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MATERIAL SAFETY DATA SHEET

Effective Date: 02/17/14 ******** Supersedes: 8/01/2004**

S-316 SOLVENT

1. Product Identification

Synonyms: C4Cl4F6 2,2,3,3 Tetrachlorohexafluorobutane, Trifluorchloroethylene polymer, Chlorotrifluoroethylene homopolymer
CAS No.: 9002-83-9
Chemical Formula: CClF2CClFCClFCClF2
Horiba Product Number: 5200-100690
Commodity Code 2903-1960-50
Dangerous Goods Indicator Profile = 002

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Poly (chlorotrifluoroethylene)	9002-83-9	65-75	Slight
Other components: $Cl(CF_2CFCl)3Cl$, $Cl(CF_2CFCl)4Cl$	9002-83-9	25-35	Slight

This product contains the following toxic chemical(s) subject to Section 313 Title 111 reporting requirements (40CFR Part 72): None

3. Health Hazard Data

A 1999 study produced no deaths among 10 rats upon an 8 hour exposure to (34.3 mg/L), and is considered by OSHA definition to be nontoxic. The animals showed no signs of treatment during exposure or 14 days afterward. All animals gained weight during the 14 day observation period. Autopsy showed no macroscopic abnormalities.

In a 4 hour exposure among rats conducted in 1989, S-316 was found to have a LC50 of 4.6mg/L. This result placed it into the EPA Toxicity Category III (Slightly Toxic).
The animals generally showed no response during exposure or for at least one day after exposure. Signs of toxicity including tremors, nasal discharge, and labored breathing began appearing two or three days after exposure. The responses generally abated in surviving animals during the second week after exposure.
More extensive toxicity studies have been conducted on slightly heavier oil (3.1). Based on all the available data in the three species of animals, limited exposure to S-316 should not be harmful to any portion of the human anatomy. Studies conducted by the Air Force have demonstrated liver toxicity in rodents, but not in primates. The observed liver toxicity is believed to be specific for rodents and relevant to humans.S-316 is not irritating to the skin, but protection should be used to prevent repeated exposure and the possibility of sensitization. All mutagenicity studies were negative. Since the potential for human toxicity cannot be ruled out, proper ventilation and work practices should be employed.

Primary Routes of Entry: Inhalation, Skin, Ingestion
Acute Effects of Overexposure: From animal studies, signs of fluoride poisoning may be expected. These include nausea, shortness of breath, and loss of appetite.
Chronic Effects of Overexposure: Unknown
Health Rating: 1
Flammability Rating: 0
Reactivity Rating: 0
Contact Rating: 0
Lab Protective Equip: Safety Glasses, Chemical Resistant Gloves
Emergency Overview

Harmful, if thermal decomposition gases are inhaled. This material produces toxic gases including HF by thermal decomposition.

4. First Aid Measures

Inhalation: Remove to fresh air. Apply artificial respiration if needed.
Ingestion: Induce vomiting. Seek medical help.
Skin Contact: Wash with soap and water.
Eye Contact: Flush eyes immediately with water for at least 15 minutes. Seek medical help.

5. Fire Fighting Measures

Fire: Non-flammable
Fire Extinguishing Media: Use agent appropriate for surrounding fire.
Special Information: None

6. Accidental Release Measures

Ventilate area, and absorb spill with absorbent such as vermiculite.

7. Handling and Storage

Wash thoroughly after handling.
Store product in a cool, dry place.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits: Not established
Ventilation System: Yes
Personal Respirators (NIOSH Approved): Yes
Skin Protection: Yes
Eye Protection: Yes

9. Physical and Chemical Properties

Appearance: Clear liquid
Odor: Slight ethereal odor
Solubility in Water: Negligible
Specific Gravity: 1.7 g/ml @38 °C
pH: N/A
Boiling Point: 134° C
Melting Point: -143°C
Vapor Density (Air=1): Not Available
Vapor Pressure (mm Hg): 10 mm Hg @ 21°C
Evaporation Rate (BuAc=1): Not Available

10. Stability and Reactivity

Stability: Stable

Hazardous Decomposition Products: The decomposition to toxic, non-sludge forming volatiles occurs rapidly at 325°C, noticeably at 300°C and in lesser amounts at lower temperatures. The maximum safe operating temperature recommended is 200°C, and a short-term temperature recommended is 260°C in scrupulously clean systems.

Hazardous Polymerization: Will not occur

Incompatibilities: Reacts with active metals like sodium, potassium, amines, liquid fluorine and liquid chlorine trifluoride

Conditions to Avoid: Incompatible Materials

11. Toxicological Information

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Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Poly(Chlorotrifluoroethylene)	None	None	None

12. Ecological Information

Environmental Fate: No Data

Environmental Toxicity: No Data

13. Disposal Considerations

Product may be incinerated by licensed waste disposal company. Observe all federal, state and local regulations.

14. Transport Information

U.S. (49CFR): Not Regulated
IATA: Not Regulated
IMDG: Not Regulated

15. Regulatory Information

--------\Chemical Inventory Status –

Ingredient	TSCA	-----Canada------ DSL	NDSL
Poly (Chlorotrifluoroethylene)	Not Regulated	Not Regulated	

16. Other Information

Disclaimer:
The above information is believed to be correct but not purport to be all inclusive and shall be used only as a guide. Horiba Instruments shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or

packing slip for additional terms and conditions of sale.
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Prepared by: Rod Ethridge
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