

**Section-1 IDENTIFICATION OF THE SUBSTANCE/  
 PREPARATION AND OF THE COMPANY/UNDERTAKING**

**1.1 Identification of the substance/preparation:**

**Commercial name:** Para Di Ethyl Benzene

**Chemical name:** Para Di Ethyl Benzene C<sub>10</sub>H<sub>14</sub>

**Synonyms:** P-Diethyl benzene, 1-4-Diethylbenzene, P-Ethyl ethyl benzene

**1.2 Use of the substance /preparation:** Intermediate; solvent. Used as a solvent in the Parex process for the production of paraxylene

**1.3 MANUFACTURER & SUPPLIER: Reliance Industries Limited**

**Emergency Coordination Centre contact details:**

Hazira Mfg. Division Village Mora, Dist Surat, Gujarat, India	SSM Office	+91 2612835050/+912612835056
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SSM: Site Shift Manager

**Section 2 – HAZARD IDENTIFICATION**

**2.1 Classification of the substance/preparation: Hazard class and category code. GHS Category:**

Health	Environmental	Physical
Irritating to eyes -Category 2	Aquatic Toxicity – Category- 2	Flammable – Category 3

NA: Not available

**GHS Category table for reference:**

Study/hazard statement	Category 1	Category 2	Category 3	Category 4	Category 5
Acute Oral LD <sub>50</sub>	≤5 mg/kg Fatal if swallowed	> 5 ≤50 mg/kg Fatal if swallowed	> 50 ≤ 300 mg/kg Toxic if swallowed	> 300 ≤ 2000 mg/kg Harmful if swallowed	> 2000 ≤5000mg/kg May be harmful if swallowed
Acute Dermal LD <sub>50</sub>	≤50 mg/kg Fatal in contact with skin	> 50 ≤ 200 mg/kg Fatal in contact with skin	> 200 ≤ 1000 mg/kg Toxic in contact with skin	> 1000 ≤ 2000 mg/kg Harmful in contact with skin	> 2000 ≤ 5000 mg/kg May be harmful in contact with skin
Acute Inhalation Dust LC <sub>50</sub> Gases LC <sub>50</sub> Vapours LC <sub>50</sub>	≤ 0.05 mg/L ≤ 100 ppm/V ≤ 0.5 mg/L Fatal if inhaled	> 0.05 ≤ 0.5 mg/L > 100 ≤ 500 ppm/V > 0.5 ≤ 2.0 mg/L Fatal if inhaled	> 0.5 ≤ 1 mg/L > 500 ≤ 2500 ppm/V > 2.0 ≤ 10 mg/L Toxic if inhaled	> 1.0 ≤ 5 mg/L > 2500 ≤ 20000 ppm/V > 10 ≤ 20 mg/L Harmful if inhaled	<b>See footnote below this table</b>
Flammable Liquids	Flash point < 23 degrees C and initial boiling point ≤ 35 degrees C. Extremely flammable liquid and vapour	Flash point < 23 degrees C and initial boiling point > 35 degrees C. Highly flammable liquid and vapour	Flash point ≥ 23 degrees C ≤ 60 degrees C. Flammable liquid and vapour	Flash point ≥ 60 degrees C ≤ 93 degrees C. Combustible liquid	<b>Not Applicable</b>

Note: Gases concentration are expressed in parts per million per volume (ppmV).

NOTE 1: Category 5 is for mixtures which are of relatively low acute toxicity but which under certain circumstances may pose a hazard to vulnerable populations. These mixtures are anticipated to have an oral or dermal LD<sub>50</sub> value in the range of 2000-5000 mg/kg bodyweight or equivalent dose for other routes of exposure. In light of animal welfare considerations, testing in animals in Category 5

ranges is discouraged and should only be considered when there is a strong likelihood that results of such testing would have a direct relevance for protecting human health.  
 NOTE 2: These values are designed to be used in the calculation of the ATE for classification of a mixture based on its ingredients and do not represent test results. The values are conservatively set at the lower end of the range of Categories 1 and 2, and at a point approximately 1/10th from the lower end of the range for Categories 3 – 5.

**GHS Category table for reference: Continued**

Study/hazard statement	Category 1	Category 2	Category 3
Eye Irritation	Effects on the cornea, iris or conjunctiva that are not expected to reverse or that have not fully reversed within 21 days. Causes severe eye damage.	2A: Effects on the cornea, iris or conjunctiva that fully reverse within 21 days. Causes severe eye irritation. 2B : Effects on the cornea, iris or conjunctiva that fully reverse within 7 days. Causes eye irritation.	Not applicable
Skin Irritation	Destruction of skin tissue, with sub categorization based on exposure of up to 3 minutes (A), 1 hour (B), or 4 hours (C). Causes severe skin burns and eye damage.	Mean value of $\geq 2.3 > 4.0$ for erythema / eschar or edema in at least 2 of 3 tested animals from gradings at 24, 48, and 72 hours (or on 3 consecutive days after onset if reactions are delayed); inflammation that persists to end of the (normally 14-day) observation period. Causes skin irritation.	Mean value of $\geq 1.5 < 2.3$ for erythema / eschar or edema in at least 2 of 3 tested animals from gradings at 24, 48, and 72 hours (or on 3 consecutive days after onset if reactions are delayed). Causes mild skin irritation.
Environment: Acute Toxicity Category	96 hr LC50 (fish) $\leq 1$ mg/L 48 hr EC50 (crustacea) $\leq 1$ mg/L, 72/96 hr ErC50 (aquatic plants) $\leq 1$ mg/L Very toxic to aquatic life	96 hr LC50 (fish) $> 1 \leq 10$ mg/L 48 hr EC50 (crustacea) $> 1 \leq 10$ mg/L 72/96 hr ErC50 (aquatic plants) $> 1 \leq 10$ mg/L Toxic to aquatic life	96 hr LC50 (fish) $> 10 \leq 100$ mg/L 48 hr EC50 (crustacea) $> 10 \leq 100$ mg/L 72/96 hr ErC50 (aquatic plants) $> 10 \leq 100$ mg/L Harmful to aquatic life
Flammable Aerosol	Extremely flammable aerosol	Flammable aerosol	Not Applicable
Flammable solids	Using the burning rate test, substances or mixtures other than metal powders: (a) wetted zone does not stop fire and (b) burning time $< 45$ seconds or burning rate $> 2.2$ mm/second Using the burning rate test, metal powders that have burning time $\leq 5$ minutes Flammable solid	Using the burning rate test, substances or mixtures other than metal powders: (a) wetted zone does not stop fire for at least 4 minutes and (b) burning time $< 45$ seconds or burning rate $> 2.2$ mm/second Using the burning rate test, metal powders that have burning time $> 5 \leq 10$ minutes Flammable solid	Not Applicable
Flammable gases	Gases, which at 20 degrees C and a standard pressure of 101.3 kPA: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit. Extremely flammable gas	Gases, other than those of category 1, which, at 20 degrees C and a standard pressure of 101.3 kPA, have a flammable range while mixed in air. Flammable gas	Not Applicable

**GHS Label: GHS02 Flame GHS 07 Warning GHS 09 Environmental Hazard**



Hazard Statements	
	H226: Flammable liquid and vapor H304: May be fatal if swallowed and enters airways [Danger Aspiration hazard] H315: Causes skin irritation H318: Causes serious eye damage [Danger Serious eye damage/eye irritation] H411: Toxic to aquatic life with long lasting effects

Precautionary Statement Prevention	<p>P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.</p> <p>P233: Keep container tightly closed.</p> <p>P240: Ground/bond container and receiving equipment.</p> <p>P241: Use explosion-proof electrical/ventilating/lighting equipment.</p> <p>P242: Use only non-sparking tools.</p> <p>P243: Take precautionary measures against static discharge.</p> <p>P264: Wash thoroughly after handling.</p> <p>P273: Avoid release to the environment.</p> <p>P280: Wear protective gloves/protective clothing/eye protection/face protection.</p> <p>P264+P265: Wash hands thoroughly after handling. Do not touch eyes.</p>
Precautionary Statement Response	<p>P301+P316 - IF SWALLOWED Get emergency medical help Immediately</p> <p>P303 +P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.</p> <p>P305+P354+P338 - Immediately rinse with water for several minutes. Remove contact lenses if present. Continue rinsing</p> <p>P317: Get emergency medical help.</p> <p>P321: Specific treatment reference to first aid instruction</p> <p>P331: Do NOT induce vomiting.</p> <p>P332+P317: If skin irritation occurs: Get medical help</p> <p>P362+P364; Take off contaminated clothing and wash it before reuse</p> <p>P370 + P378: In case of fire: Use FOAM for extinguisher.</p> <p>P302 + P352: IF ON SKIN: Wash with plenty of soap and water.</p> <p>P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present. Continue rinsing.</p>
Precautionary Statement Storage	<p>P403+P233: Store in a well-ventilated place. Keep container tightly closed.</p> <p>P405: Store locked up.</p> <p>P403+P235: Store in a well-ventilated place. Keep cool.</p>
Precautionary Statement Disposal	<p>Follow local regulation</p>

**Hazard ratings:**

NFPA HAZARD CODES	RATINGS SYSTEM
<b>HEALTH:</b> 2	0 = No Hazard
<b>FLAMMABILITY:</b> 2	1 = Slight Hazard
<b>INSTABILITY:</b> 0	2 = Moderate Hazard
	3 = Serious Hazard
	4 = Severe Hazard

**2.2 Information pertaining to particular dangers for human:**

May be harmful if inhaled. Irritating to eyes, skin and respiratory organs.

### 2.3 Information pertaining to particular dangers for the environment:

NA

### 2.4 Other adverse effects:

Flammable and Ignition possible when exposed to hot surfaces, sparks, naked flames and by electrostatic discharges too.

### Route of entry:

Those with history of lung diseases, or skin problems may be more susceptible to the effect of this material.

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	Yes	Yes	Yes	Yes

### DATA

### REFERENCE:

<https://pubchem.ncbi.nlm.nih.gov/compound/14-diethylbenzene#section=Probable-Routes-of-Human-Exposure>

### Health hazards:

Source	NTP listed?	IARC cancer review group?	OSHA Regulated?
Carcinogenicity	No	No	No

DATA REFERENCE: Toxic release inventory (TRI) basis of Occupational Safety and Health Administration (OSHA) carcinogen, National Toxicological program (NTP), International Agency for Research on Cancer (IARC),  
<https://pubchem.ncbi.nlm.nih.gov>.

## Section 3 – COMPOSITION & INFORMATION ON INGREDIENTS

Ingredients / Hazardous	CAS No.	EC No.	Percentage
1,4 – Diethyl benzene	105-05-5	203-265-2	>99.00 %

Data reference: <http://ecb.jrc.ec.europa.eu/esis/>

## Section 4 – FIRST AID MEASURES

### 4.1 General advice

#### IMMEDIATE MEDICAL ATTENTION IS REQUIRED AFTER INHALATION OR AFTER SWALLOWING.

In case of health troubles or doubts, seek medical advice immediately and show this (Material) Safety Data Sheet.

Ensure activity of vitally important functions until the arrival of the doctor (artificial respiration, inhalation of oxygen, heart massage). If patient is unconscious, or in case of danger of blackout, transport patient in a stabilized position. In case of first degree burns (painful redness), and second degree burns (painful blisters), cool the affected area with cold running water for a long time. In case of third degree burns (redness, cracking pale skin, usually without pain), do not cool affected skin, dress the area with sterile dry gauze only.

### 4.2 Inhalation

Remove patient to fresh air, keep him warm and in order to rest quietly. Avoid walking. Seek medical advice.

SYMPTOMS AND EFFECTS: irritation, headache, dizziness, weakness, stupefaction, irritant coughing, convulsions, unconsciousness, possible respiratory inhibition or arrest.

#### **4.3 Skin contact**

Immediately take off all contaminated clothing and footwear. Flush effected area with copious quantities of water. Seek medical advice.

SYMPTOMS AND EFFECTS: mild irritation.

#### **4.4 Eye contact**

Immediately flush eyes with clean lukewarm water and continue flushing for at least 15 minutes – keep the eyelids widely apart and flush thoroughly with mild water stream from the inner to the outer. Seek medical advice.

SYMPTOMS AND EFFECTS: severe irritation.

#### **4.5 Swallowing**

If patient is conscious and without convulsion, do not induce vomiting. Never give anything by mouth to an unconscious person, just put patient into a stabilized position. Seek medical advice immediately.

SYMPTOMS AND EFFECTS: nausea, vomiting, convulsions, irregular heartbeat.

### **Section 5 – FIRE FIGHTING MEASURES**

#### **5.1 Suitable extinguishing media**

Foam, Dry chemical powder, CO<sub>2</sub>.

Water in the form of spray.

#### **5.2 Extinguishing media to be avoided**

Water in the form of Jet.

#### **5.3 Caution about specific danger in case of fire and fire-fighting procedures**

Danger of violent reaction or explosion. Vapours may travel considerable far distances and cause subsequent ignition. Vapours are heavier than air, may cumulate along the ground and in enclosed spaces – danger of explosion. Do not empty into drains. When burning, it emits carbon monoxide, carbon dioxide and irritant fumes. Containers with the substance exposed to excessive heat may explode.

Keep unauthorized personnel out.

Use water as a fine spray to control fire and cool adjacent area.

#### **5.4 Special protective equipment for fire-fighters**

Wear full protective fire-resistant clothing and self-contained breathing apparatus.

### **Section 6 – ACCIDENTAL RELEASE MEASURES**

#### **6.1 Person-related safety precautions**

Wear protective clothing and equipment. Isolate hazard area. Evacuate all unauthorized personnel not participating in rescue operations from the area. Avoid entry into danger area. Remove all possible sources of ignition. Stop traffic and switch off the motors of the engines. Do not smoke and do not handle with naked flame. Use explosion-proof lamps and non-sparking tools. Avoid contact with the substance.

### **6.2 Precautions for protection of the environment**

Prevent from further leaks of substance. Dike flow of spilled material using soil or sandbags to minimize contamination of drains, surface and ground waters. If PDEB has flowed into drains, ponds or sewage systems, inform appropriate authority.

### **6.3 Recommended methods for cleaning and disposal**

Soak up residues with compatible porous material and forward for disposal in closed containers. Dispose off under valid legal waste regulations.

## **Section 7 – HANDLING AND STORAGE**

### **7.1 Information for safe handling**

Observe all fire-fighting measures (no smoking, do not handle with naked flame and remove all possible sources of ignition). Take precautionary measures against static discharges. Wear recommended personal protective equipment and observe instructions to prevent possible contact of substance with skin and eyes and inhalation. Avoid leak to environment.

### **7.2 Information for storage**

Storerooms should meet the requirements for the fire safety of constructions and electrical facilities and should be in conformity with valid regulations. Store in cool, well-ventilated place with effective exhaust, away from heat and all sources of ignition. Take precautionary measures against static discharges. Avoid leak to environment.

### **7.3 Information for specific use**

Detergent intermediate – follow bulk handling and storage procedures as noted above.

## **Section 8 – EXPOSURE CONTROL & PERSONAL PROTECTION**

### **8.1 Occupational Exposure Limits: NA**

NA: Data not available

Provide adequate ventilation when using the material and follow the principles of good occupational hygiene to control personal exposure.





### **8.2 Occupational exposure controls**

Collective protection measures: General and local ventilation, effective exhaust.

Individual protection measures: Personal protective equipment (PPE) for the protection of eyes, hands and skin corresponding with the performed labour has to be kept at disposition for the employees. In cases, where the workplace exposure control limits cannot be observed with the help of technical equipment or where it is not possible to ensure that the respiratory system exposure does not represent a health hazard for the personnel, adequate respiratory protection have to be kept at disposition. In the case of continuous use of this equipment during constant work, safety breaks have to be scheduled, if the PPE-character requires this. All PPE have to be kept in disposable state and the damaged or contaminated equipment has to be replaced immediately.



**RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT (PPE):**

HANDS			EYES	BODY		RESPIRATORY	
							

Respiratory protection: If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-face piece respirator, airline hood, or full face piece self-contained breathing apparatus.

Eye protection: Use chemical safety goggles and/or a full-face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Hand protection: Wear gloves of impervious material.

Body protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Protective coverall antistatic design recommended.

Hygiene Measures: Wash hands, forearms and face thoroughly after handling. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**8.3 Environmental exposure controls**

Proceed in accordance with valid air and water legislative regulations.

Engineering measures: If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended limits.

**Section 9 –PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	Colourless liquid
Odour	Characteristic aromatic; like benzene
Solubility in water	Slightly soluble
Relative Density (H <sub>2</sub> O=1)	0.862 @ 20 °C
Boiling Point °C	183.7 °C
Melting Point °C	-42.83°C
Relative Vapour Density (Air=1)	>1
Flash point °C	55 °C Closed cup
Auto ignition °C	430°C
Vapour pressure (mmHg) @ 25 °C	1.03
Molecular weight	134.22
Explosive limits in air % by volume	LEL 0.7% , UEL 6%
pH	NA
Viscosity cst	NA
Pour point °C	NA
Evaporation rate (water=1)	NA
Octanol/water partition coefficient log K <sub>ow</sub>	4.45
% Volatile	NA

NA: NOT AVAILABLE

DATA REFERENCE: <https://pubchem.ncbi.nlm.nih.gov>

## Section 10 –CHEMICAL STABILITY AND REACTIVITY INFORMATION

### 10.1 Conditions to avoid

Keep away from heat, & flame.

### 10.2 Material to avoid

Can react with oxidizing materials.

### 10.3 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and fumes.

**Polymerization:** Do not occur.

## Section 11 –TOXICOLOGICAL INFORMATION

### 11.1 Acute effects

Product irritates eyes and skin.

**Acute toxicity data:** NA

### 11.2 Repeated dose toxicity

Chronic effects cause mild irritation.

### 11.3 Sensitisation

May cause mild skin irritation.

**11.4 CMR effects (carcinogenicity, mutagenicity, toxicity for reproduction)** Not a CMR.

**11.5 Toxicokinetics, metabolism, distribution:** NA.

## Section 12 –ECOLOGICAL INFORMATION

**12.1 Eco toxicity data:** NA

**12.2 Mobility:** Low mobility in soil.

DATA REFERENCE: <https://pubchem.ncbi.nlm.nih.gov>

**12.3 Persistence and degradability:** NA

**12.4 Bio accumulative potential:** The potential for bio concentration in aquatic organisms is high.

DATA REFERENCE: <http://toxnet.nlm.nih.gov>

**12.5 Results of PBT assessment Persistence and Degradation:** NA **12.6**

**Other adverse effects Environmental Fate:** NA

## Section 13– DISPOSAL CONSIDERATION

**Local Legislation:** Disposal should be in accordance with applicable regional, national, and local laws and regulations. This product should not be dumped, spilled, rinsed or washed into sewers or public waterways.

### 13.1 Recommended disposal methods for the substance / preparation

Product disposal to be carried out by giving it to approved recycler in accordance with valid waste legislative regulations.

If reuse/recycle is not possible, final disposal to be carried out by giving it to approved co-processing/incineration agency.

### 13.2 Recommended disposal methods for contaminated packaging

Product is transported in tank-vehicles.

Do not drain tank-vehicle cleaning effluent into public sewer, open trench, open ground. Tank-vehicle cleaning effluent to be treated via effluent treatment plant.



### 13.3 Waste management measures that control exposure of humans and environment

Proceed in accordance with valid health, air and water legislative regulations.

### 13.4 Waste regulation

Follow local regulation.

## Section 14– TRANSPORT INFORMATION

### International Transport Regulation:

ADR/RID (Road/Rail), IMDG (Sea) and ICAO/IATA (Air) 14.1 Proper

Shipping Name: Diethylbenzene

Hazard Class: 3, Flammable Liquid

UN Number: 2049 Packaging group: III

Packaging Instructions: P001/LP01/IBC03 Portable Tank:

T2/TP1 Emergency Action Code: 3Y

14.2 Special transport precautionary measures: Not applicable.

## Section 15– REGULATORY INFORMATION

(M)SDS format on a 16 Section based on guidance provided in:

### Indian Regulation:

Manufacture, Storage and Import of Hazardous Chemicals Rule, 1989.  
The Factories Act 1948

### International Regulations:

European SDS Directive

ANSI MSDS Standard

ISO 11014-1 1994

WHMIS Requirements

### United States

Hazard Communication Standard

### Canada

Hazardous Products Act and Controlled Products Regulations

### Europe

Dangerous Substance and Preparations Directives

### Australia

National Model Regulations for the Control of Workplace Hazardous Substances

### The Globally Harmonized System of Classification and Labeling of Chemicals endorsed by The UN Economic and Social Council

\*RISK PHRASES: R10: Flammable; R36/38: Irritating to eyes and skin; R51: Toxic to aquatic organisms; R53: May cause long term adverse effects in the aquatic environment.

\*SAFETY PHRASES: S21: When using do not smoke; S22: Do not breathe dust; S23: Do not breathe vapor. S24/25: Avoid contact with skin and eyes; S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label whenever possible.); S53: Avoid exposure - obtain special instructions before use; S61: Avoid release to the environment. Refer to special instructions/safety data sheets.

\*These standard risk and safety phrases for use when interpreting (Material) Safety data Sheets are derived from the European Union Regulation, CHIP Regulations - Chemicals (Hazard Information and Packaging for Supply). They are required to be used in (Materials) Safety Data Sheets to identify potential hazards and offer safe handling advice.

**Section 16 – OTHER INFORMATION**

Training instructions

Personnel handling the product has to be acquainted demonstrably with its hazardous properties, with health and environmental protection principles related to the product and first aid principles. Tremcard details/Reference: Refer Section 14

Local bodies involved (Applicable only with in India): Local District Authority and Local Crisis Group

Sources of data used to compile the (Material) Safety Data Sheet

**Data compilation reference:** National Institute for Occupational Safety and Health guide to chemical hazards and International Chemical Safety Cards (WHO/IPCS/ILO)

<http://ecb.jrc.ec.europa.eu/esis/index.php?PGM=ein>,

<https://pubchem.ncbi.nlm.nih.gov>

(M)SDS Revision Status:

Date of Revision	Revised Sections	Supersedes
Sep. 01, 2009	Format revised	Feb. 01, 2008
Sep. 01, 2011	Section 4 (4.3)	Sep. 01, 2009
Aug. 01, 2013	Section 2 NFPA Hazard statement	Sep. 01, 2011
April 01,2016	Section 2,12,14,15	Aug. 01, 2013
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This MSDS is issued by Hazira Manufacturing Divisions, Reliance Industries Limited. Contact Details: For any enquiry/comment regarding this Material Safety Data Sheet, kindly contact the ; Hazira SSM office +91 2612835050/+912612835056

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