ANTI-REFLECTION COATED LENSES

When tinting lenses that are to be AR coated, we recommend that they be tinted at least 10 to 15 % darker than the final desired shade. Then neutralize them back to 5% darker than the final required shade. This will remove all tint from the surface and compensate for the color being reduced about 5 to 7 % by the AR process. Lenses to be AR coated can be very sensitive to incorrect UV tinting. BPI® XP-Tints™ are special fade-resistant colors for AR coated lenses.

We recommend only using BPI® Diamond Dye™ XL. Do not overheat or boil the tint and avoid leaving in the BPI® Diamond Dye™ solution for too long. The shortest period of time in the tint tank is best. All tinting and UV treatments, edge polishing, faceting and engraving must be done before AR coating. After the AR coating process is completed lenses can be grooved or edge coated.

POLYCARBONATE LENSES

Polycarbonate lenses have always presented a challenge for those who wish to tint them. With lenses made from CR-39® monomer plastic and BPI®Molecular Catalytic™ tints the tinting process is much more straight forward. These tints use a carbon molecule that shares an electron with the carbon molecule in the plastic, so that the tint bonds to, and becomes part of the lens structure itself. The end result is that the lens cures in the tinting process and has a more scratch-resistant surface. Polycarbonate, unfortunately, is very resistant to tints. To tint polycarbonate lenses one must tint the scratch coating and the better the scratch coating the harder it is to tint. The first type of coatings that were applied to polycarbonate were so resistant to tints that obtaining a sunglass shade was almost impossible.

In recent years, the types of coatings that are used on polycarbonate lenses have changed considerably. It is much more common today to see a combination of coatings used on polycarbonate. Typically, the front surface, which tends to receive the most scratches, has been very effectively coated by the factory. The back surface is now commonly coated by the optical lab. The coating on the back surface is definitely tintable, even to relatively dark shades. We recommend that you contact your manufacturer or source of polycarbonate lenses and ask them about their tintable coatings. Some types of polycarbonate tint better than others. There are some fundamental principles for tinting polycarbonate that will help you considerably. (Many of these ideas apply equally well to tinting plastic lenses).

BEFORE TINTING: Ensure that both lenses are from the same source, preferably the same batch number. Polycarbonate and lenses made from CR-39® monomer vary significantly from different manufacturers and from manufacturer's batches. Clean the lenses with BPI® Lens Prep II™. This conditions the surface of the lens and reduces the surface tension of the scratch coating. Check your lens tinting instrument thoroughly. Make sure that it is reaching and maintaining a steady temperature. Check the heat transfer fluid. If it looks old, replace it. (See page 170 for test). Always use a quality product like BPI® GL-77™. Use of other substances is not recommended and can be hazardous to your health. Ensure that the tint tank is immersed sufficiently into the BPI® GL-77™ in accordance with the manual of your lens tinting instrument. Mix the tints with distilled water. This will eliminate the possibility of any mineral contamination that may exist in your local water supply. Mix and stir the tints well. Also, continue to stir the tints at regular intervals. If you notice patches of unevenness (blotches) in the tinted lenses, it is time to change the tint. Check the temperature of your tint bath with a quality laboratory thermometer to ensure that the operating temperature of the tints is between 205°F and 210°F. (96 - 98.9°C) Polycarbonate (or lenses made from CR-39® monomer) will not tint properly at even slightly cooler temperatures. Finally, the coatings of polycarbonate lenses will absorb moisture from the air. This can create difficulty for the coatings to absorb tints. Reduce the exposure of the lenses to high levels of humidity (For instance, around a steaming tint bath) prior to tinting.

DURING TINTING: Determine for yourself a standard for the particular tint that you are using. Use a sample lens with a freshly mixed batch of tint. Ensure that all the conditions above have been fulfilled. Tint the lens for 15 minutes. Rinse dry and set aside. Test future lenses that you tint with that color against the standard after 15 minutes. When the tint ceases to match the standard, change the tint. A common mistake is trying to get more lenses from each batch of tint than is practical. It is much less expensive and time consuming to change the tint regularly than it is to keep pushing the numbers of lenses out of every batch. Limit the amount of time that the lens spends in the tint or neutralizer. You should not exceed a half hour. If you are typically spending longer, then check the temperature and, if correct, you should change your tint.

NEUTRALIZING: If you need to neutralize your polycarbonate lenses, use a top quality water-based neutralizer like BPI® H20 Neutralizer™. Keep the temperature of the neutralizer below 210°F (98.9°C) and do not exceed about ten minutes in hot neutralizer. Incorrect neutralizing can cause crazing of the lens.

ACRYLIC LENSES

Acrylic lenses can be tinted with BPI® Acrylic Tints. These are available in a range of six colors. To use: mix part A and B together. Bring to 165°F/175°F (74 - 79°C) in a lens tinting instrument. Allow to stand for 15 minutes before tinting. To avoid streaks and spots, do not agitate the tint bath. Dip the lens to be tinted into warm Lens Prep™. Then into the tint solution. After tinting, dip again into the BPI® Lens Prep™ and rinse with cold water. Lenses can be neutralized with BPI®

TRIVEX®

Trivex® is a new lens material that absorbs tint very rapidly. To get long lasting results, it has been found that lowering the temperature of the tinting solution slows the absorption rate of the material. The manufacturers of Trivex® recommend lowering the tinting temperature to 160° F. (71° C.) You may find that at this temperature, color correction will be required. Tinting at higher temperatures can result in uneven densities and higher levels of fading.

TINTING PERFECT GRADIENT LENSES

If you are doing machine gradient lenses and your finished lenses show a pronounced line of demarcation rather than a gradual fade, you are probably coloring with too hot a tint solution. For fashion tinting and gradients, 190-200°F. (88 - 93°C) is suggested. The reason for this is that most gradient systems, when going through a cycling process, have "steps" at which a momentary hesitation occurs before going on to the next step and more tint is absorbed at this point. A similar effect may be due to the presence of solvent on the surface of the lens, or a lack of preparation with BPI® Lens Prep II™.

Aside from temperature reduction, another way to accomplish smoother gradients is to re-adjust the "L" rod (which holds the lens holder) at the nylon swivel about 5 mm to alter the "steps" or grade on the lens. A dip by hand into hot BPI® Lens Prep II™ solution with the light lens area at the bottom, will help reduce lines. Or, the whole lens may be dipped into the tint for a few seconds.

A single gradient is an attractive and functional lens. The top of the lens is darker than the bottom, that is, it may be 80% absorptive at the top and as little as 10% - or clear - at the bottom. The simple technique involves turning the cleaned lenses upside down in the lens holder. The horizontal axis must remain horizontal or the lenses will have a slanted look in the frame, and will appear to be improperly tinted.

A double gradient is achieved in the same manner as the single, except that the first gradient is usually from the top of the lens to the center or below, and the lower gradient is from the bottom up. For other multicolor effects, such as 3- and 4- colored lenses, first tint the whole lens to the central shade. This is usually a light color. Then the top and bottom gradient colors are added to accent the cheek tone. The center colors usually accent that of the eye. This effect can be quite dramatic when done properly. If lenses are edged after they are colored, the resulting light edge will detract from their appearance as well as create an annoying reflective glare. It is, therefore, recommended that lenses be tinted after they are edged.