Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the Canadian Hazardous Products Regulations.

SECTION 1: Identification

1.1. Product identifier
3M™ Fluorosurfactant FC-4432

Product Identification Numbers

80-0015-0118-0	98-0212-3044-0	98-0212-3045-7	98-0212-3046-5	98-0212-3047-3
H0-0020-9491-2	JF-1000-4388-0	UU-0109-6016-7	UU-0114-2892-5	

1.2. Recommended use and restrictions on use

Intended Use
Industrial use

Restrictions on use
Not applicable

1.3. Supplier's details

Company:	3M Canada Company
Division:	Advanced Materials Division
Address:	1840 Oxford Street East, Post Office Box 5757, London, Ontario N6A 4T1
Telephone:	(800) 364-3577
Website:	www.3M.ca

1.4. Emergency telephone number
Medical Emergency Telephone:1-800-3M HELPS / 1-800-364-3577; Transportation Emergency Telephone (CANUTEC): (613) 996-6666

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture
Reproductive Toxicity: Category 1B.

2.2. Label elements
Signal word
Danger

Symbols

Health Hazard |

Pictograms

Hazard statements

May damage fertility or the unborn child.

Precautionary statements

Prevention:
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves.

Response:
IF exposed or concerned: Get medical advice/attention.

Storage:
Store locked up.

Disposal:
Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

2.3. Other hazards
None known.

SECTION 3: Composition/information on ingredients

This material is a mixture.

Ingredient	C.A.S. No.	% by Wt	Common Name
2-Propenoic Acid, 2-[Methyl[(Nonafluorobutyl)Sulfonyl]Amino]Ethyl Ester, Telomer With Methyloxirane Polymer With Oxirane Di-2-Propenoate and Methyloxirane Polymer With Oxirane Mono-Propenoate	1017237-78-3	82 - 92	No Data Available
POLYMER WITH OXIRANE	Trade Secret	1 - 6	Not Applicable
2-METHOXYMETHYLETHOXY PROPANOL	34590-94-8	3 - 5	Propanol, 1(or 2)-(2-methoxymethylethoxy)-
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	34454-97-2	< 1	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-(2-hydroxyethyl)-N-m ethyl-
Toluene	108-88-3	0 - 0.8 Trade Secret *	No Data Available
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-	68298-12-4	<= 0.1 Trade Secret *	1-Butanesulfonamide, 1,1,2,2,3,3,4,4,4-nonafluoro-N-methyl-

NONAFLUORO-N-METHYL-			

POLYMER WITH OXIRANE is a non-hazardous Trade Secret material according to WHMIS criteria.

*The actual concentration of this ingredient has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. If you are concerned, get medical advice.

Skin Contact:
Wash with soap and water. If you feel unwell, get medical attention.

Eye Contact:
Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.

If Swallowed:
Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed
No critical symptoms or effects. See Section 11.1, information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required
Not applicable

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

5.2. Special hazards arising from the substance or mixture
Closed containers exposed to heat from fire may build pressure and explode. Exposure to extreme heat can give rise to thermal decomposition.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Fluoride	During Combustion
Oxides of Nitrogen	During Combustion
Oxides of Sulfur	During Combustion

5.3. Special protective actions for fire-fighters
Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. 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

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation

to disperse or exhaust vapours, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up
Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Seal the container. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
For industrial or professional use only. Not for consumer sale or use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapours/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Avoid contact with oxidizing agents (eg. chlorine, chromic acid etc.) Use personal protective equipment (gloves, respirators, etc.) as required.

7.2. Conditions for safe storage including any incompatibilities
Store away from oxidizing agents.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits
If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Toluene	108-88-3	ACGIH	TWA:20 ppm	
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	34454-97-2	Manufacturer determined	TWA:1 mg/m3(0.07 ppm)	
2-METHOXYMETHYLETHOXY PROPANOL	34590-94-8	ACGIH	TWA:50 ppm;STEL:100 ppm	
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	68298-12-4	Manufacturer determined	TWA:3 mg/m3(0.24 ppm)	

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use with appropriate local exhaust ventilation sufficient to maintain levels of thermal decomposition products below their exposure guidelines. 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/vapours/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection
None required.

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.
Gloves made from the following material(s) are recommended: Polymer laminate

If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - polymer laminate

Respiratory protection

For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use a positive pressure supplied-air respirator.
An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
Half facepiece or full facepiece air-purifying respirator suitable for organic vapours and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Liquid
Specific Physical Form:	Liquid
Colour	Amber
Odour	Slight Mercaptan
Odour threshold	*No Data Available*
pH	*Not Applicable*
Melting point/Freezing point	*Not Applicable*
Boiling point	>=110 ºC
Flash Point	Flash point > 93 °C (200 °F)
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	*No Data Available*
Flammable Limits(UEL)	*No Data Available*
Vapour Pressure	38.7 Pa [*Details:*CONDITIONS: @ 20C]

Vapour Density and/or Relative Vapour Density	4.1 [*Ref Std:*AIR=1]
Density	1.21 g/ml
Relative density	1.21 [*Ref Std:*WATER=1]
Water solubility	6.211 mg/ml
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*No Data Available*
Viscosity/Kinematic Viscosity	2,500 - 7,000 mPa-s
Volatile Organic Compounds	78 g/l [*Test Method:*calculated SCAQMD rule 443.1]
Percent volatile	<=1 %
VOC Less H2O & Exempt Solvents	78 g/l [*Test Method:*calculated SCAQMD rule 443.1]
Molecular weight	*No Data Available*

Nanoparticles
This material does not contain nanoparticles.

SECTION 10: Stability and reactivity

10.1. Reactivity
This material is considered to be non reactive under normal use conditions.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
None known.

10.5. Incompatible materials
Strong oxidizing agents

10.6. Hazardous decomposition products

Substance	**Condition**
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

Extreme heat arising from situations such as misuse or equipment failure can generate hydrogen fluoride as a decomposition product.

SECTION 11: Toxicological information

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.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
May cause additional health effects (see below).

Skin Contact:
May be harmful in contact with skin.

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

Ingestion:
May be harmful if swallowed. May cause additional health effects (see below).

Additional Health Effects:

Reproductive/Developmental Toxicity:
Contains a chemical or chemicals which can cause birth defects or other reproductive harm.

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

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE >2,000 - ≤5,000 mg/kg
Overall product	Ingestion		No data available; calculated ATE >2,000 - ≤5,000 mg/kg
2-Propenoic Acid, 2-[Methyl[(Nonafluorobutyl)Sulfonyl]Amino]Ethyl Ester, Telomer With Methyloxirane Polymer With Oxirane Di-2-Propenoate and Methyloxirane Polymer With Oxirane Mono-Propenoate	Dermal	Rat	LD50 > 2,000 mg/kg
2-Propenoic Acid, 2-[Methyl[(Nonafluorobutyl)Sulfonyl]Amino]Ethyl Ester, Telomer With Methyloxirane Polymer With Oxirane Di-2-Propenoate and Methyloxirane Polymer With Oxirane Mono-Propenoate	Ingestion	Rat	LD50 > 2,000 mg/kg
POLYMER WITH OXIRANE	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
POLYMER WITH OXIRANE	Ingestion	Rat	LD50 5,700 mg/kg
2-METHOXYMETHYLETHOXYPROPANOL	Dermal	Rabbit	LD50 > 19,000 mg/kg
2-METHOXYMETHYLETHOXYPROPANOL	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 50 mg/l
2-METHOXYMETHYLETHOXYPROPANOL	Ingestion	Rat	LD50 5,180 mg/kg
Toluene	Dermal	Rat	LD50 12,000 mg/kg
Toluene	Inhalation-Vapor (4 hours)	Rat	LC50 30 mg/l
Toluene	Ingestion	Rat	LD50 5,550 mg/kg
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Dermal	Rat	LD50 > 2,000 mg/kg
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	Rat	LD50 > 2,000 mg/kg
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Ingestion	Rat	LD50 200-2000 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
2-METHOXYMETHYLETHOXYPROPANOL	Human and animal	No significant irritation
Toluene	Rabbit	Irritant
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Rabbit	No significant irritation
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
2-METHOXYMETHYLETHOXYPROPANOL	Rabbit	Mild irritant
Toluene	Rabbit	Moderate irritant
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Rabbit	Mild irritant
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Rabbit	Severe irritant

Skin Sensitization

Name	Species	Value
Overall product	Guinea pig	Not classified
2-Propenoic Acid, 2-[Methyl[(Nonafluorobutyl)Sulfonyl]Amino]Ethyl Ester, Telomer With Methyloxirane Polymer With Oxirane Di-2-Propenoate and Methyloxirane Polymer With Oxirane Mono-Propenoate	Guinea pig	Not classified
2-METHOXYMETHYLETHOXYPROPANOL	Human	Not classified
Toluene	Guinea pig	Not classified
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Guinea pig	Not classified
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Guinea pig	Not classified

Respiratory Sensitization

For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
2-Propenoic Acid, 2-[Methyl[(Nonafluorobutyl)Sulfonyl]Amino]Ethyl Ester, Telomer With Methyloxirane Polymer With Oxirane Di-2-Propenoate and Methyloxirane Polymer With Oxirane Mono-Propenoate	In Vitro	Not mutagenic
2-METHOXYMETHYLETHOXYPROPANOL	In Vitro	Not mutagenic
Toluene	In Vitro	Not mutagenic
Toluene	In vivo	Not mutagenic
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	In Vitro	Not mutagenic
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	In Vitro	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
Toluene	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
Toluene	Ingestion	Rat	Some positive data exist, but the data are not sufficient for classification
Toluene	Inhalation	Mouse	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test result	Exposure Duration
2-METHOXYMETHYLETHOXYPROPANOL	Inhalation	Not classified for development	Multiple animal species	NOAEL 1.82 mg/l	during organogenesis
Toluene	Inhalation	Not classified for female reproduction	Human	NOAEL Not available	occupational exposure
Toluene	Inhalation	Not classified for male reproduction	Rat	NOAEL 2.3 mg/l	1 generation
Toluene	Ingestion	Toxic to development	Rat	LOAEL 520 mg/kg/day	during gestation
Toluene	Inhalation	Toxic to development	Human	NOAEL Not available	poisoning and/or abuse
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	Not classified for female reproduction	Rat	NOAEL 250 mg/kg/day	premating & during gestation
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	Not classified for male reproduction	Rat	NOAEL 250 mg/kg/day	premating & during gestation
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	Toxic to development	Rat	NOAEL 50 mg/kg/day	premating & during gestation
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Ingestion	Toxic to female reproduction	Rat	NOAEL 150 mg/kg/day	premating & during gestation
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Ingestion	Toxic to male reproduction	Rat	NOAEL 150 mg/kg/day	28 days
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Ingestion	Toxic to development	Rat	NOAEL 150 mg/kg/day	premating & during gestation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
2-METHOXYMETHYLETHOXYPROPANOL	Dermal	central nervous system depression	Not classified	Rabbit	NOAEL 2,850 mg/kg	
2-METHOXYMETHYLETHOXYPROPANOL	Inhalation	central nervous system depression	Not classified	Rat	LOAEL 3.07 mg/l	7 hours
2-METHOXYMETHYLETHOXYPROPANOL	Ingestion	central nervous system depression	Not classified	Rat	LOAEL 5,000 mg/kg	
Toluene	Inhalation	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	
Toluene	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	
Toluene	Inhalation	immune system	Not classified	Mouse	NOAEL 0.004 mg/l	3 hours
Toluene	Ingestion	central nervous system depression	May cause drowsiness or dizziness	Human	NOAEL Not available	poisoning and/or abuse
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	nervous system	May cause damage to organs	Rat	LOAEL 2,000 mg/kg	not applicable
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Ingestion	nervous system	Not classified	Rat	NOAEL 200 mg/kg	not applicable

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test result	Exposure Duration
2-Propenoic Acid, 2-[Methyl[(Nonafluorobutyl) Sulfonyl]Amino]Ethyl Ester, Telomer With Methyloxirane Polymer With Oxirane Di-2-Propenoate and Methyloxirane Polymer With Oxirane Mono-Propenoate	Ingestion	heart | endocrine system | hematopoietic system | liver | immune system | nervous system | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days
2-METHOXYMETHYLETHOXYPROPANOL	Dermal	kidney and/or bladder | heart | endocrine system | hematopoietic system | liver | respiratory system	Not classified	Rabbit	NOAEL 9,500 mg/kg/day	90 days
2-METHOXYMETHYLETHOXYPROPANOL	Inhalation	heart | hematopoietic system | liver | immune system | nervous system | eyes | kidney and/or bladder	Not classified	Rat	NOAEL 1.21 mg/l	90 days
2-METHOXYMETHYLETHOXYPROPANOL	Ingestion	liver | heart | endocrine system | bone, teeth, nails, and/or hair | hematopoietic system | immune system | nervous system | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 1,000 mg/kg/day	28 days
Toluene	Inhalation	auditory system | eyes | olfactory system	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	poisoning and/or abuse
Toluene	Inhalation	nervous system	May cause damage to organs though prolonged or repeated exposure	Human	NOAEL Not available	poisoning and/or abuse
Toluene	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	LOAEL 2.3 mg/l	15 months
Toluene	Inhalation	heart | liver | kidney and/or bladder	Not classified	Rat	NOAEL 11.3 mg/l	15 weeks
Toluene	Inhalation	endocrine system	Not classified	Rat	NOAEL 1.1 mg/l	4 weeks
Toluene	Inhalation	immune system	Not classified	Mouse	NOAEL Not available	20 days
Toluene	Inhalation	bone, teeth, nails, and/or hair	Not classified	Mouse	NOAEL 1.1 mg/l	8 weeks
Toluene	Inhalation	hematopoietic system | vascular system	Not classified	Human	NOAEL Not available	occupational exposure
Toluene	Inhalation	gastrointestinal tract	Not classified	Multiple animal species	NOAEL 11.3 mg/l	15 weeks
Toluene	Ingestion	nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 625 mg/kg/day	13 weeks
Toluene	Ingestion	heart	Not classified	Rat	NOAEL 2,500 mg/kg/day	13 weeks
Toluene	Ingestion	liver | kidney and/or bladder	Not classified	Multiple animal	NOAEL 2,500	13 weeks

				species	mg/kg/day	
Toluene	Ingestion	hematopoietic system	Not classified	Mouse	NOAEL 600 mg/kg/day	14 days
Toluene	Ingestion	endocrine system	Not classified	Mouse	NOAEL 105 mg/kg/day	28 days
Toluene	Ingestion	immune system	Not classified	Mouse	NOAEL 105 mg/kg/day	4 weeks
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	liver	May cause damage to organs though prolonged or repeated exposure	Rat	NOAEL 50 mg/kg/day	28 days
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	immune system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 50 mg/kg/day	28 days
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-n-(2-HYDROXYETHYL)-N-METHYL-	Ingestion	kidney and/or bladder | heart | endocrine system | hematopoietic system | nervous system | respiratory system	Not classified	Rat	NOAEL 250 mg/kg/day	28 days
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Ingestion	nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 150 mg/kg/day	premating & during gestation
1-BUTANESULFONAMIDE, 1,1,2,2,3,3,4,4,4-NONAFLUORO-N-METHYL-	Ingestion	hematopoietic system | liver | immune system | heart | endocrine system | kidney and/or bladder | respiratory system	Not classified	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation

Aspiration Hazard

Name	Value
Toluene	Aspiration hazard

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

No data available.

SECTION 13: Disposal considerations

13.1. Disposal methods

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 HF. 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: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

Global inventory status

Contact 3M for more information. The components of this material are in compliance with the provisions of the Korea Chemical Control Act. Certain restrictions may apply. Contact the selling division for additional information. The components of this material are in compliance with the provisions of Japan Industrial Safety and Health Law. Certain restrictions may apply. Contact the selling division for additional information. The components of this material are in compliance with the provisions of Philippines RA 6969 requirements. Certain restrictions may apply. Contact the selling division for additional information. The components of this product are in compliance with the new substance notification requirements of CEPA. This product complies with Measures on Environmental Management of New Chemical Substances. All ingredients are listed on or exempt from on China IECSC inventory. The components of this product are in compliance with the chemical notification requirements of TSCA. All required components of this product are listed on the active portion of the TSCA Inventory.

SECTION 16: Other information

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.
Health: 3 **Flammability:** 1 **Instability:** 0 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification
Health: *1 **Flammability:** 1 **Physical Hazard:** 0 **Personal Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS® IV) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® IV ratings are to be used with a fully implemented HMIS® IV program. HMIS® is a registered mark of the American Coatings Association (ACA).

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for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

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