

## SAFETY DATA SHEET

### 1. SUBSTANCE AND SOURCE IDENTIFICATION

**Product Identifier**

**RM Number:** 8446  
**RM Name:** Perfluorinated Carboxylic Acids and Perfluorooctane Sulfonamide in Methanol  
**RM Parts:** PFCAs in Methanol  
                   PFCAs and PFOSA in Methanol  
**Other Means of Identification:** Not applicable.

**Recommended Use of This Material and Restrictions of Use**

This Reference Material (RM) is intended primarily for use in the calibration of chromatographic instrumentation. A unit of RM 8446 consists of four 2 mL ampoules, each containing approximately 1.2 mL of solution. Two ampoules contain trace amounts of perfluorinated carboxylic acids (PFCAs) in methanol, and the other two ampoules contain two additional PFCAs and perfluorooctane sulfonamide (PFOSA) in methanol.

**Company Information**

National Institute of Standards and Technology  
 Standard Reference Materials Program  
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### 2. HAZARDS IDENTIFICATION

**Classification**

**Physical Hazard:** Flammable Liquid, Category 2  
**Health Hazard:** Acute Toxicity, Oral, Category 3  
                   Acute Toxicity, Inhalation, Category 3  
                   Acute Toxicity, Dermal, Category 3  
                   STOT - Single Exposure, Category 1

**Label Elements**
**Symbol**

**Signal Word**

Danger

**Hazard Statement(s)**

H225 Highly flammable liquid and vapor.  
 H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.  
 H370 Causes damage to organs <central nervous system>.

**Precautionary Statement(s)**
**Prevention**

P210 Keep away from heat, sparks, open flames, hot surfaces. — No smoking.  
 P241 Use explosion-proof electrical, ventilating, lighting equipment.  
 P242 Use only non-sparking tools.  
 P243 Take precautionary measures against static discharge.  
 P260 Do not breathe fumes, mist, vapors, or spray.  
 P264 Wash hands thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P280 Wear protective gloves, eye protection, and protective clothing.

Response  
P301+P310 If swallowed: Immediately call a doctor.  
P330 Rinse mouth.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water.  
P308+P311 If exposed or concerned: Call a doctor.

Storage  
P403+P235 Store in a well-ventilated place. Keep cool.  
P405 Store locked up.

Dispose  
P501 Dispose of contents and container in accordance with applicable regulations.

**Hazards Not Otherwise Classified:** None.

**Ingredients(s) with Unknown Acute Toxicity:** None.

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### 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

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**Substance:** Methanol

**Other Designations:** Methyl alcohol; wood alcohol; methyl hydroxide; wood spirit; wood naphtha

**NOTE:** Components are listed in compliance with OSHA's 29 CFR 1910.1200. The trace amounts of perfluorinated carboxylic acids (PFCAs) and perfluorooctane sulfonamide (PFOSA) acids are below the reporting limit for OSHA. For actual values, see the NIST Report of Investigation.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Methanol	67-56-1	200-659-6	>99.9

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### 4. FIRST AID MEASURES

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#### Description of First Aid Measures

**Inhalation:** If adverse effects occur, remove to well-ventilated (uncontaminated) area. If breathing is difficult, qualified personnel may administer oxygen. If not breathing, qualified personnel should give artificial respiration. Seek immediate medical attention.

**Skin Contact:** Rinse affected skin with water for at least 15 minutes, then wash thoroughly with soap or mild detergent and water. If skin irritation persists, seek medical aid and bring the container or label.

**Eye Contact:** Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

**Ingestion:** If ingested, seek medical attention.

#### Most Important Symptoms/Effects, Acute and Delayed

**Inhalation:** Irritation, dizziness, tingling sensation, pain in extremities, tremors, loss of coordination, difficulty breathing, irregular heartbeat, visual disturbances, blindness, bluish skin color, convulsions, unconsciousness, and coma.

**Skin Contact:** Irritation.

**Eye Contact:** Irritation.

**Ingestion:** Same as most important symptoms/effects listed under inhalation.

**Indication of any immediate medical attention and special treatment needed, if necessary:** If any of the above symptoms are present, seek immediate medical attention.

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## 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Severe fire hazard. Vapor/air mixtures are explosive above the flash point. Vapors or gases may ignite at distant ignition sources and flash back. See Section 9, “Physical and Chemical Properties” for flammability properties.

### Extinguishing Media

Suitable: Regular dry chemical, carbon dioxide, water, or alcohol-resistant foam.

Unsuitable: None listed.

**Specific Hazards Arising from the Chemical:** Not applicable.

**Special Protective Equipment and Precautions for Fire-Fighters:** Move container from fire area if it can be done without personal risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

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## 6. ACCIDENTAL RELEASE MEASURES

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**Personal Precautions, Protective Equipment and Emergency Procedures:** Use suitable protective equipment; see Section 8, “Exposure Controls and Personal Protection”. Keep out of waters supplies and sewers.

**Methods and Materials for Containment and Clean up:** Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk, with water spray to reduce vapors. Absorb spilled material with sand or non-combustible material and collect in appropriate container for disposal.

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## 7. HANDLING AND STORAGE

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**Safe Handling Precautions:** See Section 8, “Exposure Controls and Personal Protection”.

**Storage and Incompatible Materials:** Store in a well-ventilated area. Keep separated from incompatible substances (See Section 10, “Stability and Reactivity”).

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## 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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### Exposure Limits

OSHA (PEL): 260 mg/m<sup>3</sup>; 200 ppm TWA

ACGIH (TLV): 200 ppm TWA

250 ppm STEL

Skin – potential significant contribution to overall exposure by the cutaneous route.

NIOSH (REL): 260 mg/m<sup>3</sup>; 200 ppm TWA

325 mg/m<sup>3</sup>; 250 ppm STEL

6000 ppm IDLH

Potential for dermal absorption.

**Engineering Controls:** Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**Personal Protection Measures:** In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

**Respiratory Protection:** If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye Protection:** Splash resistant safety goggles and emergency eyewash are recommended.

**Skin and Body Protection:** Chemical resistant clothing and gloves are recommended.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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Properties	Methanol (>99.9 %)
Molar Mass (g/mol)	32.04
Molecular Formula	CH <sub>3</sub> OH
Appearance (physical state, color, etc.)	clear, colorless liquid
Odor	alcohol odor
Odor threshold	100 ppm
pH	not available
Evaporation rate (butyl acetate = 1)	4.6
Melting point/freezing point	-94 °C (-137 °F)
Relative Density as Specific Gravity (water = 1)	0.7914
Density	not available
Vapor Pressure	97.25 mmHg at 20 °C
Vapor Density (air = 1)	1.11
Viscosity	0.59 cP at 20 °C
Solubilities	soluble in water solvent: ether, benzene, acetone, chloroform, ethanol, ketones, organic solvents
Partition coefficient (n-octanol/water)	not available
<b>Thermal Stability Properties</b>	
Autoignition Temperature	385 °C (725 °F)
Thermal Decomposition	not available
Initial boiling point and boiling range	65 °C (149 °F)
Explosive Limits, LEL (Volume %)	6 %
Explosive Limits, UEL (Volume %)	36 %
Flash Point (Closed Cup)	11 °C (51.8 °F)
Flammability (solid, gas)	not applicable

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## 10. STABILITY AND REACTIVITY

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**Reactivity:** Stable at normal temperatures and pressure.

**Stability:**      Stable            Unstable

**Possible Hazardous Reactions:** Not applicable.

**Conditions to Avoid:** Avoid heat, flames, sparks, and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

**Incompatible Materials:** Halo carbons, combustible materials, metals, oxidizing materials, halogens, metal carbide, bases, acids, and amines.

**Hazardous Decomposition:** Oxides of carbon.

**Hazardous Polymerization:**      Will Occur            Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Exposure:**    Inhalation      Skin            Ingestion

**Symptoms Related to the Physical, Chemical and Toxicological Characteristics:** Skin irritation, eye irritation, central nervous system depression, and nerve damage. May cause blindness.

**Potential Health Effects (Acute, Chronic, and Delayed)**

**Inhalation:** Acute and chronic exposure may cause irritation, cough, ringing in the ears, constipation, headache, drowsiness, dizziness, tingling sensation, pain in extremities, tremors, loss of coordination, blood disorders, and nerve damage. Chronic exposure may also cause sensitivity to light, changes in blood pressure, digestive issues, difficulty breathing, irregular heartbeat, visual disturbances, blindness, bluish skin color, lung congestion, heart damage, kidney damage, liver damage, reproductive effects, effects on the brain, convulsions, unconsciousness, and coma.

**Skin Contact:** Acute and chronic exposure may result in irritation, absorption may occur, headache, drowsiness, loss of coordination, blood disorders, and nerve damage.

**Eye Contact:** Acute and chronic exposure may cause irritation; acute may cause eye damage.

**Ingestion:** Acute and chronic exposure may cause the same effects as listed for inhalation.

### Numerical Measures of Toxicity

**Acute toxicity:** Category 3 for oral, inhalation, and dermal.

Human, Oral LDLo: 143 mg/kg

Rat, Oral LD50: 5628 mg/kg

Rat, Inhalation LC50: 83.2 mg/L (4 h); 145 000 ppm (1 h); 64 000 ppm (4 h)

Rabbit, Dermal LD50: 15 800 mg/kg

**Skin corrosion/irritation:** Not classified.

Rabbit, skin: 20 mg (24 h) moderate

**Serious eye damage/eye irritation:** Not classified.

Rabbit, eyes: 100 mg (24 h) moderate; 40 mg moderate

**Respiratory sensitization:** No data available.

**Skin sensitization:** No data available.

**Germ Cell Mutagenicity:** No data available.

**Carcinogenicity:** Not classified.

**Listed as a Carcinogen/Potential Carcinogen** \_\_\_\_\_ **Yes** \_\_\_\_\_ **X** **No**  
Methanol is not listed by IARC, NTP, or OSHA as a carcinogen.

**Tumorigenic:** Rat, Inhalation TClO: 1000 ppm (2 years)

**Mutagenic:** Mouse, Oral TD: 1 g/kg (cytogenetic analysis)

Rat, Oral TD: 10 µmol/kg (DNA damage)

Human, lymphocyte TC: 300 mmol/L (DNA inhibition)

**Reproductive Toxicity:** No data available.

**Specific Target Organ Toxicity, Single Exposure:** Category 1, Causes damage to central nervous system.

**Specific Target Organ Toxicity, Repeated Exposure:** No data available.

**Aspiration hazard:** Not applicable.

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## 12. ECOLOGICAL INFORMATION

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### Ecotoxicity Data

Fish, Bluegill (*Lepomis macrochirus*), LC50: 13 500 mg/L to 17 600 mg/L (96 h) flow-through

Fish, Fathead minnow (*Pimephales promelas*), LC50: 28 200 mg/L (96 h) flow-through

Fish, Fathead minnow (*Pimephales promelas*), LC50: >100 mg/L (96 h) static

**Persistence and Degradability:** No data available.

**Bioaccumulative Potential:** <10 species: fish.

**Mobility in Soil:** No data available.

**Other Adverse effects:** No data available.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose in accordance with all applicable federal, state, and local regulations.

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## 14. TRANSPORTATION INFORMATION

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**U.S. DOT and IATA:** UN1230, Methanol, Hazard Class 3, 6.1, Packing Group II.

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## 15. REGULATORY INFORMATION

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### U.S. Regulations

CERCLA Sections 102a/103 (40 CFR 302.4): 5000 lbs (2270 kg) final RQ.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): 1.0 % de minimis concentrations.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	Yes
CHRONIC HEALTH:	Yes
FIRE:	Yes
REACTIVE:	No
PRESSURE:	No

**State Regulations:** California Proposition 65: WARNING! This product contains a chemical (methanol) known to the state of California to cause reproductive/developmental effects.

**U.S. TSCA Inventory:** Methanol is listed.

**TSCA 12(b), Export Notification:** Not listed.

**Canadian Regulations:** WHMIS Information: Not provided for this material.

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## 16. OTHER INFORMATION

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**Issue Date:** 20 March 2023

**Sources:** ChemADVISOR, Inc., MSDS *Methyl Alcohol*, 09 December 2015.  
CDC, NIOSH, *Methanol*, RTECS# PC1400000, CAS No. 67-56-1; available at <https://www.cdc.gov/niosh-rtecs/PC155CC0.html> (accessed March 2023).

### Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration	STEL	Short Term Exposure Limit
LD50	Median Lethal Dose or Lethal Dose, 50 %	STOT	Specific Target Organ Toxicity
LEL	Lower Explosive Limit	TLV	Threshold Limit Value
MSDS	Material Safety Data Sheet	TPQ	Threshold Planning Quantity
NIOSH	National Institute for Occupational Safety and Health	TSCA	Toxic Substances Control Act
NIST	National Institute of Standards and Technology	TWA	Time Weighted Average
n.o.s.	Not Otherwise Specified	UEL	Upper Explosive Limit
		WHMIS	Workplace Hazardous Materials Information System

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