SAFETY DATA SHEET

Section : PRODUCT AND COMPANY INFORMATION

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Revision Date: 06/12/2018

TRADE NAME(s)	NanoProof® 5.1	**CHEMICAL FAMILY APPLICATION**	**Chemical Mixture Chemical Encapsulant**

Section 2: HAZARDOUS IDENTIFICATION

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Eye irritation (Category 2A), H319
Causes Skin Irritation (Category 2), H315

LABELING ELEMENTS Hazard and Precautionary Statements

Signal word: Warning **Pictogram(s):**

Hazard statement(s):
H315 Causes Skin Irritation
H319 Causes serious eye irritation.

Precautionary statement(s)
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P312 Call a POISON CENTER or doctor/ physician if you feel unwell.
P337 + P313 If eye irritation persists: Get medical advice/ attention.

[2C]**HAZARDS NOT OTHERWISE CLASSIFIED:** The hazards of this product are associated mainly with its processing. Inhalation of decomposition products in high concentration may cause shortness of breath (lung oedema). Inhalation of aerosol or fine spray mist may cause serious respiratory problems.

[2D]**INGREDIENTS OF UNKNOWN ACUTE TOXICITY >/= 1%:**

Section 3: COMPOSITION / INFORMATION ON INGREDIENT(S)

INGREDIENT(S)	CAS NUMBER	EINECS NO.	CONC. *
Proprietary Active Blend*	n/a	n/a	05 - 25 %
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	297730-93-9		15 - 25 %
Ethyl nonafluorobutyl ether	163702-05-4		14 - 56%
Ethyl nonafluoroisobutyl ether	163702-06-5		14 - 56%
Proprietary UV Dye*	n/a		< 1%

* The specific chemical identity and/or percentage of this material has been withheld as a trade secret.

Section 4: FIRST AID MEASURES

GENERAL ADVICE	Consult a physician. Show this safety data sheet to the doctor in attendance.Move out of dangerous area.
EYE CONTACT	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
SKIN CONTACT	Wash off with soap and plenty of water. Consult a physician.
INHALATION	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician..
INGESTION	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
MOST IMPORTANT SYMPTOMS & EFFECTS	The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11
INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED	no data available

Section 5: FIREFIGHTING MEASURES

GENERAL INFORMATION	EXTINGUISHING MEDIA Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
HAZARDOUS COMBUSTION PRODUCTS/FIRE FIGHTING ADVICE	Burning may form Carbon oxides. Use water spray to cool unopened containers.

PRECAUTIONS / SPECIAL PROTECTIVE EQUIPMENT	Exposure to extreme heat can give rise to thermal decomposition. When fire fighting conditions are severe and total thermal decomposition of the product is possible, wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

Section 6: ACCIDENTAL RELEASE MEASURES

PERSON-RELATED SAFETY PRECAUTIONS	Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation.
MEASURES FOR CLEANING/ COLLECTING	Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations. Prevent material from entering storm sewers or waterways.

Section 7: HANDLING AND STORAGE

HANDLING PRECAUTIONS	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Do not breathe thermal decomposition products. Avoid skin contact with hot material. For industrial or professional use only. Do not use in a confined area with minimal air exchange. No smoking: Smoking while using this product can result in contamination of the tobacco and/or smoke and lead to the formation of hazardous decomposition products.Wash thoroughly after handling. Do not eat, drink or smoke when using this product.
STORAGE PRECAUTIONS	Store in a well-ventilated place. Store work clothes separately from other clothing, food and tobacco products. Avoid release to the environment. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.)
STORAGE CONDITIONS	Store in a well-ventilated place. Keep container tightly closed. Store away from heat. Store away from acids. Store away from strong bases. Store away from oxidizing agents.

Section 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

COMPONENT	VALUE	CONTROL PARAMETERS	BASIS	NOTES
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	TWA	100 ppm	Manufacturer determined	
Ethyl nonafluorobutyl ether	TWA	(as total isomers) :200	Manufacturer determined	CAS 163702-05-4
Ethyl nonafluoroisobutyl ether	TWA	(as total isomers):200 ppm	Manufacturer determined	CAS 163702-06-5

VENTILATION / ENGINEERING CONTROLS	Provide appropriate local exhaust when product is heated. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.
RESPIRATORY PROTECTION	Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).
SKIN PROTECTION	Wear appropriate protective gloves to prevent skin exposure. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Gloves made from the following material(s) are recommended: Polymer laminate.
EYE PROTECTION	Wear appropriate protective eyeglasses or chemical safety goggles. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
CLOTHING	Wear appropriate protective clothing to prevent skin exposure.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.	Liquid, Clear Greenish color	**Solubility (in H_2O)**	no data available
Upper/lower flammability or explosive limits:	LEL: no data available UEL: no data available	**Initial boiling point and boiling range**	no data available
Odor	faint odor	**Flash point**	no flash point
Vapor pressure	no data available	**Evaporation rate**	> 20 (BuOAC = 1)
Odor threshold	no data available	**Flammability (solid, gas)**	no data available
Vapor density	> 1 [Ref Std: AIR=1]	**Partition coefficient: n-octanol/water**	> 4 [Details: at 30 °C]
pH	not applicable	**Auto-ignition temperature**	375 ºC
Relative Density	1.6 g/ml	**Decomposition temperature**	no data available
Melting point/freezing point	-138 °C	**Viscosity**	no data available

Section 10: STABILITY AND REACTIVITY

REACTIVITY	no data available
CHEMICAL STABILITY	Stable under recommended storage conditions.
CONDITIONS TO AVOID	None known, Excess Moisture in the solution should be avoided
INCOMPATIBLE MATERIALS	Strong oxidizing agents, strong acids, strong bases.
HAZARDOUS DECOMPOSITION PRODUCTS	At extreme conditions of heat the hazardous decomposition products include Hydrogen Fluoride and/or Perfluoroisobutylene Refer to section 5.2 for hazardous decomposition products during combustion.
HAZARDOUS POLYMERIZATION	Has not been reported

Section 11: TOXICOLOGY INFORMATION

GENERAL INFORMATION POTENTIAL HEALTH EFFECTS: SIGNS AND SYMPTOMS OF EXPOSURE

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

I**nhalation:**
May be harmful if inhaled. Material may be destructive to the tissue of the mucous membranes and upper respiratory tract. Signs/symptoms may include cough, shortness of breath, nausea, vomiting, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Skin Contact:
May be harmful if absorbed through skin. May cause irritation or skin burns.

Eye Contact:
Causes serious eye irritation or burns. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

I**ngestion:**
May be harmful if swallowed.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Dermal	Rat	LD50 > 2,000 mg/kg
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Inhalation-Vapor (4 hours)	Rat	LC50 > 50 mg/l
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Ingestion	Rat	LD50 > 2,000 mg/kg
Ethyl nonafluoroisobutyl ether	Inhalation-Vapor (4 hours)	Rat	LC50 > 989 mg/l
Ethyl nonafluoroisobutyl ether	Ingestion	Rat	LD50 > 2,000 mg/kg
Ethyl nonafluorobutyl ether	Inhalation-Vapor (4 hours)	Rat	LC50 > 989 mg/l
Ethyl nonafluorobutyl ether	Ingestion	Rat	LD50 > 2,000 mg/kg
Proprietary Active Blend			No data available

Skin Corrosion /Irritation

3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Rabbit	No significant irritation
Proprietary Active Blend		No data available

Serious Eye Damage/ Irritation

3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Rabbit	No significant irritation
Proprietary Active Blend		No data available

Skin Sensitization

3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Guinea pig	Not sensitizing
Proprietary Active Blend		No data available

Respiratory Sensitization

3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane		No data available or insufficient for classification
Proprietary Active Blend		No data available

Germ Cell Mutagenicity

3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	In Vitro	Not mutagenic	
Proprietary Active Blend		No data available	

Carcinogenicity

3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane		No data available or insufficient for classification
Proprietary Active Blend		No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC, ACGIH, NTP or OSHA

Reproductive Toxicity

Name	Route	Value	Species	Test Result	Exposure Duration
3-ethoxy-1,1,1,2,	Ingestion	Not toxic to female reproduction	Rat	NOAEL	premating

	3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane				1,000 mg/kg/day	& during gestation
	3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Ingestion	Not toxic to male reproduction	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
	3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Inhalation	Not toxic to male reproduction	Rat	NOAEL 69 mg/l	5 days
	3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Ingestion	Not toxic to development	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
	Proprietary Active Blend					No Data Available

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Inhalation	respiratory irritation	All data are negative	Rat	NOAEL 207 mg/l	5 days
Proprietary Active Blend					No data available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexan	Inhalation	liver/kidney and/or bladder	Some positive data exist, but the data are not	Rat	NOAEL 169 mg/l	5 days

	e			sufficient for classification			
	3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Ingestion	liver	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,000 mg/kg/day	28 days
	3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Inhalation	heart| endocrine system| hematopoietic system nervous system| Kidney and/or bladder	All data are negative	Rat	NOAEL 1,000 mg/kg/day	28 days
	Proprietary Active Blend					No data available	

Aspiration Hazard	3-ethoxy-1,1,1,2,3,4,4,5,5,6,6,6-dodecafluoro-2-trifluoromethyl-hexane	Not an aspiration hazard
	Proprietary Active Blend	No data available

Section 12: ECOLOGICAL INFORMATION

ECOTOXICITY	No data available
ENVIRONMENTAL	No data available
PHYSICAL	No data available

Section 13: DISPOSAL CONSIDERATIONS

Dispose of contents/ container in accordance with the local/regional/national/international regulations.
Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include halogen acid (HCl/HF/HBr). Facility must be capable of handling halogenated materials. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the

respective regulating authorities to determine the available treatment and disposal facilities.

Section 14: TRANSPORTATION INFORMATION

US DOT/IATA/EU/ EC Label for Conveyance: None

US DOT/IATA	Not regulated for transport
IMDG	

Section 15: REGULATORY INFORMATION

US

TSCA	Polymer is TSCA exempt under EPA polymer exemption. Other materials are TSCA listed. The components are REACH registered or pre-registered as appropriate
OSHA	This document has been prepared in accordance with the SDS requirements of the OSHA Hazard Communication Standard.
SARA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES	No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
The following components are subject to reporting levels established by SARA Title III, Section 313	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313
Sara 311/312 Hazards	Immediate Hazard
Massachusetts Right To Know Components	not listed
Pennsylvania Right To Know Components	not listed
New Jersey Right To Know Components	not listed
California Prop. 65 Components	This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16: OTHER INFORMATION

Revision Date: 06/12/2018 Updated Emergency Contact

06/06/2018 Updated Emergency Contact
01/26/16 Original Issue

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