6.3 MSDS of FOOD GRADE HEXANE

Section 1: Chemical Product and Company Identification	
1.1 Chemical Product Identifiers:	
1.1.1 Chemical Name	n-Hexane
1.1.1.1 Trade Name	Hexane
1.1.2 Chemical Formula	C_6H_{14}
1.1.3 CAS No.	110-54-3
1.2 Relevant identified uses of the chemical product and uses advised against	
Relevant identified uses	Solvent Laboratory chemical Laboratory and analytical use
Uses advised against	Do not use for products which come into contact with foodstuffs. Do not use for private purposes (household)
1.3 Details of the supplier of the safety data sheet	
1.3.1 Company Name	Hindustan Petroleum Corporation Limited
1.3.2 Address	HPCL Mumbai Refinery, B D Patil Marg Chembur, Mumbai-400074
1.3.3 Contact No.	022-25076605
1.3.4 Contact person in emergency	Fire & Safety Shift Supervisor
1.4 Emergency Telephone No.:	022-25076606

Section 2: Hazards Identification

2.1 Classification of the chemical product:

Hazard class	Category	Hazard class & category	Hazard statement
Flammable liquid	2	Flam. Liq. 2	H225
Skin corrosion/irritation	2	Skin Irrit. 2	H315
Reproductive toxicity	2	Repr. 2	H361f
Specific target organ toxicity - single exposure (narcotic effects, drowsiness)	3	STOT SE 3	H336
Specific target organ toxicity - repeated exposure	2	STOT RE 2	H373
Aspiration hazard	1	Asp. Tox. 1	H304
Hazardous to the aquatic environment - chronic hazard	2	Aquatic Chronic 2	H411

For full text of abbreviations: see SECTION 16

The most important adverse physicochemical, human health and environmental effects

Delayed or immediate effects can be expected after short or long-term exposure. The product is combustible and can be ignited by potential ignition sources. Spillage and fire water can cause pollution of watercourses.

2.2 Label Elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

2.2.1 GHS pictograms:

GHS02 GHS07 GHS08 GHS09

2.2.2 Signal Word(s): Danger

2.2.3 Hazard Statements(s):

H225	Highly flammable liquid and vapour
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H336	May cause drowsiness or dizziness
H361f	Suspected of damaging fertility
H373	May cause damage to organs (nervous system) through prolonged or repeated exposure (if inhaled)
H411	Toxic to aquatic life with long lasting effects

2.2.4 Precautionary Statement(s):

Precautionary statements - prevention	
P202	Do not handle until all safety precautions have been read and understood
P280	Wear protective gloves/eye protection
Precautionary statements – response	
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
P308+P313	IF exposed or concerned: Get medical advice/attention

2.3 Other hazards except those mentioned in DGCPL Rules, 201:
Results of PBT and vPvB assessment
According to the results of its assessment, this substance is not a PBT or a vPvB.

Section 3: Composition/Information on Ingredients

3.1 Name of Product: n-Hexane

3.1.1 Systematic Chemical Name or Trivial Name: Hexane

3.1.2 IUPAC Name: Hexane

3.1.3 CAS No.: 110-54-3

3.1.4 Other Identifiers

Molecular formula	C_6H_{14}
Molar mass	86.18 g/mol

Section 4: First-Aid Measures

4.1 Description of first aid measures

4.1.1 Inhalation
Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

4.1.2 Skin Contact
Rinse skin with water/shower. In case of skin irritation, consult a physician.

4.1.3 Eye Contact
Rinse cautiously with water for several minutes. In all cases of doubt, or when symptoms persist, seek medical advice.

4.1.4 Ingestion
Call a physician immediately. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). Observe aspiration hazard if vomiting occurs.

4.2 Most important symptoms and anticipated effects both acute and delayed
Aspiration hazard, Irritation, Dizziness, Drowsiness, Narcosis

4.3 Advice for immediate medical attention and special treatment needed
None

Section 5: Firefighting Measures

5.1 Extinguishing Media

- **Suitable extinguishing media**
  Co-ordinate firefighting measures to the fire surroundings water spray, dry extinguishing powder, BC-powder, carbon dioxide (CO_2)
- **Unsuitable extinguishing media**
  Water jet

5.2 Special hazards arising from the chemical product:
Combustible. In case of insufficient ventilation and/or in use, may form flammable/explosive vapour- air mixture. Solvent vapours are heavier than air and may spread along floors. Places which are not ventilated, e.g., unventilated below ground level areas such as trenches, conduits and shafts, are particularly prone to the presence of flammable substances or mixtures. Vapours are heavier than air, spread along floors and form explosive mixtures with air. Vapours may form explosive mixtures with air.

5.3 Hazardous Combustion Products:
In case of fire may be liberated: Carbon monoxide (CO), Carbon dioxide (CO_2)

5.4 Specific Extinguishing Methods
For this substance/mixture no limitations of extinguishing agents are given

5.4.1 Advice for Fire-Fighters
In case of fire and/or explosion do not breathe fumes. Do not allow firefighting water to enter drains or water courses. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

5.4.2 Special protective equipment for fire-fighters: None

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Advice for non-emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

6.2 Environmental precautions:
Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. Danger of explosion.

6.3 Methods and materials for containment and cleaning up:
Advice on how to contain a spill
Covering of drains.

Advice on how to clean up a spill
Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).
Other information relating to spills and releases
Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections:
Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

Section 7: Handling and Storage

7.1 Precautions for Safe Handling:
Provision of sufficient ventilation. Avoid exposure.

Measures to prevent fire as well as aerosol and dust generation
Keep away from sources of ignition - No smoking

Take precautionary measures against static discharge. Due to danger of explosion, prevent leakage of vapours into cellars, flues and ditches.

Measures to protect the environment
Avoid release to the environment.

7.2 Conditions for Safe Storage, including requirement of hazardous area classification and any incompatibilities:
Store in a well-ventilated place. Keep container tightly closed.

Incompatible substances or mixtures
Observe hints for combined storage.

Consideration of other advice:
Ground/bond container and receiving equipment.

Ventilation requirements
Use local and general ventilation.

Specific designs for storage rooms or vessels
Recommended storage temperature: 15 – 25 °C

Section 8: Exposure Controls and Personal Protection

8.1 Control Parameters

National Limit Values

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/mS]	STEL [ppm]	STEL [mg/mS]	Ceiling- C [ppm]	Ceiling-C [mg/mS]	Notation	Source
EU	n-hexane	110-54-3	IOELV	20	72						2006/15/EC
IE	n-hexane	110-54-3	OELV	20	72						S.I. No. 619 of 2001

Notation

- Ceiling-C: Ceiling value is a limit value above which exposure should not occur
- STEL: Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15- minute period (unless otherwise specified)
- TWA: Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours' time-weighted average (unless otherwise specified)

Human health values

Relevant DNELs and other threshold levels

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	75 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	11 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects

DNEL: Derived No Effect Level

8.2 Exposure Controls

8.2.1 Personal Protective Equipment:

Use of PPE to be ensured by working crew for exposure control. Different PPEs for exposure control of different body parts is described in the next section.

8.2.2 Suggestions for protection of eye, skin and body and respiratory system:

- **Eye/face protection**

Use safety goggle with side protection.

- **Skin protection**

a) Hand protection
Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 ° C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

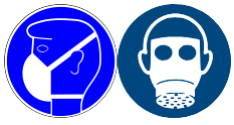
b) Type of material
NBR (Nitrile rubber)

c) Material thickness
≥0,4 mm

d) Breakthrough times of the glove material
>480 minutes (permeation: level 6)

e) Other protection measures
Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.
Flame-retardant protective clothing.

- **Respiratory protection:** Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C , colour code: Brown).



8.2.3 Environmental Exposure Controls:
Keep away from drains, surface and ground water.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	colourless
Odour	like: - Gasoline

Melting point/freezing point	-95 °C at 1.013 hPa (ECHA)
Boiling point or initial boiling point and boiling range	63 – 69 °C at 1.013 hPa
Flammability	flammable liquid in accordance with GHS criteria
Lower and upper explosion limit	1.1 vol% (LEL) – 7.5 vol% (UEL)
Flash point	-22 °C at 1.013 hPa (ECHA)
Auto-ignition temperature	225 °C (ECHA)
Decomposition temperature	not relevant
pH (value)	not determined
Kinematic viscosity	0.5 mm²/s at 20 °C
Solubility(ies)	
Water solubility	<0.1 g/l at 20 °C
Partition coefficient	
Partition coefficient n-octanol/water (log value):	4 (pH value: 7, 20 °C) (ECHA)
Soil organic carbon/water (log KOC)	3.34 (ECHA)
Vapour pressure	160 hPa at 20 °C
Density and/or relative density	
Density	0.66-0.687 g/ml at 20 °C
Relative vapour density	2.79 (air = 1)
Particle characteristics	not relevant (liquid)
Other safety parameters	
Oxidising properties	none

9.2 Other Information:
Information with regard to physical hazard classes:
There is no additional information.

Section 10: Stability and Reactivity

10.1 Reactivity
It's a reactive substance. Risk of ignition. Vapours may form explosive mixtures with air.
If heated
Risk of ignition.

10.2 Chemical stability
The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions
Violent reaction with: strong oxidiser, Chlorine, Iodine, Peroxides, Nitrogen oxides (NOx), => Explosive properties

10.4 Conditions to avoid
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

10.5 Incompatible materials
Rubber articles, different plastics

10.6 Hazardous decomposition products
Hazardous combustion products: see section 5.

Section 11: Toxicological Information

11.1 Information on Toxicological Effects: Symptoms related to the physical, chemical and toxicological characteristics

- **If swallowed**
  nausea, vomiting, aspiration hazard
- **If in eyes**
  slightly irritant but not relevant for classification
- **If inhaled**
  irritant effects, headache, vertigo, fatigue, dizziness, narcosis
- **If on skin**
  causes skin irritation
- **Other information**
  None

11.1.1 Acute Toxicity:

Exposure route	Endpoint	Value	Species	Source
Inhalation	LC50	185 mg/l/4h	rat	TOXNET
Oral	LD50	25.000 mg/kg	rat	TOXNET
Dermal	LD50	>2.000 mg/kg	rabbit	ECHA

11.1.2 Skin Corrosion/ Irritation: Causes skin irritation.

11.1.3 Serious Eye Damage/ Eye Irritation: Shall not be classified as seriously damaging to the eye or eye irritant.

11.1.4 Respiratory or Skin Sensitization: Shall not be classified as a respiratory or skin sensitizer

11.1.5 Mutagenicity: Shall not be classified as germ cell mutagenic.

11.1.6 Carcinogenicity: Shall not be classified as carcinogenic.

11.1.7 Reproductive Toxicity: Suspected of damaging fertility.

11.1.8 Specific target organ toxicity-single exposure: May cause drowsiness or dizziness.

11.1.9 Specific target organ toxicity - repeated exposure
May cause damage to organs (nervous system) through prolonged or repeated exposure (if inhaled).

Hazard category	Target organ	Exposure route
2	nervous system	if inhaled

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

11.1.11 Additional Information: There is no additional information.

Section 12: Ecological Information

12.1 Toxicity: Toxic to aquatic life with long lasting effects.

Endpoint	Value	Species	Source	Exposure time
LL50	12.51 mg/l	fish	ECHA	96 h
EL50	21.85 mg/l	aquatic invertebrates	ECHA	48 h

12.2 Persistence and Degradability:

Theoretical Oxygen Demand: 3,527 mg/mg
Theoretical Carbon Dioxide: 3,064 mg/mg

Process of degradability

Process	Degradation rate	Time
oxygen depletion	83 %	10 d

12.3 Bio Accumulative Potential: The substance fulfils the very bio accumulative criterion.

n-octanol/water (log KOW)	4 (pH value: 7, 20 °C) (ECHA)
BCF	501.2 (ECHA)

12.4 Mobility in Soil:

The Organic Carbon normalized adsorption coefficient	3.34 (ECHA)

12.5 Other adverse effects: Data are not available

Section 13: Disposal considerations

13.1 Waste Treatment Method: This material and its container must be disposed of as hazardous waste. Dispose of contents/contain- er in accordance with local/regional/national/international regulations.

- **Sewage disposal-relevant information**
  Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

13.1.1 Contaminated Packaging: It is a dangerous waste; only packagings which are approved may be used.

13.1.2 Local Regulations (if any) on Disposal: Waste material must be disposed of in accordance with the **Hazardous Waste Management Rules-2016**

Section 14: Transport Information

14.1 UN Number: UN 1208

14.2 UN Proper Shipping Name: Hexanes

14.3 Transport Class(es): 3

14.3.1 Hazard Labels: 3, "Fish and tree"

14.3.2 Symbols:

14.4 Packaging Group: II

14.5 Environmental Hazards: yes (hazardous to the aquatic environment)

14.6 Special Precautions for User: Provisions for dangerous goods (ADR) should be complied within the premises.

Section 15: Regulatory Information

15.1 Safety, health and Environmental: Regulations/legislation specific for the substance or mixture relevant provisions of **Non - Toxic/Flammable Substance** are applicable

Section 16: Other Information

Can cause motor neuropathy in exposed workers. May be irritating to respiratory tract and narcotic in high concentrations. Inhalation of 5000 ppm for 1/6 hours produces marked vertigo.
25000—1000 ppm for 12 hours produces drowsiness, fatigue, loss of appetite, paresthesia in distal extremities. 2000 ppm for 1/6 hours produces no symptoms. Dangerous if abused. A solvent, permitted in food industry for extraction of oil. A very dangerous fire and explosion hazard when exposed to heat or flame

16.1 Date of Issue: March 2023

16.2 Necessity of Specific Training: Working and handling personnel to be trained on following aspects

i. Chemical hazard awareness
ii. Safety control measures including PPE
iii. Housekeeping, hygiene and chemical storage
iv. Responding to any kind of emergency

16.3 Disclaimer: This M.S.D.S and the information it contains is offered to you in good faith as accurate. We believe that information to be correct but cannot guarantee its accuracy or completeness. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. No statement made in this data sheet shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents.