1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Name: ShieldSys™ ES1 Epoxy & Coating Stripper

Product Use: Epoxy & Coating Stripper

MANUFACTURER/DISTRIBUTOR:

Miller-Stephenson Chemical
55 Backus Ave.
Danbury, Conn. 06810 USA
(203) 743-4447

Emergency Phone Number:
(800) 424-9300

2. HAZARDS IDENTIFICATION

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Hazard classification

Acute toxicity - Oral: Category 4
Acute toxicity - Inhalation (Vapors): Category 3
Acute toxicity - Inhalation (Dusts/Mists): Category 3
Skin corrosion/irritation: Category 1A
Serious eye damage/eye irritation: Category 1
Skin sensitization: Category 1
Reproductive Toxicity: Category 2
Specific target organ toxicity (single exposure): Category 3
Specific target organ toxicity (repeated exposure): Category 2
Aspiration toxicity: Category 1
Flammable liquids: Category 3

Label elements:
Signal Word
Danger

Pictograms

Hazard Statements
Harmful if swallowed
Toxic if inhaled

Causes severe skin burns and eye damage
May cause an allergic skin reaction
Suspected of damaging fertility or the unborn child
May cause drowsiness or dizziness
May cause damage to organs through prolonged or repeated exposure
May be fatal if swallowed and enters airways
Flammable liquid and vapor

Precautionary Statements
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Use only outdoors or in a well-ventilated area
Wash face, hands and any exposed skin thoroughly after handling
Do not breathe dust/fume/gas/mist/vapors/spray
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
Keep container tightly closed
Ground/bond container and receiving equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Use explosion-proof electrical/ ventilating/ lighting/ equipment
IF exposed or concerned: Get medical advice/attention
Specific treatment (see supplemental first aid instructions on this label)

IF SWALLOWED: Rinse mouth. Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician if you feel unwell
IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.

In case of fire: Use CO_2, dry chemical, or foam for extinction.
Store locked up
Store in a well-ventilated place. Keep cool.
Dispose of contents/container to an approved waste disposal plant.
0% of the mixture consists of ingredient(s) of unknown toxicity.
May be harmful in contact with skin.
Harmful to aquatic life with long lasting effects.

Hazards not otherwise classified (HNOC): Not applicable.

3. INGREDIENTS

Material(s)	CAS No.	Approximate%
Benzyl alcohol	100-51-6	45 - 90
Formic acid	64-18-6	10 - 60
Toluene	108-88-3	1 - 30
Polyoxyethylene mono(octylphenyl)ether	9002-93-1	1 - 10

4. FIRST AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, (trained personnel should) give oxygen.

Eye: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

Skin: Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get immediate medical advice/attention. May cause an allergic skin reaction.

Inhalation: Remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If breathing is difficult, (trained personnel should) give oxygen. Delayed pulmonary edema may occur. Get immediate medical advice/attention. Aspiration into lungs can produce severe lung damage. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Immediate medical attention is required.

Oral: Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Get immediate medical advice/attention. Aspiration hazard if swallowed - can enter lungs and cause damage. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

Self-protection of the first aider: Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Do not breathe vapor or mist. See section 8 for more information.

Most important symptoms/effects, acute and delayed: Burning sensation. Itching. Rashes. Hives. Difficulty in breathing. Coughing and/ or wheezing. Dizziness. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

Notes to Physician: Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. May cause sensitization in susceptible persons. Treat symptomatically. Because of the danger of aspiration, emesis or gastric lavage should not be employed unless the risk is justified by the presence of additional toxic substances.

General information: Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

5. FIRE FIGHTING MEASURES

Fire and Explosion: May be ignited by heat, sparks or flames. Vapors can form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Runoff to sewer may create fire or explosion hazard. The product causes burns of eyes, skin and mucous membranes. Thermal decomposition can lead to release of irritating gases and vapors. Product is or contains a sensitizer. May cause sensitization by skin contact.

Suitable Extinguishing Media: Water spray, fog or alcohol-resistant foam, dry chemical or carbon dioxide. Move containers from fire area if you can do it without risk. Dike fire control water for later disposal; do not scatter the material.

Unsuitable extinguishing media: CAUTION: Use of water spray when fighting fire may be inefficient. Do not scatter spilled material with high pressure water streams.

Uniform Fire Code Flammable Liquid: I-C
Irritant: Liquid
Toxic: Liquid

Hazardous Combustion Products
Carbon oxides.

Explosion Data
Sensitivity to Mechanical Impact No.
Sensitivity to Static Discharge No.

Special Fire Fighting Instruction: Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Attention! Corrosive material. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Do not breathe vapor or mist.

Environmental precautions: Prevent further leakage or spillage if safe to do so.

Spill Cleanup: Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

7. HANDLING AND STORAGE

Handling: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. In case of insufficient ventilation, wear suitable respiratory equipment. Handle product only in closed system or provide appropriate exhaust ventilation. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. Remove contaminated clothing and shoes. Do not breathe vapor or mist.

Storage Conditions: Keep containers tightly closed in a dry, cool and well-ventilated place. Keep out of the reach of children. Protect from moisture. Store locked up. Store away from other materials.

Incompatible materials: Acids. Bases. Oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines
The following ingredients are the only ingredients of the product above the cut-off level (or level that contributes to the hazard classification of the mixture) which have an exposure limit applicable in the region for which this safety data sheet is intended or other recommended limit. At this time, the other relevant constituents have no known exposure limits from the sources listed here

Chemical name	OSHA PEL	ACGIH TLV
Formic acid 64-18-6	TWA: 5 ppm TWA: 9 mg/m^3	TWA: 5 ppm
Toluene 108-88-3	TWA: 200 ppm Ceiling: 300 ppm	TWA: 20 ppm

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits

Engineering Measures: Showers, Eyewash stations, Ventilation systems.

Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Eye/Face Protection: Face protection shield. If splashes are likely to occur, wear safety glasses with side-shields.

Skin Protection: Wear suitable, impervious gloves.

Body Protection: Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.

General Hygiene: Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing and gloves, including the inside, before re-use. Contaminated work clothing should not be allowed out of the workplace.

Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Do not breathe vapor or mist.

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: N.A.

Melting/Freezing Point: N.A.

Density: N.A.

Vapor Density (Air=1): N.A.

pH Information: N.A.

Physical Form: Liquid

Color: N.A.

Percent Volatile by Volume: N.A.

Flash Point: 47 °C (117 °F) - closed cup

Vapor Pressure: N.A.

Solubility in H_2O: N.A.

Evaporation Rate (CC14=1): N.A.

Appearance: N.A.

Odor: Aromatic

10. STABILITY AND REACTIVITY

Reactivity: No data available.

Chemical stability: Stable under normal conditions.

Possibility of hazardous reactions: None under normal processing.

Hazardous Polymerization: Hazardous polymerization does not occur.

Material and Conditions to Avoid: Exposure to air or moisture over prolonged periods. Excessive heat.

Incompatible materials: Acids. Bases. Oxidizing agents.

Hazardous Decomposition Products: Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Inhalation: Specific test data for the substance or mixture is not available. Corrosive by inhalation. (based on components). Inhalation of corrosive fumes/gases may cause coughing, choking, headache, dizziness, and weakness for several hours. Pulmonary edema may occur with tightness in the chest, shortness of breath, bluish skin, decreased blood pressure, and increased heart rate. Inhaled corrosive substances can lead to a toxic edema of the lungs. Pulmonary edema can be fatal. Aspiration into lungs can produce severe lung damage. May cause pulmonary edema. Toxic by inhalation. May cause drowsiness or dizziness.

Eye contact: Specific test data for the substance or mixture is not available. Causes burns. (based on components). Corrosive to the eyes and may cause severe damage including blindness. Causes serious eye damage. May cause irreversible damage to eyes.

Skin contact: Specific test data for the substance or mixture is not available. Corrosive. (based on components). Causes burns. May cause sensitization by skin contact. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. Repeated exposure may cause skin dryness or cracking. May be harmful in contact with skin.

Ingestion: Specific test data for the substance or mixture is not available. Causes burns. (based on components). Ingestion causes burns of the upper digestive and respiratory tracts. May cause severe burning pain in the mouth and stomach with vomiting and diarrhea of dark blood. Blood pressure may decrease. Brownish or yellowish stains may be seen around the mouth. Swelling of the throat may cause shortness of breath and choking. May cause lung damage if swallowed. May be fatal if swallowed and enters airways. Potential for aspiration if swallowed. Aspiration may cause pulmonary edema and pneumonitis.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Benzyl alcohol 100-51-6	= 1230 mg/kg (Rat)	= 2 mg/kg (Rabbit)	> 4178 mg/m^3 (Rat) 4 h
Formic acid 64-18-6	= 1100 mg/kg (Rat)	-	= 7.85 mg/L (Rat) 4 h
Toluene 108-88-3	= 2600 mg/kg (Rat)	= 12000 mg/kg (Rabbit)	= 12.5 mg/L (Rat) 4 h
Polyoxyethylene mono(octylphenyl)ether 9002-93-1	= 1800 mg/kg (Rat)	-	-

Symptoms related to the physical, chemical and toxicological characteristics

Symptoms: Redness. Burning. May cause blindness. Coughing and/ or wheezing. Itching. Rashes. Hives. Difficulty in breathing. Dizziness. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization: May cause sensitization by skin contact.

Mutagenic Effects: No information available.

Carcinogenicity: The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical name	ACGIH	IARC	NTP	OSHA
Toluene 108-88-3		Group 3		

Reproductive toxicity: Contains a known or suspected reproductive toxin. Classification based on data available for ingredients. Suspected of damaging fertility or the unborn child.

STOT - single exposure: May cause drowsiness or dizziness.

STOT - repeated exposure: May cause damage to organs through prolonged or repeated exposure.

Chronic Toxicity: Contains a known or suspected reproductive toxin. Possible risk of irreversible effects. Aspiration may cause pulmonary edema and pneumonitis. Avoid repeated exposure. Prolonged exposure may cause chronic effects. May cause adverse liver effects. Contains toluene. Exposure to toluene in animals via inhalation and intentional overexposure to toluene in humans has caused adverse fetal development effects.

Target organ effects: Respiratory system. Eyes. Skin. Reproductive system. Central nervous system. Kidney. Liver. Heart.

Aspiration Hazard: May be fatal if swallowed and enters airways.

Numerical measures of toxicity - Product Information

The following values are calculated based on chapter 3.1 of the GHS document

ATEmix (oral): 758.30 mg/kg
ATEmix (dermal): 2,222.20 mg/kg
ATEmix (inhalation-gas): 1,400.00 ppm
ATEmix (inhalation-dust/mist): 0.620 mg/L
ATEmix (inhalation-vapor): 5.41 mg/L

12. ECOLOGICAL INFORMATION

Ecotoxicity: Harmful to aquatic life with long lasting effects.

Chemical name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Benzyl alcohol 100-51-6	No data available	96h LC50: = 460 mg/L (Pimephales promelas) 96h LC50: = 10 mg/L (Lepomis macrochirus)	No data available	48h EC50: = 23 mg/L (water flea)
Formic acid 64-18-6	96h EC50: = 25 mg/L (Desmodesmus subspicatus) 72h EC50: = 26.9 mg/L (Desmodesmus subspicatus)	No data available	EC50 = 46.7 mg/L 17 h	48h EC50: = 120 mg/L (Daphnia magna) 48h EC50: 138 - 165.6 mg/L (Daphnia magna)
Toluene 108-88-3	96h EC50: > 433 mg/L (Pseudokirchneriella subcapitata) 72h EC50: = 12.5 mg/L (Pseudokirchneriella subcapitata)	96h LC50: 15.22 - 19.05 mg/L (Pimephales promelas) 96h LC50: = 12.6 mg/L (Pimephales promelas) 96h LC50: 5.89 - 7.81 mg/L (Oncorhynchus mykiss) 96h LC50: 14.1 - 17.16 mg/L (Oncorhynchus mykiss) 96h LC50: = 5.8 mg/L (Oncorhynchus mykiss) 96h LC50: 11.0 - 15.0 mg/L (Lepomis macrochirus) 96h LC50: = 54 mg/L (Oryzias latipes) 96h LC50: = 28.2 mg/L (Poecilia reticulata) 96h LC50: 50.87 - 70.34 mg/L (Poecilia reticulata)	EC50 = 19.7 mg/L 30 min	48h EC50: 5.46 - 9.83 mg/L (Daphnia magna) 48h EC50: = 11.5 mg/L (Daphnia magna)

Persistence and Degradability
No information available.

Bioaccumulation

Chemical name	Partition coefficient
Benzyl alcohol 100-51-6	1.05
Formic acid 64-18-6	-1.9
Toluene 108-88-3	2.73

Other adverse effects
No information available.

13. DISPOSAL CONSIDERATIONS

Disposal methods: This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261).

Contaminated Packaging: Dispose of in accordance with federal, state and local regulations.

US EPA Waste Number: U123 U220

Chemical name	RCRA - Halogenated Organic Compounds	RCRA - P Series Wastes	RCRA - F Series Wastes	RCRA - K Series Wastes
Toluene 108-88-3			Toxic waste waste number F025 Waste description: Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	

California Waste Codes: 331

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical name	California Hazardous Waste
Formic acid 64-18-6	Toxic Corrosive
Toluene 108-88-3	Toxic Ignitable

14. TRANSPORT INFORMATION

U.S. DOT
UN-No. UN3265
Hazard Class: 8
Packing Group: II
Proper Shipping Name: UN3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (FORMIC ACID), 8, II
Emergency Response Guide Number: 153

IATA
UN-No. UN3265
Hazard Class: 8
Packing Group: II
ERG Code: 8L
Proper Shipping Name: UN3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (FORMIC ACID), 8, II

IMDG/IMO
UN-No. UN3265
Hazard Class: 8
Packing Group: II
EmS-No.: F-A, S-B
Proper Shipping Name: UN3265, CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (FORMIC ACID), 8, II

15. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA: All ingredients are listed in TSCA inventory.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity: This material does not contain any components with a section 302 EHS TPQ.

SARA 313 (TRI Reporting): This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40CFR 372): Formic Acid (CAS 64-18-6), Toluene (CAS #108-88-3).

SARA 311/312 Hazards: Acute toxicity - Oral: Category 4
Acute toxicity - Inhalation (Vapors): Category 3
Acute toxicity - Inhalation (Dusts/Mists): Category 3
Skin corrosion/irritation: Category 1A
Serious eye damage/eye irritation: Category 1
Skin sensitization: Category 1
Reproductive Toxicity: Category 2
Specific target organ toxicity (single exposure): Category 3
Specific target organ toxicity (repeated exposure): Category 2
Aspiration toxicity: Category 1
Flammable liquids: Category 3

CWA (Clean Water Act): This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Formic acid 64-18-6	5000 lb			X
Toluene 108-88-3	1000 lb	X	X	X

CERCLA: This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical name	Hazardous Substances RQs	Extremely Hazardous Substances RQs	RQ
Formic acid 64-18-6	5000 lb		RQ 5000 lb final RQ RQ 2270 kg final RQ
Toluene 108-88-3	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ

State Regulations (U.S.)

California Proposition 65: This product contains chemicals known to the State of California to cause cancer and/or birth defects or other reproductive harm.

Chemical name	California Proposition 65
Toluene - 108-88-3	Developmental

16. OTHER INFORMATION

NPCA-HMIS Ratings:

Health	3*
Flammability	2
Physical Hazard	0

Personal Protective rating to be supplied by user depending on the conditions.

NFPA Ratings:

Health	3
Flammability	2
Instability	0
Physical and Chemical Hazard	N/A

FOR INDUSTRIAL USE ONLY

DATE: MAY 13, 2025

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user.