



20/20  
**OPTICIANS'**  
2008 HANDBOOK  
FOURTH EDITION

Sponsored by



ESSILOR



A Jobson Publication

# INNOVATION

## VARILUX® PHYSIO®

The sharpest  
vision through  
W.A.V.E. Technology™



## AIRWEAR®

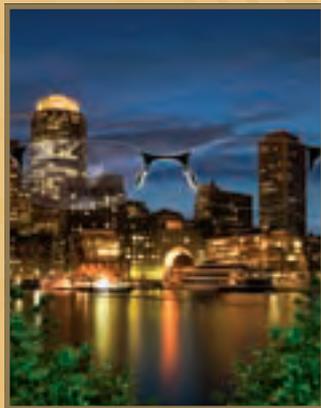
Where strong  
meets light.



## CRIZAL AVANCÉ™

with Scotchgard™ Protector

The lens made  
to stay clean



## THIN&LITE®

The complete family  
of high index lenses  
with 1.60, 1.67  
and 1.74.



## DEFINITY®

The preferred  
progressive lens for  
active presbyopes.



## ACCOLADE FREEDOM™

Advanced PAL design  
customized to eye  
shape for fast  
adaptation &  
optimized lens design  
regardless of frame



Recommend Essilor lens solutions to improve your patients' vision!

VARILUX®

Crizal  
AVANCÉ™

DEFINITY®

Accolade  
Freedom™

Airwear®

Thin&Lite®



vision)web™  
Streamline. Simplify. Succeed.™



**Mike Daley**  
President, Essilor Lenses



**Pierre Fay**  
Executive Vice President,  
Wholesale North America

# DEAR READER,

Welcome to the fourth edition of the Opticians' Handbook. This year's Handbook has been redesigned to provide an educational tool that is helpful for readers at all experience levels. Up front we highlight new trends, products and technologies that are changing the way that opticians deliver the best in eyewear. The balance of the booklet covers the principles and the basics of fitting and dispensing eyewear.

There are five main sections:

- 1) **What's New**
- 2) **The Consumer/Patient**
- 3) **Lens and Frame Considerations**
- 4) **Needs Based Solutions**
- 5) **Lab Considerations**

Each covers the rich variety of lens and frame material, design and treatment opportunities that can make exceptional glasses for every patient.

We have tried to make this book useful for the experienced optician and provide the necessary details needed by the new optician. Use it as a basis for training or to augment a more detailed educational program.

Of course, it can't provide all the information available about dispensing eyewear so be sure to contact your Essilor and Luxottica Group representatives, your Essilor lab or contact them for more information about the promotional and product programs we have to help grow you and your business.

This issue of the Opticians' Handbook is also located at [2020mag.com](http://2020mag.com) and at [luxandme.com](http://luxandme.com). Online, the Handbook will be available in a new active text format where clicking on words and phrases opens definitions, examples and illustrations. Past issues can be seen there also.

As always, Essilor and Luxottica Group are pleased to sponsor the 2008 Edition of the Opticians' Handbook.

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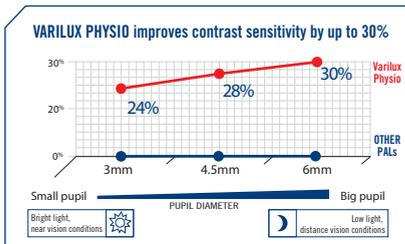
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# WHAT'S NEW

Each year, the optical industry undergoes change that is evolutionary and sometimes revolutionary. Clearer vision, advanced performance, healthy sight, luxury and personalization are all terms that described the innovative changes since the last edition of the Opticians' Handbook. We saw the implementation of Varilux 360° Optimization as a way that lens designs could be optimized to provide sharper, clearer vision. Improvements for vision health and clarity were in the forms of Transitions VI and Crizal Avancé with Scotchgard Protector Lenses. Truly luxurious eyewear and the adoption of sunwear as an essential fashion accessory took their place to ever change the way that the consumer thinks about their glasses. So, with that in mind...



30% increased contrast sensitivity

"Wavefront Technology improves vision by reducing aberrations in progressive lenses." Presented to the American Academy of Ophthalmology November 2006.

## THE 360° OPTIMIZATION REVOLUTION

maximizes lens visual performance by optimizing the relationship between the front surface Varilux design and the prescription on the back using Point-by-Point Prescription Mapping.

The unique backside design is applied with digital surfacing and the resulting lens delivers the best possible outcome for a patient's specific prescription.

Digital surfacing is a process for creating an optical surface and by itself does not make the lens any "better." However, with Essilor developed software, controlled surface cutting and flexible polishing tools, digital surfacing produces complex surfaces that can be used to create progressive and aspheric surfaces while reducing off axis and rounding errors.

Essilor designers can optimize progressives by creating dual surface PALs. They have two complex surfaces, at least one of which is digitally surfaced to optimize the prescription by fit, by frame shape, or reduction of total unwanted astigmatism.

Patients get sharper vision, improved contrast and reduced distortion resulting in wider fields of clear view. 360° Optimization is applied to the Varilux Physio, Varilux Ellipse and VariluxComfort designs.

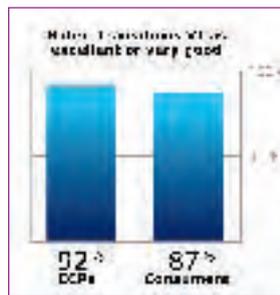
## NEW CRIZAL AVANCÉ WITH SCOTCHGARD PROTECTOR LENSES

are for patients who want the best looking anti-reflective lenses that are the easiest to clean

Design Features	Crizal Avancé with Scotchgard	Crizal Alizé	Crizal	Crizal Sun
Double sided intergrated hardcoat	Blue	Light Blue	Dark Blue	Yellow
Integrated multi-layer AR stack	Blue	Light Blue	Dark Blue	Yellow
Anti-static technology in the topcoat	Blue	Light Blue	Dark Blue	Yellow
Improved super hydrophobic topcoat	Blue	Light Blue	Dark Blue	Yellow
Super hydrophobic topcoat	Grey	Light Blue	Dark Blue	Yellow
High surface density process (HSD)	Blue	Light Blue	Dark Blue	Yellow
Pad Control System	Blue	Light Blue	Dark Blue	Yellow

**Crizal Avancé with Scotchgard Protector Lenses**

(highest contact angle, 116°) repel dust and dirt (anti-particulate technology) while offering the clearest vision and the best scratch resistance. Patients no longer have difficulties with reflections or halos at night, providing unparalleled visual clarity.



## NEW TRANSITIONS VI

Photochromic lenses deliver Advanced Performance for Healthy Sight. This new generation of photochromic lenses provides the most advanced technology on all major lens materials and designs. They are faster to darken and faster to clear, all while protecting

the eyes from the harmful effects of ultra-violet radiation (absorbs 100 percent UVA and UVB with UV400 protection). Extensive testing with consumers and eyecare professionals proved that Transitions VI lenses are better than clear lenses and provide healthy sight for your patients.

Both 9 out of 10 ECPs and 9 out of 10 consumers who have tried Transitions VI rate them as excellent or very good. ECPs agree that Transitions VI help to provide healthy sight and consumers prefer their many healthy sight benefits.



## LUXURY TAKES FRONT STAGE AT LUXOTTICA

in eyewear and a bit of luxury has become an important part of everyone's lives. Eyewear, and especially sunwear, is unique in that it allows easy access to luxury. Just look around you and you see beautiful eyewear and sunwear with jewels, brand logos or treatments that can be immediately identified with the great way that brand makes you feel.

Whether your patient wants to project or maintain an identity of individualism, refinement, be carefree,

## 2008 SPRING/SUMMER TREND REPORT



### GLOW



Fashionable women are wearing beige, cream and black clothing. Add a touch of acid glow with shoes, handbags and eyewear.



### HIGH TECH



Eyewear embodies the high-tech look with chiseled and sculpted detailing.



### LUXURY REDEFINED



Eyewear designs captivate and dazzle with sparkling crystals and precious materials that include pure gold and titanium.



### PROPORTION



Eyewear embraces a pared down and lean approach, temple embellishment and detailing are proportionate to the frame creating an elegant, understated look.



### SCULPTED



Plush fabrics, creative shoe designs and sculpted handbags inspire richly beveled frames creating a look that reflects the finest custom craftsmanship.



### TACTILE



Texture becomes a unique point-of-view linked to brand values: croco-inspired leathers, laser engraved acetate and metals, metal and enamel accents

jeweled, sleek or fashionable, the new luxury in eyewear is a unique accessory. For example, Bvlgari eyewear includes special features that make each pair precious and exclusive objects; an almost veritable jewel for the individual that has a love of rich details and eclectic interpretations. Sophisticated elegance combines with intriguing style, making Bvlgari a brand for the elite consumer.



The Thin & Lite family, right for any family

### THINNER, LIGHTER AND POLARIZED TOO

is an opportunity for patient and optician alike. When asked, consumers list lightness (comfort) as the most important lens material attribute and that becomes even more important in older vs. younger consumers. So, arm yourself with information about Thin Lite 1.60. With the way that the consumer thinks about lightness and thinness, and the complete availability of 1.60 high index, it's the new plastic. For the patient who wants the best, consider Thin Lite 1.74 high index. Add polarized to the mix, now in Airwear and in Varilux Physio and Varilux Physio 360°. With availability in all major progressive starting point for the entire practice. Another recent release is DEFINITY and DEFINITY Short in Trivex and polarized making drill mounts a breeze in both clear and sun.

### WHAT'S HOT, THE TREND REVEALED

Prestigious designer eyewear and sunwear are among the most popular fashion accessories of our time. Fashion eyewear offers patients an affordable means of owning a leading brand name for all to see. Industry surveys prove that those professional practitioners who carry a wide assortment of world-class designer and brand name frames and show their fashion savvy by staying on top of today's hottest fashion trends, have consistently increased their sales and profits.

# THE CONSUMER /PATIENT

Name: **Mary Diaz** Date: **05/14/08**

Rx:

WEAR TYPE	LENS DESIGN	MATERIAL / COAT	
<input type="checkbox"/> FULL TIME	<input type="checkbox"/> SINGLE VISION	<input type="checkbox"/> PLASTIC	<input type="checkbox"/> UV
<input type="checkbox"/> DISTANCE	<input type="checkbox"/> BIFOCAL	<input type="checkbox"/> POLY	<input type="checkbox"/> TINT
<input type="checkbox"/> INTERMED.	<input type="checkbox"/> TRIFOCAL	<input type="checkbox"/> TRANSITIONS	<input type="checkbox"/> POLARIZED
<input type="checkbox"/> SAFETY	<input type="checkbox"/> VARILUX	<input type="checkbox"/> HIGH INDEX 1.60	<input type="checkbox"/> CRIZAL
<input type="checkbox"/> READING	<input type="checkbox"/> PROGRESSIVE	<input type="checkbox"/> HIGH INDEX 1.67	<input type="checkbox"/> AR
<input type="checkbox"/> AS NEEDED	<input type="checkbox"/> COMPUTER	<input type="checkbox"/> HIGH INDEX 1.74	<input type="checkbox"/> OTHER
<input type="checkbox"/> SUN	<input type="checkbox"/> OTHER	<input type="checkbox"/> TRIVEX	<input type="checkbox"/> CRIZAL SUN
		GLASS	

SPH	CYL	AXIS	PRISM	ADD
-2.00	-2.00	90	∇2ΔBI	+2.00
-3.50	SPH			+2.00

REMARKS

YOUR NEXT APPT DATE \_\_\_\_\_

RX EXPIRES \_\_\_\_\_

SIGNATURE \_\_\_\_\_ LIC. \_\_\_\_\_

FIG. 1

best lens material and for guiding frame size and shape selection. The axis describes the meridian (or direction) of lens powers needed in the frame in front of the eye. Here's how it works.

Zero degrees is always on the left of each of the patient's eyes, 90° is up and 180° is on the right. This is the same for both the right and left eyes and is called TABO notation. Axis is described in 1 degree steps from 1 to 180 degrees. There is no need to describe axes greater than 180 since everything that happens above the 180 line also happens below the 180 line. See Fig. 2. The eye may have a simple prescription, sphere power only or a compound prescription, a sphere and cylinder

## THE PRESCRIPTION AND VISION

It starts with the prescription. The prescription (Rx) describes the patient's Refractive Error. Any Prism needed for the eyes to work together and an Add if needed for near vision/reading. (Fig. 1)

The prescription or lens formula is the starting point for recommending the

power. The position of the cylinder will be described by an axis. The prescription can be dissected to know where powers are located. This is helpful when determining how the Rx will look in the chosen frame size and shape.

See Fig. 3, the Rx R -2.00-2.00 x 90; L -3.50 sphere, when analyzed

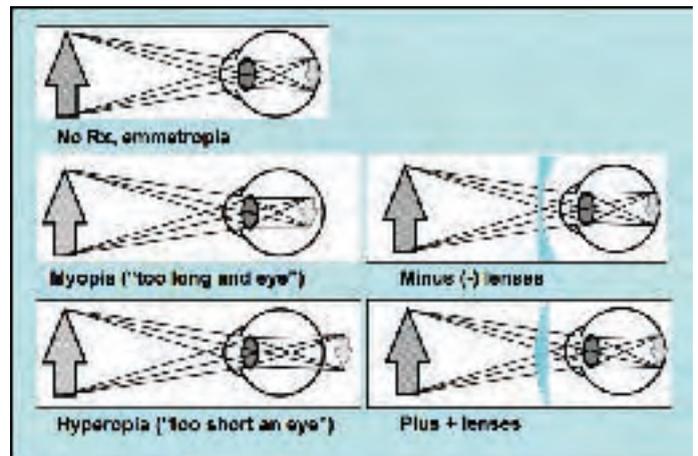


FIG. 4

looks like this. Visit [2020mag.com](http://2020mag.com) for the activated version of the Opticians' Handbook. It will have a fuller explanation of dissecting the prescription, examples and ways to test yourself.

## WHO WEARS WHAT KIND OF LENS?

If the patient has no refractive error or does not need glasses, refractive condition is called emmetropia or normal vision (Fig. 4). If the Rx is minus, the patient is myopic (near sighted), the image is focused in front of the retina and requires minus lenses to move the image backwards onto the retina. Minus lenses are more curved on the back than the front, thinner in the center than the edge. For plus Rxs, the patient is hyperopic (far sighted). An image is focused behind the retina, lenses more curved on the front than the back, thinner at the edge than the center, and move the image forward onto the retina.

When the Rx is a sphere only and has no cylinder value the eye only needs one power for correction in all meridians. However, most Rxs (about 70 percent) have a cylinder value and are astigmatic. Therefore lenses will have two different powers; arranged perpendicular to each other to correct the two powers that are needed by the eye. The cylinder axis is the orientation of the two powers (1 to 180 degrees). If there is a cylinder power, there must be an axis. An astigmatic prescription may be any combination of plus, plano or minus powers.



FIG. 2



FIG. 3

# what would you do?

## PATIENT SITUATION

Two young women enter your office, you guess that they are in their mid-twenties; Louisa has a new prescription for glasses and tells you that she wants the same look as her friend, Janet. Her prescription reads -5.50 sphere and a -6.25 - 0.50 x 180. She is about 5'10" and her friend is petite. Her friend also is wearing a pair of rimless lenses that slightly magnify her eyes. How can you use what you know so far to help you help Louisa?

## SOLUTION

First, Janet's glasses magnify, that means that the lenses are plus. In this case, Louisa requires minus lenses. That means that her glasses will not look like Janet's no matter what you do since the edges will be thicker than the centers. If Janet's are plus, the centers are thicker than

the edges.

Also, Louisa is bigger than Janet and wears a larger frame than Janet. Larger lenses will be thicker so it will be hard to get a pair of glasses to look the same as far as lens thickness. However, rimless is an option for Louisa and there are many colors and shapes that you can suggest that will make a terrific pair of eyewear. Smaller sizes that look good is the target.

What do you know? Louisa is near sighted in both eyes. Her left prescription tells you that she has a small amount of astigmatism at axis 180. For minus lenses, they are thicker at the edge than in the center. Thickness can be reduced by using smaller sized lenses and ones without sharp corners i.e., that are oval or round. Also, the better-centered Louisa's eyes are in the lens shape, the thinner the lenses.

## THE PRESCRIPTION IN EYEWEAR

The optical center (OC) of the lens is located on the optical axis (Fig. 5). The OC is the point on the lens where there is no prism. At all other locations, light is bent and therefore at that point, has a prism value.

The eye has a visual axis; this describes the patient's line of sight. When the eyes are looking far away (more than 20 feet), the visual axes are parallel and this is called the distance PD (interpupillary distance) (Fig. 6). In eyewear our goal is to align the optical axis of the lens with the visual axis of the eye. When correctly aligned, both the

right and left lenses provide the best, and most importantly, binocular vision. Both eyes must work together and that means that the brain is able to make one merged image from the image of each of the eyes.

The prism box (Fig. 7) on the Rx tells us whether the lenses will have the OC placed in front of the patient's visual axis (PD) or be offset. If there is no prescribed prism, the OC is placed at

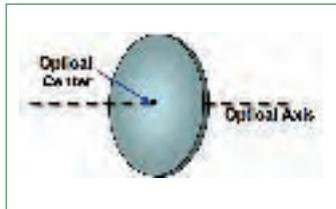


FIG. 5

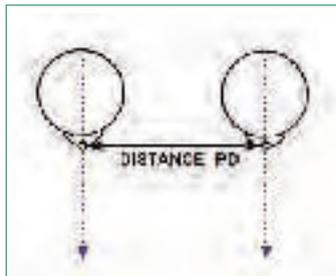


FIG. 6

SPH	CYL	AXIS	PRISM
-2.00	-2.00	90	2ΔBI
-3.50	SPH		

REMARKS

FIG. 7

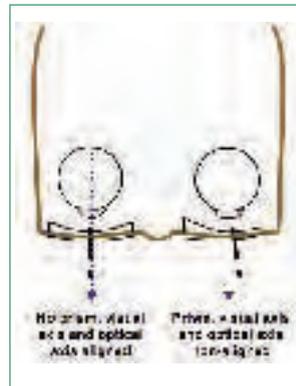


FIG. 8

the PD. If there is prescribed prism, then the point on the lens, with that amount of prism, is placed at the PD (Fig. 8). The result is a properly centered prescription on the eye.

Some time between the ages of 40 and 50, the inability to accommodate or reshape the crystalline lens to focus on near objects (i.e. reading) becomes difficult. This condition is called presbyopia and is the last condition described on the

prescription (Add). The lens in the eye can no longer be re-shaped and becomes more plus, so an additional plus lens must be added for reading or close objects. The add value is a sphere power needed for clear near vision.

The reading prescription is the sum of the distance prescription and the addition. It can be written by the doctor as a distance Rx with an add or as a SV Rx. In SV, it is the sum of the sphere power and add; the cylinder and axis stay the same. See (Fig. 9).

Name: **Mary Diaz** Date: **05/14/08**

**Rx:**

<input type="checkbox"/> WEAR TYPE	<input type="checkbox"/> LENS DESIGN	<input type="checkbox"/> MATERIAL / COAT	<input type="checkbox"/> UV
<input type="checkbox"/> FULL TIME	<input checked="" type="checkbox"/> SINGLE VISION	<input type="checkbox"/> PLASTIC	<input type="checkbox"/> TINT
<input type="checkbox"/> DISTANCE	<input type="checkbox"/> BIFOCAL	<input type="checkbox"/> POLY	<input type="checkbox"/> POLARIZED
<input type="checkbox"/> INTERMED.	<input type="checkbox"/> TRIFOCAL	<input type="checkbox"/> TRANSITIONS	<input type="checkbox"/> CRIZAL
<input type="checkbox"/> SAFETY	<input type="checkbox"/> VARILUX	<input type="checkbox"/> HIGH INDEX 1.60	<input type="checkbox"/> AR
<input checked="" type="checkbox"/> READING	<input type="checkbox"/> PROGRESSIVE	<input type="checkbox"/> HIGH INDEX 1.67	<input type="checkbox"/> OTHER
<input type="checkbox"/> AS NEEDED	<input type="checkbox"/> COMPUTER	<input type="checkbox"/> HIGH INDEX 1.74	<input type="checkbox"/> CRIZAL SUN
<input type="checkbox"/> SUN	<input type="checkbox"/> OTHER	<input type="checkbox"/> TRIVEX	<input type="checkbox"/> GLASS

SPH	CYL	AXIS	PRISM	ADD
plano	-2.00	90		
-1.50	SPH			

REMARKS

YOUR NEXT APPT DATE \_\_\_\_\_

RX EXPIRES \_\_\_\_\_

SIGNATURE \_\_\_\_\_ LIC. \_\_\_\_\_

FIG. 9

# LENS/FRAME CONSIDERATIONS

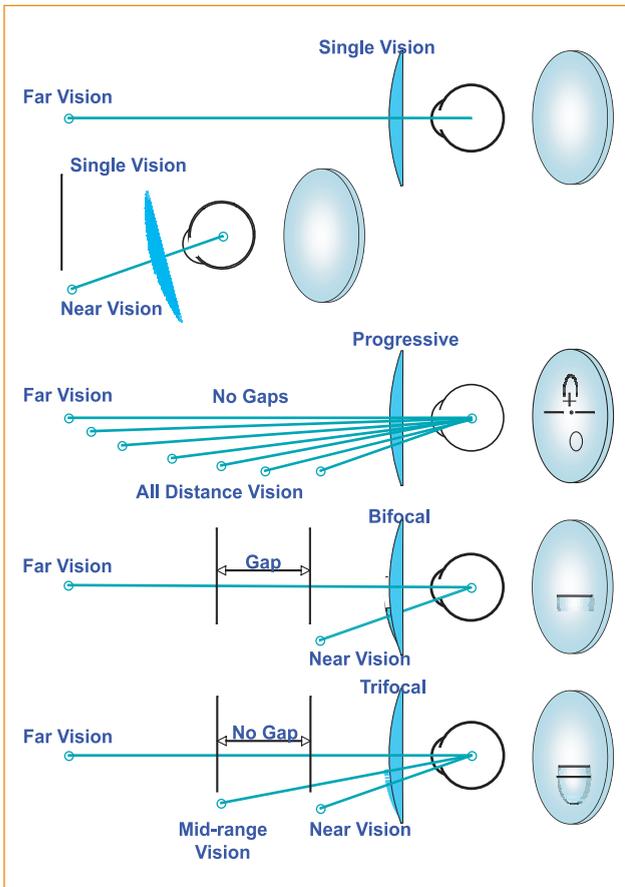


FIG. 1

Lenses correct a patient's vision and the benefits that each lens design provides, is important to patients. A single vision lens can be used for far or near vision but only has one power that is useful. For a +2.50 add presbyope, a bifocal would provide two powers, only distance and near vision while a progressive delivers an infinite number of powers i.e., clear vision at all distances, from far to near. The series of illustrations (Fig. 1) describe useful distances of clear vision.

Single vision, progressive and lined multifocal lenses are described by segment shape and size. Multifocals, lenses with more than one focus, are available in a variety of styles.

Progressives come with multiple corridor lengths so that they can fit into smaller frames and still provide excellent far to near vision. Progressives are the most popular option of multifocals available today. The older style of multi-focal lens, the bifocal is referred to as a flat top and is available in 28mm width; bifocals are also available as flat top 35s, round segments, blended round segs and executives. In trifocals, there are three zones of vision and are described by the height of the mid-range portion and the width of the segment. For example, available sizes are FTT 7x28 and FTT 8x35. Call your laboratory for a complete list of available multifocal lens styles.

## BOXING SYSTEM

**A - EYE SIZE** - The horizontal width between the two vertical lines tangent to the edges of a lens—or a box enclosing the lens (Fig. 2). Be sure to consider the depth of the bevel when measuring the frame.

**B - EYE HEIGHT** - The vertical height between the two horizontal lines tangent to the edges of the lens—or a box enclosing the lens. Be sure to consider the depth of the bevel when measuring the frame.

**DBC** - Distance between centers; the distance between the geometric centers of the right and left lens openings.

**DBL** - Bridge size; the minimum distance (nasal) between the two lenses or frame openings.

**ED** - Effective Diameter; twice the longest radius from the geometric center of lens to the farthest edge; the smallest circle that will completely enclose the lens.

**G** - The geometric center of an imaginary box enclosing the edges of a finished lens or opening in a frame ( $\frac{1}{2}$  B and  $\frac{1}{2}$  A measurements).

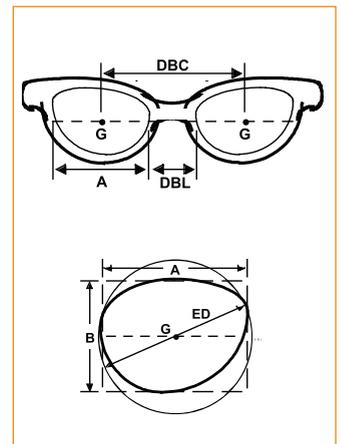


FIG. 2

	SINGLE VISION	PROGRESSIVES	BIFOCALS	TRIFOCALS
CLEAR VISION	Only 1 power (focus) Distance, mid-range or near	Infinite number of powers Far to near	2 powers Distance and near, mid-range and near	3 powers Distance, mid-range and near
BENEFITS	Large single area of clear vision	General purpose All distance vision	Large distance and near zone	Large fixed mid-range and near power zones
CONSIDERATIONS	Only one focus	Higher add patients may want larger reading or computer vision areas	Visible line, prismatic jump No mid-range vision for adds $\geq +1.75D$	Two visible lines, multiple prismatic jumps, old fashioned

## LENS DEFINITIONS

**DECENTRATION** – The horizontal distance (mm) that the OC is moved from the GC to place the OC in line with the visual axis; in towards the nose or out, towards the ear. In SV, bifocal and trifocal lenses, the OC is typically located on the mid-line vertically.

**INSET** – The horizontal distance (mm) from the OC to the segment center.

**FITTING HEIGHT** – The location of the segment top in bifocals and trifocals or the fitting cross in progressives. Height is measured in mm from the lowest position on the lens (edge of the lens) to the top of the segment or fitting cross.

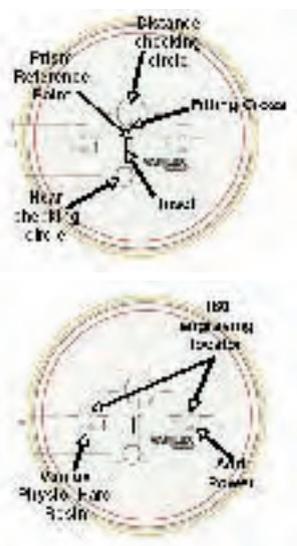
### PROGRESSIVE LENS

**ENGRAVINGS** – Semi visible engravings that allow remarking and positioning of the fitting cross of the lens. They are composed of two circles 34mm apart, 17mm to either side of PRP.

**PROGRESSIVE LENS INK MARKINGS** – Temporary inked markings used to correctly locate the fitting cross and 180° axis for processing as well as confirming correct lens-in-frame positioning.

Each manufacturer provides a unique set of semi-visible engravings and ink marks that can help the optician identify which lens a patient is wearing. These engravings tell the manufacturer, lens design, add power and material that the lens is made from. Use them to know which lenses might need to be replaced or the lenses that a patient has been wearing.

Be sure to have a complete set of lens descriptions from the manufacturer; they describe markings and logos used. Also, ask your laboratory for a OLA Progressive Lens Identification book. It lists all the lenses available and shows their markings.



## what would you do?

### PATIENT SITUATION

Mr. Travers just came in and wants to order another pair of progressives just like the ones he is wearing; same frame also. You've only been working in the office for 4 weeks. The optician has asked you to record the frame size, lens style and prescription. What do you do?

### SOLUTION

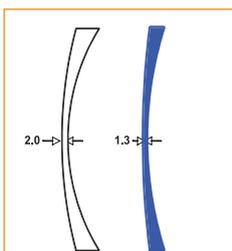
Simple, take a breath and ask Mr. Travers for his glasses so that everything that he likes about them can be verified, tell him to have a seat for a few minutes while the order is recorded and do the following. Give him a brochure on polarized sunwear so he can read about that pair of glasses he was interested in last time (there was a note in his file).

1. Pull the patient's record so that everything about his glasses can be checked so they are duplicated exactly.
2. Measure the frame A, B and DBL. Record it on the order, check that this is the same that was ordered last time.
3. Verify that the lenses are Varilux Physio progressives – look for the engravings. They will confirm Varilux Physio.
4. Look in the patient's record and confirm that the prescription was correct last time so it can be ordered again.
5. Last time Mr. Travers ordered Transitions. Be sure that they are ordered again also.
6. Don't forget the AR. You might suggest to Mr. Travers that there is a new Crizal and since he was so happy last time with the improvement – he might want to upgrade to Crizal Avancé with Scotchgard protector Lenses.

Complete the written order, clean the glasses and ask the optician to return the glasses and be sure that they are in good adjustment.

# CHOOSING LENS MATERIALS

When considering the best lens material for any patient, it's a lifestyle choice: lightness, convenience and great looks. So the target materials should be 1.67 high index or Airwear. In both cases, they provide a complete package of lens benefits that resonates with every patient. They create thin, lightweight, durable and highly impact resistant lenses. With lenses, less is more.



In this example of a high-index 1.67 and plastic 1.50, -4.00D lens, center thickness starts thinner and edge thickness is more than 40 percent less.

FIG. 1

## THINNESS AND LIGHTNESS

Lens thinness and lightness is a product of index and specific gravity. The higher the index, the more efficient the lens is at refracting or bending light and the less curvature is needed for lens power. If there's less curvature, there's less volume and less volume equals less weight (Fig. 1). So, use the information described in the table.

## CLARITY

Knowing when to recommend a material is key. Using the best is most appreciated by patients. To make better choices with patients know two or three sentences that help explain the benefits; remember, patients purchase benefits not index or abbe values. Then, show them the difference using lens samples in frames or use charts that show lens thinness by Rx.

Choice, choice, choice. I think patients are thrilled with having so many lens material options. They can choose a pair of glasses with lenses that disappear or a frame that is bold and strong. Comfort is also driving force for many patients—having a pair of glasses with lenses that wear effortlessly allows people to enjoy their lives or activities without "dealing" with glasses.

**Mary Schmidt**  
President, EyeSystems  
Walnut Creek, CA

MATERIAL	SAV...	INDEX	SPECIFIC GRAVITY	ABBE	TECHNICAL NOTES
<b>THIN&amp;LITE 1.74</b>	"Most technically advanced..." "More than 50% thinner than ordinary plastic" "Absorb 100% UVA & UVB"	1.74	1.47	33	1.74 ultra high index can make the thinnest lenses, lenses are flattened and aspheric and anti-reflection is automatically included.
<b>THIN&amp;LITE 1.67</b>	"These lenses were made for your prescription, your lenses will be up to 40% thinner and about a third lighter" "Absorb 100% UVA & UVB"	1.67	1.35	32	1.67 is terrific for drill/rimless and grooved nylon frames, available in new Transitions VI and polarized lenses. Minus lens centers as thin as 1.3mm.
<b>THIN&amp;LITE 1.60</b>	"Lenses are about 25% thinner and lighter and absorb 100% of the UVA and UVB." "The thinness and lightness of poly with the clarity of plastic"	1.60	1.30	41	1.60 has high tensile strength so it is excellent for drill/rimless frames. It's higher abbe ensures better peripheral lens clarity in Rx's >3D.
<b>AIRWEAR LENSES</b>	"More than 40% lighter and significantly flatter than standard plastic for a better looking pair of glasses" "These lenses are 10x more impact resistant than standard plastic and 100% UV protective; that's why the FDA recommends polycarbonate lenses for all kids under 16 years of age."	1.59	1.20	31	Airwear are a specially processed polycarbonate lens, made flatter and aspheric for better cosmetics and reduced magnification for the wearer. Of course, the protective properties include impact and UV protection.
<b>TRIVEX MATERIAL</b>	"In your prescription (<-3.00D) your glasses would be 25% thinner and lighter than ordinary plastic"	1.53	1.11	44	Avoids star cracks when used for drilled rimless. It has a very low specific gravity and high impact resistance. Available in Transitions VI and Definity lens designs.
<b>PLASTIC</b>	"This material works well for low to mid Rx's and for tinted sunglasses." "While this is an inexpensive material, lenses are thicker and heavier than the newer thinner and lighter materials."	1.50	1.32	58	With the lowest index, it is the reference by which we measure all newer materials. Thinner and lighter materials are replacing plastic.

# BASE CURVES, SPHERICAL AND ASPHERIC LENSES

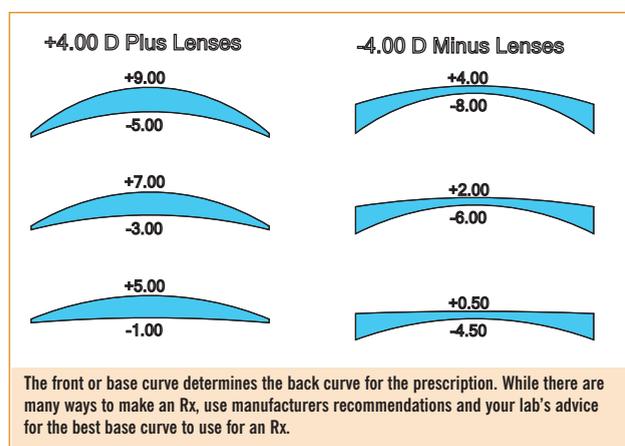


FIG. 1

The “best form” of a lens is one that provides the same vision at center and in the periphery, as the eye moves normally behind the lens. For finished lenses, manufacturers choose both front and back curves; for semi-finished lenses, a recommended series of front curves are provided usually in a base curve chart. When you order lenses from the lab, they already have these charts loaded in their computer lab management systems so the correct base curve is chosen for your order. For the best vision in a lens, it's better to let the lab choose the base curve. In best form lenses, the front surface curve is spherical i.e., the same curve or radius in all directions from center.

In contemporary frames, we have new challenges. First, frames tend to be “flatter;” in larger ones, lenses often bulge out the front. To make lenses bulge less and fit today's flatter frames consider aspheric lenses.



FIG. 2

Aspheric lenses (Fig. 2) that have been flattened to look better and see better, too. They have front surfaces that are “not-spherical;” they flatten towards the periphery in plus prescriptions and steepen towards the periphery in minus. This change of curvature is calculated to correct for the peripheral blur that would be created when a flatter base curve is used that is not best form. Benefits for the wearer are the lens looks better in the frame and is less magnifying. Less magnification makes both the wearer's eyes and the world that they see more natural in size.

This is one reason why patients tell us that they see better with their aspheric lenses than their previous glasses.

I like to use aspheric lenses for young hyperopes. Parents are always concerned about the cosmetics of plus lenses on their children. After all, no parent wants their child getting teased because they are wearing thick, magnifying lenses. By using flatter, thinner polycarbonate lenses with an anti-reflective coating, those +4.00 and +5.00 diopter prescriptions can actually look like half the power. In addition, they become patients for life. Parents return year after year as their child grows up because I understand and meet their needs and concerns.

**Jim Mitchem**

ABO Dispensing Optician  
Allina Medical Clinic - Cottage Grove, MN

## what would you do?

### PATIENT SITUATION

Mrs. Jefferson, a new patient wants desperately to make her new glasses look better than the ones she's wearing now. She was on a strict budget last time so they were plastic lenses and frames, no AR. She's chosen a semi-rimless that is the same 52 eyesize, Rx is +3.50 sphere. What can be done?

### SOLUTION

First, Mrs. Jefferson's lenses are thicker in the center than the edges and bulge out from the front of the frame. Her eyes are also quite magnified.

Since she wants to keep the same frames size, increasing the index of the lens material will reduce the lens' center thickness. The edge thickness will be the same (be sure that at the thinnest edge, the thickness is a minimum. 1.8mm is a good standard for semi-rimless).

Recommend 1.67 high index and lenses that are aspheric. The index reduces thickness by up to 40%, the flattened aspheric design further reduces thickness and lenses will not bulge out the front of the frame. The flattened lens design also reduces the magnification effects so the world appears more natural in shape and size while Mrs. Jefferson's eyes look better too.

Talk to your lab about making a standard vs. aspheric lens demonstrator. Then use it to show the differences to patients so they better understand and can see how much better aspheric lenses look.

# BASED ON WHAT YOU KNOW, WHAT WOULD YOU DO?



NAME: **Darlene C.**  
AGE: **22**  
OCCUPATION: **Grad student**  
ACTIVITIES: **Studying and golf**



○ **PATIENT SITUATION:** Darlene is studying to become an architect and is also a weekend golfer. Her prescription is R+5.00 – 0.50 x 135, L+5.25 – 1.00 x 45, PD 59, current frame is a 50x38 square, DBL 20, lenses plastic. She says her glasses are too heavy and uncomfortable all the time and when golfing doesn't want to use her clips because she finds them inconvenient and they don't fit well.

● **SOLUTION:** At the suggestion of her optometrist, Darlene's optician recommended Airwear lenses, a lightweight ("too heavy" complaint), safe (golf), better looking (thinner and aspheric) and comfortable alternative to her traditional plastic lenses. Since Darlene is a student and said she was on a tight budget but "would buy the right glasses," Airwear instead of 1.67 was recommended. The savings over an even thinner high index allowed her to add Transitions VI for outdoor convenience. In this way her optician could also address her need for better glare protection outdoors. She understood that they didn't replace a good pair of polarized sunglasses but that would be her next purchase.

Lastly, the optician suggested a different shape frame to further reduce thickness. Here the most plus power was in the 135 and 45, meridian so to have enough edge thickness at the far corners of her square frame, lenses were thicker in the center. A more oval shape was selected (no high corners) for the new Airwear, so lenses became more than 25 percent thinner and lighter than the ordinary plastic lenses. The result was a lot of great comments from Darlene's friends about how thin and good looking her new eyewear was.



NAME: **Jonah B.**  
AGE: **32**  
OCCUPATION: **Lawyer**  
ACTIVITIES: **Courtroom litigation, weekend hiking and fishing**



○ **PATIENT SITUATION:** Jonah needs a serious look in court but wants another frame that is more fun for recreation and after work. His thick edged lenses have always bothered him and so he typically chose very thick plastic frames to hide the lens. He wants to update his look and really likes the rimless frames of a colleague in the law firm. In addition, he is constantly walking from his office to the courthouse a few blocks away and always loaded down with paper. With an Rx of R-6.00 sphere, L -6.00 – 0.50 x 180 he wants to know what to do?

● **SOLUTION:** Both the doctor and optician agree that they can answer all of Jonah's wants. Here, three pairs of glasses are recommended so that they can meet all of Jonah's exact needs and then some.

First, working on the "litigation glasses," we want the smartest looking lens shape, smaller in size than he is wearing, that fits below his brow and just big enough to look right. 1.67 high index lenses are terrific for drilled rimless and will reduce the edge by more than 40 percent (the combination of 1.67 and a shape that is smaller makes a real difference). To show that he means what he says, the lenses are as clear as they can be using Crizal Avancé with Scotchgard. Every witness knows that he is looking directly at him or her. For convenience, adding Transitions VI allows him to travel back and forth to court in direct sunshine and the lenses self-adjust going back to the clear state quickly.

For after work, we chose a plastic two tone frame, in a two tone where the back of the frame is a light crème color. This makes the frame less visible than a dark color so that adds to comfort. Because the frame has some thickness, consider Airwear for lightweight comfort and thinner edges.

For recreation, Jonah chose a Persol sunglass, Airwear lenses in polarized gray. This meets his need for crisp clear vision on the open ocean where there is high glare as well as his preference for the way that gray lenses keep colors viewed the same. Airwear also provides the impact and UV protection for outdoor sports.





FIG. 1

**FRAME ANATOMY** – Metal and plastic frames are made up of a front and temples (Fig. 1). The temples may have spring hinges or fixed barrel hinges. Three piece mountings include a bridge, two endpieces and temples (Fig. 2). In some titanium frames, the temple and endpiece are all in one so there are no screws.

Semi-rimless frames are composed of fronts of



FIG. 2

eyewires and endpieces plus temples (Fig. 3). The nylon cord is looped through the eyewire end that applies tension to the lens as the nylon is stretched around the lens.

From the front, using this Bvlgari frame (Fig. 4), we can see how to measure frame dimensions using the Boxing System. This frame is 54mm wide by 28mm high and has a 17mm bridge. Remember, the size of the frame is measured as the lens size i.e., from the edge of the lens and not the inside edge of the frame so always consider the depth of the bevel.

# THE FRAME AND FIT

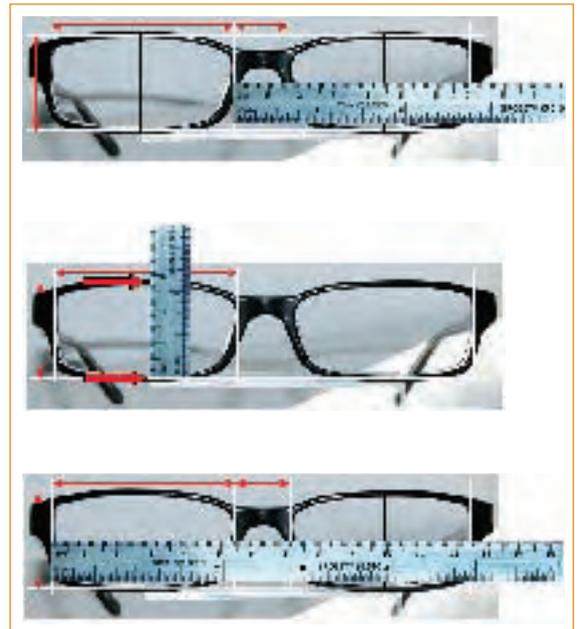


FIG. 4

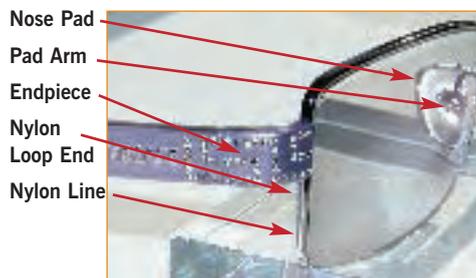


FIG. 3

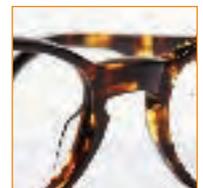
## BRIDGES



**UNIVERSAL** - meant to fit any number of nose shapes and sizes may shorten look of nose



**ADJUSTABLE NOSE PADS** - the pad arms can be straight, loops or spirals



**KEYHOLE** - supports the frame on the sides of the nose, looks like a keyhole, creates the appearance of length to the nose

# FRAMES & FRAME MATERIALS

The choice of frame material changes the way your patient and their glasses look. Describe metals as a classic, sleek material that can deliver thinner and lighter frames than other frame materials. Use high luster to matte finishes for a variety of elegant or understated looks. Plastic frames are typically thicker and available in more of an array of color and patterns. As a result, plastics can be used to draw attention to a frame and make a bolder statement. Multiple colors and patterns on the same frame are possible by sandwiching, so help patients with the degree of boldness that they want to achieve. In fact, today, many frames are a combination of materials so that fronts may be sleek while temples are bold in size, shape, color and brand logo. Rimless provides a minimalist approach to eyewear and is often preferred by the person that doesn't want their glasses seen. They can be the most comfortable and lightest eyewear. The look of both rimless and full frames is possible with semi-rimless styles which provide the patient with a boundary-free frame at the bottom of the lens.

## WHICH FRAME MATERIAL IS BEST?

Thinner frames are more easily adjusted than thicker ones. Some frames cannot be adjusted to fit a wide range of patients so be sure that the frame fits correctly before the patient leaves and you've ordered the lenses. Some metals are rigid so fit is critical.

Add crystals and branded logos, it adds elegance to a frame for everyday. It makes patients feel special and provides them with a visible identifier for a brand that they love.

The best material is a combination of looks, fashion and personal taste. Your ability to describe the differences is important so the patient understands why your service and products are the best choice.



PLASTICS	KNOW	SAY...
<b>ZYL CELLULOSE ACETATE (ZYLONITE OR "ZYL")</b>	<ul style="list-style-type: none"> <li>• Most common, frames cut from all colors, patterns, textures of sheet stock</li> <li>• Softens over time, readjustment needed, too much heat can melt, bubble or burn the frame</li> <li>• Can become dry or brittle with age, check before adjusting</li> <li>• Acetone will dissolve the frame</li> <li>• Heat to 120°C to adjust</li> <li>• Easy to insert lenses and adjust</li> <li>• Can stretch with heat or shrink with cooling (careful hidden hinge may loosen if heated too hot)</li> </ul>	<ul style="list-style-type: none"> <li>• Frames maintain their high luster</li> <li>• There's almost endless color, pattern and texture possibilities</li> <li>• Can be laminated for great effects</li> <li>• Works wonderfully for those big temples with logos and brand emblems</li> </ul>
<b>CELLULOSE PROPIONATE</b>	<ul style="list-style-type: none"> <li>• Injection molded</li> <li>• Lightweight, strong and flexible, color is added by an over-coating</li> <li>• Excess heat bubbles the frame, beads will pock the surface</li> <li>• NO acetone or alcohol</li> </ul>	<ul style="list-style-type: none"> <li>• This is one of the most comfortable and lightweight materials</li> <li>• Large sizes retain their stability, even as wrap frames</li> <li>• Less sensitive to warm weather and will hold their adjustment</li> </ul>
<b>GRILAMID</b>	<ul style="list-style-type: none"> <li>• Thermoplastic molded frame, clear and transparent</li> <li>• Lightweight, 20% lighter than zyl</li> <li>• Does not dry out</li> <li>• Cold glazing for thin lenses, slight heat for high powers, &lt;50°C</li> </ul>	<ul style="list-style-type: none"> <li>• This frame material is highly durable and resistant to aging</li> <li>• Flexible even in thin designs</li> <li>• Hypoallergenic</li> <li>• Created in a wide variety of color combinations</li> </ul>
<b>HYTREL</b>	<ul style="list-style-type: none"> <li>• Exceptionally tough and resilient</li> <li>• Resistant to creep, impact and flex fatigue</li> </ul>	<ul style="list-style-type: none"> <li>• These frames are good in a wide range of temperatures maintaining flexibility and lens retention</li> </ul>
<b>TROGAMID</b>	<ul style="list-style-type: none"> <li>• Highly resistant to chemicals and UV</li> <li>• Excellent abrasion and scratch resistance</li> </ul>	<ul style="list-style-type: none"> <li>• Great under the most extreme conditions</li> <li>• Maintains its good looks for the life of the eyewear</li> </ul>

METALS	KNOW	SAY...
<b>ALUMINUM</b>	<ul style="list-style-type: none"> <li>• Light &amp; strong (50% lighter than titanium)</li> <li>• Little flexibility, if riveted hinges, adjusting often is difficult</li> <li>• Spring hinges available</li> </ul>	<ul style="list-style-type: none"> <li>• Even thick parts make the frame extremely light</li> <li>• Good variety of finishes</li> <li>• Creates a "look"</li> <li>• Hypoallergenic</li> </ul>
<b>ANODIZED ALUMINUM</b>	<ul style="list-style-type: none"> <li>• Stronger, less scratch resistant than Aluminum</li> <li>• Imbedded spring hinges</li> </ul>	<ul style="list-style-type: none"> <li>• This material creates a sleek look and is so lightweight</li> <li>• Anodized with beautiful finishes and colors</li> </ul>
<b>BETA TITANIUM</b>	<ul style="list-style-type: none"> <li>• Strong and lightweight alloy of titanium, vanadium, aluminum</li> <li>• Nickel-free</li> <li>• More flexible than pure Ti</li> </ul>	<ul style="list-style-type: none"> <li>• For a light, comfortable, durable and flexible frame that can be highly styled</li> <li>• Hypoallergenic</li> </ul>
<b>MONEL</b>	<ul style="list-style-type: none"> <li>• Most used frame metal</li> <li>• Copper &amp; nickel in a 2:1 ratio</li> <li>• Strong solders and finishes</li> <li>• Easily adjusted, re-shaped and corrosion resistant</li> <li>• Some patients skin may react over time with some Monel finishes</li> </ul>	<ul style="list-style-type: none"> <li>• This frame is strong and easy for me to adjust for the perfect fit</li> <li>• Millions of frames in this material are dispensed every year</li> <li>• They stay stable and in shape for a long time.</li> </ul>
<b>STAINLESS STEEL</b>	<ul style="list-style-type: none"> <li>• Nickel free</li> <li>• Stainless</li> <li>• Hypoallergenic</li> </ul>	<ul style="list-style-type: none"> <li>• Creates bright shiny frames or has a beautiful matte finish in silver, black, copper, gold colors</li> <li>• Since they don't lose their shapes, a snug temple fit is great for active wearers</li> </ul>
<b>TITANIUM (90% TO 100% TITANIUM)</b>	<ul style="list-style-type: none"> <li>• Extremely lightweight yet durable</li> <li>• Corrosion resistant</li> <li>• Polishes well, electrolytic color finishes</li> <li>• Casting adds design features</li> <li>• Adjusts well but for rimless requires the right tools</li> </ul>	<ul style="list-style-type: none"> <li>• These frames are extremely lightweight yet wonderfully durable</li> <li>• They can provide that minimalist look</li> <li>• Hypoallergenic</li> <li>• Provides long life, superior strength and are a good investment</li> </ul>

## FRAME QUALITY

Quality is part look and part durability in the eyes of the patient. Look for a consistent finish over the entire frame whether it is high luster or matte. When closing the temples, be sure that the frame front butts smoothly and evenly with the temple end. Screws should not loosen easily, especially when the patient opens and closes the temples repeatedly. High fashion, branded frames like D&G, Prada, Bvlgari or Versace represent that brand so must meet the patient's expectations and experience

Aside from the "invisibility" of rimless eyewear, it's always a product that shows off new technology to great advantage. This technology extends to both new material uses such as strip titanium, and TR90 plastics as well as newer, stronger and more stable rimless mountings such as tension mountings, thermal bonding and UV curing epoxies. Unlimited customization of lens shapes is also a strong selling point.

**Lloyd Silverstein, Optician/Owner**

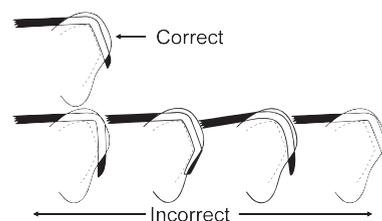
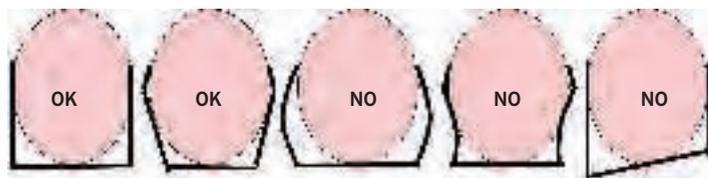
Optical Underground  
San Francisco, CA

with that brand in other products. Choose the right high-quality vendor; this ensures that brand promises are met. Quality also means the frame has been tested in accelerated aging that cycles humidity and UV corrosion resistance so frame finishes remain sparkling, lenses pass drop ball testing and metal coating thicknesses are correct and consistent.





# FITTING AND DELIVERY



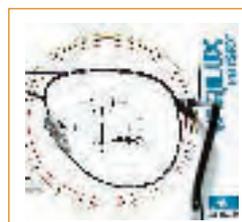
**FITTING** – Fitting eyewear requires practice since the number of possible combinations of head and frame sizes and shapes is enormous. Therefore, the more that it is done, the easier it gets. There are, however, some good rules to use to get the best fit. First, eyewear balances on three points, “the three point triangle.” Therefore, the fit on the nose and at the crest of each of the ears are the places to be scrutinized to be sure that the frame chosen fits right. Does the bridge fit? The more area that touches, the better the frame will be supported. For adjustable nose pads, are they large enough, can they be adjusted to sit flatly on the surface and not dig into the skin? In a saddle bridge, do the pads sit on the nose or does the frame only rest on the top of the nose?

When possible, choose frames that locate the eye close to the geometric center of the frame opening. This reduces the need for excessive lens decentration. It also reduces a “too narrow” look of the eyes in the frame. In a larger frame, dark frame colors will accentuate a narrow PD, lighter frame colors can help if there is lots of decentration. For large sunwear, there will be more decentration required, reduce lens thickness effects by using higher index lens materials. Of course, the eye is hidden behind the dark lens so accentuating a narrow PD is not usually a problem.

Ensure that there is enough lens in all the viewing areas that are important for this prescription. For example, a large aviator on a narrow PD may not provide enough reading area for a progressive. The lens shape may cut away most of the reading.

Choose a smaller modified aviator when possible to meet the patient’s want and their need for good reading. For sunwear, is there good coverage, and will the frame block glare in all directions?

Temples should be long enough to be bent at 45 degrees at the crest of the ear and extend about 40mm behind the ear. Too short a temple may not be comfortable and may not provide the right fit. Too long a temple is less of a problem if it remains hidden behind the ear or can be shortened (easier on metal temples).



## what would you do?

### PATIENT SITUATION

Mrs. Diaz has a prescription for multifocals. The new distance PD measurements are below. Her previous PD was 30.0/31.5. She has decided to purchase a pair of progressives for general wear. What are the fitting measurements that should be ordered and how will you verify the lenses when you receive them back from the lab?

### SOLUTION

Order exactly as you have measured. Order the distance monocular PD as R30.5/L31.5. Use the new values since you checked them twice (right?) and we know that as people age, their PD does get wider. Dissimilar fitting heights are also required and should be ordered as R18.5/L17.0. This is especially important for small frame, short corridor lenses since lens powers change quickly as the eye rotates down through the lenses. Dissimilar heights ensure that each eye sees the same power.

Capitalize upon the brand recognition and the millions of dollars spent each year by well known fashion houses on advertising and marketing. Grouping branded eyewear together and presenting it under its specific logo creates brand “critical mass.” Learn how each brand’s logo helps to define and re-enforce associations with particular lifestyles or usage. Use this knowledge to help your clients find the sport, dress, casual, work or fun styles they’re seeking.

**Barry Santini, ABOM**  
Long Island Opticians  
Seaford, NY

**DELIVERY**

Delivering a frame to a patient that, not only fits great, but looks great is key to exceeding a patients'/consumers' expectations.

**BENCH ALIGNMENT** – A frame should be bench aligned before delivery to the patient. It makes the frame look exact and precise because it is straight and symmetrical. Also, be sure that the lenses have been cleaned of all fingerprints. There are seven steps to perfect bench alignment.

1. Looking at the front, straighten the bridge so the two eyewires are aligned; from the bottom, be sure they are not propeller-ed. For metal or plastic frames, bend the bridge. For rimless, use two bracing pliers.



2. Give the frame a slight face form bend.

3. Next, be sure that none of the eye-wires are misshapen or rolled (happens on an overly heated plastic frame during glazing)— if a plastic eyewire is rolled, soften the eyewire, remove the lens, heat the eyewire again and roll the eyewire back into shape, re-insert the lens.



4. Viewing from the bottom, make the temples near parallel.



5. From the side, confirm that the temples have the same tilt angle to the front. Test for tilt with the frame upside down. Both temple tops touch the table at the same time, “a four point touch.” If not, adjust the angle so they are parallel.



6. Next, confirm that the angle of the temple tips is the same. Place frame right side up. Temple ends are at the same angle when both touch the table at the same time. If not, adjust as needed and test again.

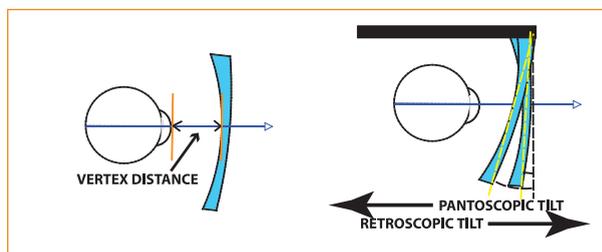
7. Last, when closed, the temples should overlap each other. This confirms that the frame is completely symmetrical. To adjust metal frames, close the temples, use a narrow plier and

move the temples until they are over each other. Be sure that the endpieces are also in line.



**BASIC FRAME FITTING TIPS** – Place the glasses on the patient for steps one and two. This keeps you in control and speeds the adjusting process. For three and four, ask the patient to put them on. This ensures that they will be where they are going to be worn and that helps adjusting for straightness and temple fit.

1. Place the frame on the patient and adjust for slight temple tension without indenting the head. For plastic, heat the endpieces or bridge slightly and open the angle, let it cool and try again. For metals use pliers and be sure that they are covered so as to not mar the frame finish. For rimless, use a bracing and post/covered plier.
2. Raise or lower the temples to adjust pantoscopic angle. About 10 degrees is right. Use a wide angling plier or parallel jaw pliers. For some frames pliers may be required to stabilize the front while the temples are bent up or down.
3. Straighten the front by adjusting for different ear heights. To raise the right side of the frame, lower or increase the pantoscopic angle of the right temple (lowering the temple raises the front of the frame on that side). For plastic, open temple slightly and angle the hinge. For metal, brace the front and angle the endpiece using a wide angling or parallel jaw plier. For rimless, a bracing and double covered plier.
4. Ask the patient to put the glasses on. Adjust temple length to the ear. Create about a 45 degree angle at the crest of the ear. If the temple bend is too short, the temples will ride up. If too long, the glasses will slide down the nose. Also, look behind the ear and contour the temple for angle and touch. The more temple contact, the more secure the fit.
5. Clean the glasses again and ask if they feel comfortable, straight, too tight, too loose.



Vertex distance is the distance in mm from the front surface of the eye to the back of the lens. Pantoscopic tilt moves the bottom of the lens towards the cheeks, retrosopic away.



“ When you are on the road all the irrelevant things fall away – it becomes the road, the bike, and you. It’s about dedication, motivation, and moving forward. Working together with Luxottica compliments my guiding philosophies and has been essential to my success.”

DR. ROBERT REED JR.  
All Eyes, Optometry  
St. Joseph, MI

**Luxottica & me**

WORKING  
TOGETHER sm

To learn more about Dr. Robert Reed and the advantages of partnering with Luxottica go to [www.luxandme.com](http://www.luxandme.com)

**LUXOTTICA**  
GROUP

# PDs & SEGMENT HEIGHTS



FIG. 1

## INTERPUPILLARY DISTANCE AND BINOCULARITY

The prescription lists the power needed; PD and height teach positioning. Proper lens centration also delivers binocularity i.e., both eyes working together to see one image. This is dependent on the combination of good PDs and good lab practice. Therefore, taking accurate and consistent PDs is critical.

Using a pupillometer (Fig. 1) conveniently and accurately measures interpupillary distance (PD), the distance between the visual axes of the eyes (Fig. 2). This is better than using a ruler since it takes more accurate PD's more consistently. To take a PD place the nose pads on the patient's nose with the forehead bar in place helping to center the instrument on the nose. Ask the patient to hold the pupillometer as if they were holding a pair of binoculars (Fig. 3) and look at the lighted circle.

1. Set distance to infinity ( $\infty$ ) for distance PD or the correct near distance for patient near task preference; 35cm= $\sim$ 14 inches, 40cm= $\sim$ 16 inches, 45cm= $\sim$ 18 inches.
2. Record monocular or binocular PDs as needed (refer to the chart).
3. Record the PD. To be sure, you might take it again.
4. Keep the paddle centered unless the patient has difficulty with both eyes focusing on the ring target, otherwise occlude each eye separately and take the monocular PD.

## MEASURING MULTIFOCALS

To measure multifocal fitting heights, sit opposite the patient and adjust the frame so that it is straight and comfortable for the wearer. Ask the patient to put on the glasses where they are comfortable wearing them. Then, with your eyes at the same height as the patient's dot the fitting height with a marking pen. For bifocals and trifocals, the starting

points are top of lower lid for bifocals and top of lower pupil margin for trifocals. For progressives it is pupil center. Refer to the chart on page 20.

Next, remove the glasses and draw a straight line (about an inch) across the dot. Place the pen against the table edge, pen against the dot and slide the glasses right and left. Ask the patient to put the glasses back on and ask them to stand. From the side, view their line of sight. For progressives, confirm that they are looking through the line, for bifocals and trifocals, above it. For bifocals and trifocals, hand the patient a reading card and, as they look down, see if they look below the segment line. Check it again while sitting. In bifocals and trifocals, it can also be confirmed by placing a piece of scotch tape across the line. The tape should be completely in the way of reading and out of the way for distance and walking.

Eyes are at usually different heights, so for progressives it's okay to order dissimilar fitting heights when needed.

Watch a patient's posture as they walk with you around the office. Adjust segment height as needed. Adjust fitting height as posture changes with age. Never assume that the previous height will be good for the new glasses.

LENS DESIGN	FITTING	PD	HEIGHT
Progressives	 Monocular distance PD Pupil center	<ul style="list-style-type: none"> <li>• Monocular distance PD</li> </ul>	<ul style="list-style-type: none"> <li>• Fit to pupil center</li> <li>• Specify dissimilar heights</li> </ul>
Bifocals	 Biocular distance PD Top of lower lid	<ul style="list-style-type: none"> <li>• Binocular PDs</li> <li>• Monocular PD in extreme cases</li> </ul>	<ul style="list-style-type: none"> <li>• Use same seg height, R/L eye</li> <li>• OC at frame midline, 3-5mm below pupil center</li> <li>• Dissimilar heights OK in extreme cases</li> </ul>
Trifocals	 Biocular distance PD Lower lid margin	<ul style="list-style-type: none"> <li>• Binocular PDs</li> <li>• Monocular PD in extreme cases</li> </ul>	<ul style="list-style-type: none"> <li>• Use same seg height, R/L eye</li> <li>• OC at frame midline, 3-5mm below pupil center</li> <li>• If eye is displaced high in frame, set OC 5mm below pupil center</li> </ul>
Single Vision	 Aligned horizontally with PD	<ul style="list-style-type: none"> <li>• Monocular distance or near PD</li> </ul>	<ul style="list-style-type: none"> <li>• OC or PRP along frame midline, 3-5mm below pupil center</li> <li>• If eye displaced high in frame, set OC 5mm below pupil center</li> </ul>



# VARILUX® Physio®

## Sam is in sales.

VARILUX Physio is the lens for him. It gives him W.A.V.E. Technology™: Wavefront Advanced Vision Enhancement. So whether Sam is driving to calls, presenting sales materials, or writing up orders, he can have the sharpest possible vision in all zones.

Every one of your patients has different needs. VARILUX® lenses use cutting-edge technology to bring you a wide range of unique designs to solve those needs and give your patients the best possible vision.

For more information on this, or any of our lenses, contact your sales representative or visit [www.VARILUX.com](http://www.VARILUX.com).

**VARILUX®**  
PHYSIO

**Crizal**  
AVANCE 

vision)web™  
*Streamline. Simplify. Succeed.*

Better vision by design.

**VARILUX®**



# NEEDS BASED SOLUTIONS - LENSES



## PROGRESSIVES FOR PRESBYOPIA

Understanding progressives makes explaining their advantages easier. If you are presbyopic yourself and wear progressives, it's really easy. If not – here's what you need to know. The front surface of a progressive lens steepens towards the bottom and that creates a gradual increase in plus power (Fig. 1). The result is a smooth, continuous increase of the add power, without visible lines or interruption of vision.

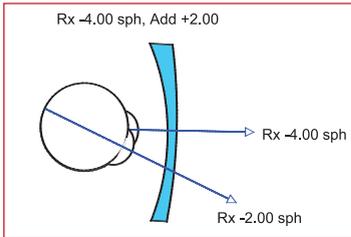


FIG. 1

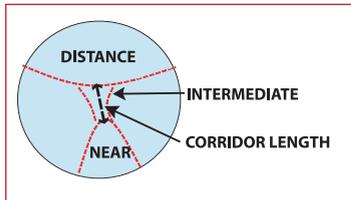


FIG. 2

There are three distinct zones of vision. Distance, a stabilized zone located in the upper portion of the lens, provides the far vision prescription. The Near, is the lower add portion of the lens, and the Intermediate, a central 'corridor' that connects distance and near increasing progressively in plus power (Fig. 2). These three zones of vision blend together seamlessly, providing the wearer with a continuous range of vision from distance to near.

Varilux Physio and Physio 360 have allowed us to upgrade many of our patients to a superior lens design. The lens is available in a large range of materials and options, which is very beneficial, no compromise is made by making it necessary to select a lens around patient needs/wants. The overall lens clarity and reduced "peripheral blur" set a new standard for progressive lenses.

**Jeff Rohlf, LDO**  
Eyewear Gallery Supervisor  
Optical Lab Instructor  
College of Optometry, Ohio State University

Modern progressives have minimal blur i.e., the astigmatism created has been reduced to the mathematical limit or about equal to the add power. New digital surfacing techniques in lenses like Varilux Physio 360° and DEFINITY allow the

astigmatic and other errors to be further reduced so there is little blur. Patients will comment that the lenses are clearer overall and with crisper, higher contrast images. This is accomplished by increasing the precision by which the molds are cut to make a semi-finished progressive and then further reducing the remaining errors by compensating for them on the back surface of the lens. The result is progressive lenses with eye comfort, smooth transitions throughout the lens, amazingly clear vision and the most natural-like vision.

The newest designs are adjusted to the wearer's prescription, frame choice, physical measurements and visual habits. They include variable inset and corridor lengths, corridors have been shortened, and the designs are changed considering the prescription's magnification and minification effects.

## LENS CLARITY — ANTI-REFLECTIVE LENSES

When it comes to providing the clearest vision to your patients, anti-reflective (AR) lenses are critical to providing your patients with optimal vision.

Recommend AR lenses to all your patients because it is best for all patients. Its performance has been shown to provide the most patient satisfaction and, as a result, the least issues for the optician.

Surface reflections are also increased as index increases. As a result, it is important that all lenses, especially high index lenses, include anti-reflective treatment. This is why the Essilor Thin&Lite 1.74 lenses are always delivered with an integrated AR. How is the best AR constructed and how does it work?



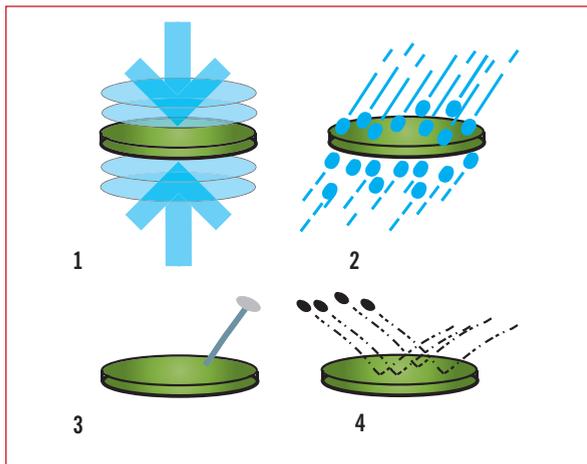


FIG. 3

High performance AR (Fig. 3) is composed of a combination of the following:

- Bare front and back lens surfaces
- Special hard coat applied directly to the lens surface (1)
- High energy bombardment etches and activates the surfaces (2)
- Application of the anti-static layer
- Application of a specialized AR stack of low and high index materials (3)
- Application of the super hydrophobic, oleophobic treatment (4)
- Essilor patented Pad Control Layer is required to allow for edging
- Systematic QC inspection.

All of this results in more transmission, highly durable, easy-to-clean and stays cleaner longer lens for your patients/consumers.

AR lenses improve visual acuity, and the overall aesthetics of glasses. They allow more light to reach the eye, providing better vision and reduced reflections, so patients see better and others see their eyes more clearly. Good AR treatments eliminate glare from overhead lights, computer screens, TVs and headlights. This means that glare that would normally cause eyestrain and fatigue, or make night driving more difficult, is virtually eliminated.

Lesser performing AR does not apply the same scratch resistance to the back of lenses. Since 40 percent of all scratches occur on the back lens surface, double side hard coating of the same quality is important. Then, surfaces are protected by Essilor's patented Pad Control System, which allows easy blocking and lens edging even with the highly slippery hydrophobic surface.

The Crizal Avancé with Scotchgard Protector Lenses addresses every former complaint with AR treated lenses. This AR technology is bonded to the matrix of the lens, more scratch resistant than an untreated lens and never "peels off or crazes" ...in fact I tell them it's guaranteed! Keeping this lens clean is a snap, with Scotchgard; in fact it is so "slippery" that it is actually easier to keep clean than an untreated lens. Finally AR lens treatment allows at least 8 percent or more light to reach your eye, helping with night driving and eliminating annoying reflections, all while enhancing the appearance of your glasses! To quote a colleague, Peter Shaw-McGinn, OD... "Would you like your lenses...with or without glare?"

**James D. Colgain, OD**

Lieutenant Colonel, USAF Retired  
OD/MD Group Practice  
Washington DC and Maryland

## VARIABLE TINT — PHOTOCHROMIC LENSES

Photochromic eyewear is convenient, comfortable, protective and fun. Photochromic lenses include dyes made of molecules that when activated by ultraviolet light (UV), change shape and appear as a color tint. As more molecules change, the darker the lens becomes. Available in all the most popular indices and lens designs, every patient can enjoy the convenience of variable tint lenses.

**ACTIVATION** – In the unactivated state (no UV) the dye molecules remain colorless. The lenses automatically change in sunlight when invisible UV radiation hits the lens surface. Remove UV and the lens becomes colorless. At higher altitude where UV is less filtered, photochromics can get very dark. At sunrise and at dusk, as the sun gets closer to the horizon, UV is filtered through more of the atmosphere and may not be as dark as they are during the brightest times of the day.

To a lesser extent, modern photochromic lenses are somewhat temperature sensitive. In very hot weather, lenses do not get as dark as they do at milder temperatures. However, this is rarely a problem for wearers today.

**SPEED** – In one minute, gray Transitions VI lenses get sunlens dark, 82 percent dark, 18 percent transmission (73°F) and clear fast: 9 minutes to 70 percent transmission. For comparison, after a minute, brown lenses are 78 percent dark, 22 percent transmission and clear to 70 percent transmission in seven minutes.

### COMFORTABLE, CONVENIENT

**AND PROTECTIVE** – Photochromics react automatically and absorb 100 percent of UVA and UVB radiation, linked to cataracts, skin cancers and other ocular conditions. Variable tint lenses ensure that patients are comfortable in any light, minimizing eyestrain and eye fatigue. They minimize discomforting and disabling glare, add AR, and they minimize distracting glare, both night and day.

Tell patients that they can wear photochromics as clear lenses, all day, every day. In fact they work just like clear lenses in all situations like driving, at the computer and for movies and TV. Congratulate them on their sophisticated choice of lenses.



## NO GLARE — TINTS AND POLARIZED LENSES

Glare knows no season so recommend glare protective eyewear to all patients all year round. In this case, sun lenses protect the patient from discomforting, disabling and blinding glare. Medium to dark tints address the first two while polarized lenses can do all three and eliminate blinding glare.

Light and gradient tints can add to the fashion of glasses, just look at the variety of large plano sunwear seen in every Sunday fashion supplement and magazine. The variety of colors and depth of gradients add to an exciting overall look. Use polarized lenses for the most protective and comfortable vision in sunwear. A polarized lens virtually eliminates glare by absorbing sunlight reflecting off water, glass, snow or sand.

Light is horizontally reflected off flat surfaces. Crystals in polarized lenses are arranged to create a vertical polarizing filter that lets only the useful light through. Polarized lenses improve contrast and enhance the visibility of all colors. Available in 1.67 high index, polycarbonate, Trivex and plastic, polarization can deliver the right thinness, lightness and properties personalized for each wearer. Polarized lenses provide 100 percent protection from harmful UVA and UVB rays.

**POLARIZING PEARLS** – Verify the axis of a polarizing

Rx lens by using a plano polarized lens held with its polarizing axis vertical (at 90 degrees). If the Rx lens' polarizing axis is correct (at 180 degrees), the two polarizers when crossed at 90 degrees will be black.

## EYE PROTECTION — RADIATION AND SUNLIGHT

UV radiation is divided into three types, or bands - UVA, UVB and UVC. The ozone layer above the earth absorbs UVC, (200-290nm), but not UVA and B radiation. The UVA and UVB that reaches the Earth's surface contribute to serious health effects. UVB (315-290nm) can be characterized as burning, UVA (380-315nm) are aging rays. UVA causes wrinkling and mottling of the skin, and damages the collagen layer. Both UVA and UVB are known causative agents for cataracts, skin cancers i.e., basal, squamous and melanoma cancer.

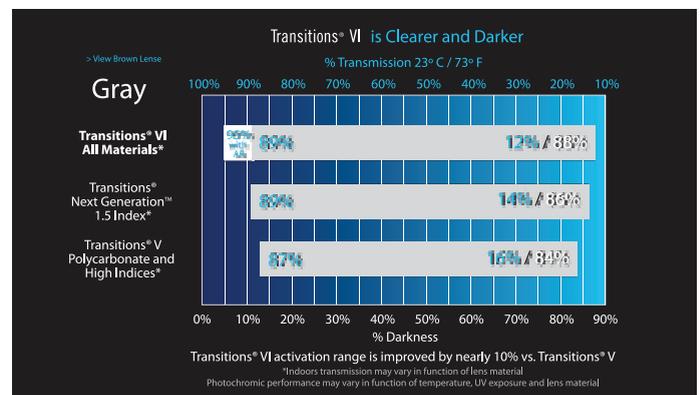
At birth, the lens of the human eye is almost 95 percent transparent and remains quite clear for the first decade of life. As the crystalline lens gradually loses transparency and begins to yellow, the amount of UV penetrating the lens decreases. By age 25, less than 20 percent of UV rays reach the retina. So start with sunglasses young.

Transitions reports that 80 percent of consumers are aware of the skin dangers of sunlight, only 10 percent are aware of the eye dangers.

There is some general agreement among researchers and experts that blue light is the most damaging wavelength to the retina, and most likely to contribute to the development of Age Related Macular Degeneration (AMD). Blue light penetrates to the retina; UV typically does not.

All this means that all lenses should be 100 percent UV absorptive. Using materials like high index, polycarbonate or Trivex and treatments like photochromics and/or polarized ensure that the lenses dispensed are most UV protective for patients. Absorbing blue light requires sun lenses with specific HEV filtering abilities. It also means that all children should be wearing sunglasses to protect the development of their eyes. It is estimated that almost 80 percent of the damage from UV is done by the age of 18.

UltraViolet Absorption	Prescription Lens or Material
<b>Best (~100%)</b>	Polycarbonate, high index, Ultra high index, Transitions All polarized
<b>Better (~96%)</b>	Mid Index
<b>Good (~90%)</b>	Prescription Hard Resin
<b>Worst (~39%)</b>	Crown glass



ACTIVITY/ LENS COLOR	RECOMMENDED MATERIALS, STYLE AND PRESCRIPTION
<b>BASEBALL</b>  <ul style="list-style-type: none"> <li>• Gray or Green</li> <li>• Polarized</li> </ul>	<ul style="list-style-type: none"> <li>• Consider background, day or night games</li> <li>• Mirror reduce the intensity of surface reflections</li> <li>• Include back surface AR and impact resistant materials</li> </ul>
<b>CYCLING</b>  <ul style="list-style-type: none"> <li>• Gray or Brown Photochromics</li> <li>• Some Greens</li> <li>• Most Browns</li> <li>• Red for vibrant and enhanced contrast</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast Brown and Green to see road hazards, high impact for safety</li> <li>• Polarized to reduce scatter and early AM road reflections, wrap-around protects from dust and wind</li> <li>• Low light — Yellow, Red or Orange</li> </ul>
<b>DRIVING</b>  <ul style="list-style-type: none"> <li>• Gray or Brown</li> <li>• Polarized</li> </ul>	<ul style="list-style-type: none"> <li>• Brown to brighten contrast</li> <li>• Polarized for safety to remove blinding reflections, AR for best clarity</li> </ul>
<b>FISHING</b>  <ul style="list-style-type: none"> <li>• Brown, Amber, Gray</li> </ul>	<ul style="list-style-type: none"> <li>• Polarized works best</li> <li>• Gray is darker, Brown enhances contrast</li> <li>• Low light, overcast or dusk try Amber</li> </ul>
<b>GOLF</b>  <ul style="list-style-type: none"> <li>• Green and Brown</li> </ul>	<ul style="list-style-type: none"> <li>• Polarized is a personal preference; always AR</li> <li>• Brown is the color of choice and density can be tuned to personal preference</li> </ul>
<b>MOTORCYCLING</b>  <ul style="list-style-type: none"> <li>• Most Browns</li> <li>• Some Grays and Green</li> <li>• Photochromics</li> <li>• Polarized</li> </ul>	<ul style="list-style-type: none"> <li>• High speed needs high contrast, high impact</li> <li>• Backside AR improves clarity and safety</li> <li>• Polarized may obstruct instrument visibility</li> <li>• Photochromics are great</li> </ul>
<b>SKIING</b>  <ul style="list-style-type: none"> <li>• Orange, Yellow, Brown</li> <li>• Polarized</li> </ul>	<ul style="list-style-type: none"> <li>• High contrast Brown, Amber or Brown-yellow lenses are best, high impact, wrap-around for high speed</li> <li>• Yellow, Orange, Vermillion (high VLT) for low light conditions.</li> </ul>
<b>SWIMMING</b>  <ul style="list-style-type: none"> <li>• Clear, Light Blue, Light Yellow</li> </ul>	<ul style="list-style-type: none"> <li>• AR and flash mirrors are particularly good to diminish the reflection off water</li> <li>• For competitive swimming — clear lenses, flash mirrors and backside AR</li> </ul>
<b>TENNIS</b>  <ul style="list-style-type: none"> <li>• Orange, Yellow, Brown and Clear</li> <li>• Polarized</li> </ul>	<ul style="list-style-type: none"> <li>• General purpose — Yellow tinted lens will pick up the Yellow ball better</li> <li>• Outdoors, Yellow will be too bright and allow in too much light, use Orange or Brown</li> </ul>

## what would you do?

### PATIENT SITUATION

Mr. Diamond, a warehouse supervisor, is in to get his glasses adjusted. He has been wearing flat top 28 bifocals for about 14 years but doesn't appear completely happy with them since his last prescription change (about 4 months ago). He describes the "gymnastics" he does to see everything on his desk and his desktop computer screen clearly when he is in the office. Most of the time he is walking through the warehouse referring to a clipboard and PDA. Distance and near vision appear to be fine – "It's everything in between that's the problem", he says. With a distance Rx of about +1.00 and an add power of +2.25 what might you do?

### SOLUTION

Mr. Diamond now wears his glasses all the time, his bifocals provide good distance and near vision, but his loss of accommodation no longer provides clear mid-range vision. The solutions are simple but require a little explanation.

First, a progressive lens would provide immediate advantages; the blur of the segment for walking around would disappear and be replaced by clear mid-range and continuous vision from side to side as well as distance to near.

This is a good general purpose solution adding AR and the convenience of Transitions for the times that he is outside at the loading dock. However, if that desk work is more than 2 hours a day, a logical other pair of glasses can be a pair of computer lenses or to meet his budget, a pair of FT28 intermediate/near bifocals would work well when he is at his desk. AR is another must here since it reduces the glare from the screen and adds to comfort.

## EYE PROTECTION – IMPACT RESISTANCE

In 1971, the Food and Drug Administration (FDA) implemented the requirement for the minimum impact resistance of all lenses sold for eyewear. Issued in the Federal Register, FDA21CFR801.410 became the standard that requires that all lenses must be shown to withstand the force of a 5/8 inch steel ball dropped 50 inches. This is called the drop ball test.

Since 1971, there have been many changes to the designs, materials and coatings of lenses but the standard remains, all lenses must be able to pass the "drop ball test." As a result, any manufacturer or laboratory must have testing programs in place to show compliance.

Material, lens thickness and coatings affect the final impact resistance of the lens. Again, manufacturers, laboratories and

Our Practice's Vision Statement is "Preserving and Protecting Vision for Life." Macular Degeneration is a leading cause of blindness and one of the controllable risk factors is sun/UV exposure. More people are exposed to sun with their lifestyles. That, coupled with the depletion of the Ozone Layer is allowing more UV to penetrate our eyes and skin, two organs that can be damaged by the sun.

We don't "sell sunglasses," we offer protection against the risks of Macular Degeneration and other damaging affects from the sun. If a patient does not choose a separate pair of sunglasses we move to Transitions, clips, fitovers. Our goal is to protect our patient's precious vision. It makes what we do feel so much more worthwhile than just getting the sale.

**Carole Miller, Optical Lead**  
Optometric Eye Care Center  
Fridley, Minnesota

lens distributors must be in compliance with the law. For more information on your responsibility for the impact requirements, contact The Vision Council ([www.visioncouncil.org](http://www.visioncouncil.org)).

Hard coats like Essilor TD2 and the Crizal AR family use an impact enhancing primer as a first layer when coating lenses. This assures that Essilor lenses have enhanced impact resistance. More than the inherent impact strength of the materials themselves.

### IMPROVE SUNGLASSES BY ADDING AR

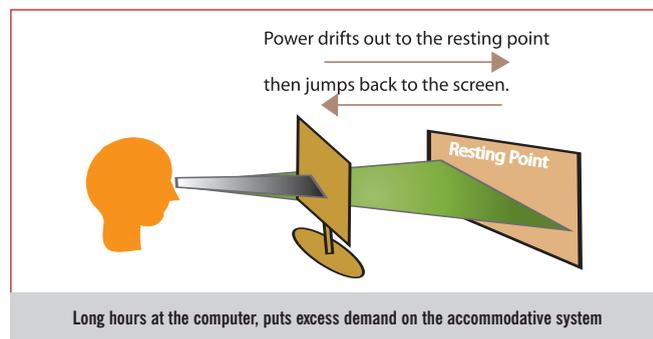
Improve any sunlens by adding AR to the lens back surface. It improves visual acuity by reducing back surface reflections and improving contrast. It also enhances a lens' high performance filtering ability. Dark lenses increase the visibility of normal surface reflections and the back concave shape magnifies the size of the reflection. This can be annoying or obscure vision at the most important time.

Add AR to the back surface and it does the following: makes back surface reflections virtually disappear, improves scratch resistance of many materials, adds a hydrophobic that makes cleaning easier and improves acuity for the most effective vision outdoors.

Adding AR to polarized lenses is straightforward; it does not change the color of the polarizing lens. However, when adding AR to tints, the cleaning process may leach tint and change the color of the final lens. This results in problems. Instead consider Crizal Sun for all sunwear, tints and polarized. Crizal Sun is unique in that it maintains the desired tint color and intensity that is shown to patients. This is a major advancement in sunwear.

Crizal Sun has the superior scratch resistance and cleanability of Crizal Alizé because its hard coat is applied to both sides of the lens. The Crizal Alizé AR layer is then added to the back side of the lens to virtually eliminate back side glare and reflections. For tinted sun lenses, Essilor uses a patented slow-dye technique to allow the dye to penetrate the substrate more deeply, ensuring lasting color and intensity. Crizal Sun is integrated into the lens. An ion gun is fired at the substrate. This ionization process creates a more porous or rougher surface, allowing for better adhesion between the substrate and coating. Crizal Sun will not wear, peel or craze, giving patients the durability they need from their sunwear.

The lens material provides UV protection. It will not absorb any of the activating UV that make photochromics work.

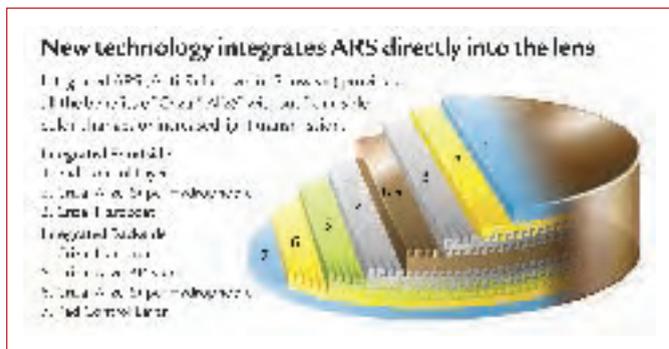


### COMPUTERS ARE HERE TO STAY

It's no stretch to say that 95 percent of your patients use a computer or other electronic devices every day – and many spend well over half their waking hours looking at intermediate or near distances. Why aren't 95 percent of your patients wearing lenses prescribed for these activities? In most cases, it is because they aren't aware of their options or the benefits of well-dispensed intermediate lenses. Don't general-purpose progressives provide intermediate vision? Yes, they do, but not with the width that is needed for all day comfort at the computer.

Remember the corridor narrows as add power increases and in a small frame, short corridor lens, the vertical availability of each power is also reduced. So, the intermediate is okay for non-critical tasks, but for two hours or more per day at the computer, computer lenses work best. How can you solve your patients' intermediate vision problems? The steps are as simple as Ask, Test and Dispense.

**ASK** – Make sure every patient gets asked about their computer use and other intermediate activities. "How many hours each





# Steer Clear of Glare



## Crizal Sun™ on Essilor Polarized lenses maximizes performance for all outdoor activities

Whether you're behind the wheel, swinging a golf club or riding a bike, glare can interfere with vision and cause eye strain while outdoors. Arm your patients with industry-leading anti-glare technology by recommending Crizal Sun on Essilor Polarized lenses.

Only Crizal Sun prevents backside reflections while preserving the original color of the sun lens and delivering on the legendary scratch resistance and ease of cleaning of Crizal lenses. Essilor Polarized lenses block glare, offer complete UV protection and relieve eye strain year round, helping your patients to achieve their finest performance in all conditions.

Crizal Sun Mirrors are now available on Polarized lenses. For more information, contact your Essilor Sales Consultant.

For the most premium Sunwear available...

**Recommend Crizal Sun on Essilor Polarized lenses to all your patients.**



[www.crizalsun.com](http://www.crizalsun.com)



# LAB CONSIDERATIONS



## THE LAB RELATIONSHIP

Your lab is your best resource to discuss the ways to create great looking eyewear, get information on new lens products, and know what lenses have been most successful.

When ordering, be sure that you have all the details needed so the order is placed completely – if anything is missing, the job will be delayed. The lab will call you for the missing data, but a day or more might be lost by the time that you and your lab connect. If you told the patient that the new eyewear would be ready in a week, the patient, of course, has begun counting the days the minute they left your office. A loss of a day or two is critical to meeting the patient's expectation. So, be clear and complete when placing the order.

Contact your lab representative for practice building and promotional programs. Use them to help set practice and product goals and provide the training, literature and point of sale materials needed to accomplish them.

## ONLINE PROCESSING

Electronic online ordering works best – it can ensure that no information is missed and it speeds the process. The benefits of using a web portal like VisionWeb are that orders can be placed 24/7, at your convenience to all of the connected suppliers. Orders go directly to supplier and begin processing sooner than orders that have to be phoned in.

Good laboratories have evolved beyond a mere supplier of goods. The products of today demand close partnerships with manufacturers in order to link the newest technology directly to the practitioner. In addition, labs that provide practice training, promotion, and marketing, supply the practice with the tools necessary to bring their patients the very latest in eyecare innovation.

**Mike Disanto**  
Lecturer, Teacher, Optician

## what would you do?

### PATIENT SITUATION

Eric, a 23 year old competitive mountain biker has a pterygium, a growth on his cornea that the doctor says is irritated by wind, ultraviolet and dust. His Rx is -1.50 sph and -1.75 -0.50 x 90, PD 63. He wears plano wrap sunglasses that he bought at the bike shop but can't see well enough to ride in competition so wears his regular glasses. However, the wind and dust get around the lenses and into his eyes. He has tried prescription wraps before but they were uncomfortable so he returned them. What would you do?

### SOLUTION

Eric needs a pair of wrap prescription riding glasses. First, he must keep all irritation from his eyes so wrap "seals" best, polycarbonate or Trivex lenses are UV and impact protective. Lens color should be tuned to where he competes most, if through the trees, Transitions may be a more versatile solution. Lastly, the lenses should be made with the correct Rx and prism for the wrap angle. Consider wrap Rx providers like Oakley that correctly compensate for the extreme angles of wrap eyewear.

Add the right coatings; back AR to reduce back surface reflections and consider front mirrors for extreme glare reduction, especially at higher altitudes.



# FINAL INSPECTION CHECKLIST

When completed eyewear is received from the lab and before calling the patient, check that everything has been received correctly. Also be sure that the quality, alignment and cleanliness of the glasses are exactly what you expect to deliver. Follow the six steps listed here, comparing the patient record card or electronic file and the lab invoice.

## 1. Complete the Visual Checks.

- A. Lens style, material and treatment
- B. Frame name, size, color
- C. Surface and edging, grooving, drilling quality
- D. Note the base curve and lens manufacturer used on the record card or chart (important for later troubleshooting)

## 2. Measure and Confirm the Mechanical Requirements.

- A. Seg height (top of segment or Fitting Cross to lowest edge of lens)
- B. Seg PD (near PD for RS, FT, FTT or Occupationals)
- C. Distance Monocular PD for inked progressives
- D. Center or edge thickness if specified single vision, Bifocal or Trifocals

## 3. Confirm the Optical Components.

## 4. Record any Variation from the Order in the Patient Record or Chart for Later Reference.

- ## 5. Alignment
- If the visual, mechanical and optical checks are acceptable, complete bench alignment. Confirm that the frame looks good, straight and symmetrical.

- ## 6. Clean-up
- Remove any ink marks, spray the lenses with a lens cleaner and towel dry. Remove any tags or labels not needed. Select the right Luxottica collection case and you are ready to call the patient.

## Single Vision, Bifocal or Trifocal

- A. Measure the strongest lens first; it's easiest to center. The other lower powered lens is then less prism sensitive.
- B. Clamp the lens and center the target (OC) or prescribed prism in the center of the reticle, adjust the stage to be equally touching the bottom of both eyewires.
- C. Verify Rx as ordered and dot the lens.
- D. Unclamp the lens and measure the other lens; do not change the stage position.
- E. Center the OC or prescribed prism horizontally, verify the Rx, dot the center and note any vertical imbalance.
- F. Measure and record PD; are the OCs in the correct position vertically?
- G. If multifocal, verify add as a front vertex measurement.

## Progressive or Near Variable Focus Lenses

- A. For the right lens, verify the distance power in the distance checking circle. Adjust the stage to be equally touching the bottom of both eyewires so the lens is oriented correctly.
- B. Verify the power of the left lens.
- C. Clamp the right lens with the manufacturer's PRP ink dot centered in the opening or stop of the Lensmeter. In Varilux progressives, this is 4mm below the Fitting Cross. Adjust the stage to be equally touching the bottom of both eyewires. Note the amount prism. This is the OC or point of prescribed prism. Prism thinning is considered prescribed prism.
- D. Center the left lens PRP in the stop and record any vertical imbalance. Remember the FC may be of different heights so the imbalance is the difference between the values at the PRP.
- E. Confirm add power using the engravings. The engravings also confirm right and left lenses, material and manufacturer. To confirm add on the lensmeter, verify add as a front vertex measurement or use a automated lensmeter that has a back vertex compensation factor built in.

# GLOSSARY

**ABERRATION** - Optical system image defects; rays of light emanating from an object-point fail to form a perfect image-point.

**ACCOMMODATION** - The eye's ability to clearly see objects at close distances.

**ADDITION** - The optical power (of a lens) required for near vision, in addition to that required for far vision.

**AMBYLOPIA** - Amblyopia, or lazy eye, is reduced visual acuity that cannot be improved by wearing eyeglasses.

**AMD** - Age-related macular degeneration, a disease that damages the macula, the central part of the retina, leading to a loss of central vision and leaving only the peripheral or lateral vision intact.

**AMETROPIA** - Eyesight disorders that prevent a clear image from forming on the retina (myopia, hyperopia, astigmatism).

**ASTIGMATISM** - An irregularity in the curvature of the cornea, resulting in unequal blur in the two principle meridians.

**BIFOCAL LENS** - Lens with two points of focus, designed to relieve presbyopia. The lower part of the lens allows near vision; the rest of the lens is designed for far vision.

**CATARACT** - Opacification of the crystalline lens. An extraction of the lens is usually replaced by an intra-ocular lens (implant).

**COATINGS** - Applied to corrective lenses after surfacing to be scratch-resistant, anti-reflective, polarizing, color, anti-static, anti-smudge.

**CONTACT LENSES** - Small soft or rigid lenses floated on the tear film over the cornea to correct eyesight.

**CONVERGENCE** - Reflex that enables the eyes to focus on a single point in near vision.

**CORNEA** - Transparent front part of the globe shaped like a slightly domed cap. It is the primary focusing structure with the lens.

**CORRECTIVE LENSES** - Corrects eyesight disorders and is a combination of material, optical surface and coatings.

**CRYSTALLINE LENS** - Transparent biconvex lens located behind the pupil; refracts light to focus images on the retina.

**DIOPTER** - Optical system with a focal distance of 1m. Refraction defects are measured in diopters (visual insufficiency).

**DIGITAL SURFACING** - Precise surface cutting using single point turning; cutting height is controlled at all points on the lens.

**EMMETROPIA** - Clear and comfortable eyesight in both far and near vision. Emmetropia is the opposite of ametropia.

**FOVEA** - Small depression in the central part of the macula measuring located close to the optical axis of the eye.

**GLAUCOMA** - Increase in intra-ocular pressure resulting, if left untreated, in an irreversible deterioration of the optical nerve and of the retina, as well as an alteration of the visual field, i.e. a reduction in visual performance, often accompanied by headaches and aching eyes.

**HALF-EYE LENSES** - Lens for near vision only shaped like the lower half of a normal lens.

**HYPEROPIA** - Far-sightedness, an eye that is too short and/or insufficiently powered. The image forms behind the retina, which explains why the hyperopic subject has better eyesight in far vision than in near vision. In cases of mild hyperopia, the subject sees correctly in far vision by compensating the hyperopia through accommodation. In cases of severe hyperopia, the eye can no longer compensate in this way.

**INTRAOCULAR PRESSURE** - Fluid pressure exerted inside the eyeball (ocular globe), which keeps the wall taut.

**IRIS** - Circular membrane that delimits the pupil. The iris acts as a diaphragm that contracts according to the intensity of light.

**MACULA** - Central part of the retina. Composed uniquely of cone cells and enables precise vision.

**MYOPIA** - Near-sightedness, an eye that is too powerful or too long. The image forms in front of the retina; a person with myopia thus sees badly in far vision but well in near vision.

**OCULAR GLOBE** - The eyeball, about 25mm in diameter when emmetropic.

**OPHTHALMOLOGIST** - Physician, surgeon specialized in the treatment of eye diseases, conditions and eyesight correction.

**OPTICAL CORRECTION** - Combination of the curvatures of the front and rear surfaces of a lens, measured in diopters.

**OPTICIAN** - Eyecare professional, designs and adapts eyeglasses in accordance with measurements specific to each wearer.

**OPTOMETRIST** - Eyecare professional, conducts refractive examinations, fits contact lenses and assesses overall eye health.

**ORGANIC/PLASTIC LENSES** - Organic lenses are made from a "polymerized" resin.

**PHOTOCHROMIC** - Variable tint lens that can darken or lighten depending on the presence of UV.

**POLYCARBONATE** - Lens material characterized by lightness, impact resistance, high refractive index, UV absorption.

**PRESBYOPIA** - Eyesight disorder caused by the aging of the crystalline lens, which with time thickens and loses its

suppleness. As the crystalline lens becomes more rigid, it changes shape less easily and the subject sees less and less well in near vision.

**PRESCRIPTION LABORATORIES** - Transforms semi-finished lenses into finished lenses and then edges and glazes into frames.

**PROGRESSIVE LENSES** - Corrects presbyopia by varying optical power progressively from an upper to lower part. No lines.

**PUPIL** - Central opening of the iris through which rays of light enter the eye. The diameter depends on ambient light.

**REFRACTIVE INDEX** - Characterizes the way a transparent optical material bends or refracts light.

**RETINA** - Light-sensitive membrane at the back of the eye on which object images are formed and which transmits information to the brain. This hypersensitive membrane plays an essential role in the perception of light, colors, details, shape and movement.

**SEMI-FINISHED LENSES** - The front surface is finished and the rear face is surfaced on demand.

**SINGLE VISION LENSES** - Correct ametropia or presbyopia. The power is the same over the entire lens.

**STRABISMUS** - Eyesight disorder related to a defect in the parallelism of the visual axes. Early detection in children is vital in order to avoid any risk of amblyopia. There are three forms of strabismus.

**SURFACING** - The grinding and polishing of a lens surface.

**VISUAL ACUITY** - Ability to discern the details of an object. A normal average eye an angle of one minute of arc (1/60th degree).

“Yoga and meditation allow me to center and regroup myself from the hecticness of modern life. As I believe in trying to live and perform at my own highest level, Luxottica’s devotion to excellence resonates well with me.”

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