

ART & SCIENCE OF



 **DRIVEWEAR™**





Written language introduced



Gutenberg invents printing press



Mass literacy influences human development



Automobile invented



More time for outdoor activities

# EVOLUTION OF DRIVE EYEWEAR



Ancient Native sunwear



Nero observed gladiators through emerald stone



First glasses created



Benjamin Franklin invents Bifocal lenses



Edwin Land invents polarizers



First plastic lens introduced

## EYEWEAR

Of all the senses that man has, sight is perhaps the most precious of all. In our modern world, it is easy to take for granted correct vision, but eyewear is a relatively new invention.

Nearly everyone will agree that clear prescription eyewear was one of the most important inventions in human history. Prescription eyewear allowed people to free themselves from a life of not seeing the world clearly to one where they could. This opened up a whole new world for people who needed vision correction to lead a productive life. This resulted in an enormous productivity gain for the human race.

Technology has had a strong influence in the development of clear eyewear. These technologies make our clear eyewear last longer and look better. Transitions® Lenses are perhaps the ultimate in everyday eyewear since they go from light to dark in varying light conditions and provide the wearer with a more comfortable and healthy sight solution.

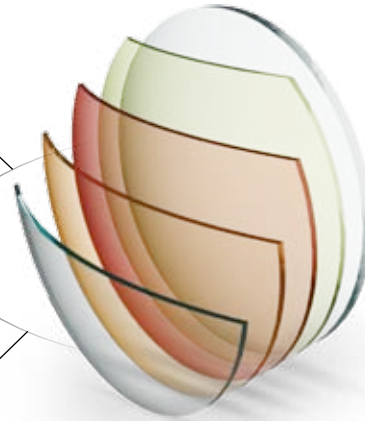
# DRIVEWEAR

While Eyewear and Sunwear are vital tools in our quest towards optimum vision, today's modern world demands more. In the past, clear eyewear was enough. In bright light conditions polarized sunwear was enough. This is no longer true. Today our lives are strongly influenced by the automobile, which has transformed the way we experience the world when we are outdoors.



# WEAR

## SUNWEAR



## DRIVEWEAR

a new lens category created

# SUNWEAR

Sunwear actually historically predates clear eyewear. Early man, especially those found in areas of intense snow glare, actually formed early sunglasses by cutting narrow slits in thin stones to protect their eyes from blinding glare.

The first prescription sunglasses were made from colored glass and these evolved into tinted plastic lenses. Different colors were chosen for different conditions, trying to maximize outdoor vision to a specific task. The problem was that the lenses could only be one color and the wearer could only have optimal vision in a particular light condition. These lenses had to be very dark and while they may have blocked out bright light, they reduced the amount of light entering the eye and did not protect from blinding or reflected glare.

Polarized lenses were a great step forward in the evolution of Sunwear. Not only do these lenses block out bright light, they also block out intense, blinding and reflective glare. These lenses have become increasingly popular with the introduction of high quality prescription polarizing lenses such as NuPolar® lenses.

The car we drive says much about the way we live. We no longer need to live next to the places we work and visit due to the freedom the automobile has given us. We literally have our entire outdoor experience affected by either going to, driving in, or leaving the automobile. For those of us with significant commute times we experience the world of outdoors behind the windshield of our car.

Traditional eyewear and sunwear do not serve this new lifestyle very well. Advanced photochromic eyewear, such as Transitions Lenses, do not get dark in the car because the windshield blocks the UV light needed to activate their photochromic response. Polarized sunwear blocks dangerous glare, but does not change in varying light conditions. We need a third category of lenses in our modern, automobile-centered world. Drivewear.

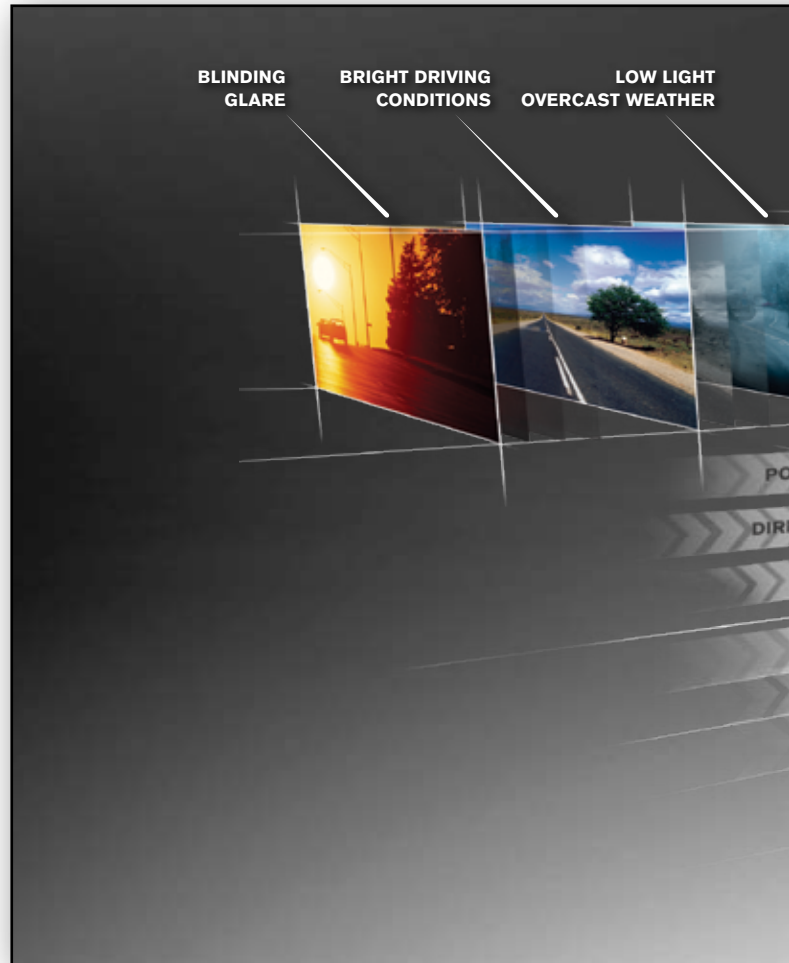
Drivewear lenses are capable of sensing and reacting to varying light conditions both outside and behind the windshield of the car. From bright sunlight accompanied by intense, blinding glare, to overcast inclement conditions, Drivewear lenses provide the wearer with the appropriate visual solution.

Drivewear lenses provide glare protection through polarization and enhance and protect vision through photochromics which are stimulated by both visible and UV light. Finally, by combining the strengths of two of the most important technologies found in eyewear and sunwear today we have developed the lens of tomorrow, Drivewear.

# DRIVING

## TASK

ALTHOUGH DRIVING HAS BECOME SUCH A MAJOR PART OF OUR DAILY LIVES, WE TAKE IT FOR GRANTED, THE TRUTH IS, DRIVING IS ONE OF THE MOST CHALLENGING AND DIFFICULT ACTIVITIES A PERSON CAN ENGAGE IN.

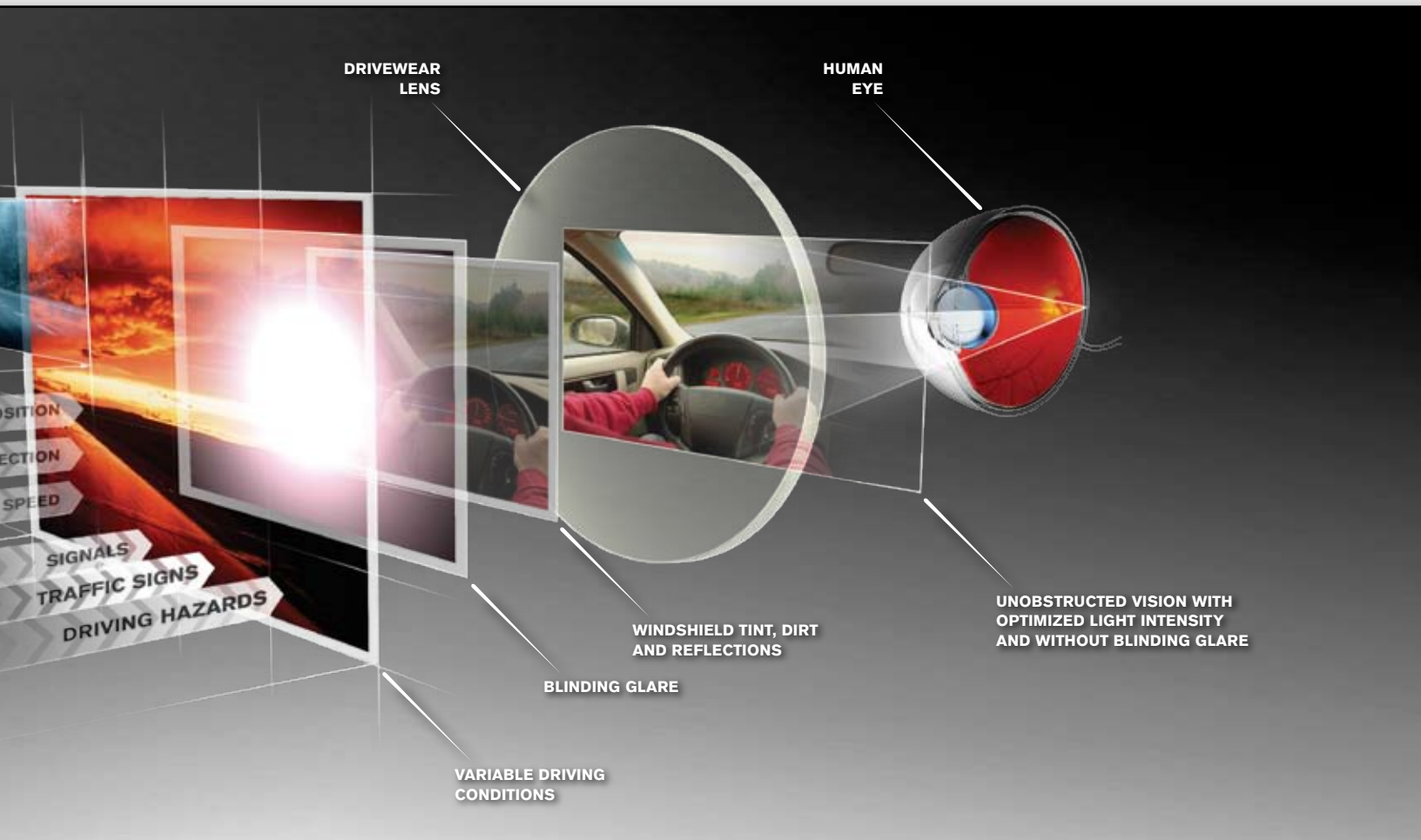


At every moment of the “Driving Task” we are constantly being challenged and “assaulted” by distractions attacking our ability to drive safely. While juggling a cell phone in one hand, adjusting the radio or CD in another, catching up on a quick lunch, and trying to keep kids in the back seat quiet, it all just becomes too much to handle. Making driving even more difficult is changing road and weather conditions. Many of us are also driving under less than ideal conditions while tired, or just not feeling our best.

Many people also cope with physical challenges or age that may slow driving reaction times. All this adds up to making driving an extremely complex task even under the best of conditions. Sometimes it is a wonder that we are able

to arrive anywhere safely. Truly, we are bordering right on the edge of our ability to handle all these stimuli, and when we go over that edge, we are in very real danger of having an accident.

The main tool we use to cope with all these driving challenges is vision. Yet vision is also pushed to the limits while driving. It takes about  $\frac{1}{4}$  of a second to process and react to a driving visual incident, and if you are traveling at 60 mph, that translates to about 22 feet! Clearly we need all the visual help we can get to drive safely.



The most common and dangerous visual assault comes from blinding glare. This glare can be intense sunlight reflected from an endless variety of smooth surfaces such as the road, hood or dashboard of your car, or even the bright chrome of the car in front of you. These conditions are especially harmful when the sun is low on the horizon, such as early mornings and late afternoons, which are also peak commuting times. Polarized lenses are the best solution to taking out most of this accident-causing glare. It is also helpful to have darker color lenses to help the driver see through the bright light.

While bright sun and glare are the most obvious visual dangers while driving, sometimes the conditions we drive

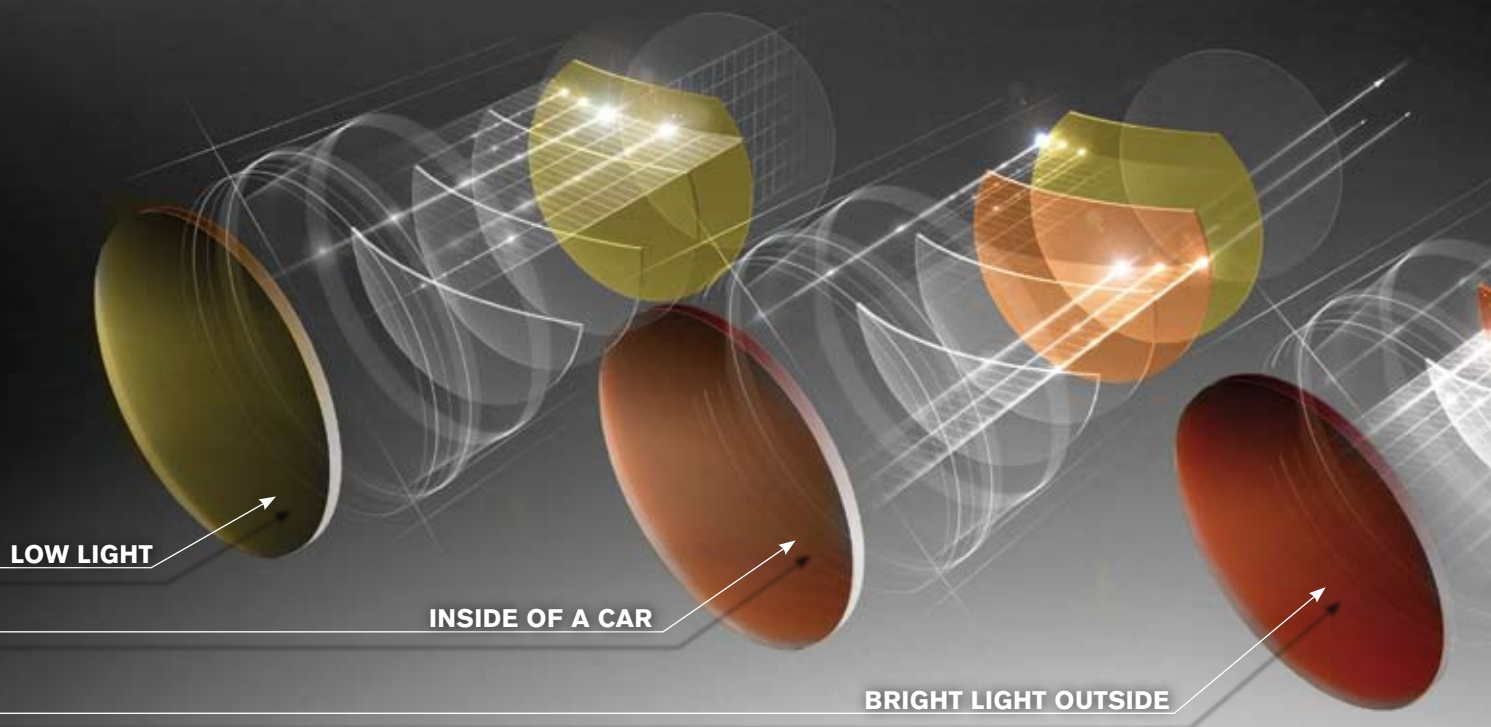
in are the reverse: overcast, often with inclement weather, and less light. For these conditions we want a lens that is as light as possible, and also of a high contrast color. Polarization protection is still important during these times because glare, particularly road glare, can unexpectedly hit at any time, and since the eye has accommodated to these overcast conditions it is particularly susceptible to blinding, bright glare.

Drivewear is the only lens developed to specifically address the Driving Task. Polarized at all times and designed to shift between a lighter and darker color as visual conditions change, it is the ultimate in driving eyewear.

# THE DRIVEWEAR

## ENGINE

IS POWERED BY USING TWO OF THE MOST ADVANCED TECHNOLOGIES FOUND IN THE EYEGLASS INDUSTRY TODAY - TRANSITIONS™ PHOTOCROMIC DYES AND NUPOLAR® POLARIZATION TECHNOLOGY.



## TRANSITIONS PHOTOCROMIC TECHNOLOGY

The photochromic properties of Drivewear lenses represent a breakthrough. In the past, photochromics responded only to UV light intensity. Upon exposure to UV light, the molecular structure of typical photochromics, such as the naphthopyrans, will change orientation, and absorb light. Windshields of cars contain UV blocking agents; therefore, conventional photochromics won't work.

The technology breakthrough needed for Drivewear was to find an array of molecules that would activate in visible light, not just UV light. This would allow for reaction of the molecules behind the windshield of a car.

Younger Optics looked to Transitions Optical, Inc., one of the foremost innovators of photochromic technologies, for the latest developments in visible and UV activated dyes to enhance the Drivewear lens.

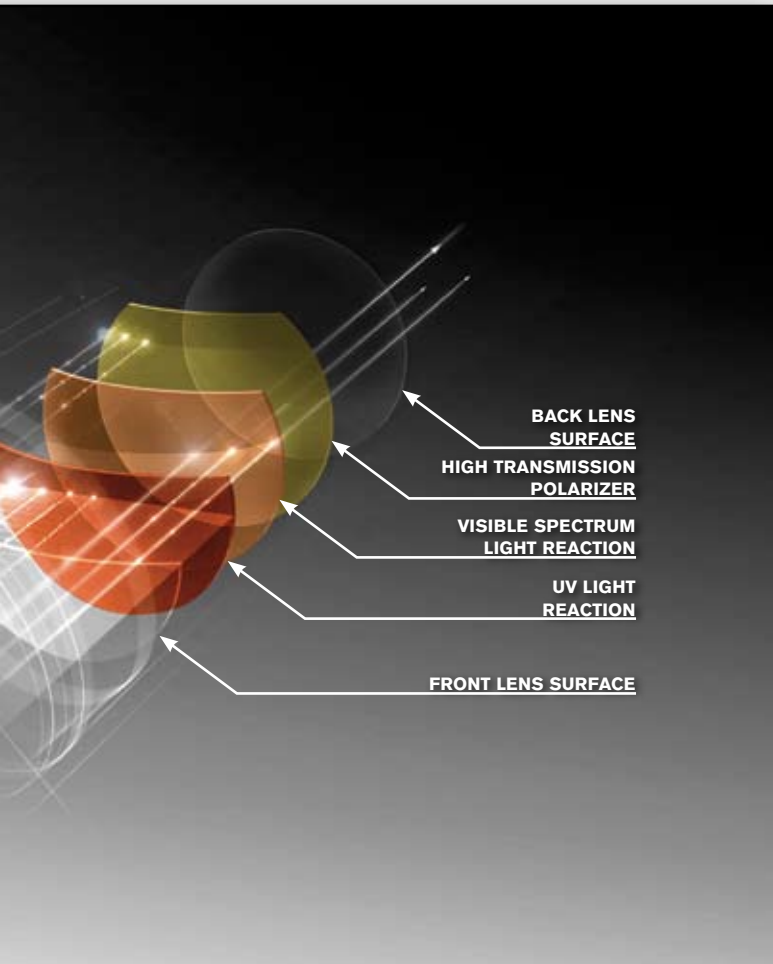
## SYNERGY COMBINING TRANSITIONS AND NUPOLAR TECHNOLOGIES

Drivewear lenses use advances in Transitions™ Photochromic Technology and breakthroughs in Younger Optics' NuPolar® polarizing technology to create a unique new product.

Many attempts have been made to combine polarization and photochromics. These attempts did not work because the properties of the lens were not designed specifically to make the two technologies work together in a complimentary and synergistic way. The resulting product did not utilize either technology to its fullest potential or achieve any direct visual improvements.

Drivewear lenses go far beyond these initial attempts by using each of these specific technologies in ways that enhances each one's capabilities. Drivewear represents the highest utilization of technology of any lens ever introduced into our industry.

Drivewear's combination of technologies is so advanced and novel that multiple patents have been filed on this invention (for instance, "Eyewear having selective spectral response", US patent #6926405 and WO 2005/001554)



### NUPOLAR TECHNOLOGY

The polarization technology of Drivewear also represents a significant breakthrough in the use of polarization. Typically, efficient polarization by absorption only occurs when there are a large quantities of absorbers present; that is, when the lenses are dark. While this is desirable for the times when there is bright sunlight, it does not address lower light conditions particularly during times of overcast weather. Drivewear lenses require a high efficiency polarizer that provides excellent polarizing properties never found before in such a high contrast, light color. This was only achieved by pushing polarized manufacturing technologies to new levels of exceptional performance and light transmittance.



# DRIVEWEAR EFFECT

The human eye is a wonderfully designed instrument to collect visual information. Drivewear's three different "stages", have all been designed to maximize the eye's natural abilities in each of the different light conditions encountered both outside in direct light and behind the windshield of a car.

## OVERCAST LOW LIGHT CONDITIONS

At low lighting conditions, Drivewear lenses provide high transmission of light to maximize the total information to all the eye's visual receptors. This results in maximum visual acuity at this low lighting level. The high contrast polarizer removes glare that would otherwise destroy vision in low light conditions. In this stage Drivewear lenses are a high contrast green/yellow color. Simply, there is no better designed lens for either outdoors or while driving under low light, overcast conditions.

## BRIGHT LIGHT BEHIND THE WINDSHIELD OF A CAR

During bright light conditions behind the windshield of a car, Drivewear lenses provides lower overall transmission to control light intensity for optimum visual acuity. Drivewear lenses promote preferential activation of the eye's red cones (and to a lesser extent, green cones) and result in the best possible vision at these higher light levels. Drivewear's high contrast polarizer is absolutely essential behind the windshield of the car, because it blocks out blinding glare, one of the most dangerous of all driving hazards. Under these conditions, the Drivewear lenses turn a copper color which many feel is the optimum color for a driving lens. This unique behind-the-windshield response protects against bright light and glare and provides better sensitivity to the "visual signal" that is vital for safe driving.

## BRIGHT LIGHT OUTDOORS

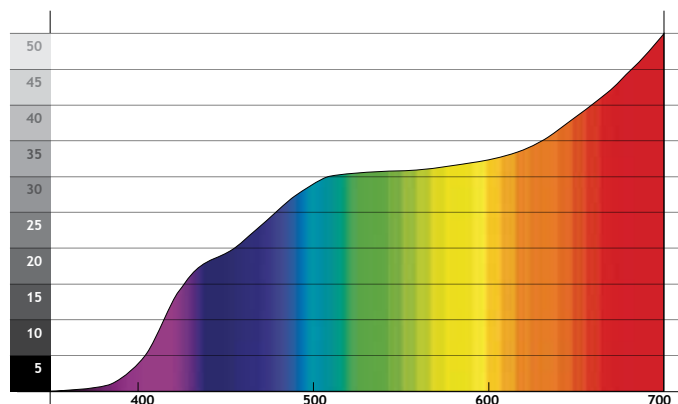
In outside bright light conditions, the eyes' visual receptors, the rods and cones, can easily get "overpowered" and "oversaturated" with light. Under these bright outside conditions the Drivewear lens is designed for maximum filtration of this excess light. It achieves its maximum dark color under these conditions. Here again, it is important to provide maximum protection from blinding glare, and only polarized lenses can do this. Drivewear is designed to provide maximum comfort to the wearer in these high outdoor light conditions.

# OVERCAST

**LOW LIGHT CONDITIONS  
HIGH CONTRAST GREEN/YELLOW COLOR**

**COLOR**  
designed to maximize useful  
light information reaching  
the eye

**POLARIZED**  
to remove glare that would  
otherwise destroy vision in  
low light condition



DRIVEWEAR TRANSMISSION IN LOW LIGHT CONDITIONS

# DAYLIGHT

**DRIVING CONDITIONS**  
**COPPER COLOR**

**COLOR**

designed to both remove excess light and provide good traffic signal recognition; highlighting the reds and greens

**POLARIZED**

to remove glare for safe driving vision



# BRIGHT LIGHT

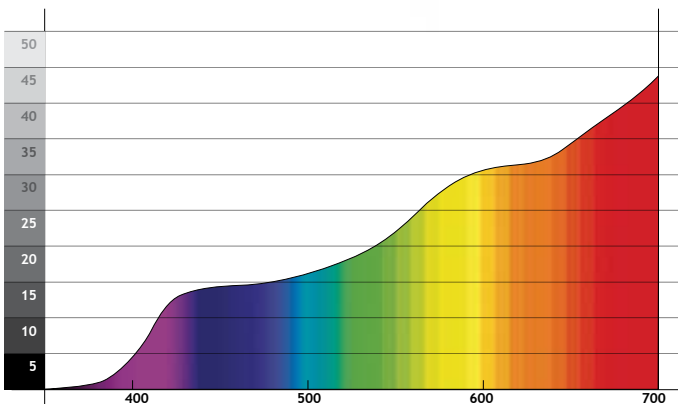
**OUTSIDE CONDITIONS**  
**DARK REDDISH BROWN COLOR**

**COLOR**

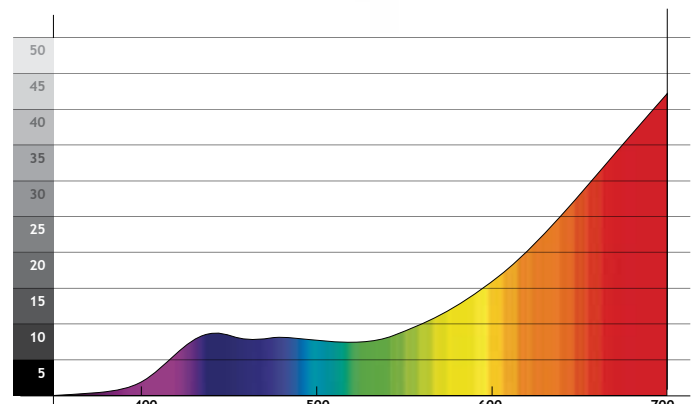
designed for maximum filtration of excess light so that the eye does not get saturated

**POLARIZED**

to provide maximum comfort in high light conditions



DRIVEWEAR TRANSMISSION DURING DRIVING



DRIVEWEAR TRANSMISSION DURING BRIGHT LIGHT CONDITIONS

# DRIVEWEAR

## MARKETING & TARGET GROUP

MARKETING & TARGET GROUP

Worldwide there are nearly 1 billion drivers and the number is growing every year. While the make and model of their cars may vary, their visual need for Drivewear lenses does not.

Literally everyone of driving age that walks into the optical shop is an ideal candidate for Drivewear Lenses. While nearly everyone can benefit from the improved vision delivered by Drivewear, there are target groups which should always have the benefits of Drivewear lenses explained to them.



### COMMUTERS

Those patients that have a significant commute to and from work each day. These patients' need for Drivewear is even more acute if their commute times are in the early morning and late afternoons when the sun is low on the horizon.



### PROFESSIONAL DRIVERS

Patients who make their living driving a motor vehicle (including truck drivers, taxi drivers, salespeople, bus drivers, emergency vehicle drivers such as paramedics, police and any other law enforcement officers), simply cannot be without the benefits of Drivewear lenses.



## **MOMS & DADS**

The driving task becomes even more difficult and challenging with children in the car. In addition, the consequences of an accident become even greater. Whether driving to the local store, or soccer practice, or school... these patients need the driving edge Drivewear can bring.



## **ELDERLY**

Elderly drivers often have slower reaction times and are unable to turn their heads as quickly as younger drivers. These patients need every advantage they can get. Whether it's protection from glare, or the help with a high contrast lens in overcast conditions, Drivewear lenses are a great choice.



## **EVERY DRIVER**

## **NEEDS DRIVEWEAR!**

DRIVEWEAR LENSES HAVE THE POTENTIAL TO LITERALLY CHANGE THE OPTICAL INDUSTRY AND YOUR BUSINESS. IN THE PAST AT BEST YOU WERE ABLE TO SELL EYEWEAR AND SUNWEAR. OFTEN SUNWEAR WAS SEEN AS A LUXURY RATHER THAN A NECESSITY. WITH A FOCUSED TARGET MARKET AND CLEARLY DEFINABLE FEATURES AND BENEFITS, DRIVEWEAR LENSES ARE DESIGNED FOR THE TARGET MARKET THAT INCLUDES NEARLY EVERYONE: AUTOMOBILE DRIVERS.

FOR MORE INFORMATION AND TECHNICAL DETAILS, VISIT  
**WWW.DRIVEWEARLENS.COM**

**DRIVEWEAR™ LENS AVAILABILITY**

HARD RESIN	PRESCRIPTION RANGE	BASES	COLORS
Single Vision	-8.00 to +6.00	2, 4, 6, 8	Drivewear™

Caution:

Drivewear lenses should not be used for night driving.

Caution:

As with all photochromic lenses, Drivewear will become much darker in cold, sunny weather, and may limit visibility. Use special caution when operating open air vehicles such as convertibles, motorcycles, snowmobiles, or all terrain vehicles, or engaging in activities such as skiing.



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