SAFETY DATA SHEET

Issue Date 20-August-2008 **Revision Date** 13-January-2015 **Version** 1

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier
Product Name LINDOXY 190

Other Means of Identification
SDS # LC-058

Recommended Use of the Chemical and Restrictions on Use
Recommended Use General industrial

Details of the Supplier of the Safety Data Sheet
Supplier Address
Lindau Chemicals, Inc.
731 Rosewood Drive
Columbia, SC 29201

Emergency Telephone Number
Company Phone Number Phone: 1-803-799-6863
Fax: 1-803-256-3639
Emergency Telephone INFOTRAC 01-352-323-3500 (International)
1-800-457-4280 (North America)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: The information below on skin sensitization relates to repeated and prolonged exposure, particularly where exposure is to the vapor form of the substance.

Classification

Skin Sensitization	Category 1
Aquatic Hazard (Acute)	Category 3

Signal Word
Warning

Hazard Statements
May cause an allergic skin reaction
Harmful to aquatic life

Appearance Colorless to light yellow liquid **Physical State** Liquid **Odor** Slight characteristic odor

Precautionary Statements - Prevention
Avoid breathing fumes or vapors.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves, protective clothing and eye protection.
Avoid release to the environment.

Precautionary Statements - Response
IF ON SKIN: Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

Precautionary Statements - Disposal
Dispose of contents/container in accordance with local, regional and national regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms 3,4-Epoxycyclohexanecarboxylic acid (3,4-epoxycyclohexylmethyl) ester; 3,4-Epoxycyclohexylmethyl 3,4-epoxycyclo-hexaneca

Formula $C_{14}H_{20}O_4$

Chemical Name	CAS No	Weight-%
3,4-Epoxycyclohexylmethyl 3,4-epoxycyclohexane carboxylate	2386-87-0	> 97

** If Chemical Name/CAS No is “proprietary” and/or Weight-% is listed as a range, the specific chemical identity and/or percentage of composition has been withheld as a trade secret.**

4. FIRST AID MEASURES

First Aid Measures

Inhalation Remove person to fresh air and keep comfortable for breathing. If exposed or concerned, call a doctor/physician or get medical advice and attention.

Eye Contact Rinse cautiously with water for several minutes. Remove contact lenses, if present. Continue flushing for at least 15 minutes. If eye irritation persists: Get medical attention.

Ingestion Rinse mouth. Do NOT induce vomiting. Immediately call a doctor/physician.

Skin Contact Take off or dispose of all polluted clothes. If on skin, wash with plenty of soap and water. If skin irritation occurs, call a doctor/physician or get medical advice and attention.

Most Important Symptoms and Effects

Symptoms Exposure may cause an allergic skin reaction.

Indication of any Immediate Medical Attention and Special Treatment Needed (if Necessary)

Note to Physician Treat symptomatically. Treatment of overexposure should be directed toward the control of symptoms and be based on the clinical condition of the patient.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Media Small fires: Dry chemical, alcohol-resistant foam, dry sand
Large fires: Dry chemical, alcohol-resistant foam, water sprinkling

Unsuitable Media Straight streams

Specific Hazards Arising from the Chemical

Product may support combustion if exposed to fire, and fire may be ignited by heat, sparks or flames. Fire may produce irritating, corrosive and/or toxic gases.

Hazardous Combustion Products Carbon monoxide, carbon dioxide

Protective Equipment and Precautions for Fire-fighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Move all containers of material from the fire area if this can be done without risk. Contaminated fire-fighting water or dilution water is corrosive and/or toxic.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures

Personal Precautions Keep unauthorized personnel away from any release. Wear appropriate personal protective equipment (see Section 8). Avoid inhalation of fumes or vapors and contact with skin and eyes. Isolate a leak or spill area by establishing a non-entry zone appropriately around the leak or spill. Keep out of areas lower than that of the leak or spill. Stay upwind from the leak or spill. Do not touch or walk through spilled material.

Environmental Precautions Prevent material from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information, and Section 13, Disposal Considerations, for additional information.

Methods and Materials for Containment and Cleaning Up

Methods for Containment A vapor-suppressing foam may be used to reduce vapors. Cover spill with dry earth, sand or other non-combustible material. For large spills, dike well ahead of the liquid.

Methods for Cleaning Up All equipment used when handling the product must be grounded. Use clean, non-sparking tools to collect absorbed material. Collect and keep material in suitable, closed containers for disposal. Dispose of in accordance with federal, state and local regulations.

Preventative Measures for Secondary Accidents

Remove all ignition sources promptly. Prohibit smoking, sparks and flames in surrounding area. Isolate flammables (such as wood, paper and oil) from the leakage or spill. Prevent flow of material into drains, sewers, basements and closed areas.

7. HANDLING AND STORAGE

Precautions for Safe Handling

Advice on Safe Handling	Handle in accordance with good industrial hygiene and safety practice. Use personal protection recommended in Section 8. Avoid contact with skin, eyes or clothing. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid breathing vapor. Use only outdoors or in a well-ventilated area. At room temperature, general mechanical room ventilation is sufficient. Local ventilation is recommended at points where heated material may vent fumes to the workplace.
General Hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Other Precautions

Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperatures and pressures, or sudden ingress of air into vacuum equipment, may result in ignitions without the presence of obvious ignition sources. Published autoignition temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

Conditions for Safe Storage (Including any Incompatibilities)

Storage Conditions	Keep container tightly closed and store in a cool, dry and well-ventilated place. Store locked up. Avoid excessive temperatures.
Packaging Materials	Do not transfer to unmarked containers. Reuse of empty drums or containers is not recommended. Dispose of all empty containers properly, in accordance with federal, state and local regulations.
Incompatible Materials	Strong oxidizing agents, strong acids, strong bases, Lewis acids, amines

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region-specific regulatory bodies.

Control Parameters

Engineering Controls	Ensure adequate ventilation, especially in confined areas.

Individual Protection Measures

Eye/Face Protection	Wear approved chemical safety goggles.
Skin and Body Protection	Wear chemical resistant, impermeable gloves. Use chemical resistant apron or other impermeable clothing, if needed, to avoid contaminating regular clothing.
Respiratory Protection	No protection is ordinarily required under normal conditions of use with adequate ventilation. In case of inadequate ventilation, wear respiratory protection.
General Hygiene	Handle in accordance with good industrial hygiene and safety practice. Wash face, hands and any exposed skin thoroughly after handling. Do not eat, drink or smoke when using this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on Basic Physical and Chemical Properties

Physical State	Liquid		
Appearance	Colorless to light yellow liquid	**Odor**	Slight characteristic odor
Color	Colorless to light yellow	**Odor Threshold**	Not determined

Property	Values	Remarks/Method
pH	Not determined	
Melting Point/Freezing Point	–20 °C (–4 °F)	
Boiling Point/Boiling Range	188 °C (370 °F)	
Flash Point	202 °C (396 °F)	Cleveland open cup
Evaporation Rate	Not applicable	
Flammability (Solid, Gas)	n/a-liquid	
Upper Flammability Limit	Not applicable	
Lower Flammability Limit	Not applicable	
Vapor Pressure	Not determined	
Relative Vapor Density	8.7 g / L	(air = 1)
Specific Gravity	1.17	(water = 1) @ 25 °C (77 °F)
Water Solubility	Very slightly soluble	@ 25 °C (77 °F)
Solubility in Other Solvents	Not determined	
Partition Coefficient (n-Octanol/Water)	Not determined	
Auto-ignition Temperature	375 °C (707 °F)	
Decomposition Temperature	288 °C (550 °F)	Initiation
Kinematic Viscosity	Not determined	
Dynamic Viscosity	Not determined	
Explosive Properties	Not determined	
Oxidizing Properties	Not determined	

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions

Chemical Stability
Stable under recommended storage conditions

Possibility of Hazardous Reactions
None under normal processing

Hazardous Polymerization Hazardous polymerization does not occur unless catalyzed by amines, strong acids or strong bases.

Conditions to Avoid
Exposure to elevated temperatures may cause decomposition of product.

Incompatible materials
Strong oxidizing agents, strong acids, strong bases, Lewis acids, amines

Hazardous Decomposition Products
Carbon monoxide, carbon dioxide

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation Breathing large amounts of chemical vapor may be harmful.

Eye Contact Exposure may cause serious eye irritation.

Ingestion May be harmful if swallowed. Consult a physician.

Skin Contact Exposure may cause skin irritation.

Information on Acute Toxicological Effects

Chemical Name	Oral LD50	Dermal LD50	Other Dermal
3,4-Epoxycyclohexylmethyl 3,4-epoxycyclohexane carboxylate 2386-87-0	5000 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	Skin irritation: mild (Rabbit) Ames test: positive

Information on Physical, Chemical and Toxicological Effects

Symptoms Please see Section 4 of this SDS for symptoms.

Delayed and Immediate Effects and also Chronic Effects from Short-term and Long-term Exposure

Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC, ACGIH or NTP. This product may find application in combination with diglycidyl ether of bisphenol A (DGEBA). Available evidence indicates that this product, alone or in mixtures with DGEBA, is unlikely to have carcinogenic effects and presents no significant hazard when normal practices of avoiding skin contact are followed.

Mutagenicity This product has exhibited evidence of mutagenic activity in several *in vitro* test systems.

STOT – Single Exposure Not determined

12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life

Chemical Name	Fish LC50
3,4-Epoxycyclohexylmethyl 3,4-epoxycyclohexane carboxylate 2386-87-0	Oncorhynchus mykiss 24 mg/L 96 h

Persistence/Degradability

Not determined

Bioaccumulation

Not determined

Mobility

Not determined

Other Adverse Effects

Not determined

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes Disposal should be in accordance with applicable regional, national and local laws and regulations. Commission a waste disposal company or licensed local public body to dispose of the material.

Contaminated Packaging Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Regulatory Entity

DOT Not regulated

IATA Not regulated

IMDG Not regulated

Note

Please see current shipping paper for most up-to-date shipping information, including exemptions and special circumstances.

15. REGULATORY INFORMATION

International Inventories

LISTED TSCA, DSL/NDSL, EINECS/ELINCS, IECSC, PICCS, NECIT, NZIoC, AICS

Legend:

TSCA *- United States Toxic Substances Control Act Section 8(b) Inventory*

DSL/NDSL *- Canadian Domestic Substances List/Non-Domestic Substances List*

EINECS/ELINCS *- European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances*

IECSC *- China Inventory of Existing Chemical Substances*

PICCS *- Philippines Inventory of Chemicals and Chemical Substances*

NECIT *- National Existing Chemical Inventory of Taiwan*

NZIoC *- New Zealand Inventory of Chemicals*

AICS *- Australian Inventory of Chemical Substances*

United States Federal Regulations

CERCLA This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355).

SARA 302 No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

United States State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals.

United States Right-to-know Regulations

Chemical Name	New Jersey	Pennsylvania
3,4-Epoxycyclohexylmethyl 3,4-epoxycyclohexane carboxylate 2386-87-0	X	X

16. OTHER INFORMATION

NFPA	**Health Hazards**	**Flammability**	**Instability**	**Special Hazards**
	1	1	1	Not determined
HMIS	**Health Hazards**	**Flammability**	**Physical Hazards**	**Personal Protection**
	1	1	1	Not determined

Issue Date	20-August-2008
Revision Date	13-January-2015
Revision Note	New format

Disclaimer

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 guide 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.

End of Safety Data Sheet