

GP Lens Modification

Before You Begin: Not all GP lenses can or should be modified. Make sure that you know the specifics of the lens you are attempting to modify.

Menicon Z undergoes an ionization process that could be damaged by lens modification. Modifications applied to any lens that has undergone a plasma coating process will damage the coating and affect the wettability of the material, resulting in a surface that is not as wettable as before the modification. Therefore, the lens **should not** be modified unless it is possible to return it to your lab for re-coating. High Dk fluoro-silicone acrylates need to be modified with care as heat builds quickly in these materials and can damage the optics and/or negatively affect the wettability of the material.

Lens designs with a posterior aspheric surface **should not** have modifications performed to the posterior surface. The anterior surface may still be polished.

Modification Tools: Your CLMA lab can help you obtain these supplies.

Modification Unit

Modification Sponge

Diamond impregnated peripheral curve tools

Peripheral curve polishing tools

Diamond impregnated 90 degree and 120 degree CN tools

90 degree and 120 degree CN polishing tools

Spinner

Suction cups for concave and convex surface

Polish (such as Sil-O₂-Care or Mirro-Polish)

Polishing pads for tools

When performing modifications, be sure to keep the surface of the modification tool very wet. Diamond impregnated tools can be kept wet with water. Polishing sponges and pads should be moistened first with water and then thoroughly saturated with polish. A failure to do so may allow too much heat to build and damage the lens surface.

Clean and Polish

GP lenses can be cleaned and polished to remove lens deposits and to smooth the edges or remove small scratches. To perform this modification you can use either a spinner tool with a suction cup to hold the lens, or in the absence of a spinner tool, a suction cup alone can be used. The two techniques, while accomplishing the same end result, are performed differently. Prior to performing **any** modification to the front surface of a GP lens be sure to check the power of the lens prior to modification. Polishing techniques performed incorrectly may result in a power change to the lens. You must know what the power was prior to polishing so you can make an appropriate power change (addressed

later in this handout) after polishing if necessary. When using the suction cup **without a spinner**, place the lens on the suction cup concave side (posterior surface) against the suction cup. A thoroughly saturated 3" inch sponge is used to polish the anterior surface of the lens. Remember that the center of the sponge spins at a slower rate than the outer edge of the sponge. Place the lens in the very center of the sponge and depress it into the sponge until most of the front surface of the lens is in contact with the sponge, then rock the lens side to side two or three times. Remove the suction cup and lens from the sponge, rotate the suction cup one quarter of a turn in your hand, dip in into a cup of cool water, apply a few drops of polish to the center of the sponge and then repeat the polishing process. Perform the "rocking" process four times, remembering to cool the lens in a cup of cool water and apply more polish to the sponge between each "rocking" process, and check the lens surface.

If using a spinner, you will simply be able to allow the lens to rotate on its own. However, you will use a different position of the sponge. I prefer to use the area directly between the center and the outer edge. Hold the lens at a neutral angle, about 45 degrees from the surface of the sponge, and lightly polish the surface. Allow the lens to remain in contact with the sponge for only 4 or 5 seconds then dip the lens in a cup of cool water to cool the lens surface. The polish may be applied either by continually dripping the polish in front of the lens as it is spinning on the sponge or applied liberally between each 4 or 5 seconds polishing cycle.

A cone sponge tool can be used to polish the posterior surface of a lens, but caution must be used to avoid changing the base curvature. I prefer to only do this if there is a significant protein build-up that cannot be removed any other way. Only polish lightly and make sure the sponge is thoroughly saturated with polish.

Edge Polish

It is sometimes necessary to polish the edge of a GP lens to remove a small edge chip or to smooth and round an edge with an improper apex. This modification can be performed with a suction cup and a modification sponge with a central hole. Thoroughly saturate the sponge with polish and place the lens on the sponge, convex side towards the sponge. Place the lens perpendicular to the sponge over the central hole and hold it there for approximately 3 seconds. The edge can also be polished using a technique known as fingerlishing. The lens would be placed on a suction cup and held on the modification spindle in a fingerlish tool. The contact lens technician would then use his polish-saturated fingers to lightly polish the edge as the lens spins.

CN Bevel

Sometimes the very edge of a contact lens (usually a high minus lens) is too thick and may need to be thinned to increase comfort and reduce interaction with the upper lid and improve centration. Depending on the amount of thinning needed, you may just need to use a polishing 90-degree CN polishing tool thoroughly saturated with polish. The lens would be placed in the suction cup, concave side against the suction cup, and then held

against the tool for approximately 3 seconds. If the edge is excessively thick, then this modification can first be performed with the diamond impregnated CN tool, then polished with the polishing CN tool. This modification thins the anterior surface of the periphery of the GP lens. For a longer taper on the front surface, a 120-degree CN tool may be used.

Reducing the Diameter

Method 1:

Verify the parameters of the lens prior to reducing the lens diameter.

Place the front surface of the contact lens securely on the green suction cup attached to the spinner tool and dip it in water to wet the surface. Place a generous amount of polish on the sponge and turn the machine on.

Position the contact lens parallel to the rotation of the sponge. Lightly apply pressure to the lens and allow the lens to rotate with the spinner tool.

After approximately 3 seconds, cool the lens with water and apply more polish to the pad.

Verify the diameter of the lens with a hand held magnifier or Slotted diameter gauge.

Repeat the procedure if needed until the desired diameter is obtained.

Do not leave the lens in contact with the pad longer than 3 seconds without cooling the lens with water and reapplying polish.

Depending on the amount of diameter change, peripheral curves may need to be re-applied to the lens.

Method 2:

Verify the parameters prior to beginning the modification.

Use the diamond impregnated 90 degree CN tool

Place the lens on the suction cup, convex side against the suction cup.

Hold the lens perpendicular against the CN tool - note the diameter will change rapidly, so only hold the lens there briefly.

When the lens is very close (about .05mm) to the appropriate diameter, flip the lens on the suction cup so you are now holding the lens by the concave surface on the suction cup and lightly touch the lens into the center of the CN tool again. This is done to position the apex of the edge about two-thirds from the front and one-third from the back of the lens. The edges will need to be thoroughly blended and polished and peripheral curves will most likely need to be reapplied.

Peripheral Curves

Peripheral curves can be blended and or reapplied to the lens surface. The tools used to perform this modification will be tools of various radii, depending on the base curve of the lens. If re-blending, then polishing tools will be necessary. If totally reapplying or

increasing the width of the curves (decreasing the OZ of the lens), then a diamond impregnated tool may first be used to start the curvature, then various polishing tools used to blend and polish. The final edge desired will usually be aspheric and should have a "ski-slope" reflection under fluorescent tube lights. If checking the edge under fluorescent lighting and the image is choppy and not smooth, then the curves are generally poorly blended and will be uncomfortable for the patient. Further blending will be necessary.

Adding Minus Power

Verify the parameters of the lens prior to adding minus.

You do not need to use the spinner to add minus power to a GP Lens. Place the contact lens securely on the green suction cup and dip it in water to wet the surface. Moisten the sponge with water and then place a generous amount of polish on the polishing pad and turn the machine on.

Position the contact lens perpendicular to the sponge and approximately 1/2" from the edge of the sponge. Lightly apply pressure to the lens while moving in a counter-clockwise motion. Keep the sponge and the lens wet with polish while performing the modification.

After approximately 3 seconds, cool the lens with water and apply more polish to the sponge. Repeat the process for power changes greater than -0.25D.

Place the lens in the lensometer to check for the appropriate power change. Repeat the procedure if needed until the desired power is obtained.

Do not leave the lens in contact with the sponge longer than 3 seconds without cooling the lens with water and reapplying polish.

Adding Plus Power

Verify the parameters of the lens prior to adding plus. Adding plus power to a GP Lens may be accomplished **either** by using a suction cup without a spinner or with a spinner tool. The process of **adding plus power** without a spinner tool is remarkably similar to **polishing** without a spinner tool described above **except** instead of a "rocking" motion you will use a "rotating" motion.

When using the suction cup **without a spinner**, place the lens on the suction cup concave side (posterior surface) against the suction cup. A thoroughly saturated 3" inch sponge is used to polish the anterior surface of the lens. Remember that the center of the sponge spins at a slower rate than the outer edge of the sponge. Place the lens in the very center of the sponge and depress it into the sponge until the edge of the lens is in contact with the sponge, then rotate the lens about one quarter of a turn. Remove the suction cup and lens from the sponge, dip in into a cup of cool water, apply a few drops of polish to the center of the sponge and then repeat the process. Perform the "rotating" process four times, remembering to cool the lens in a cup of cool water and apply more polish to the sponge between each "rotating" process. Check the power of the lens and repeat as needed.

When using the suction cup **with a spinner**. Place the contact lens securely on the green suction cup mounted in the spinner tool and dip it in water to wet the surface. Place a generous amount of polish on the polishing pad and turn the machine on.

Position the spinner tool at a 45-degree angle towards the center of the sponge. Apply enough pressure to the lens to allow the sponge to contact the center of the lens while moving it in an outward motion to the edge of the sponge. The lens should be spinning at all times.

After approximately 3 seconds, cool the lens with water and apply more polish to the sponge. Repeat the process for power changes greater than +0.25D.

Place the lens in the lensometer to check for the appropriate power change. Repeat the procedure if needed until the desired power is obtained.

Do not leave the lens in contact with the sponge longer than 3 seconds without cooling the lens with water and reapplying polish.

**Excerpts of this handout are courtesy of the website provided by ABBA Optical, Inc., Stone Mountain, GA (www.abbaoptical.com).*