

POLYCARBONATE

LENSES
& FRAMES

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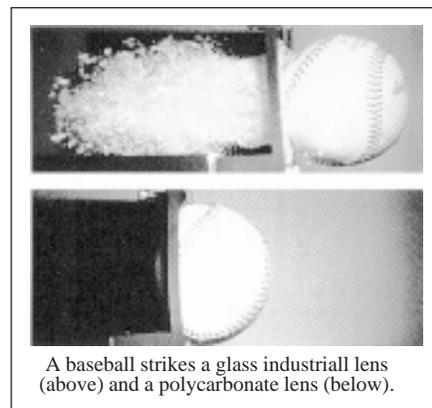
Every year, there are thousands of accidental ocular injuries that are preventable. Many of the injuries occur because there was no eye protection. Other injuries occur because the injured party's glasses were made with standard plastic (CR-39). Most injuries, however, occur during sports activities.

We all know that it is important to consider patients' chances of incurring eye injuries at work and play and to prescribe accordingly; but it's difficult to know which patients need extra protection. That's why many optical shops recommend safety lenses for most patients.

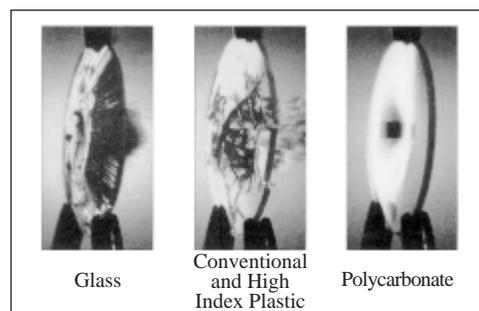
The standard of care for ophthalmic dress lenses is unclear. The last governmental word on the subject is a 1989 ANSI description (Z87.1-1989). The FDA and the US. Occupational Safety and Health Administration require prescription spectacle lenses to be tested by dropping a steel ball onto the lens from 50 inches. For dress wear, the ball is 16 grams and 5/8 of an inch in diameter. For industrial use, the ball is 68 grams and 1 inch in diameter. The velocity of both balls is 11.2 mph., much less than the usual forces that cause eye injury. The test reflected the impact resistance of CR-39 and tempered glass, the lens materials of the day.

Today, however, we have polycarbonate. This material far exceeds the impact resistance of all other lens materials on the market. Please see the two graphics on this page. A 40 lb. steel plate dropped from three feet can't break a polycarbonate lens bridging two timbers. When first used for industrial safety glasses in 1978, the optics were below par and the lenses scratched easily. But by the mid-1980s, the manufacturing processes had improved. The lenses now essentially have the same optics as glass, and improved coatings make them as scratch-resistant as CR-39 plastic treated with anti-scratch coating. Polycarbonate is more effective at absorbing ultraviolet light than glass or CR-39 plastic. It's also thinner and lighter than glass and regular CR-39.

The only problem with polycarbonate lenses occurs with patients who have worn other types of lens materials. Polycarbonate lenses are thinner than the other lens materials and will refract (bend) the light slightly different than the other lens materials. In 30% of patients converting from other lens materials, this difference slightly distorts their vision and they are unable to adjust to it even though their vision is clear in the center of the lens. Those patients need to stay with the same lens material to which they are accustomed. Fortunately,



A baseball strikes a glass industrial lens (above) and a polycarbonate lens (below).



Photographs of these high velocity experiments are reproduced here exactly as filmed, without retouching.

polycarbonate lenses are warranted. If you cannot adapt to the lenses within one month, the lenses will be replaced at no charge with conventional lenses.

In short, this material is now appropriate for everyday and industrial wear. So, although the FDA and OSHA have not updated their standards to reflect polycarbonate, it's still important for us to educate our patients to the potential dangers from spectacle-shattering forces.

As it is difficult to prevent accidents, it is also difficult to predict who will be exposed to such accidents. That's why many optical shops recommend polycarbonate lenses for almost everyone. The only time they don't is if a desired lens quality is unavailable in polycarbonate - such as powers available only in CR-39 or glass, iseikonic lenses, double-D segment and quadrafocal lenses.

It is not being suggested that lower-impact lenses should be eliminated. We do feel, however, that our patients should be informed about polycarbonate lenses. There are a few other facts of which you should be aware when you purchase lenses.

- Proper selection and use of eyewear is critical to your eye safety. No single pair of eyeglasses is best for all situations, so make sure you consider how your eyeglasses will be used before deciding whether to wear dress, safety or sport eyewear.
- Your new eyeglasses will be dress eyewear, not safety spectacles, unless you specifically request safety lenses.
- If struck with sufficient force, the lenses can break into sharp pieces that can cause serious injury to the eye, or blindness. Even if the lenses do not break, the force of impact may cause the lenses or spectacle frame to contact the eye or surrounding area, causing injury.
- If your occupational or recreational activities expose you to the risk of flying objects or physical impacts, your eye safety may require special safety spectacles with safety lenses, side shields, goggles or a full face shield.
- **SPORTS EYEWEAR:** Many sports present unique eye safety risks. Neither dress eyewear nor industrial safety eyewear are designed to protect against these special risks. As a result, special eyewear designs have been developed for a number of sports. The standards for such eyewear vary according to the sport for which they are designed, so it is important to base your selection on how the eyewear will be used.

POLYCARBONATE lenses are especially recommended for children's glasses:

- Strongest and safest lens material available.
- More impact resistant than glass, conventional, or high index plastic.
- Come with a scratch-resistant coating.
- Safest, lightest and thinnest material available.