SAFETY DATA SHEET

1. Product and Company Identification

Product identifier	**Cal-Shield (4148-08, 4148-32)**
Other means of identification	Not available
Recommended use	Coil Protectant
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	Not classified.
Health hazards	Not classified.
Environmental hazards	Not classified.
WHMIS 2015 defined hazards	Not classified
Label elements	
Hazard symbol	None.
Signal word	None.
Hazard statement	The mixture does not meet the criteria for classification.
Precautionary statement	
Prevention	Observe good industrial hygiene practices.
Response	Wash hands after handling.
Storage	Store away from incompatible materials.
Disposal	Dispose of waste and residues in accordance with local authority requirements.
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	
Composition comments	Non-hazardous by WHMIS/OSHA criteria

4. First Aid Measures

Inhalation	If symptoms develop move victim to fresh air. If symptoms persist, obtain medical attention.
Skin contact	Flush with cool water. Wash with soap and water. Obtain medical attention if irritation persists.
Eye contact	Flush with cool water. Remove contact lenses, if applicable, and continue flushing. Obtain medical attention if irritation persists.
Ingestion	Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never give anything by mouth if victim is unconscious or is convulsing. Obtain medical attention.
Most important symptoms/effects, acute and delayed	Direct contact with eyes may cause temporary irritation.
Indication of immediate medical attention and special treatment needed	Symptoms may be delayed. Treat patient symptomatically.

General information	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. Avoid contact with eyes and skin. Wear rubber gloves and safety glasses with side shields. Keep out of reach of children.

5. Fire Fighting Measures

Suitable extinguishing media	Treat for surrounding material.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	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.
Fire-fighting equipment/instructions	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	No unusual fire or explosion hazards noted.
Hazardous combustion products	May include and are not limited to: Oxides of carbon. Hydrogen fluoride.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Stop leak if you can do so without risk. Large Spills: Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. 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. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS. Prevent entry into waterways, sewers, basements or confined areas. Before attempting clean up, refer to hazard data given above. Small spills may be absorbed with non-reactive absorbent and placed in suitable, covered, labelled containers. Prevent large spills from entering sewers or waterways. Contact emergency services and supplier for advice.
Environmental precautions	Do not discharge into lakes, streams, ponds or public waters.

7. Handling and Storage

Precautions for safe handling	Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Use good industrial hygiene practices in handling this material. When using do not eat or drink. Avoid breathing vapors or mists of this product. Keep container tightly closed.
Conditions for safe storage, including any incompatibilities	Store in a closed container away from incompatible materials. Keep out of reach of children.

8. Exposure Controls/Personal Protection

Occupational exposure limits

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Acetic acid (CAS 64-19-7)	STEL	37 mg/m3 15 ppm
	TWA	25 mg/m3 10 ppm
Carbon dioxide (CAS 124-38-9)	STEL	54000 mg/m3 30000 ppm
	TWA	9000 mg/m3 5000 ppm
Carbon monoxide (CAS 630-08-0)	TWA	29 mg/m3 25 ppm

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Carbonyl fluoride (CAS 353-50-4)	STEL	13 mg/m3
		5 ppm
	TWA	5.4 mg/m3
		2 ppm
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	1.6 mg/m3
		2 ppm
	TWA	1.4 mg/m3
		1.5 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
Acetic acid (CAS 64-19-7)	STEL	15 ppm
	TWA	10 ppm
Carbon dioxide (CAS 124-38-9)	STEL	15000 ppm
	TWA	5000 ppm
Carbon monoxide (CAS 630-08-0)	STEL	100 ppm
	TWA	25 ppm
Carbonyl fluoride (CAS 353-50-4)	STEL	5 ppm
	TWA	2 ppm
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	2 ppm
	TWA	2.5 mg/m3

Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value
Acetic acid (CAS 64-19-7)	STEL	15 ppm
	TWA	10 ppm
Carbon dioxide (CAS 124-38-9)	STEL	30000 ppm
	TWA	5000 ppm
Carbon monoxide (CAS 630-08-0)	TWA	25 ppm
Carbonyl fluoride (CAS 353-50-4)	STEL	5 ppm
	TWA	2 ppm
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	2 ppm
	TWA	0.5 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
Acetic acid (CAS 64-19-7)	STEL	15 ppm
	TWA	10 ppm
Carbon dioxide (CAS 124-38-9)	STEL	30000 ppm
	TWA	5000 ppm
Carbon monoxide (CAS 630-08-0)	TWA	25 ppm
Carbonyl fluoride (CAS 353-50-4)	STEL	5 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
	TWA	2 ppm
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	2 ppm
	TWA	0.5 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Acetic acid (CAS 64-19-7)	STEL	37 mg/m3 15 ppm
	TWA	25 mg/m3 10 ppm
Carbon dioxide (CAS 124-38-9)	STEL	54000 mg/m3
		30000 ppm
	TWA	9000 mg/m3 5000 ppm
Carbon monoxide (CAS 630-08-0)	STEL	230 mg/m3
		200 ppm
	TWA	40 mg/m3 35 ppm
Carbonyl fluoride (CAS 353-50-4)	STEL	13 mg/m3
		5 ppm
	TWA	5.4 mg/m3 2 ppm
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	2.6 mg/m3
		3 ppm
	TWA	2.5 mg/m3

Canada. Saskatchewan OELs (Occupational Health and Safety Regulations, 1996, Table 21)

Components	Type	Value
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	2 ppm

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

Components	Type	Value
Acetic acid (CAS 64-19-7)	PEL	25 mg/m3 10 ppm
Carbon dioxide (CAS 124-38-9)	PEL	9000 mg/m3
		5000 ppm
Carbon monoxide (CAS 630-08-0)	PEL	55 mg/m3
		50 ppm
Carbonyl fluoride (CAS 353-50-4)	PEL	2.5 mg/m3
Hydrogen fluoride (CAS 7664-39-3)	PEL	2.5 mg/m3

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

Components	Type	Value	Form
Carbonyl fluoride (CAS 353-50-4)	TWA	2.5 mg/m3	Dust.
Hydrogen fluoride (CAS 7664-39-3)	TWA	3 ppm	

US. ACGIH Threshold Limit Values

Components	Type	Value
Acetic acid (CAS 64-19-7)	STEL	15 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
	TWA	10 ppm
Carbon dioxide (CAS 124-38-9)	STEL	30000 ppm
	TWA	5000 ppm
Carbon monoxide (CAS 630-08-0)	TWA	25 ppm
Carbonyl fluoride (CAS 353-50-4)	STEL	5 ppm
	TWA	2 ppm
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	2 ppm
	TWA	0.5 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Acetic acid (CAS 64-19-7)	STEL	37 mg/m3 15 ppm
	TWA	25 mg/m3 10 ppm
Carbon dioxide (CAS 124-38-9)	STEL	54000 mg/m3 30000 ppm
	TWA	9000 mg/m3 5000 ppm
Carbon monoxide (CAS 630-08-0)	Ceiling	229 mg/m3 200 ppm
	TWA	40 mg/m3 35 ppm
Carbonyl fluoride (CAS 353-50-4)	STEL	15 mg/m3 5 ppm
	TWA	5 mg/m3 2 ppm
Hydrogen fluoride (CAS 7664-39-3)	Ceiling	5 mg/m3 6 ppm
	TWA	2.5 mg/m3 3 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Carbon monoxide (CAS 630-08-0)	3.5 %	Carboxyhemoglobin	Hemoglobin in blood	*
	20 ppm	Carbon monoxide	End-exhaled air	*
Carbonyl fluoride (CAS 353-50-4)	3 mg/L	Fluoride	Urine	*
	2 mg/L	Fluoride	Urine	*
Hydrogen fluoride (CAS 7664-39-3)	3 mg/L	Fluoride	Urine	*
	2 mg/L	Fluoride	Urine	*

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

Exposure guidelines

Canada - Manitoba OELs: Skin designation

Hydrogen fluoride (CAS 7664-39-3) Can be absorbed through the skin.

Canada - Ontario OELs: Skin designation

Hydrogen fluoride (CAS 7664-39-3) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

Hydrogen fluoride (CAS 7664-39-3) Can be absorbed through the skin.

Appropriate engineering controls General ventilation normally adequate.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin protection

Hand protection Impervious gloves. Confirm with reputable supplier first.

Other As required by employer code.

Respiratory protection Where exposure guideline levels may be exceeded, use an approved NIOSH respirator. Respirator should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134), CAN/CSA-Z94.4 and ANSI's standard for respiratory protection (Z88.2).

Thermal hazards Not applicable.

General hygiene considerations Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.
When using do not eat or drink.

9. Physical and Chemical Properties

Appearance	Opaque
Physical state	Liquid.
Form	Liquid.
Color	White.
Odor	Not available.
Odor threshold	Not available.
pH	3.3 - 4.8
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	Not available.
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	
Density	8.39 lbs/gallon
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	Hazardous polymerization does not occur.
Chemical stability	Stable under recommended storage conditions.
Conditions to avoid	Do not mix with other chemicals.
Incompatible materials	Oxidizers.
Hazardous decomposition products	May include and are not limited to: Oxides of carbon. Hydrogen fluoride.

11. Toxicological Information

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

Information on likely routes of exposure

Ingestion	May cause stomach distress, nausea or vomiting.
Inhalation	No adverse effects due to inhalation are expected.
Skin contact	No adverse effects due to skin contact are expected.
Eye contact	Direct contact with eyes may cause temporary irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity	Not available.
Skin corrosion/irritation	Prolonged skin contact may cause temporary irritation.
Exposure minutes	Not available.
Erythema value	Not available.
Oedema value	Not available.
Serious eye damage/eye irritation	Direct contact with eyes may cause temporary 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 a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Mutagenicity	Non-hazardous by WHMIS/OSHA criteria.
Carcinogenicity	Non-hazardous by WHMIS/OSHA criteria. See below.

IARC Monographs. Overall Evaluation of Carcinogenicity

Carbonyl fluoride (CAS 353-50-4)	Volume 27, Supplement 7 - 3 Not classifiable as to carcinogenicity to humans.
Hydrogen fluoride (CAS 7664-39-3)	Volume 27, Supplement 7 - 3 Not classifiable as to carcinogenicity to humans.

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	Non-hazardous by WHMIS/OSHA criteria.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.
Aspiration hazard	Not an aspiration hazard.
Chronic effects	Non-hazardous by WHMIS/OSHA criteria.

12. Ecological Information

Ecotoxicity	Not available.
Persistence and degradability	No data is available on the degradability of this product.

Bioaccumulative potential

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 in accordance with all applicable 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)

Not regulated as dangerous goods.

Transportation of Dangerous Goods (TDG - Canada)

Not regulated as dangerous goods.

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.

Canada CEPA Schedule I: Listed substance

Carbon dioxide (CAS 124-38-9)	Listed.
Carbonyl fluoride (CAS 353-50-4)	Listed.
Hydrogen fluoride (CAS 7664-39-3)	Listed.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Carbon dioxide (CAS 124-38-9)

Precursor Control Regulations

Not regulated.

WHMIS 2015 Exemptions Not applicable

US federal regulations This product is not known to be 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)

Carbonyl fluoride (CAS 353-50-4)	1.0 % One-Time Export Notification only.

CERCLA Hazardous Substance List (40 CFR 302.4)

Acetic acid (CAS 64-19-7)	Listed.
Carbon monoxide (CAS 630-08-0)	Listed.
Carbonyl fluoride (CAS 353-50-4)	Listed.
Hydrogen fluoride (CAS 7664-39-3)	Listed.

US EPCRA Section 304 Extremely Haz. Subs. & CERCLA Haz. Subs.: Section 304 EHS reportable quantity

Hydrogen fluoride (CAS 7664-39-3)	100 LBS

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

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No 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
Hydrogen fluoride (CAS 7664-39-3)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
Hydrogen fluoride (CAS 7664-39-3)

US state regulations

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

Acetic acid (CAS 64-19-7)	Listed.
Carbon dioxide (CAS 124-38-9)	Listed.
Carbon monoxide (CAS 630-08-0)	Listed.
Carbonyl fluoride (CAS 353-50-4)	Listed.
Hydrogen fluoride (CAS 7664-39-3)	Listed.

US - Illinois Chemical Safety Act: Listed substance
Acetic acid (CAS 64-19-7)
Carbon monoxide (CAS 630-08-0)
Carbonyl fluoride (CAS 353-50-4)
Hydrogen fluoride (CAS 7664-39-3)

US - Louisiana Spill Reporting: Listed substance

Acetic acid (CAS 64-19-7)	Listed.
Carbon monoxide (CAS 630-08-0)	Listed.
Carbonyl fluoride (CAS 353-50-4)	Listed.
Hydrogen fluoride (CAS 7664-39-3)	Listed.

US - Minnesota Haz Subs: Listed substance

Acetic acid (CAS 64-19-7)	Listed.
Carbon dioxide (CAS 124-38-9)	Listed.
Carbon monoxide (CAS 630-08-0)	Listed.
Carbonyl fluoride (CAS 353-50-4)	Listed.
Hydrogen fluoride (CAS 7664-39-3)	Listed.

US - New Jersey RTK - Substances: Listed substance
Acetic acid (CAS 64-19-7)
Carbon dioxide (CAS 124-38-9)
Carbon monoxide (CAS 630-08-0)
Carbonyl fluoride (CAS 353-50-4)
Hydrogen fluoride (CAS 7664-39-3)

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

Carbonyl fluoride (CAS 353-50-4)	Listed.
Hydrogen fluoride (CAS 7664-39-3)	Listed.

US - North Carolina Toxic Air Pollutants: Listed substance
Acetic acid (CAS 64-19-7)
Carbonyl fluoride (CAS 353-50-4)
Hydrogen fluoride (CAS 7664-39-3)

US - Texas Effects Screening Levels Hazard Data: Simple asphyxiant
Carbon dioxide (CAS 124-38-9)

US - Texas Effects Screening Levels: Listed substance

Acetic acid (CAS 64-19-7)	Listed.
Carbon dioxide (CAS 124-38-9)	Listed.
Carbon monoxide (CAS 630-08-0)	Listed.
Carbonyl fluoride (CAS 353-50-4)	Listed.
Hydrogen fluoride (CAS 7664-39-3)	Listed.

US. Massachusetts RTK - Substance List
Acetic acid (CAS 64-19-7)
Carbon dioxide (CAS 124-38-9)
Carbon monoxide (CAS 630-08-0)
Carbonyl fluoride (CAS 353-50-4)
Hydrogen fluoride (CAS 7664-39-3)

US. New Jersey Worker and Community Right-to-Know Act
Hydrogen fluoride (CAS 7664-39-3)

US. Pennsylvania Worker and Community Right-to-Know Law
Acetic acid (CAS 64-19-7)
Carbon dioxide (CAS 124-38-9)
Carbon monoxide (CAS 630-08-0)

Carbonyl fluoride (CAS 353-50-4)
Hydrogen fluoride (CAS 7664-39-3)

US. Rhode Island RTK

Acetic acid (CAS 64-19-7)
Carbon dioxide (CAS 124-38-9)
Carbon monoxide (CAS 630-08-0)
Carbonyl fluoride (CAS 353-50-4)
Hydrogen fluoride (CAS 7664-39-3)

US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

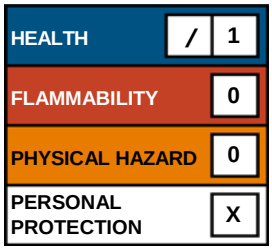
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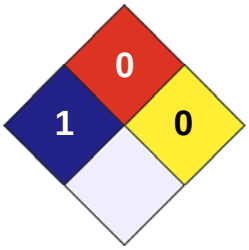
Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*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





Disclaimer 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. The information in the sheet was written based on the best knowledge and experience currently available.

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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.