



# Handling and Cleaning of Optics

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## 1. General

Dear Customer!

Thank you very much for purchasing from Tydex.

Please read carefully present manual before opening and using delivered component(s) with special attention to appropriate chapter describing how to handle with certain type of optics.

Optical components should be handled by authorized personnel only.

It is important to closely follow the recommended handling, storage, and cleaning instructions with all optically related products in order to insure their proper performance.

Delivered components were initially cleaned and packed carefully in accordance with approved packing rules and style taking into account properties of the materials.

Each element «as is» is completely ready to be adjusted and utilized itself as well as a part of optical system.

Careful additional cleaning may be applied if visual inspection of working surfaces of the components is not enough good by opinion of quality controller and traces of cosmetic imperfections seems to be visible. All these works are made on customer' own account.

At cleaning please diligently follow the recommendations below or contact us for consultation.

**Vendor does not guarantee correct working efficiency of delivered components if demands of this manual were neglected.**

Any components whose surface quality is critical should be handled in such a way that no foreign matter, particularly grease, touches the surface. They should be held only by the edge with cloth, rubber gloves, or finger cots previously cleaned with alcohol or detergent and water. Holding by the edge with bare fingers leaves grease on it as well as at working optical surfaces.

At storing or before additional shipping run the optics should also be protected as much as possible from dust and other influences of environment. Tydex' original packing boxes and packing style are highly recommended.

While providing a completely dust free environment may not be feasible; a cover directly over the component should be used as most dust travels straight down.

Many types of contaminants such as residual oils, acids, or solvents, can permanently damage coatings and substrates.

## 2. Polarizers, notch filters

### 2.1 Handling

The optical surface of ruled optics is very sensitive to mechanical shocks, contaminations and chemicals. So please take a special care about such optics. All ruled optics is supplied either in mount or in casing with its face up. To remove the optical component, carefully hold it with edges without touching the face. **Never touch the grooved surface of the optics!** Handle the parts using powder-free gloves by holding the optics by its edges only. Never allow any mount or cover to come in contact with the grooved surface.

An optics delivered should have its surface protected with a specially-designed cover that does not touch the surface itself. Optical parts those are not in use, either in the laboratory or on the manufacturing floor, should be kept in a closed box when not covered.

Do not talk or breathe over the grooved surface. Wear a nose and face mask when it is required that you talk over the surface of a part. Breath spray is particularly bad for working surfaces, so one should not speak directly over the surface; instead, either turn away or cover the mouth (with the hand or a surgical mask).

### 2.2. Cleaning procedure

The most important recommendation for ruled optics cleaning is clean the surface in case of absolute necessity only. The ruled surface is recommended to clean applying pure air flow out of a rubber bulb to blow dust off (no compressed air!). In most cases this procedure is enough. If after visual inspection the contamination remains on the surface you may need to wash your optical part in fresh 0.1% soap solution of distilled water at 35-40°C. To do this one needs to immerse the part into soap solution and rinse within 3 to 5 minutes, stirring the solution with cotton swab without touching mirror surface of the optics; take the part off the solution and rinse with fresh distilled water flow; drops left on the mirror surface should be blown off with rubber bulb only. **Don't use cotton wool, squirrel brush or any other accessories for drying! Ruled optics rinsing must be fulfilled by specialists familiar with grating features and optic handling only!**

## 3. Salt crystal

### 3.1. Handling

A special care should be taken about optics made of KBr, KCl, and NaCl. Please open and use this optics under special conditions only. The humidity of environment should not be higher than 30% when you open any water-soluble materials. Please follow all handling instructions as above (section 2.1).

**KBr:** Hygroscopic and must be used with anhydrous solvents. It withstands thermal and mechanical shock well, but must not be used with aqueous samples, glycerol, and the lower alcohols. A hard optical coating can provide additional protection from humidity. Store KBr in desiccators or at heated cabinet.

**KCl:** Hygroscopic and must be used with anhydrous solvents. It withstands thermal and mechanical shock well, but must not be used with lower molecular weight alcohols. A hard optical coating can provide additional protection from humidity. Store KCl in desiccators or at heated cabinet.

**NaCl:** Harder and less hygroscopic than KBr. NaCl must be used with anhydrous solvents. It withstands thermal and mechanical shock well, but must not be used with lower alcohols or glycerol. Store NaCl in desiccators or at heated cabinet. A hard optical coating can provide





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additional protection from humidity.

## 3.2. Cleaning procedure

In case of absolute necessity cleaning of such optics should be made by special authorized personal only. **Don't clean water-soluble optics by yourself!**

## 4. Conventional optics

### 4.1. Handling

Please follow all handling recommendations described in General (section 1).

### 4.2. Cleaning procedure

For cleaning of your optics please use a high quality equipment and tooling.

Materials used for cleaning of majority of optical components include pressurized gas (filtered dry nitrogen), lint-free lens tissue, mild soap, lint-free cotton swabs, lint or powder-free gloves and an organic solvent, such as reagent-grade isopropyl alcohol, reagent-grade acetone, or lens cleaning solution. The following are general guidelines but, because results differ, there are no guarantees.

**Uncoated optics.** One should prepare working area accordingly. This is very important because particulate contamination from the work surface or the worker is what usually scratches the coating. Clear the table of everything and wear clean clothing. Work as still as possible so as not to shake particles out of your hair while cleaning. Work in a darkened room under a freshly cleaned high intensity desk lamp so that the reflection of a bright source of light on a dark background will allow you to see what you are doing. Be sure that the work surface will not be eaten by methanol. Read all precautions regarding the safe use of methanol and follow all storage and handling instructions. Any area containing optics should prohibit smoking. Smoke vapor deposits are difficult to remove from optical surfaces. Unless otherwise noted, all methods of cleaning (vacuum, dry nitrogen, brush, cotton, and/or lens tissue) are performed from the center of the surface to its edges. The applicator (cotton, lens tissue) should be rotated as the cleaning advances, always presenting a clean surface to the object being cleaned.

Dust is the most common contaminant and can usually be removed using pressurized gas. If more cleaning is necessary, hold the lens in lens tissue and apply a few drops of reagent-grade acetone or lens cleaning solution. Slowly turn the lens while applying pressure in the center and working outward, to pull dirt off the lens instead of redistributing it on the surface. Fingerprints on a coated lens should be cleaned as soon as possible to avoid staining or damaging the optic. Larger dirt particles, however, should be removed with a dust-free blower before attempting to clean the optic with lens tissue. Larger particles trapped under the cloth will scratch the surface you are attempting to clean. If the lens is still dirty after using acetone - for instance, if the oil was just redistributed and not cleaned off the optic - then a mild soap solution can be used to gently wash the lens. Repeat the procedure with acetone and finish it with isopropyl alcohol to eliminate streaks and soap residue.

**Coated optics.** The above procedure will work well for all kind of optics both uncoated and coated. The elements coated with bare Au or other exotic materials that are not over-coated with protective layer may be too sensitive for ordinary cleaning methods. The cleaning procedure for coated optics is almost the same as above for uncoated optics, but due to coating more attention to care of the surface is required. If

repeated cleaning of coated optics is required it is recommended the use of distilled water to be used more frequently than the cleaning fluid and to apply the smallest amount of pressure when wiping the surface with lens tissue paper.

The final step is careful inspection the surfaces of the optics under proper quality control conditions.

We hope you will be satisfied with quality and performance of Tydex optics.