

sinar

Cleaning of Optical Elements Made of Glass or Plastic

General information concerning the cleaning procedure

Cleaning Agents

Sinar offers a *Digital Cleaning Kit* 551.33.090. In addition to high-quality lint-free microweave cleaning cloths like those used in clean rooms, it also contains a cloth holder and two cleaning fluids.

- **Agent Blue** is a blue cleaning fluid intended for preliminary cleaning of tenacious, fatty blemishes and also for general cleaning applications in accessible places where a moist surface can be wiped dry without the danger of causing electrostatic discharges that could destroy delicate electronic components. The antistatic additive becomes noticeable when a moist surface is being wiped dry, because at first it leaves streaks that gradually disappear during the wiping process. Dust particles do not adhere as much to the cleaned surface and they are easier to remove.

⚠ **CCD glasses must not be cleaned with Agent Blue.**

- Colorless, highly refined **Ethanol** is appropriate for follow-up cleaning of surfaces that have been pre-cleaned with Agent Blue and it is generally suitable for cleaning surfaces that cannot be wiped dry because of inaccessibility or because of the danger of causing electrostatic discharges. The cleaning cloth must always be sufficiently moist, otherwise streaks may form after the independent evaporation of the ethanol. When the cleaning cloth contains an excessive amount of ethanol, otherwise a liquid residue will be left behind at the end of the wiping stroke.

⚠ **CCD glasses may only be cleaned with Ethanol.**

Important Hints

- **Clean hands and pure cleaning solutions** are basic prerequisites for a successful cleaning procedure. Hand perspiration, hand creams and other residues on the cleaning cloth are transferred to the surface that is to be cleaned, which will then require a considerably greater cleaning effort.
- The surfaces of optical elements must **never be touched with bare fingers**. Fingerprints are very difficult to remove and they may leave permanent marks on sensitive surfaces.
- The combination of **dust and moisture** produces a stubborn film of dirt that dims the surface. Breath always contains moisture. Removing dust by blowing it off with breath condenses the moisture of the warmer breath on the cooler surfaces in the form of tiny moisture droplets. When a surface is accidentally breathed upon, its moist condition must be wiped dry very carefully.

- ⚠ **Wiping a dry surface vigorously with a dry cleaning cloth generates electrostatic charges that can cause sensitive electronic components to be destroyed by electrostatic discharges.** Therefore, special care is imperative in wiping the IR-blocking filter and the CCD glass. A surface that has been electrostatically charged in this manner also attracts more dust from its surroundings.
- ⚠ **Use only the cleaning aids provided in the Cleaning Set.** They have been tested by Sinar to ensure their suitability and compatibility. **The user will be responsible for any damages caused by the use of other cleaning materials.**

Cleaning Procedures

- Carefully remove individual **dust particles** from a surface by daubing it either with the tip of a fine brush or with a soft foam-tipped dauber. Wipe greater dust accumulations with short brush strokes from the center to the outside. In doing so, apply the brush very lightly.
- ⚠ **Caution** must be exercised when blowing away dust particles **with compressed air from a spray can**: Condensation may cause a fluid to form in the spray can. Therefore it is essential always to check the air from a spray can to ensure that it is truly dry before it is applied. Before blowing on a surface, always blow towards the floor first at a safe distance from that surface in order to discharge any condensate that may have accumulated in the nozzle. Sinar recommends the use of Chemtronics' *Ultra Jet Duster Refill*.
- It is imperative that any loose dust particles be carefully removed before any **wiping** is initiated for cleaning. Never wipe a dusty, uncleaned surface with a dry cleaning cloth, because dust particles being rubbed on a surface may cause tiny scratches on that surface.

The wiping motion should be performed with almost no pressure, and it should always be in only one direction (not back-and-forth).

- A noticeable difference between a cleaned and an uncleaned portion of a surface indicates that there is a **larger soiled area** that needs cleaning, in which case cleaning the entire surface becomes imperative. When the entire surface is soiled, that surface should be wiped over its entire length in a single continuous motion (not in several strokes) in only one direction (not back-and-forth). After each wiping stroke, fold the wiping cloth in such a way that the used portion will not be used again.
- It is fundamental that wiping motions should not go over protruding or sharp edges, for instance when the surface to be cleaned is framed by a higher ridge. Surfaces of this kind should first be cleaned along the edges and then wiped up to those edges, but not across them.

- **Never apply drops of cleaning fluid directly to the surface** that is to be cleaned. Instead, always moisten the cleaning cloth with that fluid.
- **After cleaning** a surface with non-volatile (slow-drying) cleaning fluids, carefully wipe the surface dry with a fresh, dry cleaning cloth using motions in only one direction from the center to the outside (not back and forth), in order to prevent drying residues.
- If **visible drying residues** remain after the first cleaning procedure, that procedure should be repeated meticulously with a fresh cleaning cloth. If repeated cleaning cycles do not produce the desired result, the cleaning cloth and the cleaning fluid should be examined for purity.

Cleaning of ...

Color Filters in the Expolux Tricolor Shutter

Kodak Gelatin Filters

⚠ **Caution: Gelatin filters are highly susceptible to scratches.** Therefore, cleaning by wiping should only be performed when there is absolutely no other alternative. Short-term effects of heat and/or humidity, for instance when you breathe on it or when you blow away dust from the surface of a gel filter with your breath, cause significant dimensional changes on gelatin filters. The gelatin absorbs humidity, which causes it to swell and to become softer. The filters become deformed to a greater or lesser extent. In such a case shutter they must only be used again when the deformation has subsided completely.

- Before removing fingerprints, water marks, grease spots and the like from a gelatin filter, dust particles should first be removed with a fine brush. Carefully remove individual dust particles from the surface either by using the tip of a fine brush or by gently daubing it with a foam-tipped dauber. When the surface is very dusty, sweep it with short brush strokes from the inside towards the outside. The brush should touch the surface only very lightly.
- Then wipe the soiled part of the surface very carefully with a clean cleaning cloth that has been moistened with Ethanol, with motions in only one direction, from the inside towards the outside (not back and forth). Let the resulting moisture marks on the surface dry up by themselves.
- Never wipe areas that are still moist, let them first dry out thoroughly. Gelatin is softened by moisture, thus becoming even more prone to scratches than it already is.
- ⚠ **Do not wipe them dry with a dry cleaning cloth!**
- If visible drying marks still remain after the first cleaning procedure, the entire procedure should be repeated with a fresh cleaning cloth.

Surface-coated Glass Filters

Coatings have a susceptibility to scratches similar to that of Gelatin filters. Therefore cleaning by wiping should be performed only when there is absolutely no other alternative.

- Remove dust and loose particles with dry air, or carefully remove them with a clean, soft brush or with a foam-tipped dauber.
- Fingerprints and more persistent blemishes must only be removed with a fresh cleaning cloth that has been moistened with lukewarm water.
 - ⚠ **No cleaning fluids other than water and detergent solution are permissible.**
- Carefully wipe the moist area with a dry cleaning cloth, using motions from the inside to the outside, in only one direction (never back and forth), in order to avoid drying marks.

Color Filters, Clear Glass, LCD shutter in the Sinarcam 1 and 2

For the color filters, the clear glass and the LCD shutter of the Sinarcams both cleaning liquids Agent Blue and Ethanol are permissible.

- Blow away dust and loose particles with dry air, or carefully remove them with a clean, soft brush or a foam-tipped dauber.
- After the moist cleaning of the surface with the Agent Blue carefully wipe the surface with a fresh, dry cleaning cloth, using motions from the inside towards the outside in only one direction (not back and forth), in order to avoid drying marks.
- For moist cleaning with the Ethanol, the cleaning cloth should be sufficiently moistened, and the moisture marks that remain after wiping the surface should be left to dry on their own.
 - ⚠ **Do NOT follow up by wiping the surface with a dry cleaning cloth!**
- If visible drying marks remain after the first cleaning procedure, the cleaning procedure should be carefully repeated with a fresh cleaning cloth.

Infrared Blocking Filter for the Sinarback

Both the cleaning fluids Agent Blue and Ethanol are permissible for the cleaning of the infrared blocking filter.

- Blow away dust and loose particles with dry air, or remove them carefully with a clean, soft brush or a clean foam-tipped dauber that has not been touched by fingers.

- Fingerprints and persistent blemishes should be removed first, using a fresh cleaning cloth that has been partially moistened with Agent Blue. Traces of moisture should be carefully wiped dry with a dry end of the strip of cleaning cloth.
- Take a fresh cleaning cloth from the package for the follow-up cleaning with ethanol. Wrap the cleaning cloth completely around the wide part of the cloth holder, which is only half as long as the cloth itself. Fold the loose half of the cleaning cloth over the edge of the cloth holder. Moisten the cloth with ethanol along its folded edge. Wipe the entire filter surface with a single uninterrupted motion and let any moisture traces dry by themselves.
 - ⚠ **Do not wipe them dry with a dry cleaning cloth!**
- If visible drying residues remain after the first wiping procedure, the cleaning cycle should be repeated with care. Before doing so, re-fold the cleaning cloth in such a way that the used part will face inwards or be located away from the active edge. If necessary, moisten the cloth again and then repeat the wiping procedure. Depending on the amount of dirt, several cleaning cycles may be required.
- Do not wipe beyond the edge of the glass surface, only up to the inner edge of filter frame. This prevents dust and dirt from being carried over from the filter frame to the filter surface.

CCD Glass of the Sinarback

Under no circumstances should the IR-blocking filter frame be removed by the user, because this may cause damage to the very sensitive CCD glass located under that frame. The IR blocking filter is necessary for correct color rendition, the frame protects the CCD sensor from dust and blemishes that degrade image quality, which would subsequently require otherwise unnecessary retouching work. Should the replacement of the IR blocking filter be inevitable, only authorized Sinar Service Stations, aside from Sinar itself, are empowered to perform this task.

Lens Elements

- Blow away dust and loose particles with dry air or carefully remove them with a clean, soft brush or with a foam-tipped dauber.
- Fingerprints and more persistent blemishes should be removed with a fresh, soft, lint-free

cleaning cloth that has been moistened with a lukewarm water and detergent solution.

- Carefully wipe the moistened spot dry with a dry cleaning cloth, using motions from the center to the outside in only one direction (not back and forth) in order to avoid drying marks.

Sinar Color Control Filters

⚠ **Caution:** Only use the special Sinar Filter Cleaning Set 547.79.000. Other cleaning materials cause the filters to become dim!

Focusing Screens and Fresnel Lenses

Focusing Screens and Fresnel Lenses Made of Plastic Materials

⚠ **Caution:** Fresnel lenses have concentric grooves around their center. Therefore, in order to avoid damaging the ridges of the grooves and to avoid causing scratches, the wiping motion must always be in the direction of those grooves, never across them.

- Blow away dust and loose particles with dry air, or carefully remove them with a clean, soft brush or with a foam-tipped dauber.
- Fingerprints and more persistent blemishes should be removed with a fresh, soft, lint-free cleaning cloth that has been moistened with a lukewarm water and detergent solution.
- Carefully wipe the area dry or daub it with a dry cleaning cloth.

Focusing Screens Made of Glass

⚠ **Caution:** Lines on focusing screens are applied to the matte side. Improper cleaning fluids like acetone or cleaning fluids that contain abrasives damage those lines. Cleaning fluids that contain abrasives also cause cloud-like areas on the fine structure of the matte surface.

- Fingerprints and more persistent blemishes should be removed with a fresh, soft cleaning cloth that has been moistened with a lukewarm solution of water and detergent
- Common window glass cleaners are also permissible.
- When necessary, feltpen marks can be removed with pure benzine.

⚠ **Caution should be exercised in handling, because plastic materials may be dissolved by pure benzine.**