MATERIAL SAFETY DATA SHEET

PROC 8047 INHIB METHANOL ADD

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Brenntag Canada Inc.
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Toronto, ON
M8Z 2G6
(416) 259-8231

WHMIS#: 00066281
Index: HCl5421/15D
Effective Date: 2015 October 02
Date of Revision: 2015 October 02

Website: http://www.brenntag.ca

EMERGENCY TELEPHONE NUMBER (For Emergencies Involving Chemical Spills or Releases)

1 855 273 6824

PRODUCT IDENTIFICATION

Product Name: Proc 8047 Inhib Methanol Add.

Chemical Name: Not applicable.

Synonyms: Not applicable.

Chemical Family: Mixture of aromatic hydrocarbons, oxygenated aliphatic hydrocarbons and amine compounds.

Molecular Formula: Not applicable.

Product Use: Corrosion Inhibitor. Oilfield chemical.

WHMIS Classification / Symbol:

B-2: Flammable Liquid
D-1B: Toxic (acute effects)
D-2A: Very Toxic (teratogen)
D-2B: Toxic (skin and eye irritant)

READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

2. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS#</th>
<th>ACGIH TLV (TWA)</th>
<th>% Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>200 ppm (Skin)</td>
<td>30 - 60</td>
</tr>
<tr>
<td>Pyridinium, 1-(phenylmethyl)-Et, Me derivs., chlorides</td>
<td>68909-18-2</td>
<td>10 mg/m³</td>
<td>10 - 30</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>141-43-5</td>
<td>3 ppm</td>
<td>3 - 7</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>67-63-0</td>
<td>200 ppm</td>
<td>1 - 5</td>
</tr>
<tr>
<td>Alkyl Phenol Ethoxylate Phosphate Ester</td>
<td>68412-53-3</td>
<td>---</td>
<td>1 - 5</td>
</tr>
<tr>
<td>C12-16 Pareth-5</td>
<td>68551-12-2</td>
<td>10 mg/m³</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

A4 = Not classifiable as a human carcinogen. (ACGIH-A4).

Skin Notation: Contact with skin, eyes and mucous membranes can contribute to the overall exposure and may invalidate the TLV. Consider measures to prevent absorption by these routes.

3. HAZARDS IDENTIFICATION
4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.

Skin Contact: Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of soap and water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible. Cover the exposed part with a clean, preferably sterile, lint-free dressing. Obtain medical attention IMMEDIATELY and monitor breathing and treat for shock for severe exposure. See "Note to Physicians" below.

Eye Contact: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention.

Ingestion: Do not attempt to give anything by mouth to an unconscious person. IMMEDIATELY contact local Poison Control Centre. If victim is alert and not convulsing, rinse mouth out and give 1 to 2 glasses of milk. Water may be used if milk is not available but it is not as effective. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more milk or water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians: Not available.

5. FIRE-FIGHTING MEASURES
### Flammability Limits in Air (%):

<table>
<thead>
<tr>
<th>Property</th>
<th>LEL</th>
<th>UEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashpoint (°C)</td>
<td>15</td>
<td>385</td>
</tr>
<tr>
<td>Autoignition Temperature (°C)</td>
<td>(Estimated)</td>
<td>36 (Estimated)</td>
</tr>
</tbody>
</table>

**B-2: Flammable Liquid**

**Flammability Class (WHMIS):**

**Hazardous Combustion Products:**
Thermal decomposition products are toxic and may include formaldehyde, oxides of carbon, nitrogen, phosphorous and irritating gases.

**Unusual Fire or Explosion Hazards:**
Vapours from this product are heavier than air, and may "travel" to a source of ignition (e.g., pilot lights, heaters, electric motors) some distance away, and then "flash back" to the point of product discharge causing an explosion and fire. Closed containers exposed to heat may explode. Spilled material may cause floors and contact surfaces to become slippery.

**Sensitivity to Mechanical Impact:**
Not expected to be sensitive to mechanical impact.

**Rate of Burning:**
Not available.

**Explosive Power:**
Not available.

**Sensitivity to Static Discharge:**
Expected to be sensitive to static discharge when vapours are present between the lower and upper explosive limits.

**EXTINGUISHING MEDIA**

**Fire Extinguishing Media:**
Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. This material may produce a floating fire hazard in extreme fire conditions.

**FIRE FIGHTING INSTRUCTIONS**

**Instructions to the Fire Fighters:**
Use water spray to cool fire-exposed containers or structures. Use water spray to disperse vapours; reignition is possible. Isolate materials that are not involved in the fire and protect personnel. Cool containers with flooding quantities of water until well after the fire is out. Spilled material may cause floors and contact surfaces to become slippery.

**Fire Fighting Protective Equipment:**
Use self-contained breathing apparatus and protective clothing.

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### 6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

**Containment and Clean-Up Procedures:**
In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Utilize a spill kit, if available. Spilled material may cause floors and contact surfaces to become slippery. Wear respirator, protective clothing and gloves. Any recovered product can be used for the usual purpose, depending on the extent and kind of contamination. Where a package (drum or bag) is damaged and/or leaking, repair it, or place it into an over-pack drum immediately so as to avoid or minimize material loss and contamination of surrounding environment. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere. Do not use combustible materials such as sawdust as an absorbent. Recover spilled material on non-combustible absorbents, such as sand or vermiculite, and place in covered containers for disposal. Use spark-resistant tools. Eliminate all sources of ignition. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dikes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

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### 7. HANDLING AND STORAGE

**HANDLING**

**Handling Practices:**
Ground and bond equipment and containers to prevent a static charge buildup. Use spark-resistant tools and avoid "splash-filling" of containers. Use normal "good" industrial hygiene and housekeeping practices. Containers exposed to heat may be under internal pressure. These should be cooled and carefully vented before opening. A face shield and apron should be worn. Vent container frequently, and more often in warm weather, to relieve pressure. Enforce NO SMOKING rules in area of use.

**Ventilation Requirements:**
See Section 8, "Engineering Controls".
Use only with adequate ventilation and avoid breathing vapours and aerosols. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Absorption via contact with skin, eyes and mucous membranes can contribute to the overall exposure. Consider measures to prevent absorption by these routes. Store wiping rags and similar material in metal cans with tight fitting lids.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS

Engineering Controls: Local exhaust ventilation required. Ventilation should be explosion proof. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

For personnel entry into confined spaces (i.e. bulk storage tanks) a proper procedure must be followed. It must include consideration of, among other things, ventilation, testing of tank atmosphere, provision and maintenance of SCBA, and emergency rescue. Use the “buddy” system. The second person should be in view and trained and equipped to execute a rescue. (6)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye Protection: Safety glasses with side shields are recommended to prevent eye contact. Use chemical safety goggles when there is potential for eye contact. Contact lenses should not be worn when working with this material.

Skin Protection: Gloves and protective clothing made from butyl rubber, viton, nitrile rubber or neoprene should be impervious under conditions of use. Attacks some types of rubber, plastics and coatings. Prior to use, user should confirm impermeability. Discard contaminated gloves.

Respiratory Protection: No specific guidelines available. Do not use compressed oxygen in hydrocarbon atmospheres. A NIOSH/MSHA-approved air-purifying respirator equipped with organic vapour cartridges for concentrations up to 30 ppm. A NIOSH/MSHA-approved full facepiece air-supplied respirator if concentrations are higher or unknown.

If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (6)

Other Personal Protective Equipment: Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact. Clothing and footwear that is fire retardant and dissipates static electrical charges should be worn when handling flammable materials. Natural fibers (cotton, wool, leather and linen) should be selected in favour of synthetic materials (rayon, nylon and polyester).

Skin Notation: Contact with skin, eyes and mucous membranes can contribute to the overall exposure and may invalidate the TLV. Consider measures to prevent absorption by these routes.

EXPOSURE GUIDELINES

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>ACGIH TLV (STEL)</th>
<th>OSHA PEL (STEL)</th>
<th>NIOSH REL (STEL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>250 ppm (Skin)</td>
<td>200 ppm</td>
<td>200 ppm (Skin)</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>6 ppm (Ceiling)</td>
<td>3 ppm</td>
<td>3 ppm</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>400 ppm</td>
<td>400 ppm</td>
<td>400 ppm</td>
</tr>
<tr>
<td>Ethoxylated Nonylphenol</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
Branched
Alkybenzyl Imidazolinium Chloride
Mixture of Alkyl Pyridines
Phosphoric Acid

--- --- --- --- ---
--- --- --- --- ---
3 mg/m³ 1 mg/m³ --- 1 mg/m³ 3 mg/m³

9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Dark, red liquid</td>
</tr>
<tr>
<td>Odour</td>
<td>Amine odour</td>
</tr>
<tr>
<td>Odour Threshold (ppm):</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Range (°C):</td>
<td>&gt; 65</td>
</tr>
<tr>
<td>Melting/Freezing Point (°C):</td>
<td>&lt; -35</td>
</tr>
<tr>
<td>Vapour Pressure (mm Hg at 20° C):</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapour Density (Air = 1.0):</td>
<td>Not available</td>
</tr>
<tr>
<td>Relative Density (g/cc):</td>
<td>0.91 - 0.93</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>910 - 930 kg/m³</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate (Butyl Acetate = 1.0):</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water</td>
</tr>
<tr>
<td>% Volatile by Volume:</td>
<td>Not available</td>
</tr>
<tr>
<td>pH</td>
<td>9.2 - 9.4</td>
</tr>
<tr>
<td>Coefficient of Water/Oil Distribution</td>
<td>Not available</td>
</tr>
<tr>
<td>Volatile Organic Compounds (VOC):</td>
<td>Not available</td>
</tr>
<tr>
<td>Flashpoint (°C):</td>
<td>15 (Estimated)</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY
Under Normal Conditions: Stable.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: High temperatures, sparks, open flames and all other sources of ignition.
Mixtures or reactions of alcohols with the following materials may cause explosions: barium perchlorate, chlorine, hypochlorous acid, ethylene oxide, hexamethylene diisocyanate and other isocyanates, nitrogen tetroxide, permonosulfuric acid and tri-isobutyl aluminum. (4)
Monoethanolamine and iron form a complex molecule, trisethanolamine-iron. This material can spontaneously decompose at temperatures between 130 Degrees Celsius and 160 Degrees Celsius, and has been suspected of causing a fire in a nearly empty storage tank containing a "heel" of Monoethanolamine in contact with carbon steel steam coils. If steam coil heating is used, low pressure steam in stainless steel coils is preferred. Since this same mechanism may occur in drums, take care when thawing drummed Monoethanolamine with heating coils and maintain temperatures below 130 Degrees Celsius. (3)

Decomposition or Combustion
Products: Thermal decomposition products are toxic and may include formaldehyde, oxides of carbon, nitrogen, phosphorous and irritating gases.

11. TOXICOLOGICAL INFORMATION
**TOXICOLOGICAL DATA:**

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>LD50 (Oral, Rat)</th>
<th>LD50 (Dermal, Rabbit)</th>
<th>LC50 (Inhalation, Rat, 4h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>5 600 mg/kg (1)</td>
<td>15 800 mg/kg (1)</td>
<td>64 000 ppm (1)</td>
</tr>
<tr>
<td>Pyridinium, 1-(phenylmethyl)-, Et, Me derivs., chlorides</td>
<td>50.1 mg/kg (3)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>1 090 - 3 320 mg/kg (1, 3)</td>
<td>1 000 - 2 950 mg/kg (1, 3)</td>
<td>&gt; 1.48 3</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>4 700 - 5 800 mg/kg (1, 3)</td>
<td>12 000 - 13 000 mg/kg (1, 3)</td>
<td>&gt; 20 000 ppm (3)</td>
</tr>
<tr>
<td>Ethoxylated Nonylphenol, Branched</td>
<td>3 000 mg/kg (3)</td>
<td>4 400 mg/kg (3)</td>
<td>---</td>
</tr>
<tr>
<td>Alkylbenzyl Imidazolinium Chloride</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Mixture of Alkyl Pyridines</td>
<td>1 940 mg/kg (1)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Phosphoric Acid</td>
<td>1 250 - 1 530 mg/kg (1,3)</td>
<td>&gt; 1 260 mg/kg (3)</td>
<td>---</td>
</tr>
</tbody>
</table>

Carcinogenicity Data: The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP.

Reproductive Data: Not available. No adverse reproductive effects are anticipated.

Mutagenicity Data: Not available. No adverse mutagenic effects are anticipated.

Teratogenicity Data: Methanol may cause teratogenic/embryotoxic effects based on studies in laboratory animals. See "Other Health Effects" Section.

Respiratory / Skin Sensitization Data: Cross sensitization may occur by skin contact with this material and other amines. Sensitization is the process whereby a biological change occurs in the individual because of previous exposure to a substance and, as a result, the individual reacts more strongly when subsequently exposed to the substance. Once sensitized, an individual can react to extremely low airborne levels, even below the TLV, or to skin contact.

Synergistic Materials: Alcohols may interact synergistically with chlorinated solvents (example - carbon tetrachloride, chloroform, bromotrichloromethane), dithiocarbamates (example - disulfiram), dimethylnitrosamine and thioacetamide. (6)

Amines: This product contains an amine, which may react with nitrates to form a nitrosamine. Some nitrosamines have been shown to be carcinogenic in laboratory animals.
Other Studies Relevant to Material:

Methanol caused moderate skin and eye irritation in animal tests. A well-conducted oral study using rats suggests that methanol may be carcinogenic, but further studies are required before firm conclusions can be drawn. Limited inhalation studies using mice, rats and monkeys have not shown carcinogenicity. (4)

Methanol has produced fetotoxicity in rats and teratogenicity in mice exposed by inhalation to high concentrations that did not produce significant maternal toxicity. Mice were exposed by inhalation to 1000, 2000, 5000, 7500, 10000, or 15000 ppm of days 6-15 of pregnancy (7 hr/d). No visible signs of maternal toxicity were noted, but 1/30-40 mothers died in each group exposed to 7500 ppm and above. There was a dose-related significant decrease in the number of live pups/litter (post-implantation mortality) at 7500 ppm and above. A significant increase in malformations (e.g. cleft palate, exencephaly, skeletal anomalies) was observed at 5000 ppm and above. Fetal body weights were significantly reduced at 10000 ppm and higher. (4)

Monoethanolamine: A laboratory study suggests that rats given high doses of Monoethanolamine by gavage produced increased embryofoetal death, growth retardation and some malformations (hydronephrosis/hydroureter). Long-term animal inhalation studies indicate that Monoethanolamine can cause damage to skin, liver and kidneys, damage to the nervous system, blood changes and even death. (3,4)

Isopropanol: An indication of reduced mating performance in second generation male rats was noted at oral doses of 1 000 mg/kg/day in a two-generation reproductive study. Increased neonatal mortality was also seen at doses of 500 mg/kg/day and greater in this study. (3)

Nonylphenol Ethoxylate: Based on the available findings to date, no direct link has been established between exposure to Alkylphenol Ethoxylates (APEs) or their biodegradation intermediates in the environment and any harmful effect on humans due to endocrine (hormone) disruption.

A study by the U.S. government’s National Institute of Environment Health Sciences showed no effect on reproduction in laboratory animals exposed to nonylphenol (NP). The study concluded that “NP was not a selective reproductive/developmental toxicant.” In this study of three generations of rats, there was some estrogenic activity at the two higher doses (approximately 50 or 150 mg/Kg body weight per day) and no activity at the lower doses (approximately 15 mg/Kg body weight per day). The lower dose was several orders of magnitude higher than the estimated, maximum daily human intake. There was no adverse effect on fertility even at the highest dose.

Commercial APEs, such as Nonylphenol Ethoxylate-4 (NPE4), NPE9 and Octylphenol Ethoxylate-5 (OPE5), have not demonstrated estrogenic activity when tested in the uterotrophic assay of the classic live animal study.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not available. Low acute toxicity to aquatic organisms.

Environmental Fate: Not available. Product has an unaesthetic appearance and can be a nuisance. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals: None required.

Waste Disposal Methods: This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

Safe Handling of Residues: See "Waste Disposal Methods".

Disposal of Packaging: Empty containers retain product residue and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Do not expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Do not dispose of package until thoroughly washed out.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:
UN1993, FLAMMABLE LIQUID, N.O.S. (Methanol), Class 3, PG II.
Label(s): Flammable Liquids. Placard: Flammable Liquids.
ERAP Index: -----. Exemptions: None known.

**US DOT CLASSIFICATION (49CFR 172.101, 172.102):**

UN1993, FLAMMABLE LIQUID, N.O.S. (Methanol), Class 3, PG II.
Label(s): Flammable Liquid. Placard: Flammable Liquid.
CERCLA-RQ: Methanol: 5 000 lb / 2 270 Kg. Exemptions: None known.

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**15. REGULATORY INFORMATION**

**CANADA**

CEPA - NSNR: All components of this product are included on the DSL.
CEPA - NPRI: Methanol; Isopropanol; Nonyl Phenol Ethoxylate.

Controlled Products Regulations Classification (WHMIS):
- B-2: Flammable Liquid
- D-1B: Toxic (acute effects)
- D-2A: Very Toxic (teratogen)
- D-2B: Toxic (skin and eye irritant)

**USA**

Environmental Protection Act: All components of this product are included on the TSCA inventory.
NFPA: 2 Health, 3 Fire, 0 Reactivity (6)
HMIS: 2 Health, 3 Fire, 0 Reactivity (6)

**INTERNATIONAL**

Not available.

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**16. OTHER INFORMATION**

**REFERENCES**

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
3. Supplier's Material Safety Data Sheet(s).
4. CHEMINFO chemical profile, Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
6. Regulatory Affairs Group, Brenntag Canada Inc.

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Brenntag Canada Inc. will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

To obtain revised copies of this or other Material Safety Data Sheets, contact your nearest Brenntag Canada Regional office.

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