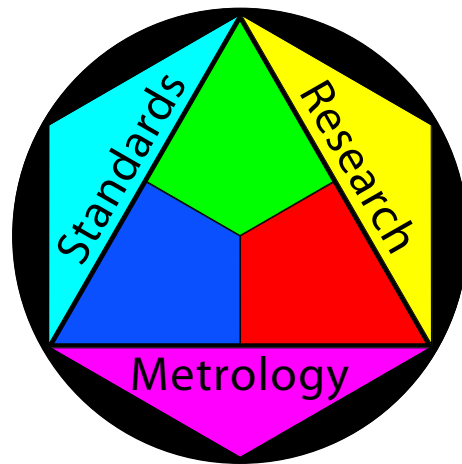


Mt. Baker Research LLC



Technical Report

Instruction Manual: Cleaning Kit for Ceramic Transfer Standards

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Because ceramic transfer standards are inherently stable, they provide an essential tool for checking instrument performance. Whenever a precision optical component is cleaned, its critical surface may be damaged. To reduce the likelihood of damage, it is important to minimize the need for cleaning. Careful handling and maintenance reduce the need for cleaning and contribute to long-term color stability. With proper care ceramic transfer standards should remain stable and in good working condition for many years.¹

Always wear clean lint-free cotton gloves when handling transfer standards. Six pairs of washable cotton gloves are supplied with the Cleaning Kit.

Before each measurement use "canned air" or a clean anti-static brush to remove dust and lint from the optical surface. The Cleaning Kit includes a Kinetronics 20 mm anti-static brush. To avoid contamination don't touch the bristles with ungloved hands.²

When a glass or ceramic transfer standard becomes contaminated with oily material, immediately clean the optical surface with isopropyl alcohol. Always wear disposable gloves during this procedure since isopropyl alcohol dissolves skin oils and cosmetic creams leading to further contamination. The Cleaning Kit includes a dispenser for isopropyl alcohol and 24 powder-free, disposable nitrile gloves. If powdered disposable gloves are used, carefully wash the gloved hands to remove powder residue and dry them with a clean lint-free towel.³

The Cleaning Kit contains 300 absorbent, non-abrasive PEC*PAD wipers. Clean the soiled standard with a fresh wiper moistened with a few drops of isopropyl alcohol. Wipe the optical surface gently in a single path using a circular motion. (Do not use a scrubbing motion. Any abrasive grit adhering to the wiper may permanently scratch the transfer standard.) Remove excess alcohol using a fresh, dry wiper and inspect the optical surface. If you observe smears, streaks or fingerprints, clean the standard with liquid detergent as described below. Discard each wiper after a single use.

Remove water spots with a fresh PEC*PAD wiper moistened with one drop of a very dilute solution of distilled white vinegar mixed with distilled water. Don't contaminate the exposed ceramic bisque with this solution, and immediately rinse the cleaned optical surface with distilled water. Remove excess moisture with a fresh wiper, and proceed immediately to the isopropyl alcohol cleaning procedure that is described

above. Never soak transfer standards in vinegar (or another acid) that contains dissolved metallic fluorides, and avoid exposing them to skin acids or acidic chemicals.

Remove fingerprints, heavy soiling or grease stains with a fresh PEC*PAD wiper moistened with unscented lab detergent. Use a gentle scrubbing action, but avoid scratching the optical surface if the soiling contains abrasive material. For heavy soiling use several treatments — always with fresh wipers. Rinse the cleaned surface with distilled water. Remove excess moisture with a fresh wiper, and proceed immediately to the isopropyl alcohol cleaning procedure that is described above.

Refer to the maintenance manual for additional information.⁴ A summary of safety information is provided in Appendix B. Full MSDS documents are included in the accompanying CD.

Notes

1. The product warranty issued by Mt. Baker Research L.L.C. applies to transfer standards that the customer receives in defective condition. Because we carefully inspect each standard prior to shipment, the customer must report defective standards within 10 days of delivery. To receive full purchase credit for the replacement standards, the customer must promptly return the defective standards together with a written description of the problem. Vendor's warranty does not apply to transfer standards that are damaged by mishandling or misuse. During a one-time-only 30-day grace period, vendor will replace standards damaged by the customer for 50% of list price. This discount does not apply to calibration services. If re-calibration is required, the customer will be billed for this service at the regular price.
2. Because of shipping restrictions, vendor does not supply canned air with the Cleaning Kit. Vendor recommends using additive-free compressed 1,1,1,2-tetrafluoroethane, which is non-contaminating and non-flammable. (Please read the safety information included in Appendix B.)
3. Because of shipping restrictions, vendor does not supply isopropyl alcohol with the Cleaning Kit. Purchase additive-free isopropyl alcohol (90%) mixed with distilled water (10%). This mixture is irritating, toxic and highly flammable. Wear eye protection and avoid prolonged exposure to the vapors. (Please read the safety information included in Appendix B.)
4. J.W. Root, "Maintenance Manual for Glass & Ceramic Transfer Standards," technical report, release 2.1, Mt. Baker Research L.L.C., Bellingham, Washington, November 18, 2007.

Appendix A: Contents of Cleaning Kit

Each cleaning kit contains the following items:

1. 6 pairs of lint-free, archival grade (washable medium weight) cotton gloves. Always wear these gloves when handling transfer standards.
2. 12 pairs of disposable nitrile gloves. Wear these gloves when cleaning transfer standards with isopropyl alcohol.
3. 300 each PEC*PAD non-abrasive wipers. Use these wipers when cleaning transfer standards.
4. 1 each 4 oz re-fillable plastic dropping bottle. Fill this dispenser with isopropyl alcohol (90%) and use it when cleaning transfer standards.
5. 15 each 3-mil (lab grade) sealable PE bags. Use these bags for disposal of PEC*PAD wipers that are contaminated with isopropyl alcohol.
6. 1 each 20 mm Kinetronics StaticWisk static-free brush. Before each measurement, use this brush to remove dust or lint from the optical surface. Do not touch the bristles with ungloved hands.
7. 1 each re-sealable black plastic case.
8. Instructions for routine cleaning a set of standards, for cleaning a contaminated standard, and for purchasing and using the isopropyl alcohol and compressed tetrafluoroethane.
9. CD that includes the maintenance and instruction manuals.

Appendix B: Summary of Safety Data

Isopropyl Alcohol

Common synonyms: isopropanol, sec-propanol, sec-propyl alcohol, IPA

Use: Rubbing alcohol, skin sterilizing agent, cleaner

Molecular Formula: $\text{CH}_3\text{CHOHCH}_3$

CAS No.: 67-63-0

Appearance: Colorless liquid with alcohol odor.

Melting point: $-89\text{ }^\circ\text{C}$

Boiling point: $82\text{ }^\circ\text{C}$

Vapor pressure: 33 mm at $20\text{ }^\circ\text{C}$

Specific gravity: 0.79

Flash point: $12\text{ }^\circ\text{C}$

Explosion limits: 2.0% - 12%

Stability: Incompatible with strong acids, strong oxidizing agents, halogens, aluminum, and active halogen compounds. Vapor-air mixtures are highly flammable and may be explosive. May react with oxygen in the air to form peroxides.

Toxicology: May be harmful by inhalation, ingestion or skin absorption. May act as an irritant.

Personal protection: Effective ventilation. Disposable gloves. Safety glasses.

1,1,1,2-tetrafluoroethane

Common synonyms: HFC 134a, fluorocarbon 134a, unsymmetric tetrafluoroethane

Use: Aerosol propellant

Molecular Formula: $\text{CF}_3\text{CH}_2\text{F}$

CAS No.: 811-97-2

Appearance: Liquefied colorless gas under pressure. Cryogenic liquid with ether-like odor.

Melting point: $-101\text{ }^\circ\text{C}$

Boiling point: $-26\text{ }^\circ\text{C}$

Explosion limits: N/A

Stability: Stable. May cause damage to the atmosphere. Incompatible with active metals, strong oxidizing agents.

Toxicology: May be harmful by inhalation. Chronic exposure may cause reproductive damage. Asphyxiant at high concentration. High levels may cause CNS damage. Contact with liquid may cause skin burns.

Personal protection: Adequate ventilation. Do not breathe vapor in high concentrations.
Protective gloves and safety glasses if handling cryogenic liquid.

1,1-difluoroethane

Common synonyms: difluoroethane, Freon 152, Freon 152A, halocarbon 152A

Use: Aerosol propellant

Molecular Formula: CHF_2CH_3

CAS No.: 75-37-6

Appearance: Liquefied colorless gas under pressure. Odorless cryogenic liquid.

Melting point: $-117\text{ }^\circ\text{C}$

Boiling point: $-25\text{ }^\circ\text{C}$

Explosion limits: N/A

Stability: Stable. Highly flammable. Vapor-air mixtures may be explosive. Incompatible with oxidizing agents, metals (in the presence of water vapor), brass, steel.

Toxicology: Asphyxiant. High levels may cause CNS damage. Contact with liquid may cause skin burns.

Personal protection: Adequate ventilation. Do not breathe vapor in high concentrations.
Protective gloves and safety glasses if handling cryogenic liquid.

Dilute Acetic Acid mixed with water

Common synonyms: vinegar, white vinegar, distilled vinegar, dilute vinegar

Use: Distilled white vinegar is a dilute aqueous solution of acetic acid. Included in many prepared foods, it is available from grocery markets. Often used as a glass cleaner.

Molecular formula: CH_3COOH (acetic acid)

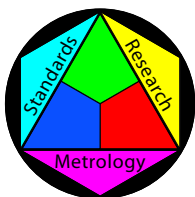
CAS No.: 64-19-7 (acetic acid)

Appearance: Colorless solution with mild vinegar odor.

Stability: Incompatible with carbonates and oxidizing agents.

Toxicology: Mild skin irritant.

Personal protection: Adequate ventilation. Disposable gloves. Safety glasses.



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