

# Handling, Care and Cleaning

## Polarizer Technical Note

### Introduction

ProFlux wire-grid polarizers are made of mirror quality aluminum patterned on glass wafers. The size and structure of the grid makes it very susceptible to physical damage and contamination. Because of the fragile nature of the wire-grid, it is necessary to follow proper handling guidelines. Damage to the wire-grid from mishandling is not covered in the warranty and Moxtek will not refund parts damaged from mishandling. Follow the handling and care information below to prevent damage to the wire-grid surface ensuring consistent performance.

### Part Handling

Please do not ever touch the polarizer side ever with anything, otherwise the ribs will be destroyed. When handling parts the most important part of clean room attire are gloves. Handling the parts without gloves will leave fingerprints on the parts and cause wicking from skin oils. The trenches between the wires cause a strong capillary force acting as a wick, pulling contamination into the clear aperture of the polarizer. (Figure 1)

To avoid contamination always wear gloves while handling the polarizer. Extensive research has shown that Nitrile gloves are best for handling the polarizers. Other less suitable options when handling polarizers are vinyl, polyethylene, latex, or low lint cotton gloves. Moxtek has found that after putting on gloves, cleaning the gloves with semiconductor grade Methanol is a simple way to reduce the risk of contamination. Always make sure gloves are tight fitting and not loose. Loose fitting fingertips hang over the part and increase the chance of damaging the polarizer.

When working with wire-grid polarizers avoid touching bare skin or other potentially contaminated areas to avoid contaminating the gloves. Oils from skin and other contamination on gloves will transfer to the parts and cause wicking of the contaminant into the wire-grid. If gloves become contaminated change gloves. (Figure 2)

Never touch the wire-grid surface of the polarizer. When handling, grip the edges of the polarizer. When holding the polarizer use light pressure to hold only the edges of the part. Using more pressure than necessary will cause the glove to “fold” around the polarizer causing damage to the wire-grid leaving marks on the edges of the part.

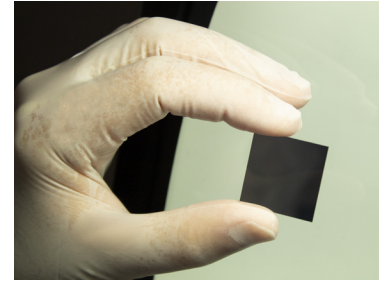


Figure 1: Wearing gloves to handle polarizers will prevent wicking.



Figure 2: To avoid this type of wicking damage always use gloves.

### Determining the Wire-Grid Side

When the polarizer is handled, it is important to always be mindful of which surface has the wire-grid, and avoid anything coming in contact with that surface. To check which side has the wire-grid, look at the edge of the part at a steep angle of incidence. Upon inspection if there is a mirror-like finish that extends uninterrupted to the edge of the part then you are looking at the wire-grid side of the part. If the mirror-like finish is interrupted at the edge then you are looking at the glass substrate side of the part. (Figure 3)

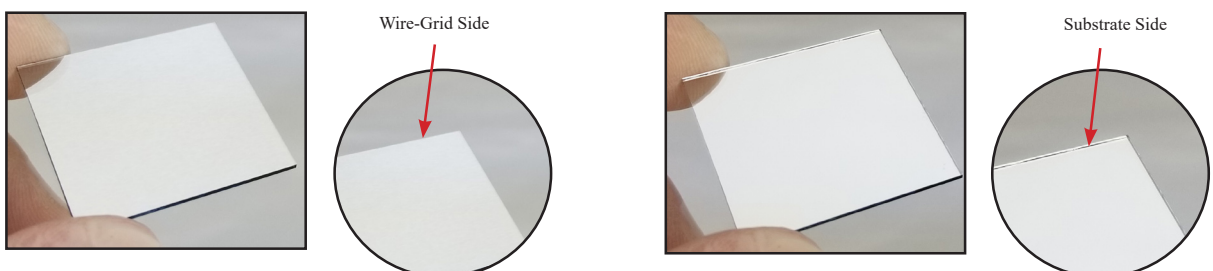


Figure 3: The reflection on the wire-grid side will extend to the edge of the part, while the substrate side will appear interrupted.

## Part Cleaning

### Wire-Grid Surface

When cleaning the wire-grid side of the polarizer use clean filtered low-pressure dry gas such as Nitrogen, or clean, dry air. The use of lens tissues or swabs is not recommended as they will easily cause permanent damage to the wire-grid. Do not use lens tissues, swabs, or other materials to dry or touch the wire-grid surface.

### Glass Substrate Surface

If cleaning of the substrate is required first make sure that you are cleaning the substrate and not the wire-grid. Filtered low-pressure dry gas such as Nitrogen, or clean, dry air can be used for cleaning and drying of part. To clean the substrate, use either optical cleaning material or a clean-room grade wipe. Wet the cleaning wipe with an optical cleaning solution such as semiconductor grade Methanol or a deionized water and Isopropyl alcohol mix. The wipe should be pulled across the substrate surface. A fresh or unused portion of the wipe should be used each time it is pulled across the surface, in the same direction as the previous pulls.

## Storage

When not using the polarizer, store in a clean dry place. Use a suitable container that is clean and particle free such as the original container the polarizer was shipped in. The polarizer may rest in the container on a flat surface with the wire-grid side up, or vertically with the polarizer being supported in slots. Moxtek provides custom sized polarizers to meet the application requirements. Because of this there are various types of packaging the polarizer may arrive in.

The most common type of packaging are trays which allow for multiple parts to be shipped simultaneously. Trays have an arrow indicator between the rows of parts which indicates the direction the wire-grid is facing. (Figure 4)



Figure 4: Polarizer trays are optimal for multiple parts.



Figure 5: Entegris carriers are optimal for individual parts.

Entegris fluoroware wafer carriers have an insert which pinches the polarizer in place during shipping. The wire-grid should be facing away from the insert during packaging. A sticker on the packaging indicates the aluminum wire-grid faces down. To safely remove the part from the carrier, start by removing the lid. Place your hand over the retention disc and part, then flip the container, and remove the base. The part is now aluminum side up and can be handled as previously described. (Figure 5)

Low tack semiconductor grade dicing tape is commonly used to hold parts within a box or other packaging, usually used for small polarizers. Polarizers are set with the glass substrate in contact with the tape and the wire-grid facing up. To remove the polarizer from the dicing tape, use tweezers to carefully grab the part and pull straight up from the tape. Make sure that the tweezers do not come in contact with the wire-grid surface. (Figure 6)

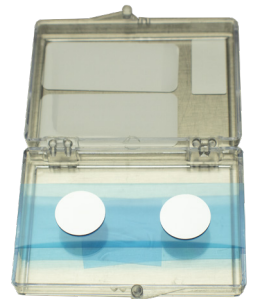


Figure 6: Low tack tape boxes are used for individual or a few small parts.



Figure 7: Gel packs are also used for individual or a few small parts.

Gel packaging is another method Moxtek uses to ship small polarizers. The substrate side is placed on the gel, which has a small amount of adhesion. Polarizers are set with the glass substrate in contact with the gel and the wire-grid facing up. To remove the polarizer from the gel pack, use tweezers carefully to grab the part and twist the part while gently lifting up. Twisting the part breaks the adhesion to the gel allowing the polarizer to cleanly be removed. (Figure 7)



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