



SAFETY DATA SHEET

Issue Date 07-May-2018

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Version 2

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier

Product Name 1,2-Cyclohexanedicarboxylic anhydride, predominantly *cis*

Other Means of Identification

SDS # LC-100

Recommended Use of the Chemical and Restrictions on Use

Recommended Use Epoxy curing agent for high performance composites and electronics

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 relates to repeated and prolonged exposure, particularly where exposure is to the dust or vapor form of the substance. The supplier has indicated that eye exposure normally results in eye irritation.

Classification

Serious Eye Damage/Eye Irritation	Category 1
Respiratory Sensitization	Category 1
Skin Sensitization	Category 1

Signal Word

Danger

Hazard Statements

H318: Causes serious eye damage

H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled

H317: May cause an allergic skin reaction

**Appearance** White solid**Physical State** Solid**Odor** Aromatic**Precautionary Statements - Prevention**

P261: Avoid breathing dust/fumes/gas/mist/vapors/spray.

P272: Contaminated work clothing should not be allowed out of the workplace.

P280: Wear protective gloves, face protection and eye protection.

P284: In case of inadequate ventilation wear respiratory protection.

Precautionary Statements - Response

P305 + P351: IF IN EYES: Rinse cautiously with water for several minutes.

P338: Remove contact lenses, if present and easy to do. Continue rinsing.

P310: Immediately call a POISON CENTER or doctor/physician.

P302 + P352: IF ON SKIN: Wash with plenty of soap and water.

P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

P362 + P364: Take off contaminated clothing and wash it before reuse.

P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P342 + P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

Precautionary Statements - Disposal

P501: Dispose of contents/container to an approved waste disposal plant.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms	Hexahydrophthalic anhydride; HHPA
Formula	C ₈ H ₁₀ O ₃
Molecular weight	154.16 g/mol

Chemical Name	CAS No	Weight-%
1,2-Cyclohexanedicarboxylic anhydride	85-42-7	<= 100

** 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

General Advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
Inhalation	If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
Eye Contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.
Ingestion	Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Skin Contact	Wash off with soap and plenty of water. Consult a physician.

Most Important Symptoms and Effects, both Acute and Delayed

Symptoms The most important known symptoms and effects are described in the labeling (see Section 2) and/or Section 11.

Indication of any Immediate Medical Attention and Special Treatment Needed

Note to Physicians No data available.

5. FIRE-FIGHTING MEASURES**Extinguishing Media**

Suitable Media Dry chemical, carbon dioxide (CO₂), water spray (fog), alcohol-resistant foam

Unsuitable Media Not determined

Specific Hazards Arising from the Chemical

Burning may produce irritating vapors, carbon monoxide and/or carbon dioxide.

Hazardous Combustion Products Carbon monoxide, carbon dioxide

Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear, if necessary.

6. ACCIDENTAL RELEASE MEASURES**Personal Precautions, Protective Equipment and Emergency Procedures**

Personal Precautions Use personal protective equipment as required. Avoid dust formation. Avoid breathing dust (primary form), vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. For personal protection, see Section 8.

Environmental Precautions Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Specific Methods and Materials for Containment and Cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

Reference to Other Sections

For disposal, see Section 13.

7. HANDLING AND STORAGE**Precautions for Safe Handling**

Advice on Safe Handling Further processing of solid materials may result in the formation of combustible dusts. The potential for dust formation should be taken into consideration before additional processing occurs. Avoid contact with skin and eyes. Avoid the formation of dusts and aerosols. Provide appropriate exhaust ventilation at any place where dust is formed. For precautions, see Section 2.

Conditions for Safe Storage, Including any Incompatibilities

Storage Conditions Keep containers tightly closed in a dry, cool and well-ventilated place. Storage class (TRGS 510): Non-Combustible Solids.

Specific End Use(s)

Apart from the uses mentioned in Section 1, no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	ACGIH Threshold Limit Value
1,2-Cyclohexanedicarboxylic anhydride 85-42-7	TWA: 0.005 mg/m ³

Remarks Eye, skin and upper respiratory tract irritation. Sensitization.

Control Parameters

Engineering Controls Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday.

Individual Protection Measures, such as Personal Protective Equipment

Eye/Face Protection Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards, such as NIOSH (USA) or EN (EU).

Skin and Body Protection Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. For body, wear suitable clothing to protect against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory Protection Where risk assessment shows air-purifying respirators are appropriate, use a full-face particle respirator type N100 (USA) or type P3 (EN 143) respirator cartridges as a back-up to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards, such as NIOSH (USA) or CEN (EU).

Control of Environmental Exposure Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment should be avoided.

9. PHYSICAL AND CHEMICAL PROPERTIES
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Information on Basic Physical and Chemical Properties

Physical State	Solid	Odor	Aromatic
Appearance	White solid	Odor Threshold	Not determined
Color	White		

<u>Property</u>	<u>Values</u>	<u>Remarks/Method</u>
pH	Not determined	
Melting Point/Freezing Point	32–34 °C (90–93 °F)	
Boiling Point/Boiling Range	158 °C / 316 °F	(17 mm Hg)
Flash Point	Not determined	
Evaporation Rate	Not determined	
Flammability (Solid, Gas)	Not determined	
Upper Flammability Limit	Not determined	
Lower Flammability Limit	Not determined	
Vapor Pressure	0.58 mm Hg (20 °C / 68 °F)	OECD TG 104
Vapor Density	Not determined	
Relative Density	1.19 g/cm ³ (40 °C / 104 °F)	
Water Solubility	4.2 g/L (20 °C / 68 °F)	OECD TG 105
Partition Coefficient	log P _{ow} 1.59 (40 °C / 104 °F)	OECD TG 117
Autoignition Temperature	Not determined	
Decomposition Temperature	Not determined	
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.

Conditions to Avoid

Slowly hydrolyzed by water. Reacts with incompatible materials.

Incompatible Materials

Strong oxidizing agents, strong acids, strong bases, water

Hazardous Decomposition Products

In the event of fire, see Section 5.

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation	Harmful if inhaled. May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Eye Contact	Causes serious eye damage
Ingestion	May cause burns of the mouth, throat and gastrointestinal tract. Normal handling and hygiene precautions should always be taken to avoid ingestion.
Skin Contact	May cause mild skin irritation. May cause allergic skin reaction.

Component Information

Chemical Name	Inhalation LC50	Dermal LD50
1,2-Cyclohexanedicarboxylic anhydride 85-42-7	> 1100 mg/m ³ (4 hr) (Rat)	> 2000 mg/kg (Rabbit)

Delayed and Immediate Effects as well as Chronic Effects from Short-term and Long-term Exposure

Sensitization	Guinea Pig Maximization Test: May cause sensitization by skin contact (OECD TG 406).
Carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.
Mutagenicity	Ames test: <i>S. typhimurium</i> : negative
Reproductive Toxicity	No data available
STOT (Single or Repeat)	No data available
Aspiration Hazard	No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life.

Chemical Name	Fish LC50	Crustacea EC50	Algae EC50	Bacteria EC50
1,2-Cyclohexanedicarboxylic anhydride 85-42-7	Danio rerio > 1000 mg/L 96 h (static)	Daphnia magna > 95 mg/L 24 h (static)	Pseudokircheriella subcapitata 90.5 mg/L 72 h (static)	Sludge treatment 370 mg/L 3 h (respiration inhibition)

Persistence and Degradability

Aerobic, exposure time 28 days: 98%, readily biodegradable.

Bioaccumulation

Partition Coefficient: log P_{ow} 1.59 (40 °C / 104 °F)

Mobility

Not determined

Results of PBT and vPvB Assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

Other Adverse Effects

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated Packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations. Dispose of as unused product.

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; EINECS/ELINCS; ENCS; IECSC; KECI; PICCS, TCSI, AICS, NZIoC

Legend:

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

DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List

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

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECI - Korea Existing Chemicals Inventory

PICCS - Philippines Inventory of Chemicals and Chemical Substances

TCSI - Taiwan Chemical Substance Inventory

AICS - Australian Inventory of Chemical Substances

NZIoC - New Zealand Inventory of Chemicals

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) of 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.

EPCRA This product does not contain any chemicals with known CAS numbers that are subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-know Act of 1986 (40 CFR 372).

United States State Regulations

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

United States State Right-to-know Regulations

Chemical Name	New Jersey	Pennsylvania
1,2-Cyclohexanedicarboxylic anhydride 85-42-7	X	X

16. OTHER INFORMATION

<u>NFPA</u>	Health Hazards	Flammability	Instability	Special Hazards
	3	0	0	Not determined
<u>HMIS</u>	Health Hazards	Flammability	Physical Hazards	Personal Protection
	3	0	0	Not determined

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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