



MATERIAL SAFETY DATA SHEET (MSDS)

PENTANES

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SUBSTANCE OR PREPARATION TRADE NAME	PENTANES
CHEMICAL CLASSIFICATION	Iso Pentane, n- Pentane, Cyclo Pentane
COMPANY/ UNDERTAKING NAME AND ADDRESS	Haldia Petrochemicals Limited, PO Box No 12, Haldia Plant PO Durgachak, Dist Midnapore West Bengal, India PIN 721 602
TELEPHONE	091-3224-274384 / 274400
EMERGENCY TELEPHONE NUMBER	091-3224-275916


2. COMPOSITION AND INFORMATION ON INGREDIENTS

CHEMICAL NAME	CHEMICAL FORMULA	CONTENT	CAS NUMBER	EXPOSURE LIMITS IN AIR (ppm)		
				ACGIH TLV-TWA	ACGIH TLV-STEL	IDLH
Iso Pentane	C ₅ H ₁₂	Wt% 35-56	78-78-4	1000	NA	NA
n- Pentane	C ₅ H ₁₂	Wt% 30-50	109-66-0	1000	1800	NA
Cyclopentane	C ₅ H ₁₀	Wt% 9.62 min	287-92-3	600	NA	NA
Butane	C ₄ H ₁₀	Wt% 7 Max	106-97-8	800	NA	NA

3. HAZARD CLASSIFICATION

EMERGENCY OVERVIEW	Highly flammable liquid, vapour may form explosive mixture with air and may cause drowsiness and dizziness.				
POTENTIAL HEALTH HAZARDS					
	EYE	SKIN	INHALATION	INGESTION	OTHERS
ACUTE	To cause prolonged or Significant eye irritation	No Known Significant effects or critical hazards	Can cause central nervous system depression. May cause drowsiness and dizziness.	Can cause central nervous system depression.	
CHRONIC	Repeated or prolonged contact with skin may cause dermatitis The possibility that chronic exposure to very high concentrations may lead to polyneuropathy				
NFPA HAZARD SIGNALS	HEALTH	FLAMMABILITY	REACTIVITY	SPECIAL	
	1	4	0	-	
HAZCHEM CODE	3				
GHS-Classification	Flammable liquids Category 2 Aspiration hazard Category 1 Chronic aquatic toxicity, Category 2 Acute aquatic toxicity, Category 2 Target Organ Systemic Toxicant - Single exposure, Category 3, Narcotic Effects.				

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GHS- labeling Hazard pictograms	
Signal word (GHS-US)	Danger
Hazard statements	Highly Flammable liquid and vapour May form explosive mixtures with air. May cause drowsiness and dizziness. Toxic to aquatic life with long lasting effects.
Precautionary statements	-Prevention: Prevention: Wear protective gloves. Wear eye or face protection. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosionproof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Avoid breathing vapor. Response: Collect spillage. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Storage: Store locked up. Store in a well-ventilated place. Keep cool. Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

4. FIRST AID MEASURES

SKIN CONTACT	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
EYE CONTACT	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
INHALATION	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison centre or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an

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	open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
INGESTION	Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison centre or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
OTHER INSTRUCTIONS	Note to Physician: For ingestion, consider gastric lavage. Consider oxygen

5. FIRE FIGHTING MEASURES

FLASH POINT	- 58.5 °C (Tag closed cup)
AUTO IGNITION TEMP	>273 °C
FLAMMABLE LIMITS IN AIR BY VOL%	LEL%: 1.5, UEL%: 7.8%
FIRE EXTINGUISHING AGENTS AND SPECIAL PROCEDURES	Carbon dioxide, dry chemical, foam or water spray. Do not use a solid water stream as it may scatter and spread fire.
UNUSUAL FIRE AND EXPLOSION HAZARDS	Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. Runoff to sewer may create fire or explosion hazard. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk-through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
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ENVIRONMENTAL PRECAUTIONS	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.
METHOD OF CLEANING	Small Spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. Large Spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product.

7. HANDLING AND STORAGE

HANDLING	Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container. Ventilation hoods and fans required when working.
STORAGE	Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination.

8. EXPOSURE CONTROLS-PERSONAL PROTECTION

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VENTILATION AND ENGINEERING CONTROL	Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.		
OTHER CONTROL PARAMETERS	Electrical equipment should be protected to the appropriate standard. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear antistatic protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.		
PERSONAL PROTECTION EQUIPMENT			
EYE/ FACE PROTECTION	RESPIRATORY PROTECTION	HAND PROTECTION	BODY PROTECTION
Goggles giving complete protection to eyes	Incase of insufficient ventilation wear suitable respiratory protection.	PVC or other plastic material gloves/solvent-resistant gloves (butyl rubber)/Chemical resistant.	Chemical resistant apron/flame retardant antistatic protective clothing, heavy duty work shoes

9. PHYSICAL AND CHEMIAL PROPERTIES

APPEARANCE	ODOUR	PHYSICAL STATE	BOILING POINT
Colourless	Like gasoline,	Liquid	Initial: 14 - 35 °C Final: 65°C Max
MELTING / FREEZING POINT	SPECIFIC GRAVITY (AT15°C) (WATER=1)	PH	SOLUBILITY IN WATER (AT 30°C)
-130°C	0.62- 0.65	NA	Not Soluble
REID VAPOUR PRESSURE (AT 37.8°C) IN KG/CM2	VAPOUR DENSITY (AIR=1)	OTHER INFORMATIONS	VISCOSITY
1.4 Max	2.5	Soluble in common organic	Not available

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID	Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
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MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE	Oxidizing materials
HAZARDOUS DECOMPOSITION PRODUCTS	Under normal conditions of storage and use, hazardous decomposition products should not be produced
HAZARDOUS POLYMERIZATION	Polymerisation will not occur

11. TOXICOLOGICAL INFORMATION

ANIMAL TOXICITY DATA	
ORAL LD50 (rat): 11400 mg/kg (Cyclo Pentane) ORAL LD50 (rat): 5000 mg/Kg (n-Pentane) ORAL LC50 (rat): 280000 mg/m ³ /4hrs (Iso Pentane)	DERMAL LD50 (rabbit): 3000 mg/kg (n pentane) LC50 inhalation rat : 364 mg/l/4hrs (n pentane) LC50 inhalation rat: 658 mg/l/4hrs (n-Butane)
REPRODUCTIVE TOXICITY INFORMATION	
REPRODUCTIVE TOXICITY	No information available
MUTAGENICITY	No information available
EMBRYOTOXICITY	No information available
TERATOGENICITY	No information available
TARGET ORGAN	Central nervous system

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY	This product is not readily biodegradable
EFFECT OF MATERIAL ON PLANTS OR ANIMALS	Miscible or partly miscible with water. Lighter than water. Risk of bioaccumulation. Slightly Water contaminating.
EFFECT OF CHEMICAL ON AQUATIC LIFE	This material is expected to be harmful to aquatic organism

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS	Can be incinerated, when in compliance with local regulations. If recycle is not practicable, dispose of in compliance with local regulations.
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14. TRANSPORT INFORMATION

	PROPER SHIPPING NAME	HAZARD CLASS	IDENTIFICATION NUMBER	PACKING GROUP	LABEL REQUIRED
DOT	Flammable liquids	3	UN1265	I	-
TDG	Flammable liquids	3	UN1265	I	-
IMDG/IMO	Flammable liquids	3	UN1265	I	-
ICAO	Flammable liquids	3	UN1265	I	-

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15. REGULATORY INFORMATION

INDIAN REGULATION		Manufacture Import & Storage of hazardous chemical rules. Amended as on 2000
INTERNATIONAL REGULATIONS		
US Federal regulations		CERCLA Hazardous Substances: does not have an RQ SARA Section 302: Does not have a TPQ SARA Codes: – immediate, delayed, fire Section 313: It is not subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
OSHA CLASSIFICATION		Not considered highly hazardous by OSHA
EU-Regulations		Contains no REACH substances with Annex XVIII restrictions Contains no REACH candidate substances Contains no REACH Annex XIV substances

16. OTHER INFORMATION

DISCLAIMER	Information contained in this material safety data sheet is believed to be reliable but no representation, guarantee or warranties of any kind are made as to its accuracy, suitability for a particular application or results to be obtained from them. It is up to the user/ distributor to ensure that the information contained in the material safety data sheet is relevant to the product manufactured/ handled or sold by him as the case may be. HPL makes no warranties, expressed or implied, in respect of the adequacy of this document for any particular purpose.
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