

# EDGE

SAFETY EYEWEAR



VERSION 15.1

INDEPENDENTLY TESTED  
AND COMPLIANT  COLTS  
LABORATORIES

Z87.1 + 2010  
**ANSI**  
SAFETY RATED

 MILITARY  
MCEPS  
SAFETY RATED  
**DAKOTA**

— DON'T **FOG** UP! —



VAPOR

VAPOR SHIELD® LENSES HAVE PASSED  
THE FOLLOWING LABORATORY TESTS:

- Transition from 76°F to -44°F: NO FOG!
- Transition from -44°F to 76°F: NO FOG!
- 125°F with 80% humidity: NO FOG!

# WE HAVE THE RIGHT FEATURES FOR YOU

Because facial structures differ and work environments vary, Edge Eyewear provides solutions that meet a broad range of specific needs.

Use these icons as a guide to find the unique features & benefits offered by Edge Eyewear.

# SHIELD<sup>®</sup>

## MILITARY GRADE ANTI-FOG



- VAPOR SHIELD ANTI-FOG 
- POLARIZED 
- STANDARD ANTI-FOG 
- FOAM GASKET LINING 
- XL (WIDE) FIT 
- MULTI-FIT 
- WELDING 
- LADIES STYLE 
- MAGNIFIERS 
- FIT OVER RX 

# WHY TEST?

## PROTECTING YOU FROM WHAT YOU DIDN'T SEE COMING

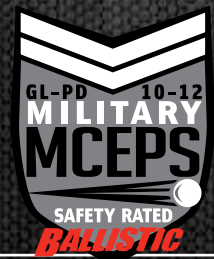
According to the Center for Disease Control, there are more than 10,000 eye injuries in North America every day. The Department of Labor reported that approximately 2,000 of these injuries require medical treatment and time off work, and the Bureau of Labor states 85% of these cases require up to five days off work.

While it is not surprising that eye injuries happen on the job site, many are shocked to learn 63% of all eye injuries happen away from work: 47% at home and 16% while playing sports. In an effort to decrease these statistics, the American National Standards Institute (ANSI) created a series of voluntary tests that determine the durability of safety eyewear.

Several tests are required by ANSI and Military Combat Eye Protection Systems (MCEPS). Protective spectacles must pass all of these tests and more to be considered compliant with current ANSI and MCEPS standards. All Edge Eyewear glasses are independently tested by the accredited COLTS Laboratories.



# STANDARDS



## WHAT IS ANSI Z87.1+2010?

Z87.1+2010 is ANSI's most current standard for high impact eye protection. In 1922, the War Department, Navy Department, and National Bureau of Standards created the first edition of the Z2 Standard for eye and head protection. Over many decades, these testing standards have been revised, improved, and renamed – resulting in today's ANSI Z87.1-2010 requirements, which are enforced by OSHA. Edge Eyewear has added a "+" to the Z87.1 markings to indicate that glasses are compliant with the high impact level of the standard, referred to as Z87+.

## WHAT IS MILITARY MCEPS GL-PD 10-12 (BALLISTIC STANDARD)?

The current Military Combat Eye Protection Systems (MCEPS) standard is called MCEPS GL-PD 10-12, which superseded the MIL-PRF-31013 standard in April of 1996. This standard contains a series of tests that are much more aggressive than ANSI's, such as ballistic fragmentation tests, to simulate projectiles and other dangers faced in combat.

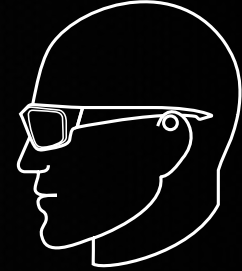
# HIGH IMPACT TESTING (+)

Some of the many impact tests required for compliance with ANSI standards are shown here.



150 ft/s (102 mph): ANSI Z87.1+2010

660 ft/s (450 mph): Military MCEPS GL-PD 10-12



## HIGH VELOCITY IMPACT TEST

Spectacle frames and lenses must be capable of resisting impact from a 6.35 mm (.25 in) diameter steel ball traveling at a velocity of 45.72 m/s (150 ft/s).

(ANSI Handbook: Section 6.2.3)

## MILITARY MCEPS TEST

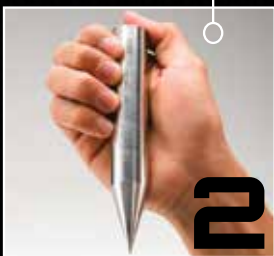
This follows the same guidelines as the High Velocity Impact Test, but the speed is increased to 201.17 m/s (660 ft/s).

# \* MILITARY MCEPS TEST : 660 FT/S SIMULATES A SHOTGUN BLAST FROM 33 FEET

\* Often referred to as BALLISTIC standard



Scan to Watch Shotgun Video



## HIGH MASS IMPACT TEST

Spectacle frames and lenses must be capable of resisting a 500 g (17.6 oz) spike dropped from a height of 127 cm (50 in).

(ANSI Handbook: Section 6.2.2)



## PENETRATION TEST

Lenses must be capable of resisting penetration by a weighted needle with a total weight of 44.2 g (1.56 oz) dropped from a height of 127 cm (50 in).

(ANSI Handbook: Section 6.2.4)

## WHAT CONSTITUTES A FAILURE?

When each test is conducted as indicated in ANSI Handbook Sections 6.2.2, 6.2.3, and 6.2.4, a complete device will fail if any of the following occurs:

- Fracture of the lens
- Penetration of the rear surface of the lens
- Piece fully detaches from the inside of the spectacle
- Lens is not retained by the frame
- Lens and/or frame touches the eye area, even if the glasses remain intact

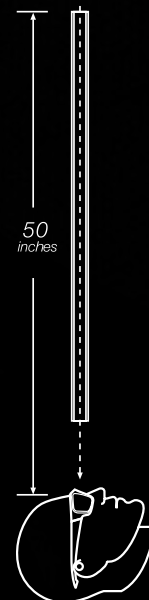


Diagram of High Mass Impact and Penetration Tests

# OPTICAL TESTS

Some of the many optical tests required for compliance with ANSI standards are explained here.

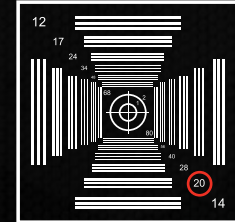
## RESOLVING POWER TEST

The Resolving Power Test examines the ability of a lens to form separate, distinct images of objects that are close together when viewed from 10.67 m (35 ft) away.

### What constitutes a failure?

The lens fails if there is an inability to distinguish three separate lines at the 20-line mark on an NBS pattern, both vertically and horizontally.

(ANSI Handbook: Section 5.1.4)



# 1

## LUMINOUS TRANSMISSION TEST

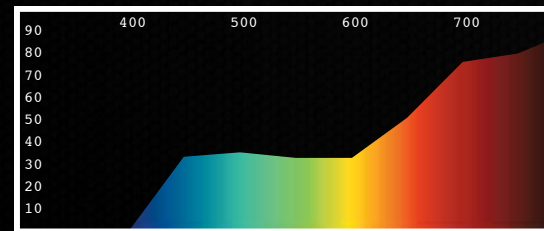
The Luminous Transmission Test evaluates the percentage of Visual Light Transmission (VLT), which is the amount of light that passes through a lens.

### What are the requirements?

**Clear:** Minimum of 85% VLT

**Tinted:** Minimum of 8% and maximum of 85% VLT

(ANSI Handbook: Sections 5.1.2 & 7.1.2)



# 2

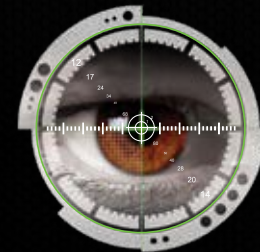
## ASTIGMATISM TEST

The Astigmatism Test looks for improper lens curvature or flat areas that cause refractive error and image shifting.

### What constitutes a failure?

≥ .06 diopters difference

(ANSI Handbook: Section 5.1.4)



# 3

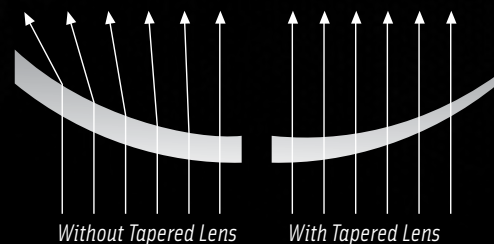
## PRISMATIC POWER TEST

The Prismatic Power Test measures the angular deviation of a light ray after it passes through a lens. This is similar to the way light refracts and bends through a prism, causing images to shift.

### What constitutes a failure?

≥ .5 diopters of deviation

(ANSI Handbook: Section 5.1.4)



# 4

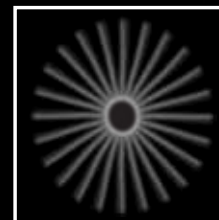
## REFRACTIVE POWER TEST

The Refractive Power Test determines the ability of a lens' entire surface area to focus on the rays of a sunburst image without blurring, blending, or bending the lines of the pattern.

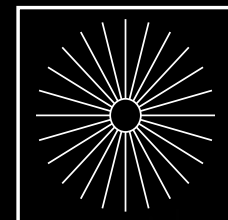
### What constitutes a failure?

Refraction of light ± .06 diopters

(ANSI Handbook: Section 5.1.4)



Fail



Pass

# 5

# MARKINGS

For more information see the ANSI Handbook's REQUIRED MARKINGS: SECTION 5.4 TABLE A

## LENS MARKINGS

- Company Initials or Logo - "E" signifies Edge Eyewear
- Impact Rating - "Z87+" indicates high-impact compliance
- Additional Lens Filtration - "S" stands for special purpose

## LEFT & RIGHT TEMPLE MARKINGS

- Impact Rating - "Z87+" indicates high-impact compliance

## FRAME MARKINGS

- Company Initials or Logo - "E" signifies Edge Eyewear
- Impact Rating - "Z87+" indicates high-impact compliance



# COVERAGE

For more info see ANSI Handbook COVERAGE - SECTION 5.2.5 and ANNEX D - "RULE OF 10s"



# TASK & FIT SOLUTIONS

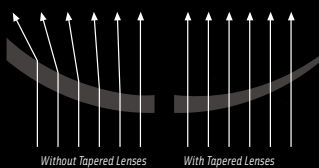
## CONSTRUCTION FEATURES:

### TPR TECHNOLOGY

Thermoplastic rubber (TPR) is a soft and pliable compound that increases its grip as it becomes warm or damp from perspiration. This technology is used in temple tips and nose pads to prevent slipping and keep glasses on the face.

### LENS TECHNOLOGY

Tapered lenses eliminate refraction



- Lenses filter 99.9% of UVA/UVB/UVC rays
- Fog-resistant lenses improve visibility
- Triple-dipped in anti-scratch coating
- Polycarbonate lenses comply with:
  - ANSI Z87.1+2010
  - Military MCEPS GL-PD 10-12

### FRAME TECHNOLOGY

- Frames are made with a flexible and durable TR90/nylon compound material
- Wrap-around frame style does not cause side shield distortion
- Straight temple arms rest comfortably on the head and don't pinch



## OPTIONAL FEATURES:



### VAPOR SHIELD ANTI-FOG

Most situations can be handled with Standard Anti-Fog lenses, but for extreme environments Edge Eyewear developed a revolutionary, military grade anti-fog technology called Vapor Shield. It is completely resistant to fog.

VAPOR SHIELD LENSES HAVE PASSED THE FOLLOWING LABORATORY TESTS:

- -44°F for 15 minutes
- Transition from -44°F to 76°F
- 125°F with 80% humidity



### STANDARD ANTI-FOG

Anti-Fog coating offers increased clarity in humid, hot, or cold circumstances. Moisture rolls off the lens, keeping vision clear at all times.



To see Vapor Shield in action scan or visit:

[youtube.com/theEdgeEyewear](https://youtube.com/theEdgeEyewear)



### MAGNIFIERS

Safety means more than just covering the eyes – it is also about optical clarity. Edge Eyewear's bifocal reading glasses are perfect for intricate work and viewing fine details. They are available in three magnification powers (1.5, 2.0, and 2.5) and with polarized lens technology.



We know that safety is more than simply covering your eyes. It is also about how clearly you see clearly.





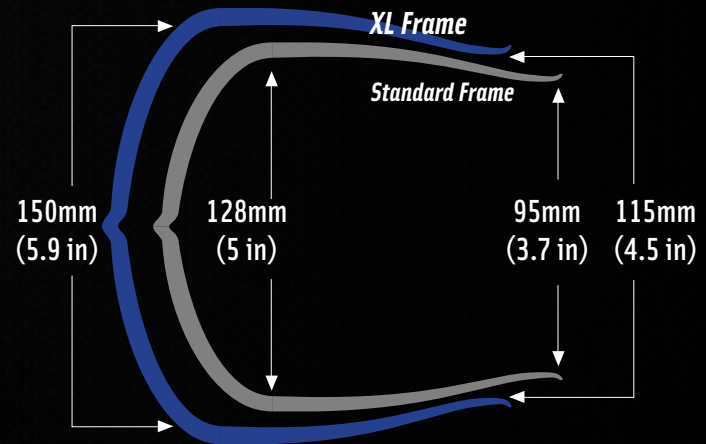
## FOAM GASKET LINING

A foam gasket is essential to safety in environments with high levels of airborne debris, dust, or wind. This technology creates a seal that keeps foreign particles out of the glasses and away from the eyes.



## XL (WIDE) FIT

Head size varies from person to person and standard-sized glasses can be too small on the face or tight in the temples for those with larger heads. The solution is a wider frame that not only feels comfortable but also looks natural.



## MULTI-FIT

Multi-Fit glasses, sometimes referred to as Asian Fit, are specifically designed to accommodate a variety of facial and nose bridge structures. With the addition of an adjustable nosepiece, a perfect fit can be achieved by bending each flexible nose pad inward, outward, forward, or backward.



## WELDING

Welders, cutting torches, germicidal lamps, and other man-made UV sources can expose the eyes to UVC rays – the most harmful type of ultraviolet radiation. Edge Eyewear's welding lenses protect the cornea from intense, long-term exposure to infrared light.



## FIT OVER $R_x$

Visual clarity is essential to safety and sometimes magnifier lenses aren't enough to read or see fine details. Edge Eyewear's large safety glasses fit comfortably over most prescription eyeglasses.



## LADIES STYLE

Ladies glasses are designed to meet fashion standards for women while also maintaining their safety rating. They won't ride on the cheekbones, don't touch the eyelashes, and are made with materials that will not snag the hair.

# LENS TECHNOLOGY



## 99.9% UV PROTECTION!

Ultraviolet radiation can cause serious damage to the eyes. Edge Eyewear lenses filter dangerous UVA, UVB, and UVC rays for optimal safety.

**UVA (315-380 nm)** Although UVA rays are the least intense, they account for more than 90% of UV radiation reaching the earth and remain constant throughout the year. Exposure to high levels of this light without proper lens filtration may cause damage to all layers of the cornea.

**UVB (280-315 nm)** UVB rays are the main cause of sunburn and are strongest in the summer. Permanent retina or lens damage can result from exposure to high levels of this light without proper lens filtration.

**UVC (180-280 nm)** The most harmful type of ultraviolet radiation comes from UVC rays. The ozone layer keeps most of the sun's UVC radiation from reaching the earth, but some man-made UV sources, such as welders and cutting torches, do emit these hazardous rays. Exposure to high levels of this light without proper eye protection may result in photokeratitis, often referred to as "welder's flash."

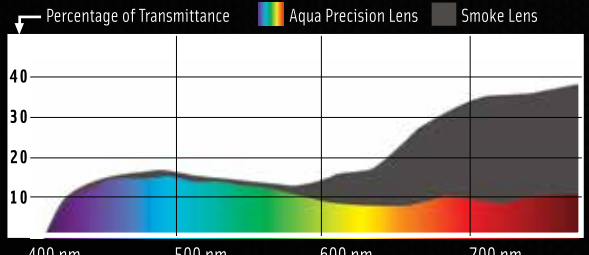
*All Edge Eyewear lenses contain light-reflecting compounds that scatter UV waves. This blocks 99.9% of UV radiation, which is the highest level of protection on the market.*

## AQUA PRECISION LENSES

Aqua Precision technology, originally developed by NASA, was first used on astronaut helmet visors and the windows of satellite portholes. Edge Eyewear is the **first company ever** to offer safety glasses featuring Aqua Precision lenses. This unique technology effectively blocks infrared light and also reduces excess blue and red light on both ends of the visible light spectrum. The result is unbeatable visual clarity and definition, especially in bright light conditions.



Without Aqua Precision Lenses | With Aqua Precision Lenses



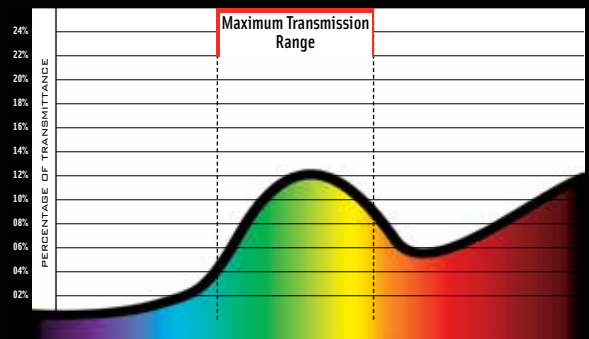
Aqua Precision lenses greatly reduce red and infrared light transmission.

## G-15 LENSES

The U.S. Air Force engineered G-15 technology for use in aviator lenses during the 1950s. Through extensive experimentation with the light spectrum, it was found that the transmission of green and yellow light – the two colors best perceived by the human eye – could be maximized. The outcome is a neutral and true-to-life perspective that results in a noticeable cooling sensation for the eyes. Edge Eyewear is the **first company ever** to offer a safety-rated G-15 lens.



Without G-15 Lenses | With G-15 Lenses



600

650

700

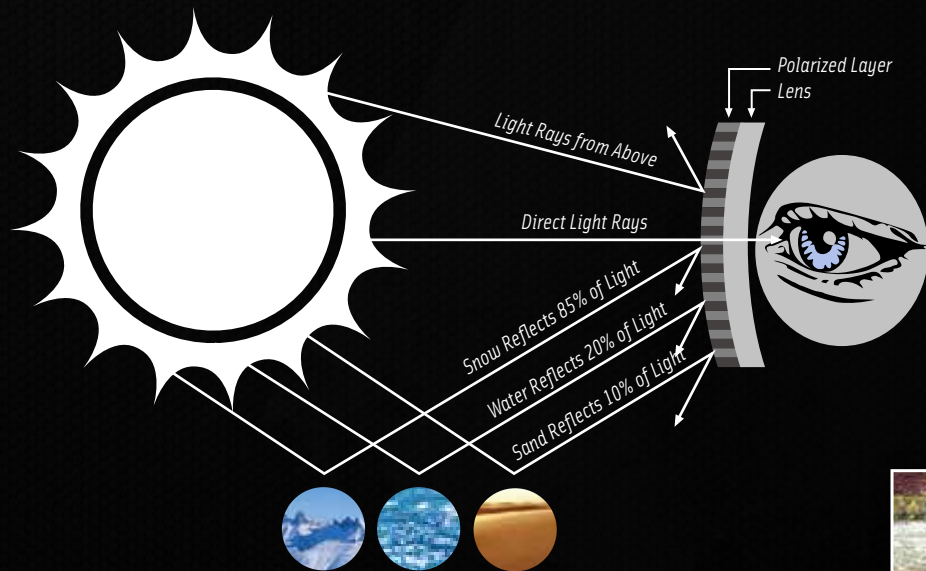
750

800



## POLARIZED LENSES

In 1999, Edge Eyewear became the **first company ever** to offer polarized lenses for safety glasses. Polarized technology can be compared to the horizontal slats of open window blinds. These "slats" create a special filtering layer that blocks reflected light from below and glare from above, allowing only direct light rays to enter. This maximizes clarity and overall visibility and is ideal for environments with bright sun, snow, water, or sand.

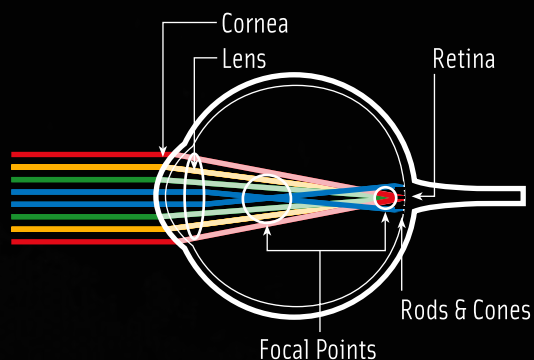


Without Polarized Lenses

With Polarized Lenses

## BLUE LIGHT FILTER LENSES

Blue light has short wavelengths, which cause the eye to focus too far in front of the retina. The result is a blue blur that can cause eyestrain, particularly while driving. Copper, amber, and yellow colored lenses reduce blue light to give greater depth perception and a brighter, sharper view of surroundings. Edge Eyewear is the **first company ever** to offer Blue Light Filter lenses for safety glasses, which offer a brighter and sharper view of surroundings.



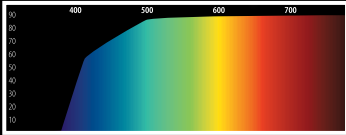
Without Blue Light Filter

With Blue Light Filter

# LIGHT TRANSMISSION GRAPHS

ALL EDGE EYEWEAR LENSES BLOCK 99.9% OF UVA, UVB, AND UVC RAYS – THE HIGHEST LEVEL OF PROTECTION ON THE MARKET

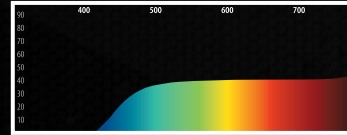
**CLEAR** is the classic lens color for safety glasses. These lenses allow the greatest amount of light to enter, making them ideal for indoor and low light conditions.



**85% Light Transmission**



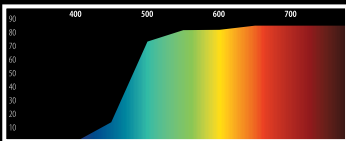
**ANTI-REFLECTIVE** lenses can be used in both indoor and outdoor conditions. A light silver mirror coating on a clear lens reflects light and reduces glare.



**65% Light Transmission**



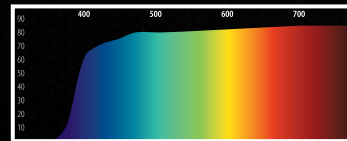
**YELLOW** lenses make dull, overcast, and foggy conditions appear brighter and filter low levels of blue light. This lens color increases depth perception and contrast during dawn or dusk activities, including driving. (See Blue Light Filter Lens, page 9)



**80% Light Transmission**



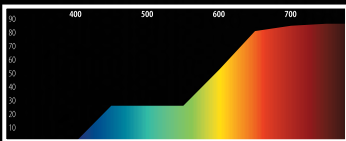
**LIGHT BLUE** lenses decrease eye fatigue that results from yellow light. They are perfect for use in settings with yellow incandescent, yellow fluorescent, or sodium vapor lighting.



**69% Light Transmission**



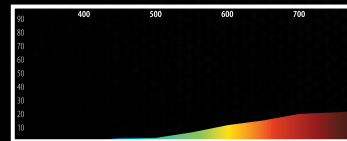
**AMBER** lenses make variable light conditions appear brighter and filter medium levels of blue light. Amber coloring increases depth perception and contrast during activities where light is flat or contrast is minimal, such as working in the snow or skiing. (See Blue Light Filter Lens, page 9)



**57% Light Transmission**



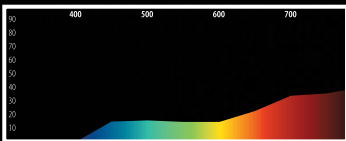
**COPPER** lenses make bright and variable conditions appear sharper and filter high levels of blue light. This Blue Light Filter lens relieves eye fatigue by increasing depth perception and contrast, making it the ideal tint for daytime driving and golfing. (See Blue Light Filter Lens, page 9)



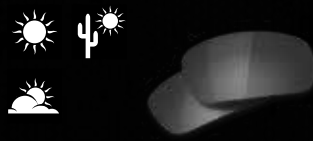
**8% Light Transmission**



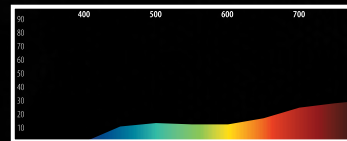
**SMOKE** lenses provide the perfect all-around tint for bright light conditions. This popular lens color blocks the brightest sunrays and glare without causing color distortion.



**16% Light Transmission**



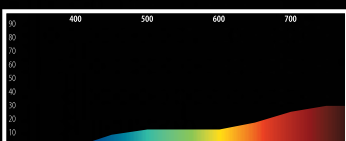
**SILVER MIRROR** lenses reflect light in bright conditions, decrease visible brightness, and reduce glare. A silver-colored mirror coating adds a reflective layer to the light-blocking properties of a smoke base tint.



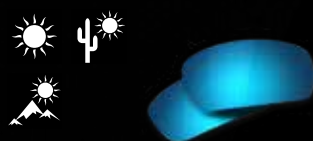
**13% Light Transmission**



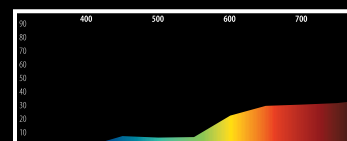
**BLUE MIRROR** lenses reflect light in bright conditions, decrease visible brightness, and reduce glare. A blue-colored mirror coating adds a highly reflective layer to the light-blocking properties of a smoke base tint.



**12% Light Transmission**



**ROSE MIRROR** lenses reflect light in bright conditions, reduce glare, and sharpen details in flat light. A light silver mirror coating adds a reflective layer to the warming properties of a rose-colored base tint.



**11% Light Transmission**



## CHOOSE A LENS FOR THE FOLLOWING CONDITIONS:



Bright, Sunny Conditions



Cloudy Conditions



Snowy or High Altitude Conditions



Water Conditions



Light Welding & Torch Cutting



Partly Cloudy Conditions



Hazy Conditions



Desert Conditions

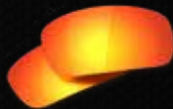
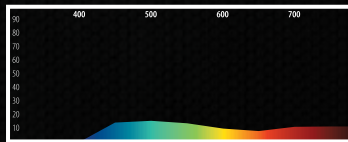


Cloudy, Snowy, or High Altitude Conditions



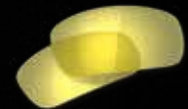
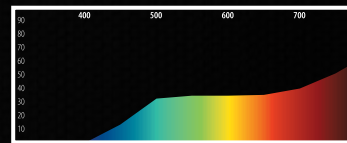
Indoor or Low Light Conditions

**AQUA PRECISION RED** lenses offer unbeatable visual clarity and contrast in bright light conditions. A flame-colored mirror coating adds glare reflection to an Aqua Precision lens – a clear lens infused with anti-reflective ions, rather than a lens created by a layering process. This is the same optical technology created by NASA for helmet visors and satellite portholes. (See Aqua Precision Lens, page 8)



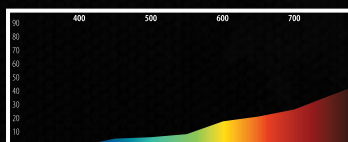
13% Light Transmission

**POLARIZED YELLOW** lenses make dull, overcast, and foggy conditions appear brighter and filter low levels of blue light. This lens color increases depth perception and contrast during dawn or dusk activities, including driving. The addition of a polarizing filter increases clarity by reducing glare.



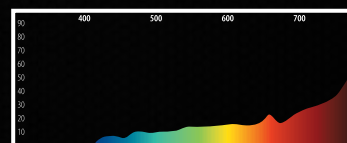
36% Light Transmission

**POLARIZED COPPER** lenses make bright and variable conditions appear sharper and filter high levels of blue light. This Blue Light Filter lens relieves eye fatigue by increasing depth perception and contrast, making it the ideal tint for daytime driving and golfing. The addition of a polarizing filter increases clarity by reducing glare.



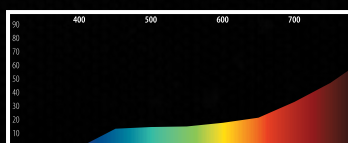
8% Light Transmission

**POLARIZED GRADIENT SMOKE** lenses have a vertical smoke-to-clear tint that equalizes harsh light from above and soft light from below. It is a favorite for daytime reading and driving because of its dual lens tint. The addition of a polarizing filter increases clarity by reducing glare.



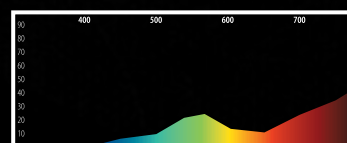
16% Light Transmission

**POLARIZED SMOKE** lenses provide the perfect all-around tint for bright light conditions. This popular lens color blocks the brightest sunrays and glare without causing color distortion. The addition of a polarizing filter increases clarity by reducing glare.



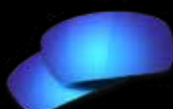
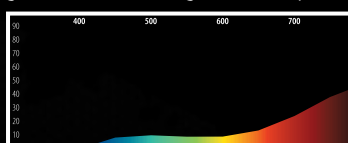
14% Light Transmission

**POLARIZED G-15 SILVER MIRROR** lenses provide contrast and image definition while maintaining a neutral, true-to-life perspective. A silver mirror coating adds a reflective layer to the cooling properties of a G-15 base tint – a technology pioneered by the U.S. Air Force. The addition of a polarizing filter increases clarity by reducing glare. (See G-15 Lens, page 8)



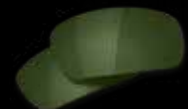
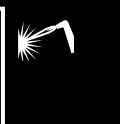
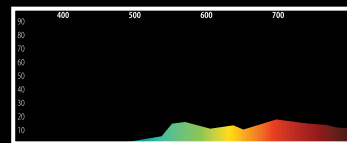
11% Light Transmission

**POLARIZED AQUA PRECISION BLUE** lenses offer unbeatable visual clarity and contrast in bright light conditions. A blue-colored mirror coating adds glare reflection to an Aqua Precision lens – a clear lens infused with anti-reflective ions. This is the same optical technology created by NASA for helmet visors and satellite portholes. The addition of a polarizing filter results in the greatest reduction of glare. (See Aqua Precision Lens, page 8)



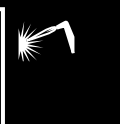
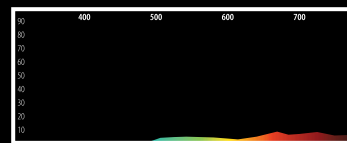
10% Light Transmission

**IR3 WELDING** lenses filter low levels of intense infrared light produced during gas welding, brazing, and torch cutting. These green tinted welding lenses provide protection from harmful UVC rays.



12% Light Transmission

**IR5 WELDING** lenses filter medium levels of intense infrared light produced during gas welding, brazing, and torch cutting. These dark green tinted welding lenses provide extra protection from harmful UVC rays.



2% Light Transmission

[LEARN MORE ABOUT POLARIZED LENS TECHNOLOGY ON PAGE 9]