

MATERIAL SAFETY DATA SHEET

6PPD Pastel

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

Product Name:	6PPD Pst
Chemical Name	N-1,3-dimethylbutyl-N'-phenyl-p-phenylenediamine
Use of the substance/preparation	Production of tyres and general rubber goods Antioxidant use in fuel - refineries Antioxidant use in SBR polymer Antioxidant use in acrylate
Supplier	Castle Chemicals Ltd, Peak House 6 Oxford Road, Altrincham, Cheshire WA14 2DY Tel: +44 161 608 8800 Fax: +44 161 608 1910 Email: info@castlechemicals.com

2. HAZARD IDENTIFICATION

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]	
Classification:	SKIN SENSITIZATION - SKIN Category 1 ACUTE TOXICITY: ORAL - ORAL Category 4 AQUATIC TOXICITY (ACUTE) - Category 1 AQUATIC TOXICITY (CHRONIC) - Category 1
Hazard statements (code):	H302 Harmful if swallowed. H317 May cause an allergic skin reaction. H410 Very toxic to aquatic life with long lasting effects.
Classification according to Directive 67/548/EEC [DSD]/ EU Dangerous Preparations Directive 1999/45/EC.	
Classification:	Xn Harmful R22 Harmful if swallowed. R43 May cause sensitization by skin contact. N Dangerous for the environment. R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Signal word:	Warning
Hazard statements:	H302 Harmful if swallowed.

	H317 May cause an allergic skin reaction. H410 Very toxic to aquatic life with long lasting effects.
Precautionary statements Prevention:	P261 Avoid breathing dust/fume/gas/mist/vapors/spray. P273 Avoid release to the environment. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Disposal	P501 Dispose of contents and container in accordance with all local, regional, national and international regulations.
Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII:	No. Not fulfilling PBT criteria.
Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	No. Not fulfilling vPvB criteria.
Other hazards which do not result in classification	None

3. COMPOSITION INFORMATION ON INGREDIENTS

Substance	Mono-constituent substance	
Product/ingredient/constituent Identifiers	N-1,3-dimethylbutyl-N'-phenyl- p-phenylenediamine EC:212-344-0 CAS : 793-24-8	
%	97 - 100	
Classification	67/548/EEC Regulation (EC) No. 1272/2008 [CLP]	Xn; R22 Xi; R43 N; R50/53 Acute Tox., 4, Skin Sens., 1, Aquatic Acute, 1, Aquatic toxicity (chronic), 1,
Type	[1] Substance classified with a health or environmental hazard	

4. FIRST AID MEASURES

General	Get medical attention if adverse health effects persist or are severe.
Inhalation	Move exposed person to fresh air. Keep person warm and at rest. 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. 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. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Ingestion	Wash out mouth with water. Move exposed person to

fresh air. Keep person warm and at rest. 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. 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.

Skin contact

Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. If splashed by molten material, cool quickly with water and seek medical aid : do not pull off from skin.

Eye contact

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Remove contact lenses, if present and easy to do. Continue rinsing. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.

Most important symptoms / effects, acute and delayed
Potential acute health effects

Eye contact

No known significant effects or critical hazards.

Inhalation

No known significant effects or critical hazards.

Skin contact

May cause skin sensitization.

Ingestion

Harmful if swallowed.

Indication of immediate medical attention and special treatment needed, if necessary

Protection of first-aiders

Get medical attention if adverse health effects persist or are severe.

Notes to physician

In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments

Not available.

5. FIREFIGHTING MEASURES

Suitable Extinguishing media
Special hazards arising from the substance or mixture

Use dry chemical powder, CO₂, Water spray, foam

No specific fire or explosion hazard. Emits toxic fumes under fire conditions. Decomposition products may include the following materials: carbon oxides nitrogen oxides

Advice for firefighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without

suitable training. This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

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

For non-emergency personnel	See Section 8 for information on appropriate personal protective equipment.
For emergency responders	See Section 8 for information on appropriate personal protective equipment.
Environmental precautions	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
Methods and materials for containment and cleaning up	
Containment techniques:	Small spill : Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Large spill : Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Stop leak if without risk. 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.
Methods for cleaning up	Clear spills immediately. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. See Section 13 for additional waste treatment information.
Other information	None.
Reference to other sections	Note: see section 8 for personal protective equipment and section 13 for waste disposal.

7. HANDLING AND STORAGE

Precautions for safe handling	
Recommendations	Put on appropriate personal protective equipment. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid release to the environment. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Avoid dust generation. Take precautionary measures against electrostatic discharges.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.

Conditions for safe storage, including any incompatibilities
Storage

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. 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 unlabeled containers. Use appropriate containment to avoid environmental contamination. Packaging materials Recommended: Use original container.

Specific end use(s)

Recommendations

See Exposure Scenario.

Exposure Scenario information

See Exposure Scenario.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredient name

Occupational exposure limits

N-1,3-dimethylbutyl-N'-phenyl-p-phenylenediamine

OSHA PEL Notes: For dust or mist of substances with special limit values, those values apply. Limit values for inert dust: 8-hour Occupational exposure limit 4 mg/m³ Form: respirable dust 8-hour Occupational exposure limit 10 mg/m³ Form: inhalable dust

DNELs

N-1,3-Dimethylbutyl-N'-Phenyl-1,4-Phenylenediamine

Exposure	Value	Population	Effects
Short term Dermal	8 mg/kg bw/day	Workers	Systemic
Short term inhalation	56.8 mg/m.	Workers	Systemic
Long term Dermal	1 mg/kg bw/day	Workers	Systemic
Long term inhalation	7.1 mg/m.	Workers	Systemic
Short term Dermal	4 mg/kg bw/day	General population	Systemic
Short term inhalation	13.6 mg/m.	General population	Systemic
Short term Oral	4 mg/kg bw/day	General population	Systemic
Short term Dermal	0.5 mg/kg bw/day	General population	Systemic
Long term inhalation	1.7 mg/m.	General population	Systemic
Long term Oral	0.5 mg/kg bw/day	General population	Systemic

PNECs N-1,3-Dimethylbutyl-N'-Phenyl-1,4-Phenylenediamine

Compartment Detail	Value	Method Detail
Fresh water	0.37 .g/l	Assessment Factors
Marine	0.037 .g/l	Assessment Factors
Fresh water, intermittent	0.28 .g/l	Assessment Factors
Fresh water sediment	0.21 mg/kg dwt	Equilibrium Partitioning
Marine water sediment	0.021 mg/kg dwt	Equilibrium Partitioning
Soil	41.8 .g/kg dwt	Equilibrium Partitioning
Sewage Treatment Plant	4.2 mg/l	Assessment Factors

Exposure controls	Processes and activities covered by the exposure scenario
Appropriate engineering controls	If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances. No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure below any recommended or statutory limits.
Individual protection measures	
Hand protection	No special protection is required.
Eye protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
Skin protection	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.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	
Color	Dark brown
Physical state	Pastilles
Odor	Faint odor.
Odor threshold	Not available.
PH	7 [Conc. (% w/w): 10 g/l]
Melting/freezing point	49.2 °C @ 1,013 hPa
Initial boiling point/boiling range	163 - 165 °C @ 1.33 hPa
Flash point	Closed cup: 202.5 °C @ 1,013 hPa
Evaporation rate	Not available.
Flammability (solid, gas)	Non-flammable in the presence of the following materials or conditions: contact with water
Upper/lower flammability or explosive limits	Lower: Not available Upper: Not available
Vapor pressure	0.0000066 hPa [25 °C]
Vapor density	Not applicable.
Relative density	0.995 g/cm ³ @ 50 °C bulk density

Solubility(ies)	Water solubility: 1 mg/l @ 50 °C Soluble in most organic solvents.
Partition coefficient: n- octanol/water	4.68
Auto-ignition temperature	Not applicable
Decomposition temperature	Not available.
Viscosity	Dynamic: Not available Kinematic: Not available
Explosive properties	Not applicable.
Oxidizing properties	Not applicable
Other information	Not available.

10. STABILITY AND REACTIVITY

Reactivity	Emits toxic fumes when heated.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	Decomposition temperature > 200 °C Take precautionary measures against static discharges.
Incompatible materials	Strong oxidising agents.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity

Product/ingredient name

N-1,3-dimethylbutyl-N'-phenyl- p-phenylenediamine

Result	Species	Dose	Method
LD50 Oral	Rat	893 mg/kg	OECD 401
LD50 Dermal	Rabbit	> 7,940 mg/kg	Other

Conclusion/Summary Harmful if swallowed.

Irritation/Corrosion

Product/ingredient name

N-1,3-dimethylbutyl-N'-phenyl -p- phenylenediamine

Result	Species	Score	Exposure	Observation
skin – Edema	Rabbit	0	72 h	Non-irritating (EU).
eyes -Erythema/Eschar	Rabbit	20.6	24 h	Fully reversible in 7 days or less

Conclusion/Summary

skin
eyes

Non-irritating to the skin (rabbit)
Slightly irritating to eyes but not sufficient for classification (rabbit).

Respiratory

Not available.

Sensitizer
Product/ingredient name
N-1,3-dimethylbutyl-N'-phenyl-p- phenylenediamine

Roue of exposure	Species	Result
skin	Guinea pig	Sensitizing

Conclusion/Summary
skin Produced dermal sensitization (guinea pigs).
Respiratory Not available.

Mutagenicity
Product/ingredient name
N-1,3-dimethylbutyl-N'-phenyl-p- phenylenediamine

Test	Experiment	Result
OECD 471	In vitro; -	Negative
OECD 473	In vivo; -	Negative
OECD 476	In vitro; -	Negative
OECD 482	In vitro; -	Negative
Chromosome Aberration Test	In vivo; -	Negative

Conclusion/Summary Not sufficient for classification.

Carcinogenicity
Product/ingredient name
N-1,3-dimethylbutyl-N'-phenyl-p- phenylenediamine

Result	Species	Dose	Exposure
Negative – Oral	Rat	1000 ppm The highest achievable concentration in this study.	24 months Oral - feed

Conclusion/Summary Not sufficient for classification.

Teratogenicity
Product/ingredient name
N-1,3-dimethylbutyl-N'-phenyl-p- phenylenediamine

Result	Species	Dose	Exposure
Negative – Oral	Rat	250 mg/kg	Oral – gavage

Conclusion/Summary No known significant effects or critical hazards.

Reproductive toxicity
Product/ingredient name
N-1,3-dimethylbutyl-N'- phenyl-p-phenylenediamine

Maternal toxicity	Fertility	Development toxin	Species	Dose	Exposure
25 mg/kg	Negative	-	Rat	Oral: 100 mg/kg	Oral - gavage

Conclusion/Summary Not sufficient for classification.

Specific target organ toxicity (single exposure)

Product/ingredient name

Category Route of exposure Target organs

Conclusion/Summary Not sufficient for classification.

Other information Not fulfilling criteria - EU - Substances of very high concern - CMR

12. ECOLOGICAL INFORMATION

Toxicity

Product/ingredient name

N-1,3-dimethylbutyl-N'- phenyl-p-phenylenediamine

Result	Species	Exposure	Method
Acute LC50 0.028 mg/l Fresh water	Fish - <i>Oryzias latipes</i> Medaka, high-eyes	96 h	OECD 203
Acute EC50 0.23 mg/l	Aquatic invertebrates. - 5Water flea (<i>Daphnia magna</i>)	48 h	OECD 202
Acute EC50 0.69 mg/l	Aquatic invertebrates. - 5Water flea (<i>Daphnia magna</i>)	48 h	OECD 202
Acute EC50 2.6 mg/l Fresh water	Aquatic plants – Green algae	72 h	OECD 201
Acute EC10 0.23 mg/l Fresh water	Aquatic plants – Green algae	72 h	OECD 201
Acute NOEC 0.23 mg/l Fresh water	Aquatic plants – Green algae	72 h	OECD 201
Chronic EC50 420 mg/l	Micro-organism - Activated sludge	3 h	OECD 209
Chronic NOEC 0.0037 mg/l Fresh water	Fish - <i>Oryzias latipes</i> Medaka, high-eyes	41.0 d	OECD 210
Chronic NOEC 0.0028 mg/l	Aquatic invertebrates. - 5Water flea (<i>Daphnia magna</i>)	21 d	OECD 211
Conclusion/Summary	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.		

Persistence and degradability

Product/ingredient name

N-1,3-dimethylbutyl-N'-phenyl-p-phenylenediamine

Aquatic half-life	Photolysis (Half-life)	Biodegradability
Fresh water 0.33 d	0.07 d	Not readily biodegradable.

Bioaccumulative potential
Product/ingredient name
N-1,3-dimethylbutyl-N'-phenyl-p-phenylenediamine

	LogPow	BCF	Bioaccumulative potential
	4.77		
N-phenyl-p-benzoquinine monoimine		1.2 – 23	low

Mobility in soil
Soil/water partition coefficient (KOC) 4.68
Mobility Low potential for volatilization from surface water.

Results of PBT and vPvB assessment
PBT P: No.
B: No.
T: No.
vPvB vP: No.
vB: No.
Other adverse effects None known.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods
Disposal methods The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

14. TRANSPORT INFORMATION

UN number	
ADR/RID	UN3077
ADN/ADNR	UN3077
IMDG	UN3077
IATA	UN3077

UN proper shipping name	
ADR/RID	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., molten (N-1,3-dimethylbutyl-N'-phenyl-p-phenylenediamine)
ADN/ADNR	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., molten (N-1,3-dimethylbutyl-N'-phenyl-p-phenylenediamine)

IMDG	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., molten (N-1,3-dimethylbutyl-N'-phenyl- p-phenylenediamine)
IATA	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., molten (N-1,3-dimethylbutyl-N'-phenyl- p-phenylenediamine)
Transport hazard class(es)	
ADR/RID	Class 9: Miscellaneous hazardous material.
ADN/ADNR	Class 9: Miscellaneous hazardous material.
IMDG	Class 9: Miscellaneous hazardous material.
IATA	Class 9: Miscellaneous hazardous material.
Packing group	
ADR/RID	III
ADN/ADNR	III
IMDG	III
IATA	III
Environmental hazards	
ADR/RID	Yes
ADN/ADNR	Yes
IMDG	Yes
IATA	Yes
Special precautions for user	
ADR/RID	Not available.
ADN/ADNR	Not available.
IMDG	Not available.
IATA	Not available.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not available.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

Other EU regulations

Integrated pollution prevention and control list (IPPC) – Air	Not listed
Integrated pollution prevention and control list (IPPC) – Water	Not listed
Aerosol dispensers	Not applicable.
Directive 96/82/CE – SEVESO	Qualifying quantity (Art. 6 & 7) is: 100,000 kg Qualifying quantity (Art. 9) is: 200,000 kg

National regulations

Chemical Safety Assessment	Completed.
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16. OTHER INFORMATION

Abbreviations and acronyms

- ATE = Acute Toxicity Estimate
- CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
- DNEL = Derived No Effect Level
- EUH statement = CLP-specific Hazard statement
- PNEC = Predicted No Effect Concentration
- RRN = REACH Registration Number
- LOAEL = Lowest observed adverse effect level
- NOEL = No Observed Effect Level
- LC50 = Median lethal concentration
- EC50 = Half maximal effective concentration
- LD50 = Median lethal dose
- dwt = dry weight
- OECD = Organisation for Economic Co-operation and Development
- PEL = Permissible Exposure Limit

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