to its high Abbe number. This reduces chromatic aberration in the periphery.

HIGH INDEX 1.67

NuPolar 1.67 lenses are made from MR-10™, a high-index material that allows for very thin and light lenses with very good heat resistance to withstand a range of working temperatures.

ULTRA HIGH INDEX 1.74

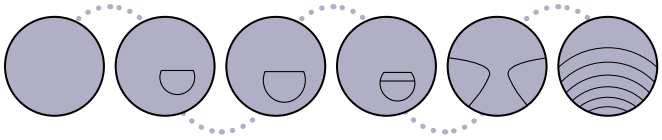
NuPolar 1.74 lenses are the latest addition to the NuPolar family. These lenses are made from MR-174™, an ultra high-index material that allows for ultra-thin lenses of the highest refractive index. MR-174™ is made using plant-derived materials.

SINGLE VISION

NuPolar Single Vision lenses are spherical and designed to be processed to a single power, but can also be processed digitally into a range of progressive designs.

FLAT-TOPS

Many patients still prefer a multi-focal lens over a progressive. NuPolar flat-tops offer those patients the best in polarization. NuPolar lenses are available as FT28 and FT35 bifocals, as well as a 7 x 28 trifocals.



PROGRESSIVES

NuPolar Image® and Adage® are traditional progressive designs with ultra-wide distance zones, perfect for driving and outdoor activities.

NuPolar Camber™ is a free-form lens blank that can be digitally processed into several design options that are customizable to individual patients. NuPolar Camber lenses are available through Camber-authorized labs only.

Patient Education
Supporting Tools

Like all value-added features, polarized lenses require a bit of consumer education. Younger Optics is committed to providing the eye-care professional with a wide range of marketing materials that make this task simple. The most effective of these is the NuPolar Glare Demonstrator. It makes evident the benefits of polarized lenses by allowing customers the opportunity to "see for themselves" the positive effects of glare reduction. This demonstrator, as well as many other marketing resources designed to make selling second pairs easier, is available to retailers and labs that sell NuPolar lenses. For a complete list of available resources, please visit the Marketing section at www.NuPolar.com.

What NuPolar® means

TO PATIENTS
NuPolar eyewear means

- improved visual acuity
- best eyewear for day time driving
- better visibility and safety, less eye fatigue
- protection from sun and UVA and UVB
- true colors and improved contrast
- stylish look

TO OPTICIANS
Offering NuPolar eyewear means

- premium product that is easy to demonstrate
- satisfied customers
- increased sales
- enhanced practice profitability
- patient loyalty resulting in referrals and recalls
- great sense of personal accomplishment

NUPOLAR® LENS AVAILABILITY

HARD RESIN*	BASES	COLORS	ADD RANGE
Single Vision	1, 2, 3, 4, 5, 6, 7, 8	Gray 3, Brown & Green	
Single Vision 80.5 mm Ø	4, 6, 8	Gray 3, Brown	
Single Vision	2, 4, 6, 8	Gray 1	
Single Vision	2, 3, 4, 5, 6, 7, 8	Silver Mirror, Blue Mirror, Gold Mirror	
IMAGE® Progressive	2, 4, 6, 8	Gray 3 & Brown	1.00 - 3.00
Camber™ Lens Blank	.50, 2, 3, 4, 5, 6, 7, 8	Gray 3 & Brown	
FT 28 Bifocal	2, 4, 6, 8	Gray 3 & Brown	0.75 - 4.00
FT 35 Bifocal	2, 4, 6, 8	Gray 3	0.75 - 4.00
7 x 28 Trifocal	4, 6, 8	Gray 3	1.50 - 4.00
Finished Plano	6	Gray 1, Gray 3, Brown & Green	
POLYCARBONATE	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	.50, 1, 2, 3, 4, 5, 6, 7, 8	Gray 3 & Brown	
Single Vision	.50, 2, 4, 6, 8	Copper & Green	
Single Vision	2, 4, 6, 8	Silver Mirror, Blue Mirror, Gold Mirror	
Single Vision	4, 6, 8	Gradient Gray/Gray, Brown/Gray & Brown/Brown	
IMAGE® Progressive	2, 4, 6, 8	Gray 3 & Brown	1.00 - 3.00
IMAGE Wrap® Progressive	8	Gray 3	1.00 - 3.00
ADAGE® Progressive	2, 4, 6, 8	Gray 3 & Brown	1.00 - 3.00
Camber™ Lens Blank	.50, 2, 3, 4, 5, 6, 7, 8	Gray 3 & Brown	
FT 28 Bifocal	2, 4, 6, 8	Gray 3 & Brown	1.00 - 3.00
Finished Plano	6, 8-decentered	Gray 3, Brown, Green	
1.60 HIGH INDEX MR-8™	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	1, 2, 3, 4, 5, 6, 7, 8	Gray 3, Brown & Green	
Camber™ Lens Blank	.50, 2, 3, 4, 5, 6, 7, 8	Gray 3 & Brown	
1.67 HIGH INDEX MR-10™*	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	1, 2, 3, 4, 5, 6, 7, 8	Gray 3, Brown & Green	
Camber™ Lens Blank	.50, 2, 3, 4, 5, 6, 7, 8	Gray 3 & Brown	
FT 28 Bifocal	2, 4, 6, 8	Gray 3 & Brown	1.50 - 3.00
TRILOGY®	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	2, 4, 6, 8	Gray 3 & Brown	
Finished Plano	6	Gray 3 & Brown	
1.74 HIGH INDEX MR-174™	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	2, 4, 6, 8	Gray 3, Brown	

TRANSITIONS® DRIVEWEAR® LENS AVAILABILITY

HARD RESIN	BASES	COLORS	ADD RANGE
Single Vision	1, 2, 3, 4, 5, 6, 7, 8	Transitions Drivewear	
POLYCARBONATE	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	2, 4, 6, 8	Transitions Drivewear	
IMAGE® Progressive	2, 4, 6, 8	Transitions Drivewear	1.00 - 3.00
Camber™ Lens Blank	.50, 2, 3, 4, 5, 6, 7, 8	Transitions Drivewear	
TRILOGY®	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	2, 4, 6, 8	Transitions Drivewear	
Finished Plano	6 Hardcoated	Transitions Drivewear	
1.67 HIGH INDEX MR-10™*	**BASES**	**COLORS**	**ADD RANGE**
Single Vision	2, 4, 6, 8	Transitions Drivewear	

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The Optical Lens Innovators

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NuPolar lenses block 100% UVB and 99%-100% UVA. Transitions Drivewear lenses block 100% UVA and UVB. All NuPolar and Transitions Drivewear lenses pass the ANSI Z80.3 and ISO 8980-3 standards for Traffic Signal recognition. NuPolar and Transitions Drivewear lenses are not intended for night driving.