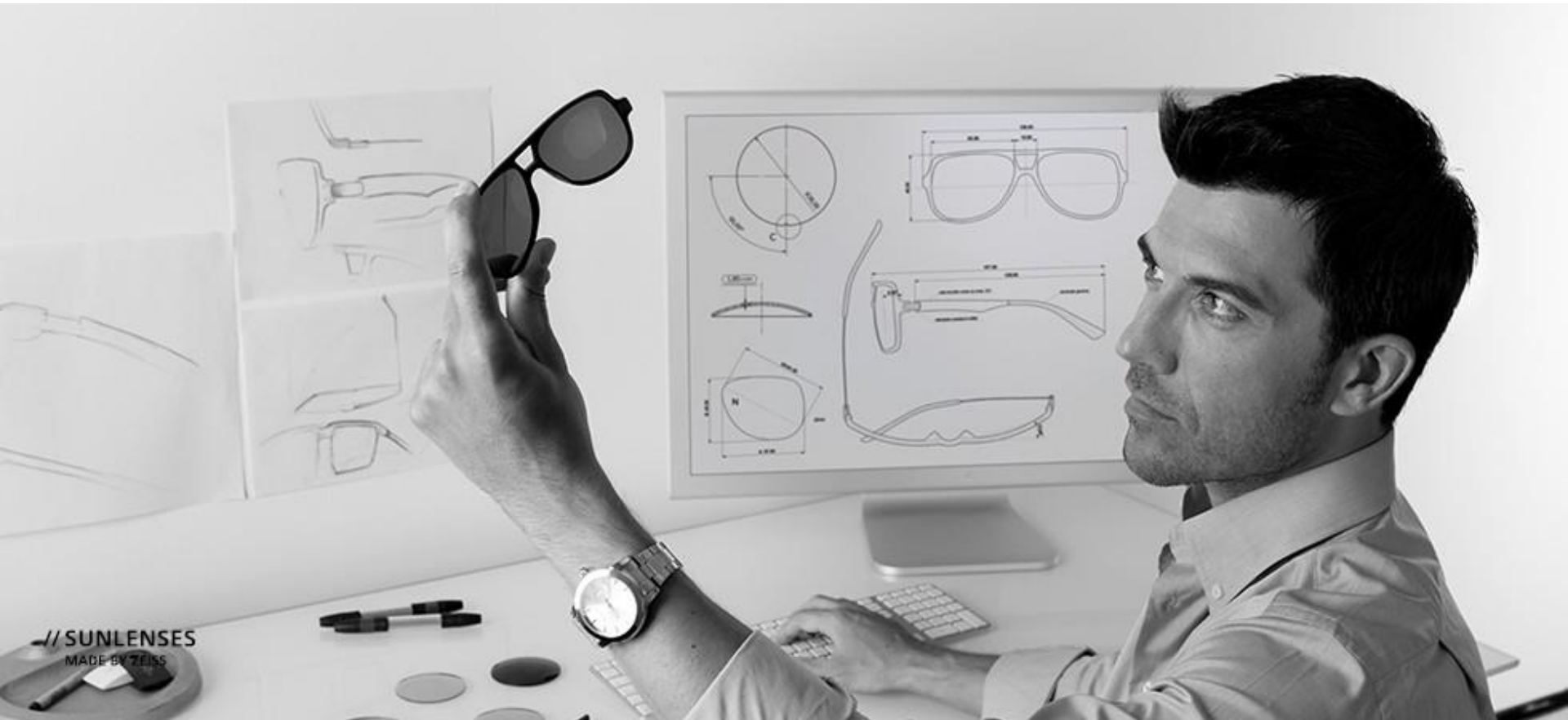


ZEISS ENFASI COLOR CONTRAST PATENTED TINT



R&D & Marketing Sunlens

Castiglione Olona , July 2017

Agenda



What is ZEISS ENFASI

Background

- The color spectrum
- The eye sensitivity to green colors
- The eye overwhelmed with green information

The solution: ZEISS ENFASI

- General information
- Patented technology: Color curve explanation
- Visual benefits: green reader
- Visual benefits: polarization

Lens field of usage

- Golf
- Boating and fishing
- Hunting and tactical



// SUNLENSES
MADE BY ZEISS

WHAT IS ZEISS ENFASI



ZEISS ENFASI is a patented **polycarbonate polarized injected tint**, especially developed to make contours and light-colored objects stand out more clearly, especially in environments dominated by green and vegetation.

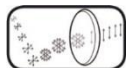
US Patent 6,382,788 B1



Key features:



Green detector: the specific color curve enables to read every “green” detail and nuances = detect field undulations (curvature and slopes).



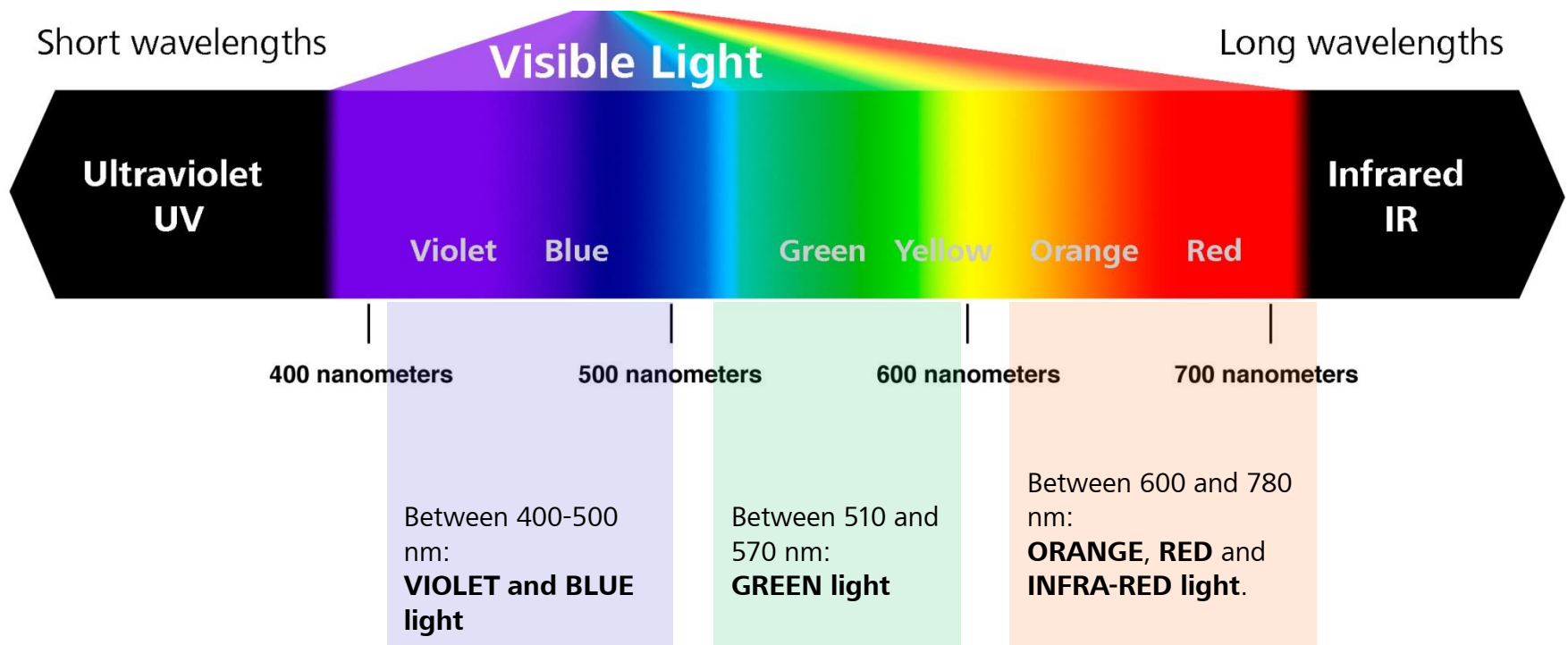
Polarization efficiency: polarized filter for contrast enhancement and glare reduction for a comfortable vision.

Background:

The color spectrum



The visible light, which allows the eye to distinguish shapes and colors, extends from 380 nm to 780 nm: from blue/violet to red.

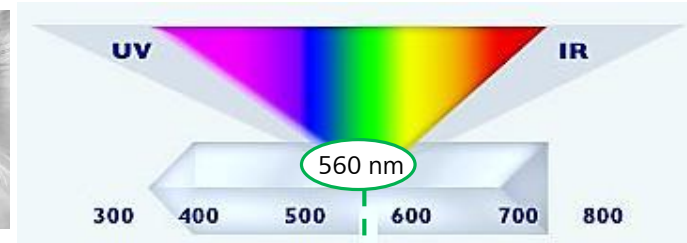


Background:

The eye sensitivity to green colors



The **human eye** has maximum peak of **colors perception (sensitivity)** at around **560 nm** where the light is pure green.



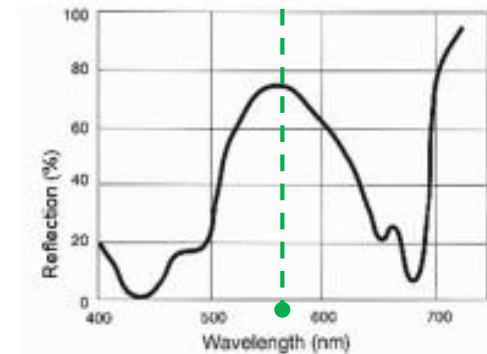
This means that the human eye:

- is **highly sensitive to the green**
- **perceives the green better** than it perceives other colors.

The **grass** has a 100% **reflection peak** at about **556-560 nm**, where the human eye is highly sensitive.



Graph: Reflection spectrum of chlorophyll



The eye is highly **sensitive to green** and **perceives 100% reflectance** of pure green when viewing grass.

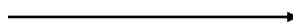
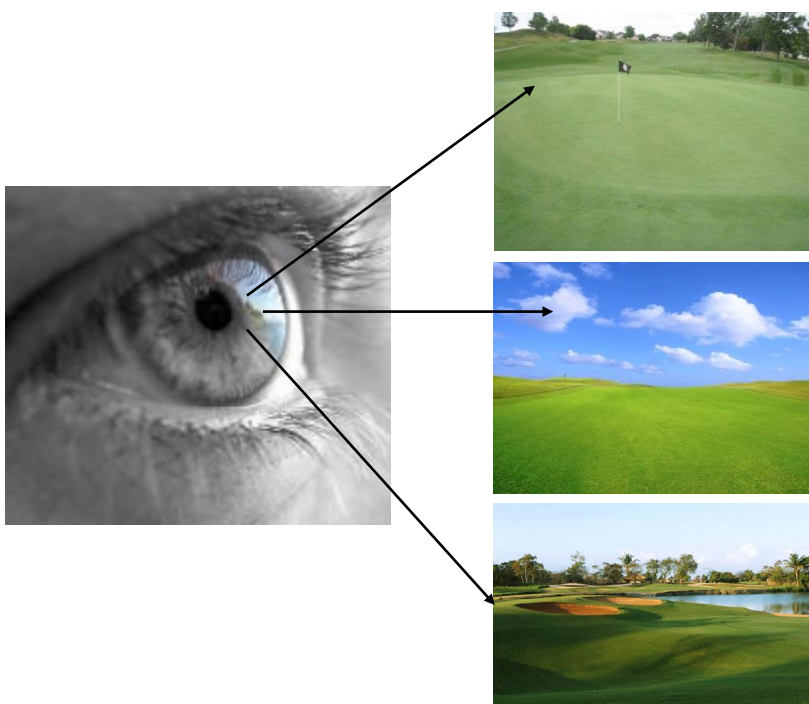
Background:

The eye overwhelmed with green information



As a consequence:

the **eye is overwhelmed with the color green**, making it very difficult to perceive the subtle differences in the shades of green.



ZEISS ENFASI purpose is to **take away a portion of green light** in order to read better the green shades.



The solution: ZEISS ENFASI



ZEISS ENFASI is a patented polarized contrast enhancement tint, especially developed to make contours and light-colored objects stand out more clearly, especially in environments dominated by green and vegetation.

Patented
technology

KEY BENEFITS:

- **Green reader:** by eliminating some portion of green, the lens enables the eye to spot sharply and clearly to every “green” detail and different green nuances.
- **Ground detector:** allows to detect all field undulations (hills, hollows, shadows) to make the right stroke.
- **Color contrast amplification:** enhances image definition, enlightens colors and contrasts.
- **Polarization efficiency:** glare reduction for a comfortable vision.
- **Ensures visual protection and concentration**

New patented PPC injected polarized tint

US Patent 6,382,788 B1

- **Color:** contrast grayish purple
- **Material:** available on Polycarbonate Polarized injected lenses
- **Available on the following shapes:** 6D, 6D dec. , 8D dec. lens
- **Available coatings:**
 - Tri-Flection™
 - Tri-Pel™
 - Ri-Pel™
 - Anti-reflective
 - Additional mirrors (to be defined)
- **ZEISS ENFASI platform: customizable versions according to customer needs**

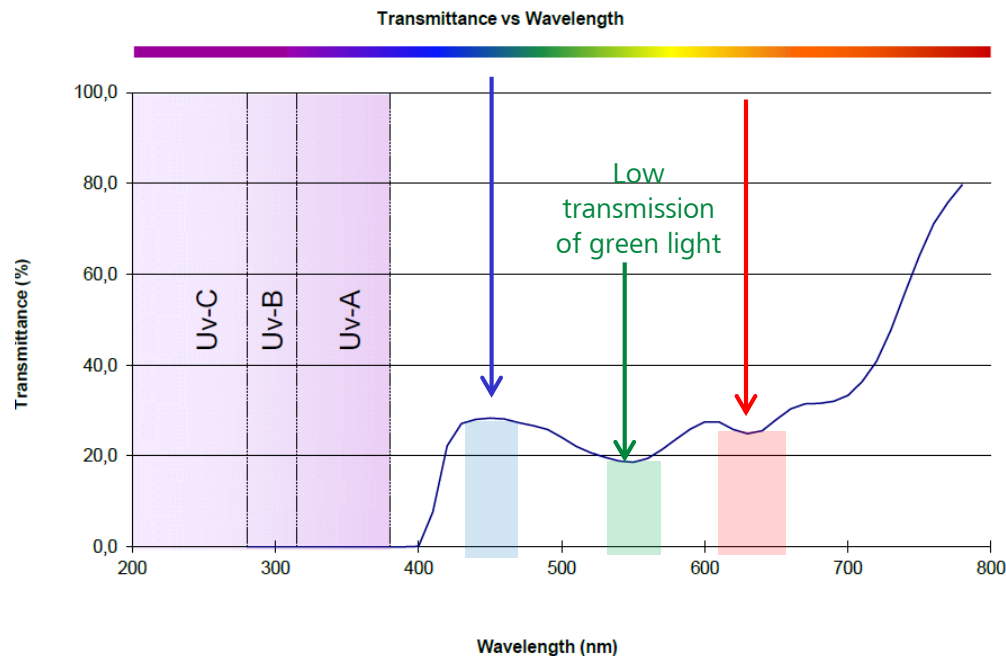
Possibility to customize the tint keeping patent validity, without altering the patented spectral curve. For example it is possible to develop a version suitable for driving.

Patented technology

Color curve explanation



Higher transmission of blue red and red light



Luminous Transmittance: 22,34%

Filter Cat. 2

Degree of polarization: 93,55%

The lens, by filtering the green and adding some blue and red, enables the eye to better read the different green shades.

Lens innovation:

The lens has a **minimum transmittance in the range between 510 to 585 nm** (in the medium - green wavelengths).

The lens **absorbs the green light** in the green portion of the spectrum (510-585 nm) and **allows a higher transmission** in the other part of the spectrum (**red, blue**).

Visual benefits: green reader



Without ZEISS ENFASI

The field of view is overwhelmed by too many green shades which makes it difficult to “read” the ground and detect hills, hollows, shadows etc. The field looks flat and even.

With ZEISS ENFASI

The lens, by eliminating some green color, makes it easier to recognize the different green shades (which are represented in different colors) and field undulations.



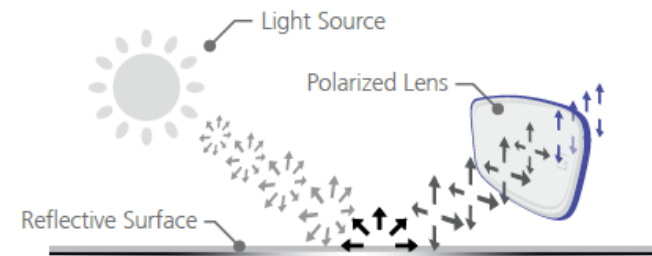
Without Polarized Lens

With Polarized Lens

*Note: Degree of polarization: **93,55%**
The polarization level is purposely set lower than a standard polarized lens (97%) in order to not completely eliminate all the information that comes from reflective surfaces (for e.g. reading the grass).*

Benefits of polarization

- Elimination of nuisance and discomfort caused by glare for a safe and relaxed vision.
- Amazing visibility and clarity: vision improvement and image contrast.
- Enabling the wearer to see beneath the glare like terrain obstacles.



Lens field of usage



This new lens was primarily developed for **golfers**, but also works well in other application such as: **boating, fishing, hunting.**



Lens field of usage

Golf: a precision lens for a precision game



- **Green reader:** by eliminating some portion of green, the golfer can easily recognize the different green shades of the playground area.
 - **Ground detector:** allows to detect all field undulations (hills, hollows, shadows) to make the right stroke.
-
- **Enhance contrasts** between the target - the golf ball - and ground brightness.
 - **Facilitates the identification of the golf ball** in the grass and consequently reducing eye fatigue caused the by continuous search of the ball.
 - **Relaxed vision:** offers the wearer a relaxed game without eye-fatigue and strain-headaches caused by reflections, ball tracking etc.

Lens field of usage

Boating and fishing



BOATING

- Eliminates the glare and reflections from the water surface.
- Provides protection from prolonged exposure to UV-rays coming from the water.
- Facilitates the observation of coastline and the water depth.



FISHING - *ideal for fly-fishing or sight fishing*

- Enables to see beneath the glare on the water surface, making it easier to catch the big fish.
- Provides protection from prolonged exposure to UV-rays coming from the water.
- Helps the fisherman to walk securely in the water in order to find the best place for fishing.

Lens field of usage

Hunting – Tactical



- Thanks to its green filter, the lens suppresses the green colors of vegetation, revealing the presence of prays.
- Facilitates to spot and keep the eyes on the target.
- Enhances the orange and red colors of the safety clothing of hunters.
- The lens has been tested in **clay pigeon shooting**: the filter helps to see the bright colors of the clay pigeon, increasing the contrast between the sky and the pigeon.



We make it visible.