

SHOTOVER M2 Multi-Sensor Window Cleaning

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Introduction

The condition of the M2 optical windows directly affects image quality and overall system performance. Optical windows should be inspected prior to each flight and must be free of any visible chips, cracks, or excessive buildup of dirt, dust, insects, moisture, or other contaminants.

If cleaning is required, follow the procedure outlined in this section. The cleaning process uses a progressive approach, beginning with the removal of loose particles before proceeding to wet cleaning and drying. Care must be taken to avoid dragging debris across the window surface, as bonded particles can act as an abrasive and damage the optical window or its coatings.

Following the recommended cleaning procedure will help maintain optimal image quality and minimize the risk of damage to the M2 optical windows.

Environmental Considerations

Environmental conditions can significantly affect the condition of the M2 optical windows and may require more frequent inspection and cleaning. Operators should consider the operating environment when determining appropriate cleaning intervals.

Cold Weather Operations

Aircraft operating in cold weather environments may be exposed to de-icing fluids during ground operations. Whenever possible, avoid direct application of de-icing fluid onto the M2 optical windows, as residue may affect image quality and require additional cleaning.

Maritime Operations

Operations conducted in coastal or maritime environments can expose the optical windows to salt spray and airborne salt particles. As moisture evaporates, salt deposits may remain on the window surface. These deposits can scratch the optical surface if wiped before being properly loosened and removed. Always allow salt contamination to soak before attempting to clean the window.

Urban and Industrial Environments

Aircraft operating in urban or industrial areas may be exposed to airborne pollutants, exhaust residue, smoke, and other contaminants. Over time, these contaminants can bond to the optical window surface and degrade image quality. Increased inspection and cleaning frequency may be required when operating in these environments.

Precautions

CAUTION	Never use paper towels, tissues, or other abrasive materials to clean optical windows.
CAUTION	Do not use excessive force when cleaning the optical windows. Allow cleaning solutions sufficient time to loosen bonded contaminants before attempting removal.
CAUTION	Never wipe a dry optical window with a dry cloth. Dust, dirt, and other contaminants can scratch the optical surface or damage optical coatings.
CAUTION	Do not scrape or pick at contaminants adhered to the optical window surface. Soak the affected area and allow the contaminant to loosen naturally.
CAUTION	Do not use pressure washers or high-pressure water streams to clean the M2.
CAUTION	Do not allow cleaning solutions or rinse water to dry on the optical window surface. Drying may leave residue or staining that can affect image quality.
CAUTION	Always use clean, uncontaminated cloths when cleaning optical windows. Replace cloths as they become soiled to prevent debris from being transferred back onto the optical surface.
CAUTION	If an optical window exhibits chips, cracks, delamination, coating damage, or any other condition that cannot be removed through normal cleaning, discontinue use and contact SHOTOVER Customer Support for further guidance.

Approved Cleaning Materials

ITEM	DESCRIPTION
Compressed Air	Clean, dry compressed air for removing loose particles prior to wet cleaning.
Mild Non-Abrasive Detergent	Liquid dishwashing soap free of lotions, lanolin, or other additives.
Purosol® Glass Cleaner or Equivalent	Approved optical cleaning solution for routine cleaning and removal of fingerprints or light contamination. Manufactured by Purosol. See https://www.purosol.com/
99% Isopropyl Alcohol	May be used for removal of oils, fingerprints, or other contaminants that cannot be removed using detergent and water alone.
Kimwipes®	Lint-free wipes suitable for cleaning optical surfaces. Kimwipes are manufactured by Kimberly-Clark: See www.kcprofessional.com
Lint-Free Optical Cleaning Cloths	Clean, non-abrasive, lint-free cloths suitable for cleaning optical surfaces.
Clean Rinse Water	Clean water used to remove cleaning solution residue during the final cleaning step.

Cleaning Procedure

Perform the following procedure whenever the M2 optical windows require cleaning.

1. Inspect each optical window for dirt, dust, insects, salt residue, fingerprints, water spots, or other contamination.
2. Using clean, dry compressed air or low-pressure water, remove any loose particles from the optical window surface. This reduces the risk of scratching during subsequent cleaning steps.
3. Prepare a cleaning solution using warm water and a mild non-abrasive detergent.
4. Apply the cleaning solution to the optical window surface and allow it to soak. The soaking process helps loosen contaminants that may be bonded to the surface. Do not allow the cleaning solution to dry on the window.
5. Reapply the cleaning solution as required to keep the surface wet.
6. Using a clean Kimwipe® or lint-free optical cleaning cloth saturated with the cleaning solution, slowly drag the wipe or cloth across the optical window surface using light pressure. Replace the wipe or cloth as it becomes contaminated.
7. After contaminants have been removed, rinse the optical window using clean water.
8. Using a new clean Kimwipe® or lint-free optical cleaning cloth, gently dry the optical window surface. Do not reuse cloths that contain visible debris.
9. Inspect the optical window to verify that all contamination has been removed.
10. If contamination remains, repeat Steps 3 through 9 as necessary. For fingerprints, oils, or other stubborn contaminants, Purosol® Glass Cleaner or 99% Isopropyl Alcohol may be used in place of the detergent solution.

Additional Cleaning Guidance

The drag method is the preferred cleaning technique for M2 optical windows. When performed correctly, the cleaning solution lifts contaminants from the surface while minimizing the risk of scratching the optical window or damaging optical coatings.

When using solvents such as Purosol® Glass Cleaner or Isopropyl Alcohol, saturate the cleaning wipe or cloth prior to contacting the optical surface. Avoid excessive rubbing and always use a clean portion of the wipe or cloth for each pass across the window.

If contamination cannot be removed using the procedures described in this section, contact SHOTOVER Customer Support for further guidance.

SHOTOVER Systems Support

Phone +1 (720) 744-3300

Email support@shotover.com

**WhatsApp
Chat**

