

## 11 Cleaning and Disinfection

### 11.1 Safety During Cleaning and Disinfection

#### CAUTION!

#### **Improper care and cleaning of optical components**

could lead to coating failure.

Contaminants on the optical surfaces increase scatter off the surface and absorb light energy.

- ▶ Do not use alcohol prep wipes to clean lenses or optical surfaces.
- ▶ Wipe gently and carefully to avoid scratching the instrument and auxiliary lenses.

#### CAUTION!

#### **Cleaning lenses too frequently**

can damage optic surfaces.

- ▶ Clean optics only when necessary.
- ▶ Keep the protective cover on your device when not in use.

#### CAUTION!

#### **Using aerosols near or placing containers of liquid on or near the instrument**

could damage the equipment. The instrument is not designed with any specific measures to protect against harmful ingress of water or other liquids (classified IPXO - ordinary equipment).

- ▶ Do not place containers of liquid, or use aerosols on or near the equipment.

### 11.2 Cleaning Agents

Item	Explanation
Latex Finger Cots and Gloves	Solvents are harsh to the skin; wear protection.
Optics Cleaning Tissue	Soft, absorbent, lint-free lens tissue is best.
Swabs	Cotton swabs with wooden handles or polyester swabs with polypropylene handles are best.
Blower	Filtered dry nitrogen blown through an antistatic nozzle is best. Canned dusters also work. Bulb-type blowers and brushes must be kept clean to prevent recontamination.
Mild Soap	Neutral soap, 1% in water. Avoid perfumed, alkali, or colored soaps. Several drops of green soap (available at a pharmacy) per 100 cc of distilled water is acceptable.
Isopropyl Alcohol	Spectroscopic grade; evaporates more slowly than acetone.
Acetone	Spectroscopic grade.

Item	Explanation
Hemostats	For holding lens tissue.
Bright Light	For inspection.

## 11.3 Cleaning Optical Components

### 11.3.1 Brush Cleaning Method

#### NOTE

#### Edges on mounted optics

are often hard to reach.

- ▶ Wrap a lens tissue around a swab.
- ▶ Soak the covered swab in acetone.
- ▶ Brush around the edge of the lens and then across the middle using a continuous figure-eight stroke.
- ▶ Repeat if necessary.

Use this technique to clean small lenses. Hold a folded lens tissue with a hemostat to brush the surface clean.

#### Action

1. Fold a lens tissue about as wide as the lens. Do not touch the area of the tissue that will contact the lens.
2. Using hemostats, hold the tissue near the fold.
3. While holding the optic, using tweezers if necessary, blow off any dust.
4. Soak the tissue with acetone.
5. Brush the fold in the tissue across the surface of the optic using light pressure.
6. Repeat as necessary until the optic is clean, using a new lens tissue with each wipe.

### 11.3.2 Wipe Cleaning Method

Use this technique to clean very dirty lenses and mirrors.

#### Action

1. Blow off dust.
2. Fold a lens tissue as with the brush method.
3. Apply acetone to the tissue.
4. Holding the lens tissue in your hand with the fold near the tip of your fingers, apply uniform pressure while gently wiping across the surface of the optic.
5. Repeat as necessary until the optic is clean, using a new lens tissue with each wipe.

### 11.3.3 Dust Cleaning

Static electricity can bind dust tightly onto optics. Blowing removes some dirt; use a wet alcohol swab to remove the remainder. Acetone dries the optic quickly, which helps eliminate streaks.

*Action*

1. Blow off dust.
2. If any dust remains, twist lens tissue around a swab, soak in alcohol, and wipe the optic in one direction with a gentle figure-eight motion.
3. Repeat as necessary.
4. Repeat the steps above, using acetone.

### 11.3.4 Cleaning Heavy Contamination

#### NOTE

**Always clean fingerprints, oil, and water spots from lens and optics immediately.**

Skin acids can permanently damage optical coatings. Solvents can redistribute dirt and oil.

- ▶ Use soap or other wetting agent to clean the optical surfaces.
- ▶ Use water to remove the soap.
- ▶ Use alcohol to remove the water.
- ▶ Use acetone to speed drying and eliminate streaks.

*Action*

Use this technique to clean fingerprints, oil, or water spots.

1. Blow off dust.
2. Using a soap-saturated lens tissue placed around a swab, wipe the optic gently in a figure-eight motion.
3. Repeat as necessary.
4. Repeat this procedure with distilled water.
5. Repeat again with alcohol.
6. Repeat once more with acetone.

## 11.4 Cleaning the Chin Cup and Forehead Rest

#### WARNING!

**Strong solvents such as Acetone or Methyl Alcohol** will damage the chin cup and forehead rest.

- ▶ Use a gentler disinfectant such as isopropyl alcohol.

*Action*

1. Clean the chin cup and forehead rest with a disinfectant such as isopropyl alcohol.
2. If disinfectant contacts the ocular lens during cleaning, gently wipe the lens (see: Wipe Cleaning Method [▶ 408]).

## 11.5 Cleaning Peripherals and Table

 **CAUTION!**

**Do not use any cleaning agent on the screen.**

*Action*

1. Wipe the monitor with a soft, non-linting cloth.
2. Regularly dust or wipe down the table.