

MSDS # Z0534

Manufacturer's Product Name: Easy Seal Direct Inject (4050-08)

Sid Harvey Part # 4050-08

Last Revision Date: 2/28/19

1. Product and Company Identification

| | |
|--------------------------------------|--|
| Product identifier | EasySeal Ultimate-LS (4050-07, 4050-08) |
| Other means of identification | Not available |
| Recommended use | Refrigerant leak sealant |
| Recommended restrictions | None known. |
| Manufacturer information | Nu-Calgon 2611 Schuetz Road St. Louis, MO 63043 US Phone: 314-469-7000 / 800-554-5499 Emergency Phone: 1-800-424-9300 (CHEMTREC) |
| Supplier | See above. |

2. Hazards Identification

| | | |
|-----------------------------------|---|-------------|
| Physical hazards | Flammable liquids | Category 3 |
| Health hazards | Skin corrosion/irritation | Category 1B |
| | Serious eye damage/eye irritation | Category 1 |
| | Sensitization, skin | Category 1 |
| | Specific target organ toxicity, repeated exposure | Category 2 |
| Environmental hazards | Not classified. | |
| WHMIS 2015 defined hazards | Not classified | |

Label elements



Signal word Danger

Hazard statement Flammable liquid and vapor. Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical, ventilating and lighting equipment. Use non-sparking tools. Take action to prevent static discharges. Wear protective gloves, protective clothing, eye protection and face protection. Do not breathe mist or vapor. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace.

Response In case of fire: Use appropriate media to extinguish. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. If skin irritation or rash occurs: Get medical advice/attention. Immediately call a POISON CENTER or doctor. Specific treatment (see information on this label). IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage Store in a well-ventilated place. Keep cool. Store locked up.

Disposal Dispose of container in accordance with local, regional, national and international regulations.

WHMIS 2015: Health Hazard(s) not otherwise classified (HHNOC) None known

WHMIS 2015: Physical Hazard(s) not otherwise classified (PHNOC) None known

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

3. Composition/Information on Ingredients

Mixture

| Chemical name | Common name and synonyms | CAS number | % |
|--|--------------------------|------------|--------|
| 1-Propanamine, 3-(triethoxysilyl)- | | 919-30-2 | 10-30* |
| 2-Butanone, O,O',O''-(methylsilylidyne)trioxime | | 22984-54-9 | 10-30* |
| Methyl triethoxysilane | | 2031-67-6 | 45-70* |

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition comments US GHS: The exact percentage (concentration) of composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.
*CANADA GHS: The exact percentage (concentration) of composition has been withheld as a trade secret.

4. First Aid Measures

| | |
|---|---|
| Inhalation | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. |
| Skin contact | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor. Wash contaminated clothing before reuse. Specific treatment (see information on this label). If skin irritation or rash occurs: Get medical attention. |
| Eye contact | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor. |
| Ingestion | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor. |
| Most important symptoms/effects, acute and delayed | Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Prolonged exposure may cause chronic effects. |
| Indication of immediate medical attention and special treatment needed | Provide general supportive measures and treat symptomatically. Symptoms may be delayed. |
| General information | Take off all contaminated clothing immediately. If you feel unwell, seek medical advice (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. Wash contaminated clothing before reuse. Avoid contact with eyes and skin. Keep out of reach of children. |

5. Fire Fighting Measures

| | |
|--|--|
| Suitable extinguishing media | Water fog. Foam. Dry chemical powder. Carbon dioxide. |
| Unsuitable extinguishing media | Do not use water jet as an extinguisher, as this will spread the fire. |
| Specific hazards arising from the chemical | Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed. |
| Special protective equipment and precautions for firefighters | Self-contained breathing apparatus and full protective clothing must be worn in case of fire. |
| Fire-fighting equipment/instructions | In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. |
| Specific methods | Use standard firefighting procedures and consider the hazards of other involved materials. |
| General fire hazards | Flammable liquid and vapor. |
| Hazardous combustion products | May include and are not limited to: Oxides of carbon. Oxides of nitrogen. |

6. Accidental Release Measures

| | |
|--|---|
| Personal precautions, protective equipment and emergency procedures | Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS. |
|--|---|

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Do not discharge into lakes, streams, ponds or public waters.

7. Handling and Storage

Precautions for safe handling

Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. All equipment used when handling the product must be grounded. Take precautionary measures against static discharges. Use non-sparking tools and explosion-proof equipment. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Wear appropriate personal protective equipment. Wash thoroughly after handling. Use good industrial hygiene practices in handling this material. When using do not eat or drink.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. 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.

Individual protection measures, such as personal protective equipment**Eye/face protection**

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection**Hand protection**

Impervious gloves. Confirm with reputable supplier first.

Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. As required by employer code.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Where exposure guideline levels may be exceeded, use an approved NIOSH respirator.

Thermal hazards

Not applicable.

General hygiene considerations

When using do not 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. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and Chemical Properties

Appearance

Clear

Physical state

Liquid.

Form

Liquid.

Color

Blue

Odor

Amine

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

Not available.

Initial boiling point and boiling range

Not available.

Pour point

Not available.

| | |
|---|-------------------------------|
| Specific gravity | Not available. |
| Partition coefficient (n-octanol/water) | Not available. |
| Flash point | 107.6 °F (42.0 °C) Closed Cup |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Not applicable. |
| Upper/lower flammability or explosive limits | |
| Flammability limit - lower (%) | Not available. |
| Flammability limit - upper (%) | Not available. |
| Explosive limit - lower (%) | Not available. |
| Explosive limit - upper (%) | Not available. |
| Vapor pressure | Not available. |
| Vapor density | Not available. |
| Relative density | Not available. |
| Solubility(ies) | Not available. |
| Auto-ignition temperature | Not available. |
| Decomposition temperature | Not available. |
| Viscosity | Not available. |
| Other information | |
| Explosive properties | Not explosive. |
| Oxidizing properties | Not oxidizing. |

10. Stability and Reactivity

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|---|--|
| Reactivity | This product may react with strong oxidizing agents. |
| Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| Chemical stability | Material is stable under normal conditions. |
| Conditions to avoid | Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Do not mix with other chemicals. |
| Incompatible materials | Strong oxidizing agents. |
| Hazardous decomposition products | May include and are not limited to: Oxides of carbon. Oxides of nitrogen. |

11. Toxicological Information

| | |
|---|---|
| Routes of exposure | Eye, Skin contact, Inhalation, Ingestion. |
| Information on likely routes of exposure | |
| Ingestion | Causes digestive tract burns. May cause stomach distress, nausea or vomiting. |
| Inhalation | May cause damage to organs through prolonged or repeated exposure by inhalation. May cause irritation to the respiratory system. |
| Skin contact | Causes severe skin burns. May cause an allergic skin reaction. |
| Eye contact | Causes serious eye damage. |
| Symptoms related to the physical, chemical and toxicological characteristics | Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. |

Information on toxicological effects

Acute toxicity May cause an allergic skin reaction.

| Components | Species | Test Results |
|---|----------------|---|
| 1-Propanamine, 3-(triethoxysilyl)- (CAS 919-30-2) | | |
| Acute | | |
| <i>Dermal</i> | | |
| LD50 | Rabbit | > 6 ml/kg, 24 Hours, ECHA 4.3 ml/kg, 24 Hours, ECHA 4 ml/kg, 24 Hours, ECHA |
| | Rat | 8 - 16 ml/kg, 24 Hours, ECHA |

| Components | Species | Test Results |
|--|--|---|
| <i>Inhalation</i> LC50 | Rat | > 16 ppm, 6 Hours, ECHA > 7.4 mg/L, 4 Hours, ECHA > 5 ppm, 6 Hours, ECHA |
| <i>Oral</i> LD50 | Mouse | 2000 mg/kg, ECHA 530 mg/kg, ECHA |
| | Rat | 1780 mg/kg, Sigma Aldrich 7.1 ml/kg, ECHA 6.5 ml/kg, ECHA 3.7 ml/kg, ECHA 3 ml/kg, ECHA 2.8 ml/kg, ECHA 1.6 ml/kg, ECHA |
| 2-Butanone, O,O',O''-(methylsilyldiylidene)trioxime (CAS 22984-54-9) | | |
| Acute | | |
| <i>Dermal</i> LD50 | Rat | > 2000 mg/kg, 24 Hours, ECHA |
| <i>Inhalation</i> LC50 | Not available | |
| <i>Oral</i> LD50 | Rat | 2463 mg/kg, ECHA 2453 mg/kg, ECHA |
| Methyl triethoxysilane (CAS 2031-67-6) | | |
| Acute | | |
| <i>Dermal</i> LD50 | Rabbit | > 14240 mg/kg, 24 Hours, ECHA 11837 mg/kg, 24 Hours, ECHA |
| | Rat | > 2007 mg/kg, 24 Hours, ECHA |
| <i>Inhalation</i> LC50 | Rat | > 13500 mg/m ³ , 4 Hours, ECHA |
| <i>Oral</i> LD50 | Rat | > 2007 mg/kg, ECHA 7627 mg/kg |
| Skin corrosion/irritation | Causes severe skin burns and eye damage. | |
| Exposure minutes | Not available. | |
| Erythema value | Not available. | |
| Oedema value | Not available. | |
| Serious eye damage/eye irritation | Causes serious eye damage. | |
| Corneal opacity value | Not available. | |
| Iris lesion value | Not available. | |
| Conjunctival reddening value | Not available. | |
| Conjunctival oedema value | Not available. | |
| Recover days | Not available. | |
| Respiratory or skin sensitization | | |
| Respiratory sensitization | Not a respiratory sensitizer. | |
| Skin sensitization | May cause an allergic skin reaction. | |
| Mutagenicity | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. | |
| Carcinogenicity | | |

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

| | |
|---|--|
| Reproductive toxicity | This product is not expected to cause reproductive or developmental effects. |
| Teratogenicity | Not available. |
| Specific target organ toxicity - single exposure | Not classified. |
| Specific target organ toxicity - repeated exposure | May cause damage to organs through prolonged or repeated exposure. |
| Aspiration hazard | Not an aspiration hazard. |
| Chronic effects | May cause damage to organs through prolonged or repeated exposure. |

12. Ecological Information

| | |
|--------------------------------------|---|
| Ecotoxicity | Not available. |
| Persistence and degradability | No data is available on the degradability of this product. |
| Bioaccumulative potential | No data available. |
| Mobility in soil | No data available. |
| Mobility in general | Not available. |
| Other adverse effects | No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component. |

13. Disposal Considerations

| | |
|--|--|
| Disposal instructions | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| Local disposal regulations | Dispose in accordance with all applicable regulations. |
| Hazardous waste code | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| Waste from residues / unused products | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| Contaminated packaging | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |

14. Transport Information

| | |
|---|--|
| Transport of Dangerous Goods (TDG) Proof of Classification | Classification Method: Classified as per Part 2, Sections 2.1 – 2.8 of the Transportation of Dangerous Goods Regulations. If applicable, the technical name and the classification of the product will appear below. |
|---|--|

U.S. Department of Transportation (DOT)

Basic shipping requirements:

| | |
|--------------------------------|-------------------------------------|
| UN number | UN2920 |
| Proper shipping name | Corrosive liquids, flammable, n.o.s |
| Technical name | 1-Propanamine, 3-(triethoxysilyl)- |
| Technical name | Methyl triethoxysilane |
| Hazard class | 8 |
| Subsidiary hazard class | 3 |
| Packing group | II |
| Special provisions | B2, IB2, T11, TP2, TP27 |
| Packaging exceptions | 154 |

Transportation of Dangerous Goods (TDG - Canada)

Basic shipping requirements:

| | |
|--------------------------------|-------------------------------------|
| UN number | UN2920 |
| Proper shipping name | CORROSIVE LIQUID, FLAMMABLE, N.O.S. |
| Technical name | 1-Propanamine, 3-(triethoxysilyl)- |
| Technical name | Methyl triethoxysilane |
| Hazard class | 8 |
| Subsidiary hazard class | 3 |
| Packing group | II |
| Special provisions | 16 |

DOT



TDG



15. Regulatory Information

Canadian federal regulations This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

WHMIS 2015 Exemptions

Not applicable

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

All chemicals used are on the TSCA inventory.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

No

SARA 311/312 Hazardous chemical

No

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

US state regulations

See below

US - Texas Effects Screening Levels: Listed substance

- 1- Propanamine, 3-(triethoxysilyl)- (CAS 919-30-2) Listed.
- 2- Butanone, O,O',O''-(methylsilylydine)trioxime (CAS 22984-54-9) Listed.
- Methyl triethoxysilane (CAS 2031-67-6) Listed.

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

Not Listed.

Inventory status

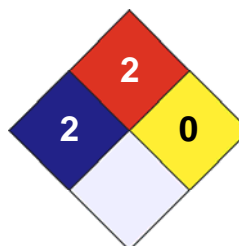
| Country(s) or region | Inventory name | On inventory (yes/no)* |
|-----------------------------|---|------------------------|
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

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

16. Other Information

| LEGEND | |
|----------|---|
| Severe | 4 |
| Serious | 3 |
| Moderate | 2 |
| Slight | 1 |
| Minimal | 0 |

| | | |
|---------------------|---|---|
| HEALTH | * | 2 |
| FLAMMABILITY | | 2 |
| PHYSICAL HAZARD | | 0 |
| PERSONAL PROTECTION | | X |

**Disclaimer**

The information in the sheet was written based on the best knowledge and experience currently available. Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

Issue date

28-February-2019

Version #

01

Effective date

28-February-2019

Prepared by

Nu-Calgon Technical Service Phone: (314) 469-7000

Other information

For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.



SAFETY DATA SHEET

1. Product and Company Identification

| | |
|--------------------------------------|---|
| Product identifier | Easy Seal Direct Inject (4050-08, 4050-07) |
| Other means of identification | Not available |
| Recommended use | Refrigerant leak sealant |
| Recommended restrictions | None known. |
| Manufacturer information | Nu-Calgon 2008 Altom Court St. Louis, MO 63146 US Phone: 314-469-7000 / 800-554-5499 Emergency Phone: 1-800-424-9300 (CHEMTREC) |
| Supplier | See above. |

2. Hazards Identification

| | | |
|-----------------------------------|---|-------------|
| Physical hazards | Flammable liquids | Category 3 |
| Health hazards | Skin corrosion/irritation | Category 1B |
| | Serious eye damage/eye irritation | Category 1 |
| | Sensitization, skin | Category 1 |
| | Specific target organ toxicity, repeated exposure | Category 2 |
| Environmental hazards | Not classified. | |
| WHMIS 2015 defined hazards | Not classified | |
| Label elements | | |



Signal word Danger

Hazard statement Flammable liquid and vapor. Causes severe skin burns and eye damage. May cause an allergic skin reaction. May cause damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention

Do not breathe mist or vapor. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. Contaminated work clothing should not be allowed out of the workplace. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep container tightly closed. Ground and bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use non-sparking tools. Take action to prevent static discharges.

Response

In case of fire: Use appropriate media to extinguish. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor. Specific treatment (see information on this label). IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage

Store locked up. Store in a well-ventilated place. Keep cool.

Disposal

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

WHMIS 2015: Health Hazard(s) not otherwise classified (HHNOC) None known

WHMIS 2015: Physical Hazard(s) not otherwise classified (PHNOC) None known

Hazard(s) not otherwise classified (HNOC) None known.

Supplemental information None.

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Do not discharge into lakes, streams, ponds or public waters.

7. Handling and Storage

Precautions for safe handling

Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. When using do not smoke. Explosion-proof general and local exhaust ventilation. All equipment used when handling the product must be grounded. Take precautionary measures against static discharges. Use non-sparking tools and explosion-proof equipment. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Wear appropriate personal protective equipment. Wash thoroughly after handling. Use good industrial hygiene practices in handling this material. When using do not eat or drink.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. 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.

Individual protection measures, such as personal protective equipment**Eye/face protection**

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection**Hand protection**

Impervious gloves. Confirm with reputable supplier first.

Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. As required by employer code.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Where exposure guideline levels may be exceeded, use an approved NIOSH respirator.

Thermal hazards

Not applicable.

General hygiene considerations

When using do not 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. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and Chemical Properties

Appearance

Clear

Physical state

Liquid.

Form

Liquid.

Color

Blue

Odor

Amine

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

Not available.

Initial boiling point and boiling range

Not available.

Pour point

Not available.

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

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Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. 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.

Individual protection measures, such as personal protective equipment**Eye/face protection**

Wear safety glasses with side shields (or goggles) and a face shield.

Skin protection**Hand protection**

Impervious gloves. Confirm with reputable supplier first.

Other

Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. As required by employer code.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Where exposure guideline levels may be exceeded, use an approved NIOSH respirator.

Thermal hazards

Not applicable.

General hygiene considerations

When using do not 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. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and Chemical Properties

Appearance

Clear

Physical state

Liquid.

Form

Liquid.

Color

Blue

Odor

Amine

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

Not available.

Initial boiling point and boiling range

Not available.

Pour point

Not available.

| | |
|---|-------------------------------|
| Specific gravity | Not available. |
| Partition coefficient (n-octanol/water) | Not available. |
| Flash point | 107.6 °F (42.0 °C) Closed Cup |
| Evaporation rate | Not available. |
| Flammability (solid, gas) | Not applicable. |
| Upper/lower flammability or explosive limits | |
| Flammability limit - lower (%) | Not available. |
| Flammability limit - upper (%) | Not available. |
| Explosive limit - lower (%) | Not available. |
| Explosive limit - upper (%) | Not available. |
| Vapor pressure | Not available. |
| Vapor density | Not available. |
| Relative density | Not available. |
| Solubility(ies) | Not available. |
| Auto-ignition temperature | Not available. |
| Decomposition temperature | Not available. |
| Viscosity | Not available. |
| Other information | |
| Explosive properties | Not explosive. |
| Oxidizing properties | Not oxidizing. |

10. Stability and Reactivity

| | |
|---|--|
| Reactivity | This product may react with strong oxidizing agents. |
| Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| Chemical stability | Material is stable under normal conditions. |
| Conditions to avoid | Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Do not mix with other chemicals. |
| Incompatible materials | Strong oxidizing agents. |
| Hazardous decomposition products | May include and are not limited to: Oxides of carbon. Oxides of nitrogen. |

11. Toxicological Information

| | |
|---|---|
| Routes of exposure | Eye, Skin contact, Inhalation, Ingestion. |
| Information on likely routes of exposure | |
| Ingestion | Causes digestive tract burns. May cause stomach distress, nausea or vomiting. |
| Inhalation | May cause damage to organs through prolonged or repeated exposure by inhalation. May cause irritation to the respiratory system. |
| Skin contact | Causes severe skin burns. May cause an allergic skin reaction. |
| Eye contact | Causes serious eye damage. |
| Symptoms related to the physical, chemical and toxicological characteristics | Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. |

Information on toxicological effects

Acute toxicity May cause an allergic skin reaction.

| Components | Species | Test Results |
|---|----------------|---------------------|
| 1-Propanamine, 3-(triethoxysilyl)- (CAS 919-30-2) | | |
| Acute | | |
| <i>Dermal</i> | | |
| LD50 | Rabbit 4 | ml/kg, ECHA |
| <i>Inhalation</i> | | |
| LC50 | Rat | > 7.4 mg/L, ECHA |

| Components | Species | Test Results |
|---|--|--|
| <i>Oral</i> LD50 Ra | t | 1780 mg/kg, SIGMA ALDRICH 4.2 ml/kg, ECHA |
| 2-Butanone, O,O',O''-(methylsilyldiylne)trioxime (CAS 22984-54-9) | | |
| Acute | | |
| <i>Dermal</i> LD50 | Rat > | 2000 mg/kg, ECHA |
| <i>Oral</i> LD50 | Rat | 2650 mg/kg, ECHA, female 2260 mg/kg, ECHA, male |
| Methyl triethoxysilane (CAS 2031-67-6) | | |
| Acute | | |
| <i>Dermal</i> LD50 | Rabbit | > 14240 mg/kg, ECHA, female 11837 mg/kg, ECHA, male |
| <i>Inhalation</i> LC50 | Not available | |
| <i>Oral</i> LD50 | Rat | 10057 mg/kg, ECHA, male 7627 mg/kg, ECHA, female |
| Skin corrosion/irritation | Causes severe skin burns and eye damage. | |
| Exposure minutes | Not available. | |
| Erythema value | Not available. | |
| Oedema value | Not available. | |
| Serious eye damage/eye irritation | Causes serious eye damage. | |
| Corneal opacity value | Not available. | |
| Iris lesion value | Not available. | |
| Conjunctival reddening value | Not available. | |
| Conjunctival oedema value | Not available. | |
| Recover days | Not available. | |
| Respiratory or skin sensitization | | |
| Respiratory sensitization | Not a respiratory sensitizer. | |
| Skin sensitization | May cause an allergic skin reaction. | |
| Mutagenicity | No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic. | |
| Carcinogenicity | | |
| US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050) | Not listed. | |
| Reproductive toxicity | This product is not expected to cause reproductive or developmental effects. | |
| Teratogenicity | Not available. | |
| Specific target organ toxicity - single exposure | Not classified. | |
| Specific target organ toxicity - repeated exposure | May cause damage to organs through prolonged or repeated exposure. | |
| Aspiration hazard | Not an aspiration hazard. | |
| Chronic effects | May cause damage to organs through prolonged or repeated exposure. | |

12. Ecological Information

| | |
|--------------------------------------|--|
| Ecotoxicity | Not available. |
| Persistence and degradability | No data is available on the degradability of this product. |
| Bioaccumulative potential | No data available. |
| Mobility in soil | No data available. |

| | |
|------------------------------|---|
| Mobility in general | Not available. |
| Other adverse effects | No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component. |

13. Disposal Considerations

| | |
|--|--|
| Disposal instructions | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| Local disposal regulations | Dispose in accordance with all applicable regulations. |
| Hazardous waste code | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| Waste from residues / unused products | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| Contaminated packaging | Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal. |

14. Transport Information

| | |
|---|---|
| Transport of Dangerous Goods (TDG) Proof of Classification | In accordance with Part 2.2.1 (SOR/2014-152) of the Transportation of Dangerous Goods Regulations, we certify that the classification of this product is correct as of the SDS date of issue. |
|---|---|

U.S. Department of Transportation (DOT)

Basic shipping requirements:

| | |
|-----------------------------|--------------------------------------|
| UN number | UN2920 |
| Proper shipping name | Corrosive liquids, flammable, n.o.s. |
| Technical name | 1-Propanamine, 3-(triethoxysilyl)- |
| Technical name | Methyl triethoxysilane |
| Hazard class | Limited Quantity - US |
| Packing group | II |
| Special provisions | B2, IB2, T11, TP2, TP27 |
| Packaging exceptions | 154 |
| Packaging non bulk | 203 |
| Packaging bulk | 242 |

Transportation of Dangerous Goods (TDG - Canada)

Basic shipping requirements:

| | |
|-----------------------------|-------------------------------------|
| UN number | UN2920 |
| Proper shipping name | CORROSIVE LIQUID, FLAMMABLE, N.O.S. |
| Technical name | 1-Propanamine, 3-(triethoxysilyl)- |
| Technical name | Methyl triethoxysilane |
| Hazard class | Limited Quantity - Canada |
| Packing group | II |
| Special provisions | 16 |

IATA/ICAO (Air)

Basic shipping requirements:

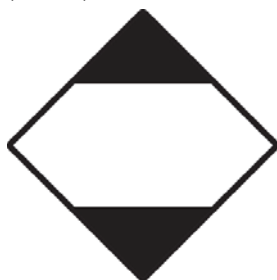
| | |
|-----------------------------|-------------------------------------|
| UN number | UN2920 |
| Proper shipping name | Corrosive liquid, flammable, n.o.s. |
| Technical name | 1-Propanamine, 3-(triethoxysilyl)- |
| Technical name | Methyl triethoxysilane |
| Hazard class | Limited Quantity - IATA |
| Packing group | II |

IMDG (Marine Transport)

Basic shipping requirements:

| | |
|-----------------------------|-------------------------------------|
| UN number | UN2920 |
| Proper shipping name | CORROSIVE LIQUID, FLAMMABLE, N.O.S. |
| Technical name | 1-Propanamine, 3-(triethoxysilyl)- |
| Technical name | Methyl triethoxysilane |
| Hazard class | Limited Quantity - IMDG |
| Packing group | II |
| EmS | F-E, S-C |

DOT; IMDG; TDG



IATA



15. Regulatory Information

Canadian federal regulations This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

WHMIS 2015 Exemptions Not applicable

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance No

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)
Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

US state regulations See below

US - Texas Effects Screening Levels: Listed substance

1-Propanamine, 3-(triethoxysilyl)- (CAS 919-30-2) Listed. 2-Butanone, O,O', O''-(methylsilylidyne)trioxime (CAS 22984-54-9) Listed.

Methyl triethoxysilane (CAS 2031-67-6)

Listed.

US. Massachusetts RTK - Substance List

Not regulated.

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania Worker and Community Right-to-Know Law

Not listed.

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

Not Listed.

Inventory status

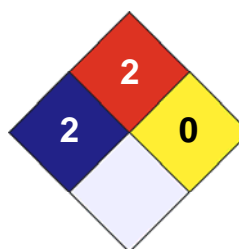
| Country(s) or region | Inventory name | On inventory (yes/no)* |
|-----------------------------|---|------------------------|
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

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

16. Other Information

| LEGEND | |
|----------|---|
| Severe | 4 |
| Serious | 3 |
| Moderate | 2 |
| Slight | 1 |
| Minimal | 0 |

| | |
|----------------------------|-----|
| HEALTH | * 2 |
| FLAMMABILITY | 2 |
| PHYSICAL HAZARD | 0 |
| PERSONAL PROTECTION | X |



Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available. Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

Issue date

11-October-2016

Version #

01

Effective date

11-October-2016

Prepared by

Nu-Calgon Technical Service Phone: (314) 469-7000

Other information

For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.

1. Product and Company Identification

| | |
|--------------------------------------|---|
| Product identifier | Easy Seal Direct Inject (4050-08) |
| Other means of identification | Not available |
| Recommended use | Refrigerant leak sealant |
| Recommended restrictions | None known. |
| Manufacturer | Nu-Calgon 2008 Altom Court St. Louis, MO 63146 US Phone: 314-469-7000 / 800-554-5499 Emergency Phone: 1-800-424-9300 (CHEMTREC) |

2. Hazards Identification

| | | |
|------------------------------|---|---|
| Physical hazards | Flammable liquids | Category 3 |
| Health hazards | Skin corrosion/irritation | Category 2 |
| | Serious eye damage/eye irritation | Category 2A |
| | Reproductive toxicity (the unborn child) | Category 2 |
| | Specific target organ toxicity, single exposure | Category 3 respiratory tract irritation |
| | Specific target organ toxicity, single exposure | Category 3 narcotic effects |
| | Specific target organ toxicity, repeated exposure | Category 2 |
| Environmental hazards | Not classified. | |
| OSHA defined hazards | Not classified. | |

Label elements



Signal word Warning

Hazard statement
 Flammable liquid and vapor.
 Causes skin irritation.
 Causes serious eye irritation.
 May cause respiratory irritation.
 May cause drowsiness or dizziness.
 Suspected of damaging the unborn child.
 May cause damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention
 Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge.
 Wash thoroughly after handling.
 Use only outdoors or in a well-ventilated area.
 Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
 Do not breathe mist or vapor. Wear protective gloves/protective clothing/eye protection/face protection.

Response
 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.
 In case of fire: Use appropriate media to extinguish.
 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
 If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
 If exposed or concerned: Get medical advice/attention. Specific treatment (see this label).

Storage Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up.

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

| | |
|--|-----------------|
| Hazard(s) not otherwise classified (HNOC) | None known. |
| Supplemental information | Not applicable. |

3. Composition/Information on Ingredients

Mixture

| Chemical name | Common name and synonyms | CAS number | % |
|------------------------|--------------------------|------------|-----------|
| Triethoxy(vinyl)silane | | 78-08-0 | 73 - 77 |
| Ethanol | | 64-17-5 | 24 - 27 |
| Toluene | | 108-88-3 | 0.1 - 1.5 |

4. First Aid Measures

| | |
|---|---|
| Inhalation | If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. |
| Skin contact | If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. |
| Eye contact | If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. |
| Ingestion | Rinse mouth. Do not induce vomiting. Get medical attention if symptoms occur. Never give anything by mouth if victim is unconscious, or is convulsing. Obtain medical attention. |
| Most important symptoms/effects, acute and delayed | Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. May cause redness and pain. Prolonged exposure may cause chronic effects. |
| Indication of immediate medical attention and special treatment needed | Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed. |
| General information | Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Take off all contaminated clothing immediately. IF exposed or concerned: Get medical advice/attention. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse. |

5. Fire Fighting Measures

| | |
|--|---|
| Suitable extinguishing media | Alcohol resistant foam. Water fog. Dry chemical powder. |
| Unsuitable extinguishing media | Do not use water jet as an extinguisher, as this will spread the fire. |
| Specific hazards arising from the chemical | Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed. Firefighters should wear a self-contained breathing apparatus. |
| Special protective equipment and precautions for firefighters | Firefighters should wear full protective clothing including self contained breathing apparatus. Self-contained breathing apparatus and full protective clothing must be worn in case of fire. |
| Fire-fighting equipment/instructions | In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. |
| Specific methods | Use standard firefighting procedures and consider the hazards of other involved materials. |
| General fire hazards | Flammable liquid and vapor. |
| Hazardous combustion products | May include and are not limited to: Oxides of carbon. |
| Explosion data | |
| Sensitivity to mechanical impact | Not available. |
| Sensitivity to static discharge | Not available. |

6. Accidental Release Measures

| | |
|--|---|
| Personal precautions, protective equipment and emergency procedures | Keep unnecessary personnel away. Keep out of low areas. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of vapors or mists. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS. |
|--|---|

Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Take precautionary measures against static discharge. Use only non-sparking tools. Keep combustibles (wood, paper, oil, etc.) away from spilled material. Stop the flow of material, if this is without risk.

Large Spills: Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Avoid discharge into drains, water courses or onto the ground.

Environmental precautions

7. Handling and Storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Vapors may form explosive mixtures with air. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Use only with adequate ventilation. Do not breathe mist or vapor. Avoid contact during pregnancy/while nursing. Avoid contact with eyes, skin and clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. Use personal protective equipment as required. When using, do not eat, drink or smoke. Wash thoroughly after handling. Keep container tightly closed.

Conditions for safe storage, including any incompatibilities

Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a closed container away from incompatible materials. Store in a cool, dry place out of direct sunlight. Store away from incompatible materials (see Section 10 of the SDS). Keep in an area equipped with sprinklers. Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits**US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

| Components | Type | Value |
|-----------------------|------|------------------------|
| Ethanol (CAS 64-17-5) | PEL | 1900 mg/m ³ |
| | | 1000 ppm |

US. OSHA Table Z-2 (29 CFR 1910.1000)

| Components | Type | Value |
|------------------------|---------|---------|
| Toluene (CAS 108-88-3) | Ceiling | 300 ppm |
| | TWA | 200 ppm |

US. ACGIH Threshold Limit Values

| Components | Type | Value |
|------------------------|------|----------|
| Ethanol (CAS 64-17-5) | STEL | 1000 ppm |
| Toluene (CAS 108-88-3) | TWA | 20 ppm |

US. NIOSH: Pocket Guide to Chemical Hazards

| Components | Type | Value |
|------------------------|------|------------------------|
| Ethanol (CAS 64-17-5) | TWA | 1900 mg/m ³ |
| | | 1000 ppm |
| Toluene (CAS 108-88-3) | STEL | 560 mg/m ³ |
| | | 150 ppm |
| | TWA | 375 mg/m ³ |
| | | 100 ppm |

Biological limit values**ACGIH Biological Exposure Indices**

| Components | Value | Determinant | Specimen | Sampling Time |
|------------------------|-----------|---------------------------|---------------------|---------------|
| Toluene (CAS 108-88-3) | 0.3 mg/g | o-Cresol, with hydrolysis | Creatinine in urine | * |
| | 0.03 mg/l | Toluene | Urine | * |
| | 0.02 mg/l | Toluene | Blood | * |

* - For sampling details, please see the source document.

| | |
|--|--|
| Appropriate engineering controls | Explosion-proof general and local exhaust ventilation. |
| Individual protection measures, such as personal protective equipment | |
| Eye/face protection | Wear safety glasses with side shields. |
| Skin protection | |
| Hand protection | Rubber gloves. Confirm with a reputable supplier first. |
| Other | Wear appropriate chemical resistant clothing. As required by employer code. |
| Respiratory protection | Where exposure guideline levels may be exceeded, use an approved NIOSH respirator. |
| Thermal hazards | Not applicable. |
| General hygiene considerations | 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. Wash hands before breaks and immediately after handling the product. When using do not eat or drink. |

9. Physical and Chemical Properties

| | |
|---|---------------------|
| Appearance | Clear |
| Physical state | Liquid. |
| Form | Liquid. |
| Color | Slight green |
| Odor | Alcohol to Toluene |
| Odor threshold | Not available. |
| pH | Not available. |
| Melting point/freezing point | Not available. |
| Initial boiling point and boiling range | 143.06 °F (61.7 °C) |
| Pour point | Not available. |
| Specific gravity | Not available. |
| Partition coefficient (n-octanol/water) | Not available. |
| Flash point | 100.0 °F (37.8 °C) |
| Evaporation rate | < 1 (BuAc = 1) |
| Flammability (solid,gas) | Not applicable |
| Upper/lower flammability or explosive limits | |
| Flammability limit - lower (%) | Not available. |
| Flammability limit - upper (%) | Not available. |
| Explosive limit - lower (%) | Not available. |
| Explosive limit - upper (%) | Not available. |
| Vapor pressure | Not available. |
| Vapor density | 0.91 (water = 1) |
| Relative density | Not available. |
| Solubility(ies) | Not available. |
| Auto-ignition temperature | Not available. |
| Decomposition temperature | Not available. |
| Viscosity | Not available. |

10. Stability and Reactivity

| | |
|---|--|
| Reactivity | This product may react with strong oxidizing agents. |
| Possibility of hazardous reactions | No dangerous reaction known under conditions of normal use. |
| Chemical stability | Stable under recommended storage conditions. |
| Conditions to avoid | Avoid heat, sparks, open flames and other ignition sources. Do not mix with other chemicals. |
| Incompatible materials | Strong oxidizing agents. |
| Hazardous decomposition products | May include and are not limited to: Oxides of carbon. |

11. Toxicological Information

Routes of exposure Eye, Skin contact, Inhalation, Ingestion.

Information on likely routes of exposure

Ingestion Expected to be a low ingestion hazard.

Inhalation Prolonged inhalation may be harmful. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. May cause damage to organs by inhalation.

Skin contact Causes skin irritation.

Eye contact Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

Information on toxicological effects

Acute toxicity Narcotic effects. May cause respiratory irritation.

| Components | Species | Test Results |
|--------------------------------------|---------------|---|
| Ethanol (CAS 64-17-5) | | |
| Acute | | |
| <i>Dermal</i> | | |
| LD50 | Not available | |
| <i>Inhalation</i> | | |
| LC50 | Mouse | 39 mg/l, 4 Hours |
| | Rat | 31623 ppm, 4 Hours 20000 ppm, 10 Hours |
| <i>Oral</i> | | |
| LD50 | Dog 5 | 500 mg/kg |
| | Guinea pig | 5600 mg/kg |
| | Mouse | 3450 mg/kg |
| | Rat | 7060 mg/kg |
| Toluene (CAS 108-88-3) | | |
| Acute | | |
| <i>Dermal</i> | | |
| LD50 | Rabbit | 12196 mg/kg 12125 mg/kg 8390 mg/kg 14.1 ml/kg |
| <i>Inhalation</i> | | |
| LC50 | Mouse | 7100 mg/l, 4 Hours 5320 ppm, 8 Hours 400 ppm, 24 Hours |
| | Rat | 26700 ppm, 1 Hours <= 28800 mg/m ³ , 4 Hours 12200 ppm, 2 Hours 8000 ppm, 4 Hours 12.5 mg/l/4h |
| <i>Oral</i> | | |
| LD50 | Rat | > 5580 mg/kg 636 mg/kg |
| Triethoxy(vinyl)silane (CAS 78-08-0) | | |
| Acute | | |
| <i>Dermal</i> | | |
| LD50 | Rabbit | 9100 mg/kg |

| Components | Species | Test Results |
|---|--|--------------|
| <i>Inhalation</i> | | |
| LC50 | Not available | |
| <i>Oral</i> | | |
| LD50 | Not available | |
| Skin corrosion/irritation | Causes skin irritation. | |
| Exposure minutes | Not available. | |
| Erythema value | Not available. | |
| Oedema value | Not available. | |
| Serious eye damage/eye irritation | Causes serious eye irritation. | |
| Corneal opacity value | Not available. | |
| Iris lesion value | Not available. | |
| Conjunctival reddening value | Not available. | |
| Conjunctival oedema value | Not available. | |
| Recover days | Not available. | |
| Respiratory or skin sensitization | | |
| Respiratory sensitization | Not available. | |
| Skin sensitization | This product is not expected to cause skin sensitization. | |
| Germ cell mutagenicity | Non-hazardous by WHMIS/OSHA criteria. | |
| Mutagenicity | Non-hazardous by WHMIS/OSHA criteria. | |
| Carcinogenicity | Not classified or listed by IARC, NTP, OSHA and ACGIH. | |
| ACGIH Carcinogens | | |
| Toluene (CAS 108-88-3) | A4 Not classifiable as a human carcinogen. | |
| IARC Monographs. Overall Evaluation of Carcinogenicity | | |
| Ethanol (CAS 64-17-5) | Volume 44, Volume 96, Volume 100E Volume 96, Volume 100E | |
| Toluene (CAS 108-88-3) | Volume 47, Volume 71 - 3 Not classifiable as to carcinogenicity to humans. | |
| US - California Proposition 65 - CRT: Listed date/Carcinogenic substance | | |
| Ethanol (CAS 64-17-5) | Carcinogenic. | |
| Reproductive toxicity | Possible reproductive hazard. Suspected of damaging the unborn child. | |
| Teratogenicity | Toluene (benzene, methyl-) has caused fetotoxicity (reduced fetal weight), behavioural effects (effects on learning and memory) and hearing loss (in males). These effects have been observed in the offspring of rats exposed by inhalation to 1200 or 1800 ppm toluene. These effects were observed in the absence of maternal toxicity. | |
| Specific target organ toxicity - single exposure | Respiratory tract irritation. Narcotic effects. | |
| Specific target organ toxicity - repeated exposure | May cause damage to organs through prolonged or repeated exposure. | |
| Aspiration hazard | Not available. | |
| Chronic effects | Prolonged inhalation may be harmful. May cause damage to organs through prolonged or repeated exposure. | |
| Further information | Not available. | |
| Name of Toxicologically Synergistic Products | Not available. | |

12. Ecological Information

| Components | Species | Test Results |
|-----------------------|---|---------------------------|
| Ethanol (CAS 64-17-5) | | |
| Crustacea | EC50 Daphnia | 11744.5 mg/L, 48 Hours |
| Aquatic | | |
| Crustacea | EC50 Water flea (Daphnia magna) | 7.7 - 11.2 mg/l, 48 hours |
| Fish | LC50 Fathead minnow (Pimephales promelas) | > 100 mg/l, 96 hours |

| Components | Species | Test Results |
|--------------------------------------|---|---|
| Toluene (CAS 108-88-3) | | |
| Algae | IC50 | Algae 433 mg/L, 72 Hours |
| Crustacea | EC50 | Daphnia 7.645 mg/L, 48 Hours |
| Aquatic | | |
| Crustacea | EC50 | Water flea (Daphnia magna) 5.46 - 9.83 mg/l, 48 hours |
| Fish | LC50 | Coho salmon, silver salmon (Oncorhynchus kisutch) 8.11 mg/l, 96 hours |
| Persistence and degradability | No data is available on the degradability of this product. | |
| Bioaccumulative potential | No data available. | |
| Mobility in soil | No data available. | |
| Mobility in general | Not available. | |
| Other adverse effects | No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component. | |

13. Disposal Considerations

| | |
|--|--|
| Disposal instructions | Dispose of contents/container in accordance with local/regional/national/international regulations. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. |
| Local disposal regulations | Dispose in accordance with all applicable regulations. |
| Hazardous waste code | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| US RCRA Hazardous Waste U List: Reference | |
| Toluene (CAS 108-88-3) | U220 |
| Waste from residues / unused products | Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). |
| Contaminated packaging | Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied. |

14. Transport Information

U.S. Department of Transportation (DOT)

Basic shipping requirements:

| | |
|-----------------------------|--|
| UN number | UN1993 |
| Proper shipping name | Flammable liquids, n.o.s. (Ethanol RQ = 400 LBS) |
| Hazard class | Limited Quantity - US |
| Packing group | III |
| Special provisions | B1, B52, IB3, T4, TP1, TP29 |
| Packaging exceptions | 150 |
| Packaging non bulk | 203 |
| Packaging bulk | 242 |

Transportation of Dangerous Goods (TDG - Canada)

Basic shipping requirements:

| | |
|-----------------------------|------------------------------------|
| UN number | UN1993 |
| Proper shipping name | FLAMMABLE LIQUID, N.O.S. (Ethanol) |
| Hazard class | Limited Quantity - Canada |
| Packing group | III |
| Special provisions | 16 |

IATA/ICAO (Air)

Basic shipping requirements:

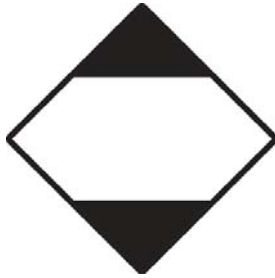
| | |
|-----------------------------|------------------------------------|
| UN number | UN1993 |
| Proper shipping name | Flammable liquid, n.o.s. (Ethanol) |
| Hazard class | Limited Quantity - IATA |
| Packing group | III |

IMDG (Marine Transport)

Basic shipping requirements:

| | |
|-----------------------------|------------------------------------|
| UN number | UN1993 |
| Proper shipping name | FLAMMABLE LIQUID, N.O.S. (Ethanol) |
| Hazard class | Limited Quantity - US |
| Packing group | III |

DOT; IMDG; TDG



IATA



15. Regulatory Information

Canadian federal regulations This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Canada NPRI VOCs with Additional Reporting Requirements: Mass reporting threshold/Identification Number

| | |
|------------------------|----------|
| Ethanol (CAS 64-17-5) | 1 TONNES |
| Toluene (CAS 108-88-3) | 1 TONNES |

Canada WHMIS Ingredient Disclosure: Threshold limits

| | |
|------------------------|-------|
| Ethanol (CAS 64-17-5) | 0.1 % |
| Toluene (CAS 108-88-3) | 1 % |

WHMIS status

Controlled

WHMIS classification

Class B - Division 3 - Combustible Liquid, Class D - Division 2A, 2B

WHMIS labeling



US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

| | |
|------------------------|-------|
| Toluene (CAS 108-88-3) | 1.0 % |
|------------------------|-------|

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

| | |
|------------------------|---------|
| Toluene (CAS 108-88-3) | Listed. |
|------------------------|---------|

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US CWA Section 311 Hazardous Substances: Listed substance

| | |
|------------------------|---------|
| Toluene (CAS 108-88-3) | Listed. |
|------------------------|---------|

US CWA Section 307(a)(1) Toxic Pollutants: Listed substance

| | |
|------------------------|---------|
| Toluene (CAS 108-88-3) | Listed. |
|------------------------|---------|

CERCLA Hazardous Substance List (40 CFR 302.4)

| | |
|------------------------|---------|
| Toluene (CAS 108-88-3) | Listed. |
|------------------------|---------|

US CAA Section 111 Volatile Organic Compounds: Listed substance

| | |
|------------------------|---------|
| Ethanol (CAS 64-17-5) | Listed. |
| Toluene (CAS 108-88-3) | Listed. |

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

| | |
|------------------------|---------|
| Toluene (CAS 108-88-3) | Listed. |
|------------------------|---------|

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - Yes
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance No

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

| Chemical name | CAS number | % by wt. |
|---------------|------------|-----------|
| Toluene | 108-88-3 | 0.1 - 1.5 |

Other federal regulations

Safe Drinking Water Act (SDWA) Not regulated.

Food and Drug Administration (FDA) Not regulated.

US state regulations

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

US - California Hazardous Substances (Director's): Listed substance

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US - Illinois Chemical Safety Act: Listed substance

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US - Louisiana Spill Reporting: Listed substance

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US - Michigan Critical Materials Register: Parameter number

Toluene (CAS 108-88-3) 00108-88-3 Listed.

US - Minnesota Haz Subs: Listed substance

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US - New Jersey RTK - Substances: Listed substance

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US - New York Release Reporting: Hazardous Substances: Listed substance

Toluene (CAS 108-88-3) Listed.

US - North Carolina Toxic Air Pollutants: Listed substance

Toluene (CAS 108-88-3) Listed.

US - Texas Effects Screening Levels: Listed substance

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US - Washington Chemical of High Concern to Children: Listed substance

Toluene (CAS 108-88-3) Listed.

US. Massachusetts RTK - Substance List

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US. Pennsylvania RTK - Hazardous Substances

Ethanol (CAS 64-17-5) Listed.
 Toluene (CAS 108-88-3) Listed.

US. Rhode Island RTK

Toluene (CAS 108-88-3) Listed.

Inventory status

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|----------------------|-------------------------------------|------------------------|
| Canada | Domestic Substances List (DSL) | Yes |
| Canada | Non-Domestic Substances List (NDSL) | No |

Country(s) or region

Inventory name

On inventory (yes/no)*

United States & Puerto Rico Toxic Substances Control Act (TSCA) Inventory

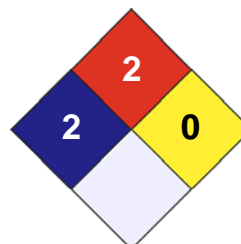
Yes

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

16. Other Information

| LEGEND | |
|----------|---|
| Severe | 4 |
| Serious | 3 |
| Moderate | 2 |
| Slight | 1 |
| Minimal | 0 |

| | | |
|---------------------|---|---|
| HEALTH | * | 2 |
| FLAMMABILITY | | 2 |
| PHYSICAL HAZARD | | 0 |
| PERSONAL PROTECTION | | X |



Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available. Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

Issue date

15-December-2014

Effective date

15-December-2014

Expiry date

15-December-2017

Further information

For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.

Prepared by

Nu-Calgon Technical Service Phone: (314) 469-7000

Other information

This Safety Data Sheet was prepared to comply with the current OSHA Hazard Communication Standard (HCS) adoption of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).