1. Chemical Product and Company Identification

Product Name: Precision Optical Cleaner; #MCC-POC03S; #MCC-POC03H
Chemical Family: Hydrofluoroethers (HFEs) blended with alcohol.

2. Composition/Information on Ingredients

- Chemical Name: Methyl Nonafluoroisobutyl Ether
  - CAS #: 163702-07-6
  - Wt.% Range: 0.0-15.0
  - TLV Units: See Section 8

- Chemical Name: Methyl Nonafluorobutyl Ether
  - CAS #: 163702-08-7
  - Wt.% Range: 0.0-15.0
  - TLV Units: See Section 8

- Chemical Name: Isopropyl Alcohol
  - CAS #: 67-63-0
  - Wt.% Range: 0.0-15.0
  - TLV Units: 400 ppm

All components of this material are listed on the TSCA inventory.

3. Hazard Identification

Emergency Overview: Colorless liquid with a slight alcohol odor. This product is not flammable. Liquid will irritate eyes and skin under repeated or prolonged exposure. Product vapors displace air and can cause asphyxiation especially in confined spaces.

Potential Health Effects

- Eyes: Liquid contact will irritate eyes and may cause redness, swelling, pain, tearing, and hazy vision. Persons wearing contact lenses should wear chemical protective safety glasses when exposed to this product.
- Skin: For repeated contact: dry/chapped skin, risk of chronic dermatitis. Wear chemical protective safety glasses when exposed to this product.
- Ingestion: Harmful if swallowed. Irritating to the mouth, throat and stomach. May be absorbed after ingestion and cause target organ effects.
- Inhalation: Symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea. Intentional misuse or deliberate inhalation may cause death without warning.
- Medical Conditions Aggravated by Exposure: Presence of this chemical may cause preexisting disease of the heart, lungs, skin and eyes.
- Target Organ Effects: Central Nervous System Depression: Signs may include headache, dizziness, drowsiness, incoordination, nausea, slowed reaction time, slurred speech, giddiness and unconsciousness.

4. First Aid Measures

- Eyes: Immediately flush with water. Remove any contact lenses and continue flushing for 15 minutes, lifting eyelids occasionally until no evidence of the chemical remains. If irritation develops or persists call a physician.
- Skin: Wash promptly with soap and water. Remove contaminated clothing and shoes and replace with clean clothing.
- Ingestion: Do NOT induce vomiting unless instructed to do so by medical personnel. Immediately give two glasses of water. Never give anything by mouth to an unconscious person. Call a physician.
- Inhalation: Remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Do not give Epinephrine. Call a physician.

5. Firefighting Measures

Flash Point: None; TCC/TOC Flammable Limits in Air: LEL/UEL (% by volume): Not Established
Autoignition Temperature: Not Established
Extinguishing Media: CO2, dry chemical, water spray, water fog.
Special Firefighting Procedures: Evacuate personnel. Wear self contained breathing apparatus (SCBA) and full protective equipment. Decomposition may occur. Containers generate pressure when heated causing violent bursting and dangerous propelling of container.

6. Accidental Release Measures

Spill or Leak: Evacuate area, absorb spilled liquid with commercial, nonflammable absorbent i.e. sand, vermiculite. Remove unprotected personnel. Protected personnel should remove ignition sources and shut off fire sources. Provide ventilation. Shovel (spark proof) absorbent material into drums and close. Do not flush to sewer.

7. Handling and Storage

Avoid breathing vapors or mist. Do not eat, drink or smoke when using this product. Use only with adequate ventilation. Avoid repeated or prolonged contact with eyes, skin or clothing. Wash thoroughly after handling. Do not store in direct sunlight. Store in cool dry place away from children. Keep container tightly closed. Use approved NIOSH self-contained or supplied air respirators for emergencies and in situations where air may be displaced by vapors.

8. Exposure Controls/Personal Protection

- Respiratory Protection: Use only with adequate ventilation. Keep container tightly closed. Use approved NIOSH self-contained or supplied air respirators for emergencies and in situations where air may be displaced by vapors.
- Eye Protection: Use chemical protective safety glasses.
- Protective Clothing: Where there is potential for skin contact, use appropriate impervious gloves, apron, pants and jacket.

Exposure Guidelines: Applicable Exposure Limits.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>TWA (AIHA)</th>
<th>STEL (ACGIH)</th>
<th>TWA (OSHA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl Nonafluoroisobutyl Ether</td>
<td>750 ppm</td>
<td>400 ppm</td>
<td>200 ppm</td>
</tr>
<tr>
<td>Methyl Nonafluorobutyl Ether</td>
<td>750 ppm</td>
<td>400 ppm</td>
<td></td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>750 ppm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NFPA, NPCA-HIMIS RATING:

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Personal Protection rating to be supplied by user depending on use conditions.
9. Physical and Chemical Properties

- **Physical Form:** Clear colorless liquid
- **Odor:** Slight alcohol
- **Boiling Point:** 54°C / 129°F
- **pH:** Not Applicable
- **Solubility in Water:** Slight
- **Specific Gravity:** 1.37 g/ml
- **% Volatile by Weight:** 100
- **Vapor Pressure:** 207 mm/hg at 25°C
- **Vapor Density (air=1):** 7.0

10. Reactivity

- **Chemical Stability:** Material is stable.
- **Hazardous Polymerization:** Will not occur.
- **Incompatibilities:** Alkali or alkaline earth metals powdered Al, Zn, Be, Na, Mg, etc. Incompatible w/strong bases such as NaOH, KOH, etc.
- **Decomposition Products:** Decomposes with heat. High temperatures (open flame, glowing metal surfaces, etc.) can decompose forming carbon dioxide, carbon monoxide, hydrogen fluoride and possibly perfluoroisobutylene (PFIB).

11. Toxicological Information

- **Toxicity information for the individual components of this product are listed below.**
  - Methyl Nonafluoroisobutyl Ether and Methyl Nonafluoroisobutyl Ether: Acute Inhalation Lethal Concentration: >100,000 ppm (4 hr.). Oral Toxicity: Practically nontoxic (LD50>5g/kg in albino rat). Developmental toxicity: No abnormal effects observed. Mutagenicity: Not a mutagen in reverse mutation or chromosomal aberration assays. Cardiac Sensitization: No signs of sensitization at exposures up to 1000,000 ppm. Primary Dermal Irritation: Minimally Irritating. Dermal Sensitization: Not a skin sensitizer.
  - **Carcinogenicity:** None of the components present in this material are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

12. Ecological Information

- **Aquatic Toxicity:** Testing results indicate that the components to this cleaner have insignificant toxicity to aquatic organisms at their saturation point (Lowest LC50, EC50 or IC50 > substance water solubility). These compounds are highly volatile and have high Henry's Law constants and are thus expected to move rapidly through vaporization from solution in an aquatic compartment or from a soil surface in a terrestrial compartment to the atmosphere.

13. Disposal Considerations

- **Waste Disposal:** Reclaim by distillation or remove to a permitted waste disposal facility. Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial and Local regulations.
- **EPA Hazardous Waste Number (RCRA):** Not Regulated

14. Transportation Information

- **Bulk Packaging/Non Aerosol:** Not Regulated as Hazardous Material by DOT, IMO, or IATA.

15. Regulatory Information

- **Section 313 Supplier Information:** This material contains the following toxic chemicals subject to the emergency reporting requirements of Section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40 CFR 372:

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
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</tbody>
</table>

This information must be included in all MSDSs that are copied and distributed for this material.

- **Title III Hazard Communications Sections 311, 312**
  - Acute: Yes
  - Chronic: No
  - Fire: No
  - Reactivity: No
  - Pressure: Yes

- **Lists:**
  - SARA Extremely Hazardous Substance: No
  - CERCLA Hazardous Substance: No
  - SARA Toxic Chemicals: No

16. Other Information

For additional information, contact Tech Support at MicroCare:
Telephone (860) 827-0626 or email: techsupport@microcare.com