



Novec™ HFE-7100 MSDS

Effective Date: June 20, 2013

24 Hour Emergency Contact:

ChemTel: (800)255-3924

www.pioneerforensics.com

1. PRODUCT AND COMPANY IDENTIFICATION

Product: Novec™ HFE-7100 Formula
Product Number(s): N/A
CAS#: Mixture
Synonyms: Mixture
Manufacturer: Pioneer Forensics, LLC
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Loveland, CO 80537
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2. HAZARDS IDENTIFICATION

Emergency Overview: MAY BE HARMFUL IF INHALED, SWALLOWED, OR ABSORBED THROUGH SKIN. CAUSES IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

Safety Ratings: Health: 1, Slight Reactivity: 0, None
Flammability: 0, None Contact: 1, Slight

OSHA Regulatory Status: This product is not considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Acute Health Effects:

Routes of Exposure: Inhalation, ingestion, skin contact, eye contact

Inhalation: May be harmful if thermal decomposition occurs.

Ingestion: No health effects are expected.

Skin Contact: Contact with the skin is not expected to result in significant irritation.

Eye Contact: Contact with the eyes is not expected to result in significant irritation.

Target Organs: Skin, Central nervous system, Liver, Reproductive system, Eyes

Chronic Health Effects: Exposure to this chemical is not known to aggravate existing medical conditions.

Potential Environmental Effects: This product may undergo partial biodegradation in the environment. It will likely diffuse rapidly into the atmosphere if exposed to the environment. Take measures to prevent environmental exposure.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Components</u>	<u>CAS#</u>	<u>Chemical Formula</u>	<u>Formula Weight</u>	<u>Hazardous</u>	<u>% by Weight</u>
Methyl Nonafluorobutyl Ether	163702-07-6 20-80	C ₅ H ₃ F ₉ O	250.06	No	
Methyl Nonfluoroisobutyl Ether	163702-08-7 20-80	C ₅ H ₃ F ₉ O	250.06	No	

4. FIRST AID MEASURES

First Aid Procedures:

- Inhalation:** Remove to fresh air. If breathing is difficult, administer oxygen. If the victim is not breathing, provide artificial respiration. Get medical attention if symptoms persist.
- Ingestion:** Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, keep head low so that vomit does not enter lungs. Never give anything by mouth to an unconscious person.
- Skin Contact:** Wash affected area with soap and plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. Get medical attention if symptoms occur.
- Eye Contact:** Check for and remove contact lenses. Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention if symptoms persist.

General Advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

Notes to Physician: Treat symptomatically. Symptoms may be delayed.

5. FIRE FIGHTING MEASURES

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 0

Flammable Properties: May be combustible at high temperatures.

Flash Point: No information found.

Auto-ignition Temp: No information found.

Flammable Limits in Air (% by volume): Lower Explosion Limit: No information found.
Upper Explosion Limit: No information found.

Suitable Extinguishing Media: Water spray, Dry powder, Alcohol resistant foam, Carbon dioxide

Unsuitable Extinguishing Media: Do not use a solid (straight) water stream as it may scatter and spread fire.

Hazardous Combustion Products:	Carbon monoxide, Carbon dioxide, Hydrofluoric Acid, Perfluoroisobutylene
Specific Hazards:	Extreme heat conditions may result in thermal decomposition into Hydrofluoric acid (HF) and Perfluoroisobutylene (PFIB), which are highly toxic.
Special Protective Equipment For Firefighters:	As in any fire, wear MSHA/NIOSH approved (or equivalent) self-contained positive pressure or pressure-demand breathing apparatus and full protective gear.
Specific Methods:	Use water spray to cool unopened containers. Move containers from fire area if you can do so without risk. In the event of fire and/or explosion do not breathe fumes.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Ventilate area of leak or spill. Isolate hazard area and keep unnecessary and unprotected personnel away from the area of the leak or spill. Keep upwind. Keep out of low areas. Wear appropriate personal protective equipment as specified in the Exposure Control and Personal Protection Section 8. Avoid contact with eyes, skin, and clothing. Pay attention to flashback. Take precautionary measures against static discharges.
Environmental Precautions:	Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground. In case of large spill, dike if needed.
Methods for Containment:	Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. Dike the spilled material, where this is possible. In case of large spill, water spray or vapor suppressing foam may be used to reduce vapors.
Methods for Cleaning Up:	Absorb spill with an inert material (e.g. vermiculite, dry sand, earth, cloth, fleece), and place in a suitable container for reclamation or disposal. Clean contaminated surface thoroughly. Never return spills in original containers for re-use. Clean up in accordance with all applicable regulations.

7. HANDLING AND STORAGE

Handling:	Do not handle or open near sources of extreme heat (>150°C). Wear personal protective equipment (see section 8). Use only in well-ventilated areas. Provide sufficient air exchange and/or exhaust in work rooms. Avoid contact with skin, eyes and clothing. Do not breathe vapors or spray mist. Do not ingest. When using, do not smoke. Keep away from incompatible materials. Handle in accordance with good industrial hygiene and safety practice. Wash thoroughly after handling. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquids). Observe all warnings and precautions listed for the product.
Storage:	Store in a cool, dry, ventilated area. Store in a segregated and approved area away from flame, heat, acids, strong bases, oxidizers, and incompatible materials. Store in original container and out of excessive light. Keep containers tightly closed and upright. Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

8. EXPOSURE CONTROL AND PERSONAL PROTECTION

Exposure Limits:

Product:	No exposure limits established for this product.		
Components:	Methyl nonafluorobutyl ether:	AHIA:	TWA: 750 ppm
	Methyl nonafluoroisobutyl ether:	AHIA:	TWA: 750 ppm

Engineering Controls: Ensure adequate ventilation. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment:

Eye/Face Protection:	Wear goggles or safety glasses with side shields and a face shield.
Skin Protection:	Wear appropriate chemical resistant clothing (with long sleeves) and appropriate chemical resistant gloves.
Respiratory Protection:	Use a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.
General Hygiene Considerations:	Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Provide eyewash station and safety shower.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Appearance:	Clear liquid
Color:	Colorless, clear
Odor:	Characteristic, ethereal
Molecular Formula:	Mixture
Molecular Weight:	Mixture
pH:	No information found.
Specific Gravity:	1.50 (estimated)
Freezing/Melting Point:	-135° C (-211° F)
Boiling Point:	61° C (142° F)
Flash Point:	No information found.
Auto Ignition Temperature:	405° C (761° F)
Flammable Limits in Air (% by Volume):	
Upper:	No information found.
Lower:	No information found.
Solubility:	Not soluble in water (<12 ppm)
Vapor Pressure:	26.9 kPa at 25°C
Vapor Density:	8.6
Percent Volatile:	100%

Odor threshold (ppm): No information found.
Evaporation Rate: 49 BuAc
Partition Coefficient (n-octanol/water): 3.54

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid: Heat, temperatures above 60°C, excessive light

Incompatible Materials: Oxidizing agents, strong acids, strong bases

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, hydrogen fluoride, perfluoroisobutylene, toxic vapor, gas

Possibility of Hazardous Reactions: Can react vigorously, violently or explosively with the incompatible materials listed above.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data: Oral Rat LD50: > 5000 mg/kg
Inhalation Rat LC50: > 100,000 ppm 4 H

Acute Effects: No information found.

Local Effects: Contact with skin or eyes may cause irritation. May be harmful if inhaled or ingested. Although no specific toxic effects were found, always keep exposure to a minimum.

Sensitization: Not a skin sensitizer.

Chronic Effects: No information found.

Carcinogenic Effects: This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Skin Corrosion/Irritation: Minimal irritation.

Epidemiology: No epidemiological data is available for this product.

Mutagenicity: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Neurological Effects: No information found.

Reproductive Effects: No information found.

Teratogenic Effects: No information found.

Target Organs and Symptoms: No information found.

12. ECOLOGICAL INFORMATION

Ecotoxicological Data:	EC50 Water flea (<i>Daphnia magna</i>):	> 10 mg/L 48 H
	LC50 Fathead minnow (<i>Pimephales promelas</i>):	> 7.9 mg/L 96 H
	IC50 Green algae (<i>Selenastrum capricornutum</i>):	> 8.9 mg/L 96 H
Ecotoxicity:	This product may be harmful to aquatic organisms.	
Environmental Effects:	This product is not expected to be harmful to the environment.	
Persistence and Degradability:	Expected to vaporize rapidly from aerobic environments.	
Partition Coefficient (n-octanol/water):	3.54	

13. DISPOSAL INFORMATION

Disposal Instructions:	All wastes must be handled in accordance with local, state and federal regulations.
Contaminated Packaging:	Since emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.
Waste Codes:	No information found.

14. TRANSPORT INFORMATION

Not regulated per U.S. DOT, IATA, or IMO.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

OSHA: This product is not considered a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Inventory: Methyl nonafluorobutyl ether, Methyl nonafluoroisobutyl ether

U.S. EPCRA (SARA Title III):

Sections 311/312:	<u>Hazard Categories</u>	<u>List (Yes/No)</u>
	Section 311 – Hazardous Chemical	Yes
	Immediate Hazard	Yes
	Delayed Hazard	No
	Fire Hazard	No
	Pressure Hazard	No
	Reactivity Hazard	No

Section 313: No information found.

CERCLA: No information found.

International Inventories:	<u>Country(s) or Region</u>	<u>Inventory Name</u>	<u>On Inventory (Yes/No)*</u>
	Australia	Australian Inventory of Chemical Substances (AICS)	Yes
	Canada	Domestic Substances List (DSL)	Yes
	Canada	Non-Domestic Substances List (NDSL)	No
	China	Inventory of Existing Chemical Substances in China (IECSC)	No
	Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
	Europe	European List of Notified Chemical Substances (ELINCS)	Yes
	Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
	Korea	Existing Chemicals List (ECL)	No
	New Zealand	New Zealand Inventory	No
	Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes

*A "Yes" indicates that the listed component(s) of this product comply with the inventory requirements administered by the governing country(s)

16. OTHER INFORMATION

Product Use: Laboratory and/or field reagent

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Reason for Revision: Not applicable