

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

1.1 Identification of the substance/mixture:

Commercial name: Paraxylene

Chemical name: Paraxylene C₈H₁₀

Synonyms: p-Dimethyl benzene, p-methyl toluene, p-Xylol.

1.2 Use of the substance /mixture:

Synthesis of terephthalic acid for polyester. Used as a chemical intermediate for the synthesis of 1,4-bis(chloromethyl)benzene; dimethyl terephthalate; poly-p-xylylene; terephthalic acid; 4-(tri-fluoromethyl)benzaldehyde; 4-(trifluoromethyl)benzyl alcohol; 2,5-xylylidine.

1.3 MANUFACTURER & SUPPLIER: Reliance Industries Limited

Emergency Coordination Centre contact details:

Jamnagar Mfg. Division Village Meghpar / Padana, Taluka Lalpur, Dist. Jamnagar, Gujarat	SSM Office	+ 91 288 6612400 Mobile 9998007989 + 91 288 6611190/1/6
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SSM: Site Shift Manager

Section 2 – HAZARD IDENTIFICATION

2.1 Classification of the substance/mixture: Hazard class and category code.

GHS Category:

Health	Environmental	Physical
Acute Toxicity -Inhalation– Category 4 Acute Toxicity -Oral– Category 4 Skin Irritation Category: 2	Aquatic Toxicity – Category- 2	Flammable – Category 3 flammable

NA: Not available.

GHS Category table for reference:

Study/hazard statement	Category 1	Category 2	Category 3	Category 4	Category 5
Acute Oral LD50	≤ 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 LD50	≤ 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 LC50 Gases LC50 Vapours LC50	≤ 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 ≤ 1.0 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	See footnote below this table
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	Not Applicable

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 LD50 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) ≤ 1 mg/L 48 hr EC50 (crustacea) ≤ 1 mg/L, 72/96 hr ErC50 (aquatic plants) ≤ 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 ≤ 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: Flammable Liquid, GHS07 Warning



Details of Statements:

Hazard Statements	H 226: Flammable liquid and vapour. H332: Harmful if inhaled. H312: Harmful in contact with skin. H315: Causes skin irritation.
Precautionary Statement Prevention	P102: Keep out of reach of children. P103: Read label before use. P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking. P233: Keep container tightly closed. P240: Ground/bond container and receiving equipment. P241: Use explosion proof electrical/ventilating/lighting

	<p>equipment. P243: Take precautionary measures against static charges. P261: Avoid breathing dust/fume/gas/mist/vapours/spray*. P264: Wash thoroughly after handling. P271: Use only outdoors or in a well-ventilated area.</p>
Precautionary Statement Response	<p>P101: If medical advice is needed, have product container or label at hand. P302: IF ON SKIN: P303: IF ON SKIN (or hair): P304: IF INHALED: P312: Call a POISON CENTER or doctor/physician if you feel unwell. P321: Specific treatment (see on this label). P322: Specific measures (See on this label). P340: Remove to fresh air and keep at rest in a position comfortable for breathing. P352: Wash with plenty of soap and water. P353: Rinse skin with water/shower. P361: Remove/take off immediately all contaminated clothing. P362: Take off contaminated clothing and wash before re use. P363: Wash contaminated clothing before re use. P370: In case of fire: P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P378: Use for extinction. P381: Eliminate all ignition sources if safe to do so.</p>
Precautionary Statement Storage	<p>P403: Store in well ventilated area. P235: Keep cool.</p>
Precautionary Statement Disposal	<p>Follow local regulation</p>

Hazard ratings:

NFPA HAZARD CODES	RATINGS SYSTEM
HEALTH: 2	0 = No Hazard
FLAMMABILITY: 3	1 = Slight Hazard
REACTIVITY: 0	2 = Moderate Hazard
	3 = Serious Hazard
	4 = Severe Hazard

Data Reference: <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>.

2.2 Information pertaining to particular dangers for human:

Severely irritating if inhaled. Prolonged or repeated contact may cause moderate, irritation, redness, itching, inflammation, dermatitis and possible secondary infection.

2.3 Information pertaining to particular dangers for the environment:

NA

2.4 Other adverse effects:

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 effects of this substance. 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: <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>.

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), <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>.

Section 3 – COMPOSITION & INFORMATION ON INGREDIENTS

Ingredients / Hazardous	CAS No.	EC No.	Percentage
Paraxylene	106-42-3	203-396-5	99.70%

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.

4.2 Inhalation

No fumes/dust.

4.3 Skin contact

Immediately take off all contaminated clothing and footwear. Flush effected area with copious quantities of lukewarm water and soap or with another suitable cleaning agent. 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, immediately try to 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, powder, CO₂.
Cool containers with water spray.

5.2 Extinguishing media to be avoided

Water.

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.

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

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. Apply recommended full protective personal equipment. When escaping from the contaminated area, wear mask with cartridge against organic vapours. In case of general average, evacuate personnel from danger area.

6.2 Precautions for protection of the environment

Prevent from further leaks of substance.

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. Store in tightly closed container. Do not store together with oxidizing agents.

Take precautionary measures against static discharges. Avoid leak to environment.

7.3 Information for specific use

Not applicable.

Section 8 – EXPOSURE CONTROL & PERSONAL PROTECTION

8.1 Occupational Exposure Limits:

Material	Source	Type	ppm	mg/m3	Notation
Paraxylene	ACGIH	TWA	NA		
	ACGIH	STEL	NA		
	NIOSH	IDLH	900		
	ACGIH	SKIN_DES TWA	NA		
	OSHA	TWA	100	435	
	OSHA	STEL	150		

NA: Data not available

DATA REFERENCE: National Institute for Occupational Safety and Health guide to chemical hazards and International Chemical Safety Cards (WHO/IPCS/ILO) and <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>.

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

Recommended determination method in the work place atmosphere: gas chromatography, detector tube.

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. protective mask with canister A (brown coloured, protecting against organic vapours), 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, impervious when handling big amounts (nitrile rubber), sealed leather footwear (free from synthetic adhesives)

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: Use only with adequate ventilation. 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. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Liquid, colourless or light yellow
Odour	Aromatic odour
Solubility in water	Negligible in cold water
Relative Density (H ₂ O=1)	0.861 @ 20°C
Boiling Point °C	138.35 °C
Melting Point °C	13.2°C
Relative Vapour Density (Air=1)	3.7
Flash point °C	25°C Closed cup
Auto ignition °C	528 °C
Vapour pressure (mmHg) @ 25 °C	8.84
Molecular weight	106.16
Explosive limits in air % by volume	LEL 1.1% UEL 7.0%
pH	NA
Viscosity cP @20 °C	0.648
Pour point	NA
Evaporation rate	9.9 (ether=1)
Octanol/water partition coefficient log K _{ow}	3.15
% volatile	NA

NA: NOT AVAILABLE

DATA REFERENCE: National Institute for Occupational Safety and Health guide to chemical hazards and International Chemical Safety Cards (WHO/IPCS/ILO) and <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>: "http://ptcl.chem.ox.ac.uk/"

Section 10 – CHEMICAL STABILITY AND REACTIVITY INFORMATION

10.1 Conditions to avoid

Prolonged exposure of containers or tank cars to heat or fire may cause the material to expand with possible container rupture

10.2 Material to avoid

Very dangerous fire hazard when exposed to oxidizers

10.3 Hazardous decomposition products

Thermal decomposition generates carbon monoxide and carbon dioxide.

Polymerization: Polymerization occurs if heated in sunlight or presence of air; reaction is exothermic.

Section 11 – TOXICOLOGICAL INFORMATION

11.1 Acute effects

Product irritates eyes and skin. High vapour concentrations irritate respiratory system and eyes and may lead to fast coma and death

Acute toxicity data:

Parameter	Route	Species	Values	Exposure period
LD50	Oral	Rat	4300 mg/Kg	Not applicable
LD50	Oral	Mouse	1590 mg/Kg	Not applicable

Data Reference: "<http://ptcl.chem.ox.ac.uk/>", <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>.

11.2 Repeated dose toxicity

Chronic effects cause irritation

11.3 Sensitisation

May cause skin irritation.

11.4 CMR effects (carcinogenicity, mutagenicity, toxicity for reproduction)

Not a carcinogen

11.5 Toxicokinetics, metabolism, distribution

Not applicable.

Section 12 – ECOLOGICAL INFORMATION

12.1 Ecotoxicity data:

Parameter	Route	Species	Values	Exposure period
LC50	Inhalation	Shrimp	2.0 ppm	96 hours

Data not established

12.3 Persistence and degradability: Substance is biodegradable

12.4 Bioaccumulative potential: NA.

12.5 Results of PBT assessment Persistence and Degradation: NA

12.6 Other adverse effects

Environmental Fate: In air, xylenes degrade by reacting with photochemically produced hydroxyl radicals. In soil it will volatilize and reach into groundwater. Vapour-phase xylene is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; ambient levels of xylene are detected in the atmosphere due to large emissions of this compound.

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 reuse or disposal in accordance with valid waste legislative regulations.

13.2 Recommended disposal methods for contaminated packaging

Product is transported in tank vehicles.

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: Paraxylene
Hazard Class: 3, Flammable Liquid
UN Number: UN1307
PACKING GROUP: III
Emergency Action Code: 3YE



14.2 Special transport precautionary measures

Not applicable.

Section 15– REGULATORY INFORMATION

MSDS 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, R20 Harmful by inhalation, R21 Harmful in contact with skin, R38 Irritating to skin.

*SAFETY PHRASES: S2 Keep out of the reach of children, S9 Keep container in a well-ventilated place, S16 Keep away from sources of ignition, S24 Avoid contact with skin, S25 Avoid contact with eyes, S29 Do not empty into drains.

*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 (With in India Only): Additional District Magistrate 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) and <http://toxnet.nlm.nih.gov/cgi-bin/sis/search>, <http://webnet3.oecd.org/eChemPortal/Results2.aspx?SubstanceId=169630>, <http://ecb.jrc.ec.europa.eu/esis/index.php?PGM=ein>, <http://www.cdc.gov/niosh/npg/npgd0049.html>

Revised sections: 1 to 16

This MSDS is issued by the Centre for HSE Excellence, Reliance Industries Limited

Contact Details: For any enquiry/comment regarding this Material Safety Data Sheet, kindly contact the Centre for HSE Excellence at HSE.ExcellenceCentre@ril.com

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