

MAKING
SENSE OF...

LENS CLEANING



Symphony
by Keeler

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HOW TO CARE FOR AND CLEAN OPTICAL SURFACES

Many ophthalmic devices have optical components such as windows, lenses, mirrors, filters, and prisms; even very small irregularities (such as scratches) can cause unwanted scattering of light which reduces quality. The surfaces of lenses, prisms, and windows are often coated with an anti-reflective layer to prevent loss of light due to reflection. Mirrors have a highly reflecting coating to get maximum reflection of light. Filters have coatings to cut out undesired wavelengths. The coatings are very thin and delicate and can be damaged by improper handling and cleaning. By following these suggestions, you will help ensure that all of the optical surfaces in your eye care equipment perform optimally.

GENERAL CARE

Place a dust cover over eye care equipment when not in use.

- Always replace the lens caps, if available, when not in use.
- Keep eye care equipment in an environment that is not humid; this will prevent the growth of fungus on optical components.
- Repeated cleaning will wear out the surface coating described earlier and the property of the surface may change. It is better to protect optical components from dust, stain and fungus.

BEFORE YOU CLEAN

Place a dust cover over eye care equipment when not in use.

- If the optical component is not dirty, do not clean it.
- First, read the manufacturer's instructions.
- Laser optics should only be cleaned by trained, qualified specialists.

WHAT YOU WILL NEED

Place a dust cover over eye care equipment when not in use.

- dust blower (Figure 1)
- lens brush, which is sometimes attached to the dust blower (Figure 1)
- lint-free lens tissue (available in photography shops)
- optical cleaning solutions (see below)
- lint-free cotton gloves
- bamboo tweezers
- cotton swabs (Figure 2). Use non-sterile, medical-grade cotton swabs, with degreased fibres that will not release lint. If these are not available, fresh cotton swabs can be prepared with wooden sticks and medical-grade cotton.

Figure 1



Figure 2



OPTICAL CLEANING SOLUTIONS

First consult the manufacturer. If this is not possible, commercial lens-cleaning solutions sold in camera shops can be used for most optical cleaning. Otherwise try the following, going from weakest (1) to strongest (4) until the surface is clean:

- 1 Distilled water.
- 2 A water-based solution: 1 part mild, neutral detergent to 19 parts distilled water.
- 3 A mixture of 60% acetone and 40% methanol (not for use on plastic lenses)
- 4 Isopropyl alcohol (90% purity). Note: slow evaporation can leave drying marks on the surface.

TIPS FOR CLEANING

Do not touch optical surfaces with your bare fingers, since they leave behind grease and moisture marks that are hard to remove. Wear cotton, lint-free gloves if available and hold loose optical components by their edge (Figure 3).

- Be careful of sharp instruments, including your fingernails, near optical surfaces. Use wooden, bamboo, or plastic implements instead. Always place optical components on a soft surface to avoid scratches.
- Do not apply optical cleaning solutions directly onto the optical components of a device, since these can enter the machine and cause spots on other lenses or otherwise damage the device. Instead, apply the cleaning solution to the lens paper or swab first.
- When removing stains, avoid excess pressure since this can remove the delicate surface coating.

Figure 3



STEPS

First consult the manufacturer. If this is not possible, commercial lens-cleaning solutions sold in camera shops can be used for most optical cleaning. Otherwise try the following, going from weakest (1) to strongest (4) until the surface is clean:

- 1 Always remove dust first! Dust particles can produce scratches. Never wipe dust off optical surfaces, especially when they are dry. First use a dust blower to remove dust. Use a camel hair brush, sometimes included as part of the blower (Figure 1), to remove any dust that sticks to the surface.
- 2 To remove stains, use a lint-free cotton swab or a lens-cleaning tissue dipped in the optical cleaning solution. For round surfaces, move the swab or tissue in a circular path, starting from the centre and going in a widening spiral towards the edge (Figure 3). For rectangular surfaces, use repeated strokes parallel to each other and in the same direction until you have covered the surface. Repeat this step, using a fresh swab every time, until the stain is no longer visible at any angle under a bright light. If cotton lint is left on the component, remove it using the blower or a clean lens brush.
- 3 To remove stains on plastic components, use optical cleaning solution number 2 (the waterbased solution). Do not use other cleaning solutions on plastic, unless indicated by the manufacturer, because they can permanently cloud the surface.
- 4 To remove fungus, use an optical fungicide. If unavailable, use surgical scrub soap.

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VOLK'S RECOMMENDED METHOD

CLEANING

- 1 Cleaning should be performed regularly to remove bodily fluids, dust and soil on the surface of the lens.
- 2 Select the appropriate method of cleaning from the CLEANING METHODS TABLE listed below.
- 3 If the lens is to be sterilized prior to its re-use, Volk recommends that it first be cleaned using cleaning Method C.



CLEANING METHODS TABLE

Method A	To remove any debris clean with running water and use a mild soap or detergent using a clean cotton cloth or swab. Do not use detergent with any type of Emollients.
Method B	Clean the glass element with Volk Precision Optical Lens Cleaner (POLC) or a Volk LensPen® Clean lens surface in a clockwise direction to help prevent loosening of the insert in the ring. Do not use the Volk LensPen® or Volk's POLC on surfaces that contact the eye.
Method C	<ol style="list-style-type: none">1 Prepare fresh enzymatic cleaner (e.g. Enzol) solution) – 2 ounces per gallon using warm (~30-43°C) tap water.2 Soak each device in solution for 20 minutes.3 After soaking, brush knurled surface of housing with a soft-bristle brush and wipe lens portion with a soft cloth until all traces of cleaner and soil are removed. Pay special attention to all crevices and other hard-to-reach areas. Note: Do not brush lens portion to avoid scratching; use soft cloth.4 Thoroughly rinse devices in a room temperature tap water bath (not under running water) until all visible cleaner has been removed.5 Transfer the devices to a freshly prepared enzymatic solution (per step 1 above) and sonicate for 20 minutes.6 After sonication, thoroughly rinse devices in a room temperature tap water bath (not under running water) until all visible cleaner has been removed.7 Inspect each device for remaining debris. If any is observed, repeat the cleaning procedure with freshly prepared cleaning solutions.

ACKNOWLEDGEMENTS/SOURCE MATERIAL

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