



8210 N. Austin Avenue, Morton Grove, IL 60053-3205, U.S.A.  
 847-967-6000 800-323-8144  
 (Monday - Friday: 7:30 a.m. - 4:00 p.m. CST)

**Emergency Contact:**  
 INFOTRAC 800-535-5053 [U.S.A.]

Name: Pyridine  
 Code: 1-270013-200, 1-270013-500

..... **SAFETY DATA SHEET** .....

**1 SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY** .....

- 1.1 Product Identifier
  - Name Pyridine
  - Code 1-270013-200, 1-270013-500
- 1.2 Use of Substance/Mixture
  - Use Analytical Solvent
- 1.3 Details of Manufacturer/Supplier
  - Company Regis Technologies, Inc.  
 8210 N. Austin Avenue  
 Morton Grove, IL 60053  
 847-967-6000; 800-323-8144 (toll free)  
 Email: cservice@registech.com  
 www.registech.com
- 1.4 Emergency Telephone
  - INFOTRAC 800-535-5053 [U.S.A.]

**SECTION 2 HAZARDS IDENTIFICATION** .....

- 2.1 Classification of the Substance or Mixture
  - GHS Classification
  - Physical Hazards
    - Flammable Liquid Category 2 H225
  - Health Hazards
    - Acute toxicity (oral) Category 4 H302
    - Acute toxicity (dermal) Category 4 H312
    - Acute toxicity (inhalation) Category 4 H332
    - Skin Corrosion / Irritation Category 2 H315
    - Serious Eye Damage / Irritation Category 2A H319
    - Specific Target Organ Toxicity – Single Exposure, Narcotic Effects Category 3 H336
  - Environmental Hazards
    - Acute aquatic toxicity Category 3 H402

GHS Label Elements

Pictograms or hazard symbols



Signal Word Danger

Hazard Statement

- H225 - Highly flammable liquid and vapor.
- H302 + H312 + H332 - Harmful if swallowed, inhaled or in contact with skin.
- H315 + H319 - Causes skin and serious eye irritation.
- H336 - May cause drowsiness or dizziness.
- H402 - Harmful to aquatic life.

Precautionary Statements

- [Prevention] P210 - Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- P233 - Keep container tightly closed.

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- [Response] P243 - Take precautionary measures against static discharge.
- P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P302 + P352 - IF ON SKIN: Wash with plenty of soap and water.
- P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- [Storage] P402 + P404 - Store in a dry place. Store in a closed container.
- P403 + P235 - Store in a well-ventilated place. Keep cool.

**SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS**

Name Pyridine  
 Synonyms Azabenzene, azine

Hazardous components

Component	Classification	Concentration
Pyridine	Flam. Liq. 2; Acute Tox. 4; Skin Irr. 2; Eye Irr. 2A; STOT-SE 3; Aquatic Acute 3; H225, H302 + H312 + H332, H315 + H519; H402	≥ 99%
CAS No. 110-86-1		
EC No. 203-809-9		

For full test of the H-Statements mentioned in this Section, see Section 16.

**SECTION 4 FIRST AID MEASURES**

- 4.1 Description of first aid measures
  - General: Do not attempt to neutralize as it frequently makes matters worse.
  - Eye contact: Rinse eyes with plenty of water for at least 15 minutes; lift eyelids occasionally. If irritation persists, consult physician.
  - Skin contact: Immediately remove contaminated clothing and shoes, then wash skin with soap and plenty of water. If irritation persists, consult physician.
  - Inhalation: Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and keep person warm and at rest. Consult physician.
  - Ingestion: Give large amounts of water or milk (maximum two glasses). Avoid vomiting. Consult physician immediately.
  - Physician note: Symptomatic and supportive care. There is no specific antidote.
- 4.2 Most important symptoms and effects, both acute and delayed.
  - Eyes-severe irritation, possible burns; Other routes-mild irritation. cough, central nervous system effects with large or prolonged exposure (dizziness, headache, nausea, narcotic effects). Long term exposure may cause liver damage.
- 4.3 Indication of immediate medical attention and special treatment needed.
  - No information available.

**SECTION 5 FIRE-FIGHTING MEASURES**

- 5.1 Suitable Extinguishing Media
  - Carbon dioxide, dry chemical powder, sand, fog, or appropriate foam.
  - Water may be effective for cooling, but may not effect extinguishment.
- 5.2 Specific hazards arising from the chemical.
  - Highly flammable liquid and vapor.
  - Vapors are heavier than air, may travel long distances along the ground to ignition sources and flash back.
  - Vapor-air mixtures are explosive above flash point, within above stated limits.
  - Water spray may be used to cool fire-exposed containers. Containers may build pressure or rupture when heated.
  - Emits toxic fumes under fire conditions: carbon oxides, nitrogen oxides, cyanides

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5.3 Advice for fire-fighters  
 Wear personal protective equipment for flammable conditions. Wear self-contained breathing apparatus (SCBA) if necessary.

**SECTION 6 ..... ACCIDENTAL RELEASE MEASURES.....**

6.1 Personal precautions, protective equipment, and emergency procedures  
 For non-emergency personnel - Do not breath vapors or mists. Avoid material contact. Evacuate unnecessary personnel from area, observe emergency procedures, consult an expert.

For emergency responders – Protective equipment for flammable amine vapor conditions. See Section 8.3.

6.2 Environmental precautions  
 Prevent material from entering drains.

6.3 Methods of clean up  
 Evacuate unnecessary people from area. Isolate spilled material.  
 Ventilate area. Eliminate all ignition sources. Use spark proof tools.  
 If neat or in solution, mix with sand or similar inert adsorbent material or spill pillow.  
 Sweep up, seal in appropriate hazardous waste container, and hold for proper waste disposal.  
 Keep out of water supplies and sewers. Wash spill site after material pickup is complete.

**SECTION 7 ..... HANDLING AND STORAGE.....**

7.1 Safe Handling Precautions  
 Wear suitable protective equipment to avoid contact with skin, eyes, or inhalation of vapors.  
 Severe eye damage possible on contact.  
 Readily absorbed through skin. Wash thoroughly after handling. Immediately remove contaminated clothing.  
**Exposure levels of 1000 ppm is immediately dangerous to life and health--**Adequately ventilate.  
 Handle in a dry, well ventilated area. Use local exhaust if vapor can be generated.  
 Keep away from ignition sources. Take precautionary measures against static discharge.  
 Ground and bond containers or use inert gas purge when transferring or handling material.

7.2 Storage Conditions  
 Store under inert gas in a tightly sealed container. Store in a cool, dry place suitable for flammable materials. Protect from ignition sources and store away from incompatible materials (See Section 10.).

**SECTION 8 ..... EXPOSURE CONTROLS / PERSONAL PROTECTION.....**

8.1 Control parameters  
 Exposure limits: Pyridine (110-86-1) –  
                           OSHA – PEL 5 PPM (15 mg/m3) TWA  
                           ACGIH – TLV 1 PPM (3.2 mg/m3) TWA

Environmental Do not empty into drains.

8.2 Appropriate engineering controls  
 Safety shower and eye wash  
 Local exhaust and mechanical ventilation required. Hood recommended. Fume scrubber.

8.3 Personal protection  
 Eye/Face Chemical safety eyewear or goggles  
 Hand Compatible chemical-resistant gloves: Rubber (e.g., natural rubber, neoprene, nitrile, or equivalent), Silver Shield®, Viton®  
 Respiratory NIOSH/MSHA or European Standard EN 149 approved respirator for amine gas, dust, and mists if exposure limits are exceeded or irritation or other symptoms are experienced.

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Dermal (not hand) Protective Clothing (e.g., lab coat)--flame retardant anti-static material recommended.  
Hygiene Avoid inhalation, ingestion; contact with eyes, skin, and clothing; and prolonged or repeated exposure.  
Wash thoroughly after handling. Wash contaminated clothing before reuse. Discard contaminated footwear.

**SECTION 9 ..... PHYSICAL AND CHEMICAL PROPERTIES .....**

9.1 Information on physical and chemical data

Chemical Formula	
Molecular Weight	79.10
Form	liquid
Appearance	clear, colorless to yellow
Odor	strong fishy stench
Odor threshold	Not available
pH	8.5 (0.2 M soln.)
Melting/freezing point	-42°C; -44°F
Boiling point:	115.3°C; 239°F
Flammability (liquid, solid)	
Flash Point	20°C; 68°F
Flammable limits (%v/v)	Method: closed cup UEL (upper explosive limit) 12.4% LEL (lower explosive limit) 1.8%
Autoignition temperature	482°C; 900°F
Decomposition temperature	Not available
OSHA Flammability Class	IB
Evaporation Rate (BuAc = 1.0)	Not available
Vapor pressure (mmHg)	16 mmHg at 20°C and 20.8 mm Hg at 25°C]
Vapor density (air=1):	2.73
Relative density (g/cm <sup>3</sup> )	0.978
Water Solubility	miscible in water; volatile in steam
Water reactive	No
Solubility (other)	miscible with alcohol, ether, and petroleum ether, oils and many organic liquids
Partition coefficient: N-octanol/water	Kow (Pow) = 0.64
Viscosity	0.95 mPa.s at 20°C
Taste	Amine
% Volatiles	100% (21°C)
Refractive Index (n <sub>D</sub> <sup>20</sup> =):	1.5100
Dissociation constant (pKa)	pKa = 5.23

**SECTION 10 ..... STABILITY AND REACTIVITY .....**

10.1 Reactivity  
Stable.

10.2 Chemical Stability  
Stable is stored protected from heat and ignition sources.

10.3 Possibility of hazardous reactions  
Violently decomposes on contact with water or moist air to form corrosive pentafluoropropionic acid.

10.4 Conditions to avoid  
Avoid incompatibilities. Protect from heat and ignition sources.  
Keep out of water supplies and sewers.

10.5 Incompatible materials  
Strong oxidizers, Acids, acid chlorides, or chloroformates; Bromine trifluoride  
Mixtures with formamide, iodine, and sulfur trioxide, maleic anhydride

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10.6 Hazardous decomposition products  
 Combustion carbon oxides, nitrogen oxides, cyanides

**SECTION 11 ..... TOXICOLOGICAL INFORMATION.....**

11.1 Toxicological Information

Acute toxicity	<p>orl rat LD<sub>50</sub> 1580 mg/kg (Smyth 1951)</p> <p>800 mg/kg &lt; oral rat LD<sub>50</sub> &lt;1600 mg/kg (Verschueren 1983)</p> <p>orl mus LD<sub>50</sub> 1500 mg/kg (PharmResCom 1969)          sleep, general depressed activity, shortness of breath</p> <p>inh rat LC<sub>50</sub> 9010 ppm 1H (Vernot 1997)</p> <p>inh rat LC<sub>Lo</sub> 4900 ppm 4H (Kinney 1984)          general depressed activity, respiratory depression, weight change</p> <p>skn gpg LD<sub>50</sub> 1 g/kg (Karger 1948)</p> <p>1000 mg/kg &lt; dermal rbt LD<sub>50</sub> &lt; 2000 mg/kg (Pullin 1973)          lethargy, weight changes, topical skin burns</p>
Skin corrosion/irritation	<p>skn rbt 500 mg/24H mild (Marhold 1986)</p>
Serious eye damage/irritation	<p>moderate to severe eye irritation (Dutertre-Catella 1989; Grant 1986)</p>
Respiratory irritation	<p>irritating (Grant 1986)</p>
Respiratory or skin sensitization	<p>non-sensitizing (NIH Pub. No. 99-4494; Reinhardt 1981)</p>
Germ cell mutagenicity	<p>orl mus TD 1,000 mg/kg, negative          not mutagenic (ATSDR Pyridine 09/1992 – Mutation references)</p> <p><i>Salmonella typhimurium</i> 50nL/plate to 5000 nL/plate. Negative (OECD-471)          not mutagenic (Vlaminckx 1993)</p>
Carcinogenicity	<p>IARC          NTP          OSHA</p> <p>Group 3 – Not classifiable as to its carcinogenicity to humans.          Pyridine has NOT been listed in the NTP's Report on Carcinogens.          (NTP TR-470, 2000 and NTP BSC Review 12/1997.)</p> <p>Not available</p>
Reproductive toxicity	<p>An OECD 421 study on pyridine was conducted in 2008, with doses of 12, 25, and 50 mg/kg bw/d in rats given via oral gavage. Mild elevation in liver weights indicated the adult rats reached a toxicity level for all doses. The highest dose tested, 50 mg/kg bw/d, was the NOAEL for reproductive parameters in adult animals. This study indicates that there is no adverse reproductive toxicity at doses several-fold higher than doses causing toxicity in the adults.          (Yuill, 2008; ECHA Reg Subs Pyridine 07/19/12.)</p>
STOT-single exposure	<p>orl mus LDLo 1000 mg/kg (JAT V1 Pg 1981-.)          liver toxicity</p>
STOT-repeated exposure	<p>Several repeat dose toxicity test studies have been done on mice and rats, which produced evidence of adverse liver toxicity after subchronic or chronic oral exposures. These drinking water studies lasted between 13 weeks to 2 years and the NOAEL levels ranged from 1 to 15 mg/kg/day. Other organ effects on kidney,</p>

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blood, cardiac, and reproductive system were reported, but were isolated occurrences or did not occur as reproducibly as the liver effects. A single subchronic inhalation study in rats exposed to levels exceeding regulatory exposure limits over a 4-day period reported olfactory lesions. Neurotoxicity-- Although currently discontinued, in the past, pyridine has been used as an epilepsy treatment.

(Anderson 1987; Pullin 1979; Nikula 1994; Pollock 1943)

Aspiration hazard Not available

RTECS Number UR8400000 (Pyridine record updated last: April 2012.)

11.2 Further Information

**Note:** The following previously reported toxicological data was retrieved from the April 1999 RTECS pyridine record. Upon review, this data has been removed from the RTECS pyridine record prior to April 2012. The original data source RTECS had referenced in April 1999 was "BIOFX\* 14-4/1970; BIOFAX Industrial Bio-Test Laboratories, Inc., Data Sheets. (1810 Frontage Rd., Northbrook, IL 60062)." The U.S. EPA HPV Hazard Characterization Document for the Pyridine and Pyridine Derivatives Category noted that there were no acute rat oral toxicity studies were identified in literature that could be scored as reliable under the criteria they employed to in the HPV assessment. They further noted that "the rat oral LD50 values found for pyridine in the literature ranged from 800 to 1600 mg/kg, which are in good agreement with the rat oral LD50 values for the other chemicals of the Pyridine and Pyridine Derivatives Category." The source of the for the single end point oral rat LD50 891 mg/kg data noted for pyridine as IBT was confirmed on the EPA document # 878211800 acquired from TSCATS. This company, also known as IBT, was involved in major fraud for unacceptable laboratory practices and a significant amount of their data has been considered suspect or invalid by the U. S. EPA and U. S. FDA. IBT suspended its testing in 1978 and has been out of business for several decades. The data, however, has continued to be in circulation. Since this data cannot be substantiated as valid data, Regis is choosing to discontinue use of it.

**Discontinued data:** orl rat LD50 891 mg/kg ihl rat LC50 28500 mg/m3/1H skn rbt LD50 1121 mg/kg

**SECTION 12 ..... ECOLOGICAL INFORMATION.....**

12.1 Ecotoxicity

Test Substance	Species	End Point	Result	Reference
Pyridine	Pimephales promelas (fathead minnow)	LC50	99 mg/L-96 hr	Broderius 1985
Pyridine	Daphnia magna (Water flea)	LC50	1165 mg/L-48 hr	Adema 1978
Pyridine	Daphnia magna (Water flea)	LC50	1755 mg/L-48 hr	Adema 1978
Pyridine	Daphnia magna (Water flea)	LC50	1130 mg/L-48 hr	Adema 1978
3-Methylpyridine	Selanastrum capricornutum (green agla)	EC50	320 mg/L/72 hr	Weytjens 1991
Pyridine	Tetrahymena sp.	LC100	113.8 mmol/L/24 hr	Verschuren 1983

12.2 Persistence and degradability

Pyridine biodegradation is considered to be rapid to moderate, with environmental conditions or concentration potentially slowing or impacting the process. Pyridine and many other chemicals were tested using several biodegradability OECD protocols as a comparison of the effectiveness of the protocols in mimicking biodegradation scenarios. Biodegradation rates for pyridine ranged from 0% in OECD 301A and 301D screening tests, to 15% in OECD 301C tests, and 98% in OECD 301B, OECD 302B, and OECD 303A tests. The study concluded that it is biodegradable in some, but not all guideline test protocols. (Gerike 1979)

12.3 Bioaccumulative potential

BCF = 88 (Devoogt 1991)  
 Pyridine is expected to have low bioaccumulation potential and low persistence.

12.4 Motility in soil

Log Kow = 0.64-0.65.  
 Complete biodegradation in soils (aerobic and anaerobic) within 66-170 & 32-66 days, respectively.

(Log Kow 0.64=measured: Buhler 1990; Log Kow 0.65=determined: Hansch 1995; Naik 1972)

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12.5 Other adverse effects No data available.

**SECTION 13** ..... **DISPOSAL CONSIDERATIONS** .....

13.1 Disposal methods

U . S. EPA Waste Codes U196, D038, D001

Waste Characterization (per U. S. regulations) RCRA Hazard Class (40CFR 261): Ignitable  
 Generator is responsible for proper waste characterization. NOTE: U. S. state hazardous waste regulations may differ considerably from U. S. Federal regulations.

Waste Disposal That which cannot be recovered or recycled, should be disposed of in accordance with all applicable international, national, regional, state, and local laws. Do NOT dump into any sewer, on ground, or into any body of water. Empty containers or equipment rinsate may be considered hazardous under regulations. Refer to the European Waste Catalogue (EWC) for appropriate code for disposal in the EC.

**SECTION 14** ..... **TRANSPORT INFORMATION** .....

14.1 UN number UN 1282  
 14.2 UN proper shipping name Pyridine  
 14.3 Transport Hazard Class 3  
 14.5 Packing group PG II  
 14.6 Environmental hazards Not applicable  
 14.6 Special precautions for user See Section 8 for exposure/personal protection guidance.

**SECTION 15** ..... **REGULATORY INFORMATION** .....

15.1 Safety, health and Environmental regulations specific for the product in question.

NFPA: H2 F3 R0 HMIS: H2\* F3 PH0 (\*chronic health hazards)

15.2 Chemical Inventory Lists

..... Pyridine  
 CAS Number..... 110-86-1  
 TSCA: ..... Y  
 EINECS:..... Y  
 Number..... 203-809-9  
 CERCLA [Section 103 (40 CFR 302.4)]:..... Y  
 RQ (lbs) ..... 1,000  
 RCRA Waste Code..... U196  
 OSHA Process Safety [29 CFR 1910.119]: ..... NL  
 TQ (lbs)..... NA  
 Clean Air Act  
 [Section 112r (40 CFR 68)]:..... NL  
 TQ (lbs)..... NA  
 Contains Ozone Depleters (Class I or Class II) ..... N  
 [Section 103 (40 CFR 302.4)]: ..... NL  
 SARA Title III Notification [40 CFR 302.4]:  
 Section 302/304 (EHS) Ingredient [40 CFR 355.3]..... NL  
 TPQ (lbs)..... NA  
 RQ (lbs) ..... NA  
 Section 313 Ingredient [40 CFR 372.65] ..... Y  
 SARA Hazards Acute.....Y Chronic..... N Fire.....Y Pressure..... N Reactivity .....Y

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..... Pyridine  
 CAS Number..... 110-86-1  
 State Lists:..... NL  
 States..... CA,FL,PN,MN,MA  
 On CA 65 Significant Risk Level..... NL

**SECTION 16** ..... **OTHER INFORMATION** .....

16.1 Full test of H-Statements referred to under Section 2 and 3.

Acute Tox.	Acute Toxicity
Aquatic Acute	Acute Aquatic Toxicity
Eye Irr.	Eye Irritant
Flam. Liq.	Flammable liquids
H225	Highly flammable liquid and vapor.
H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H332	Harmful if inhaled.
H315	Causes skin irritation.
H519	Causes serious eye irritation.
H336	May cause drowsiness or dizziness.
H402	Harmful to aquatic life
Skin Irr.	Skin Irritant
STOT-SE	Specific Target Organ Toxicity – Single Exposure

16.2 Literature References

Adema, 1978: Adema, **1978**. *Hydrobiologia*, 59(2): 125-134.  
 Anderson 1987: NTP TR-470, 2000; U. S. EPA HPV: Anderson, R. C. **1987**. *90-Day Subchronic Oral Toxicity in Rats Test Material: Pyridine*. Report number 55463-03. Arthur D. Little, Inc., Washington, DC, US.  
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 Grant 1986: HSDB-118 06/24/05: Grant, W.M. *Toxicology of the Eye*. 3rd ed. Springfield, IL: Charles C. Thomas Publisher, **1986**., p. 774.  
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 HSDB-118 06/24/05: Toxnet Hazardous Substance Data Base (HSDB) number 118, Pyridine, Last Revision Date: 20050624, U.S. National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894, National Institutes of Health, Health & Human Services.  
 JAT V1 Pg 1981-: RTECS Apr 2012; *Journal of Applied Toxicology* (John Wiley & Sons Ltd., Baffins Lane, Chichester, W. Sussex PO19 1UD, UK, V.1-, 1981-).  
 Karger, 1948: RTECS 04/2012: 85JCAE-,839,1986: *Structure et Activite Pharmacodynamique des Medicaments du Systeme Nerveux Vegetatif*, Bovet & Bovet-Nitti, NY, S. Karger, 1948.  
 Kinney 1984: RTECS 04/2012: HPV361 -,2003: U. S. EPA HPV 201-14925B1 Appendix A: Kinney et al. **1984**. *Lethal Concentration(s) by Inhalation of Pyridine and 3-Methylpyridine with Cover Letter*. EPA Doc. No. 878214921. E. I. du Pont de Nemours & Co. Inc., Wilmington, DE, U. S.  
 Marhold 1986: RTECS 04/2012: 85JCAE -,839,1986: "*Prehled Prumyslove Toxikologie; Organicke Latky*," Marhold, J., Prague, Czechoslovakia, Avicenum, **1986**.  
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 NIH Pub. No. 99-4494: US DHHS - NTP: NICEATM-ICCVAM: *The Murine Local Lymph Node Assay: A Test Method for Assessing the Allergic Contact Dermatitis Potential of Chemicals/Compounds*. The Results of an Independent Peer Review Evaluation Coordinated by ICCVAM and NICEATM (NIH Publication No. 99-4494).

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- Nikula 1994: Nikula et al, *Fundam. Appl. Toxicol.*, **1994**, 23:510 – 517.  
NTP BSC Review 12/1997: [NTP] *Final BSC TR Peer Review Minutes Dec 1997*: Audit of the TR-470 found a remarkably high incident of tumors in the control group and raised other questions about the study.  
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The above information is believed to be correct to the best of our present state knowledge, but does not purport to be all-inclusive and shall be used only as a guide. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

***This is the last page of this MSDS.***

Prepared by Regis Technologies, Inc.