

N-PENTANE

GHS Safety Data Sheet

Version No:4

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

N-PENTANE

OTHER NAMES

C5-H12, H3C(CH2)3CH3, "amyl hydride", "normal pentane", normal-pentane, "n pentane", "solvent hydrocarbon", "hydrocarbon solvent", "aliphatic hydrocarbon solvent"

PROPER SHIPPING NAME

PENTANES, liquid

PRODUCT USE

Solvent, component of petroleum ether, in artificial ice manufacture, low temperature thermometers, solvent extraction processes, blowing agent in plastics and as a pesticide.

SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

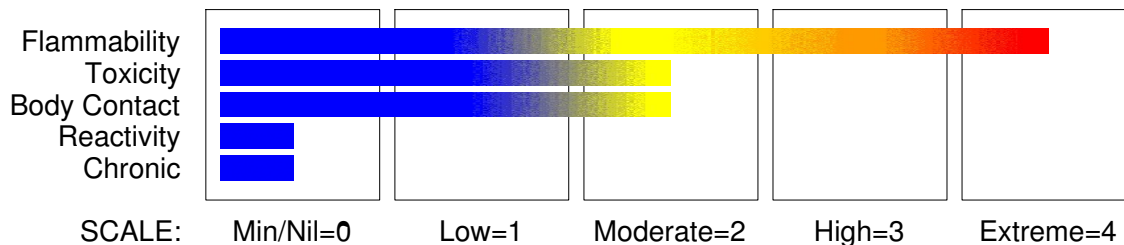
technical@sdfine.com

Telephone: 91- 22- 24959898

Telephone: 91- 22- 24959899

Fax: 91- 22- 24937232

HAZARD RATINGS



Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Oral) Category 4
Chronic Aquatic Hazard Category 2
Flammable Liquid Category 2
Respiratory Irritation Category 3

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Section 2 - HAZARDS IDENTIFICATION



EMERGENCY OVERVIEW

HAZARD

DANGER

Determined by using GHS criteria:

H335 H225 H302 H411

May cause respiratory irritation

Highly flammable liquid and vapour

Harmful if swallowed

Toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

Prevention

Use only non-sparking tools.

Take precautionary measures against static discharge

Use explosion-proof electrical/ventilating/lighting/equipment

Wash hands thoroughly after handling.

Do not eat, drink or smoke when using this product.

Ground/bond container and receiving equipment.

Keep away from heat/sparks/open flame - No smoking.

Keep container tightly closed.

Wear protective gloves and eye/face protection.

Response

Specific treatment: refer to Label or MSDS.

In case of fire, use foam for extinction.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

If on skin or hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.

Storage

Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
n- pentane	109-66-0	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

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Section 4 - FIRST AID MEASURES

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

EYE

If this product comes in contact with the eyes:

- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- If pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.

NOTES TO PHYSICIAN

For acute or short term repeated exposures to petroleum distillates or related hydrocarbons:

- Primary threat to life, from pure petroleum distillate ingestion and/or inhalation, is respiratory failure.
- Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO₂ 50 mm Hg) should be intubated.
- Arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyperventilation improves clearance.
- A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
- Epinephrine (adrenalin) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
- Lavage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients. [Ellenhorn and Barceloux: Medical Toxicology].

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Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- If safe, switch off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

FIRE/EXPLOSION HAZARD

- Liquid and vapour are highly flammable.
- Severe fire hazard when exposed to heat, flame and/or oxidisers.
- Vapour forms an explosive mixture with air.
- Severe explosion hazard, in the form of vapour, when exposed to flame or spark.
- Vapour may travel a considerable distance to source of ignition.
- Heating may cause expansion / decomposition with violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).

FIRE INCOMPATIBILITY

Avoid reaction with strong oxidisers.

Personal Protective Equipment

Gloves, boots (chemical resistant).
Breathing apparatus.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb small quantities with vermiculite or other absorbent material.
- Wipe up.
- Collect residues in a flammable waste container.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.

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Section 6 - ACCIDENTAL RELEASE MEASURES

- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse /absorb vapour.
- Contain spill with sand, earth or vermiculite.
- Use only spark-free shovels and explosion proof equipment.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

n-pentane 1500 ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

n-pentane 610 ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:

n-pentane 610 ppm

The threshold concentration below which most people will experience no appreciable risk of health effects:

n-pentane 610 ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	$\geq 0.1\%$	Toxic (T)	$\geq 3.0\%$
R50	$\geq 0.25\%$	Corrosive (C)	$\geq 5.0\%$
R51	$\geq 2.5\%$		
else	$\geq 10\%$		

where percentage is percentage of ingredient found in the mixture

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+



X



X



X



X



+

+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

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Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of overexposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid generation of static electricity.
- DO NOT use plastic buckets.
- Earth all lines and equipment.
- Use spark-free tools when handling.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

SUITABLE CONTAINER

- Packing as supplied by manufacturer.
- Plastic containers may only be used if approved for flammable liquid.
- Check that containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

Avoid reaction with oxidising agents.

STORAGE REQUIREMENTS

- Store in original containers in approved flammable liquid storage area.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- No smoking, naked lights, heat or ignition sources.
- Keep containers securely sealed.
- Store away from incompatible materials in a cool, dry, well-ventilated area.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- n- pentane: CAS:109- 66- 0 CAS:2672- 01- 7 CAS:2492- 34- 4
CAS:8031- 35- 4

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
n- pentane		1, 500 [LEL]

NOTES

Values marked LEL indicate that the IDLH was based on 10% of the lower explosive limit

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.

MATERIAL DATA

NOTE: Detector tubes for n-pentane, measuring in excess of 100 ppm, are commercially available.

The TLV-TWA is thought to be protective against narcotic effects produced at higher concentrations and the development of axonopathies. Although the possibility exists that chronic exposure to high concentrations may produce polyneuropathy, there is no specific data to support the role of pentane in the pathogenesis of central peripheral distal axonopathy.

PERSONAL PROTECTION



EYE

- Safety glasses with side shields.
- Chemical goggles.
- Close fitting gas tight goggles.
- Full face shield.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

PVC gloves.
Butyl rubber gloves.
Neoprene gloves.
Safety footwear.
PVC boots.

OTHER

PVC apron.
Overalls.
• Impervious protective clothing.
• Eyewash unit.
Ensure there is ready access to a safety shower.

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:

"Forsberg Clothing Performance Index".

The effect(s) of the following substance(s) are taken into account in the computer-generated selection: n-pentane

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Protective Material

VITON	A
PVA	A
NITRILE	B
NITRILE+PVC	C
NEOPRENE	C
NEOPRENE/NATURAL	C
PVC	C

A: Best Selection

B: Satisfactory; may degrade after 4 hours continuous immersion

C: Poor to Dangerous Choice for other than short term immersion

NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -

* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	AX- AUS	-
1000	50	-	AX- AUS
5000	50	Airline *	-
5000	100	-	AX- 2
10000	100	-	AX- 3
	100+		Airline**

* - Continuous Flow

** - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult your Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.

An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:
solvent, vapours, degreasing etc., evaporating
from tank (in still air).
aerosols, fumes from pouring operations,

Air Speed:
0.25- 0.5 m/s (50- 100 f/min.)
0.5- 1 m/s (100- 200 f/min.)

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation) direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion) grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).

1- 2.5 m/s (200- 500 f/min.)

2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

1: Room air currents minimal or favourable to capture

2: Contaminants of low toxicity or of nuisance value only.

3: Intermittent, low production.

4: Large hood or large air mass in motion

Upper end of the range

1: Disturbing room air currents

2: Contaminants of high toxicity

3: High production, heavy use

4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Colourless, mobile, highly flammable liquid with a mild gasoline-like odour; floats on water. Miscible with alcohol, ether and many organic solvents. Odour threshold 300-500 ppm. with 50% recognition at 990 ppm. Solubility in water 0.04% at 20 deg. C. Other pentane isomers are 2-methyl butane, tetramethyl methane and ethyl dimethyl methane (3-dimethyl butane).

PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Floats on water.

Molecular Weight: 72.15

Melting Range (°C): - 130

Solubility in water (g/L): Immiscible

pH (1% solution): Not applicable.

Volatile Component (%vol): 100

Relative Vapour Density (air=1): 2.5

Lower Explosive Limit (%): 1.4

Autoignition Temp (°C): 260

Boiling Range (°C): 36.1 (n- pentane)

Specific Gravity (water=1): 0.63

pH (as supplied): Not applicable

Vapour Pressure (kPa): 66.7 @ 25 deg.

Evaporation Rate: 28.6 BuAc=1

Flash Point (°C): - 49

Upper Explosive Limit (%): 7.8

Decomposition Temp (°C): Not Available

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

State: Liquid

Viscosity: Not Available

log Kow (Sangster 1997): 3.39

log Kow : 2.71-3.39

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Accidental ingestion of the material may be damaging to the health of the individual. Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

EYE

The vapour and liquid both produce eye discomfort. Tearing and reddening of the eyes are symptomatic of overexposure. Higher levels of vapour are generated with increased temperature and engineering controls should be introduced when any discomfort is experienced following exposure to mists or vapour.

Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

SKIN

The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

The liquid may produce skin discomfort following prolonged contact. Defatting and/or drying of the skin may lead to dermatitis.

The material may accentuate any pre-existing skin condition.

Open cuts, abraded or irritated skin should not be exposed to this material.

Material on the skin evaporates rapidly and may cause tingling, chilling and even temporary numbness.

INHALED

Inhalation may produce health damage*.

Acute effects from inhalation of high concentrations of vapour are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterised by headache and dizziness, increased reaction time, fatigue and loss of co-ordination.

Central nervous system (CNS) depression may include nonspecific discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in

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Section 11 - TOXICOLOGICAL INFORMATION

respiratory depression and may be fatal.

Material is highly volatile and may quickly form a concentrated atmosphere in confined or unventilated areas. Vapour is heavier than air and may displace and replace air in breathing zone, acting as a simple asphyxiant. This may happen with little warning of overexposure.

If exposure to highly concentrated solvent atmosphere is prolonged this may lead to narcosis, unconsciousness, even coma and possible death.

Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

Inhalation of vapour may aggravate a pre-existing respiratory condition.

CHRONIC HEALTH EFFECTS

Principal routes of exposure are by accidental skin and eye contact and by inhalation of vapours especially at higher temperatures.

Chronic exposure may result in chemical pneumonitis, pulmonary edema or peripheral neuropathy.

TOXICITY AND IRRITATION

TOXICITY

Inhalation (human) LCLo: 130000 ppm

Inhalation (rat) LC50: >6100 ppm

Inhalation (human) TCLo: 90000 ppm (5m)

IRRITATION

Nil Reported

[GENIUM and CCINFO, V.W.&R.]

Section 12 - ECOLOGICAL INFORMATION

Fish LC50 (96hr.) (mg/l): 100

log Kow (Sangster 1997): 3.39

log Kow : 2.71-3.39

Koc: 580-1600

Half-life (hr) air: 72-108

Half-life (hr) H₂O surface water: 2.5-168

Henry's atm m³ /mol: 1.26

Log BCF: 1.9-2.35

Section 13 - DISPOSAL CONSIDERATIONS

- Consult manufacturer for recycling options and recycle where possible .
- Consult State Land Waste Management Authority for disposal.
- Incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

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Section 14 - TRANSPORTATION INFORMATION



Labels Required: FLAMMABLE LIQUID
HAZCHEM: 3[Y]E

UNDG:

Dangerous Goods Class: 3
UN Number: 1265
Shipping Name: PENTANES, liquid

Subrisk: None
Packing Group: II

Air Transport IATA:

ICAO/IATA Class: 3
UN/ID Number: 1265
ERG Code: 3H
Shipping name: PENTANES, liquid

ICAO/IATA Subrisk: None
Packing Group: II

Maritime Transport IMDG:

IMDG Class: 3
UN Number: 1265
EMS Number: F- E, S- D
Shipping name: PENTANES, liquid

IMDG Subrisk: None
Packing Group: II

Section 15 - REGULATORY INFORMATION

REGULATIONS

n-pentane (CAS: 109-66-0) is found on the following regulatory lists;
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
OECD Representative List of High Production Volume (HPV) Chemicals

No data available for n-pentane as CAS: 2672-01-7, CAS: 2492-34-4, CAS: 8031-35-4.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
n- pentane	109- 66- 0, 2672- 01- 7, 2492 - 34- 4, 8031- 35- 4

The above information is believed to be accurate and represent the best information

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Section 16 - OTHER INFORMATION

currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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