

Purchasing a pair of eyeglasses can be an intimidating experience for many people, even though over 50% of all Americans use some type of prescription eyewear. Patients typically only buy glasses every few years, so it's difficult to stay abreast of changes in technology, styles, brands and pricing. The goal of this brochure is to educate patients on eyeglasses and the buying experience so they will make the decisions best suited to them.

Lens types

Single vision lenses are intended to correct for one of the two common types of refractive error – nearsightedness (myopia) or farsightedness (hyperopia) – and may also correct for astigmatism. For example, patients with myopia have difficulty seeing objects in the distance, so the lens is made to improve distance vision.

Multifocal lenses correct for more than one refractive error. The most common multifocal lens is the **bifocal** lens, where the upper portion of the lens is corrected for distance viewing and the lower portion of the lens is corrected for near viewing (14 – 20 inches). **Trifocals** add a third segment, typically just above the near segment, to allow for intermediate viewing (20 – 36 inches). With traditional bifocals and trifocals, the near and intermediate segments are distinct, so they are often referred to as **lined bifocals** or **lined trifocals**.

Progressive lenses were developed in 1958 to eliminate the lines on bifocals and trifocals that many patients find bothersome. Progressive lenses also allow both distance and near vision, but provide a gradual transition between the different segments. Because there are no lines, progressive lenses are often considered to be more attractive than lined bifocals or trifocals. Varilux™ is perhaps the most widely known brand of progressive lenses and, because the Varilux™ company is so confident that patients will like its lenses, they offer a no-risk 60-day trial for these lenses.

Lens materials

While emeralds and crystals were used by the affluent as vision aids as early as the Roman era, **glass** lenses were the most common lens material from 1,000 A.D. until the 1980's. Glass lenses continue to be available today, although they are heavier, thicker, less protective and less cosmetically appealing than other types of lenses.

Plastic lenses were first introduced in 1962 and became more popular than glass lenses in the 1980's. Traditional plastic lenses are as thick as glass lenses, but they are much lighter.

In 1983, the **polycarbonate** lens became commercially available. Polycarbonate lenses were lighter, thinner and more scratch-resistant (when combined with scratch coating) and impact-resistant than glass or plastic lenses, but the optics in these lenses were still not as sharp as glass or plastic lenses. In the past twenty years, the optics quality of polycarbonate lenses has improved dramatically and, because they are the most impact-resistant lens available, they are recommended for all children as well as for safety glasses.

Several years later, **high-index plastic** lenses were introduced with great fanfare, since they were light, provided excellent optics, good scratch protection, and eliminated the 'Coke-bottle' look for patients with high prescriptions. While high-index lenses are more expensive than regular plastic lenses, high-index lenses are the best option for over half of all patients when considering the weight, thickness and cosmetic appearance of the lenses.

Photochromatic lenses, which darken when exposed to bright light and become transparent when in dim light, were first introduced by Corning in the 1960's. The most common photochromatic lens today is the Transition™ lens. The speed at which these lenses change color has improved dramatically in the past ten years, but their popularity is waning as sunglass clips become

popular and more cost-effective additions to regular eyeglass frames. In addition, the photochromatic lenses require direct exposure to sunlight to change, so they are not as effective in a car with closed windows.

Polarized lenses are available in non-prescription and prescription sunglasses as well as sunglass clips. Polarized lenses reduce the glare coming from objects you are viewing, such as a wet street, windshield, oncoming cars and snow. In particular, fishermen find that polarized lenses provide significant vision improvement in lakes and rivers on sunny days. An in-office tool can quickly demonstrate the usefulness of polarized lenses.

Lens options

Once you select a lens material, you can also select whether to add the following options:

Scratch-resistant coating can be applied to plastic lenses; they generally are a standard feature on progressive, high-index, photochromatic and polycarbonate lenses. The coating provides a harder finish to the lens, making the lens more scratch resistant. Depending on the optical store, patients who purchase this coating may receive a no-cost twelve-month scratch warranty, where each lens will be replaced once if it becomes scratched in the year following the lens purchase.

Anti-reflective coating is a multi-layered coating that reduces lens surface reflection and improves vision by allowing more light to pass through the lens. Without anti-reflective coating, eyeglass lenses have a tendency to produce glare, reflections and halos around lights. Anti-reflective coating reduces these distortions and the lens reflections that other people see on your glasses when they look at you. Early versions of anti-reflective coating wore off easily, but current coatings such as Crizal and Zeiss Advantage eliminated these problems. A one-year no-cost warranty is provided with these anti-reflective coatings.

Ultraviolet coating is an additional lens application that blocks ultraviolet A (UVA) and ultraviolet B (UVB) emissions from the sun. Research suggests that UVA and UVB may cause early cataract formation, macular degeneration and eyelid damage.

Tinted lenses are an option for patients who are particularly sensitive to bright lights and sunlight. While tinting is an affordable option, it often reduces a patient's vision in dimly lit environments. Many patients now find more success with photochromatic lenses, prescription sunglasses or regular glasses fitted with a removable sunglass clip.

Frame options

Selecting the right eyeglass frame for you can be exciting, particularly if you want a new 'look.' Your optician can help you find the frame material, size, shape and color that best suits you, although many patients rely on a family member or friend for final approval. Just like in the clothes industry, there are a wide variety of eyeglass frame styles, and cyclical trends may dictate what is 'hip' now. For example, large eyeglasses were quite common in the 1970's, and after two decades of 'smaller is better,' it is now fashionable to again wear oversized sunglasses. The list below includes some of the features that you should consider when selecting a frame:

- **Size** – While smaller frames are still the norm for prescription eyeglasses, bifocals and progressive lenses do require a minimum frame size in order for the lens to function properly. Larger frames provide a wider field of vision, but dramatically increase the weight and edge thickness of the lenses.
- **Shape** – Eyeglass frames are quite varied, so lens shapes may be round, oval, rectangular or any combination of shapes. The popularity of lens shapes is subject to fashion trends, and the shape of a person's head may lend itself to a few specific lens shapes.

- **Material** – Frames can be constructed from plastic, stainless steel, titanium, metal alloy, and other derivatives of plastics and metals. Each material varies in terms of weight, flexibility, durability and cost. In addition, rimless frames are also widely available and minimize the cosmetic presence of eyeglasses.
- **Hinges** – In addition to the traditional hinges on eyeglass frames, many frames have spring hinges that bend in both directions. This feature is particularly important for children and active adults who are more likely to have their glasses hit by balls, toys and other people. Without spring hinges, the force of a blow may damage the frames; with spring hinges, the glasses are more likely to flex with the impact and then return to the original shape. Finally, due to flexible materials like titanium, some frames may have no hinges, eliminating the opportunity for lost screws and enhancing the durability of the frame.
- **Nosepieces** – Virtually all metal and metal alloy frames rest on the nose using 'floating' nose pads, while plastic frames often rest directly on the nose. When nose pads are used, a smaller area of the eyeglasses is in contact with the nose, which may increase comfort. In addition, nose pads are adjustable for those of us with noses that are narrow, broad or slightly askew. Before purchasing a frame without nose pads, be sure the frame properly rests on your nose.

Specialty glasses

While less commonly sold than general-purpose eyeglasses, the following types of specialty eyeglasses are available:

- **Computer** glasses generally have single-vision lenses corrected to crisply see objects 18 – 30 inches away. Because the lenses are corrected for only one distance, the patient can view the entire computer screen from all

areas of the lens, reducing distortions, eye fatigue and neck pain.

- **Reading** glasses are similar to computer glasses but are corrected to see objects 14 – 16 inches away. These glasses are ideal for reading books and newspapers or for hobbies that require fine near vision. Less expensive over-the-counter reading glasses can be used for this purpose if a patient has limited astigmatism and needs the same correction power in both eyes.
- **Sports** glasses and goggles are form-fitting eyepieces with sturdy frames and polycarbonate lenses that can safely withstand the impact of collisions, racquetballs and other traumatic events.
- **Hunting** glasses are made with sturdy frames and polycarbonate lenses that can withstand the rigors of hunting and provide needed eye protection. In addition, the lenses are often corrected to specifically enhance distance vision, and a yellow tint may be utilized to increase vision in dimly-lit environments.

Opticians

Anyone can be an optician – someone who is a hammer salesman this week could decide to be an optician next week – but the best opticians have years of experience and certification in their field. The American Board of Opticianry is a national organization that certifies those who dispense and work with spectacles. Certification is voluntary and the test is quite difficult, but successful completion and maintenance of the certification is evidence of the skill and dedication of the optician.

Opticians play many key responsibilities. They assist patients in selecting the correct style and material for the frame and lenses, as well as the lens options that will be useful. They take key measurements to prepare for the manufacturing of the lenses, and they work with the laboratory to ensure the lenses are made correctly. Most

patients find their eyeglasses need adjustments after a few months of wearing, if only from putting them on and taking them off, and performing adjustments without breaking the eyeglass frame is a true art. Finally, with their strong understanding of optics, the best opticians are expert problem solvers when patients have vision problems with their glasses.

Guarantees and warranties

Guarantees and warranties vary widely by optical store, with some stores providing these at no charge, while others will provide warranty coverage for a fee of \$30 - \$50. A reputable provider of eyeglasses will provide the following guarantees and warranties at no cost:

- A satisfaction guarantee allowing you to return your glasses, for any reason, within 90 days of purchase for a full refund.
- A one-year warranty on any scratch coating purchase you make, limited to one free remake per lens.
- A one-year warranty on any anti-reflective coating purchase you make, limited to one free remake per lens.
- Free cleaning, adjustments, hinge screw replacements and nose pad replacements for the life of your glasses.

Eyeglass prices

Eyeglasses come in a wide range of price ranges, from \$50 to well over \$1,000 for exclusive brands. Consumer Reports noted in June 2001 that, based on their survey of readers, the average price for a pair of glasses was approximately \$195. The survey, based on 64,000 responses, revealed the following prices by category:

Eyeglass seller	Average price
Ophthalmologist/optometrist office	\$197
Lenscrafters	\$201
Pearle Vision	\$208
Eyemasters	\$219

In general, Consumer Reports readers tend to be more cost-conscious than the average shopper. For example, the 2001 Consumer Reports revealed that half of its readers had purchased scratch-resistant coating, while in the Midwest this percentage is closer to 80%. The market share of progressive lenses and high-index lenses has also grown considerably since 2001, further increasing the average price of eyeglasses.

Economy eyeglasses

You'll undoubtedly see advertisements for "Two pairs of glasses and an exam for \$89" from discount retailers. In the Consumer Reports study, the largest discount retailer in the Midwest did provide the lowest costs as advertised, but it also was the worst-ranked seller overall and in terms of service, quality and speed. Patients using this discounter had almost three times as many problems with their eyeglasses as the average for all sellers.

Discount eyeglass sellers are able to provide these low prices by purchasing discontinued frames and lenses in large lots. Because the manufacturer no longer produces the frames, these frames are essentially disposable; when the frames break, they often cannot be repaired by the seller. Similarly, lens styles made by Varilux™ and other manufacturers that were discontinued over 20 years ago are still being sold by discounters

These discounters typically do not provide warranties or guarantees on their products. In addition, although the majority of eyeglass sellers will remake lenses for free if the doctor has to refine the eye prescription, discount eyeglass sellers may charge full retail price for the new lenses.

Discount eyeglass sellers serve a useful purpose, since not everyone can afford to spend \$200 on a pair of eyeglasses. However, patients should understand that in exchange for low prices, they

may be sacrificing the quality of the product and optician, as well as speed and service.

Two-for-one sales, etc.

In the marketing world, savvy advertisers understand that 'two-for-one,' 'half-off frames,' and '\$100 off' sales grab and keep patients' interest. Consequently, for those chain eyeglass retailers that advertise, these offers are much more common than 'check out our fairly-priced glasses.' However, once these special offers are applied to high beginning retail prices, the final price is on average more expensive than prices found at independent retailers, as noted by the 2001 Consumer Reports survey listed above.

National chains are able to purchase eyeglasses and lenses at lower costs than local and regional retailers. However, annual reports for these national chains indicate that the chains spend 7 – 10% of their receipts on advertising, more than eliminating the purchasing power that they hold over smaller optical shops owned by doctors.

Comparison shopping and brand names

The 2001 Consumer Reports survey evaluated optical sellers in four areas: quality, service, speed and cost. If cost is the patient's primary concern, they should be encouraged to compare prices at different optical sellers. While it may be difficult to compare eyeglass frame costs unless the same frame is stocked by each seller, the comparison of lenses is quite easy.

Well over half of eyeglass frames on the market are designated with the brand name of an optical manufacturer, fashion company or celebrity. In particular, celebrities will allow manufacturers to use their name on frames for a licensing fee, and the popularity of the celebrity may not correlate to the quality of the frame. In evaluating the quality of the frame, look past the brand name and ask the optician to comment on its quality.