

Safety Data Sheet acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

1 Identification

- **Product identifier**
- **Trade name:** 6-PPD
- **Synonym**
N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine
N1-(1,3-dimethylbutyl)-N4-phenyl-1,4-benzenediamine
Antioxidant 4020
- **CAS Number:**
793-24-8
- **Other means of identification**
- **Article number:** 38246
- **EC number:**
212-344-0
- **Application of the substance / the mixture**
This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Cayman Chemical Co.
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
USA
- **Information department:** Product safety department
- **Emergency telephone number:**
During normal opening times: +1 (734) 971-3335
US/CANADA: 800-424-9300
Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS08 Health hazard

Reproductive toxicity 1B

H360

May damage fertility or the unborn child.

Specific target organ toxicity (repeated exposure) 2 H373

May cause damage to organs through prolonged or repeated exposure.



GHS09 Environment

Aquatic Acute 1

H400

Very toxic to aquatic life.

Aquatic Chronic 1

H410

Very toxic to aquatic life with long lasting effects.

(Contd. on page 2)

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 1)



GHS07

Acute toxicity - oral 4

Skin irritation 2

Eye irritation 2A

Sensitization - skin 1

Specific target organ toxicity (single exposure) 3

H302

Harmful if swallowed.

H315

Causes skin irritation.

H319

Causes serious eye irritation.

H317

May cause an allergic skin reaction.

H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

Label elements

GHS label elements

The substance is classified and labeled according to the Globally Harmonized System (GHS).

Hazard pictograms



GHS07



GHS08



GHS09

Signal word Danger

Hazard statements

H302 Harmful if swallowed.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H317 May cause an allergic skin reaction.

H360 May damage fertility or the unborn child.

H335-H336 May cause respiratory irritation. May cause drowsiness or dizziness.

H373 May cause damage to organs through prolonged or repeated exposure.

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P264 Wash thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P272 Contaminated work clothing must not be allowed out of the workplace.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P301+P312 If swallowed: Call a poison center/doctor if you feel unwell.

P330 Rinse mouth.

P302+P352 If on skin: Wash with plenty of water.

P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308+P313 IF exposed or concerned: Get medical advice/attention.

P321 Specific treatment (see on this label).

P314 Get medical advice/attention if you feel unwell.

P362+P364 Take off contaminated clothing and wash it before reuse.

P333+P313 If skin irritation or rash occurs: Get medical advice/attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

(Contd. on page 3)

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 2)

P391 Collect spillage.
 P403+P233 Store in a well-ventilated place. Keep container tightly closed.
 P405 Store locked up.
 P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- **Information pertaining to particular dangers for man and environment:**
- **Classification system:**
- **NFPA ratings (scale 0 - 4)**



Health = 2
 Fire = 1
 Reactivity = 0

- **HMIS-ratings (scale 0 - 4)**



Health = *2
 Fire = 1
 Reactivity = 0

- **Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Classification according to (d)(1)(ii) of § 1910.1200**
 The SDS issuer does not object to the classifications provided by importers or manufacturers of precursor products.
- **Hazards not otherwise classified**
 There are no adverse physical or health effects known that are not covered by the hazard classes of the Hazard Communications Standard.

3 Composition/information on ingredients

- **Chemical characterization: Substances**
- **CAS No. Description**
 793-24-8 6-PPD
- **Identification number(s)**
- **EC number:** 212-344-0

4 First-aid measures

- **Description of first aid measures**
- **General information:**
 Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:**
 Supply fresh air and to be sure call for a doctor.
 In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:**
 Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** Immediately call a doctor.
- **Most important symptoms and effects, both acute and delayed**
 No further relevant information available.

(Contd. on page 4)

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 3)

- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
Use fire fighting measures that suit the environment.
A solid water stream may be inefficient.
- **Special hazards arising from the substance or mixture** No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures** Not required.
- **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Dispose contaminated material as waste according to section 13.
- **Protective Action Criteria for Chemicals**
- **PAC-1:** Substance is not listed.
- **PAC-2:** Substance is not listed.
- **PAC-3:** Substance is not listed.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Precautions for safe handling**
No special precautions are necessary if used correctly.
Avoid breathing dust/fume/gas/mist/vapours/spray.
Avoid prolonged or repeated exposure.
Keep away from sources of ignition.
Take precautionary measures against static discharge.re.
- **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:** Store in accordance with information listed on the product insert.
- **Requirements to be met by storerooms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Control parameters**
- **Components with limit values that require monitoring at the workplace:** Not required.

(Contd. on page 5)

US

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 4)

- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Appropriate engineering controls** No further data; see section 7.
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
- **Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
- **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

- **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Physical state** Solid
- **Color:** Not determined.
- **Odor:** Characteristic
- **Structural Formula** C₁₈H₂₄N₂
- **Molecular Weight** 268.4 g/mol
- **Storage Buffer**
- **Odor threshold:** Not determined.
- **Formulation**
- **Melting point/Melting range:** 50 °C (122 °F)
- **Boiling point/Boiling range:** 260 °C (500 °F)
- **Flammability:** Product is not flammable.

(Contd. on page 6)

-US-

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 5)

- **Explosion limits:**
- **Lower:** Not determined.
- **Upper:** Not determined.
- **Flash point:** 204 °C (399.2 °F)
- **Decomposition temperature:** Not determined.
- **pH-value:** Not applicable.
- **Viscosity:**
- **Kinematic:** Not applicable.
- **SOLUBILITY** DMF: 25 mg/ml; DMSO: 10 mg/ml; Ethanol: 25 mg/ml
- **Dynamic:** Not applicable.
- **Solubility in / Miscibility with**
- **Water:** Not determined.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Vapor pressure:** Not applicable.
- **Vapor pressure:**
- **Density at 20 °C (68 °F):** 1.02 g/cm³ (8.5119 lbs/gal)
- **Relative density** Not determined.
- **Vapor density** Not applicable.
- **Particle characteristics** Not determined.
- **Other information**
- **Appearance:**
- **Form:** Solid
- **Important information on protection of health and environment, and on safety.**
- **Ignition temperature:** Not determined.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Change in condition**
- **Evaporation rate** Not applicable.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **RTECS Number** ST0900000
- **Information on toxicological effects**
- **Acute toxicity:**

· LD/LC50 values that are relevant for classification:

Oral	LD50	271 mg/kg (rat)
Inhalative	LC50	>200 mg/m ³ /6H (rat)

(Contd. on page 7)

-US-

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 6)

- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Irritating effect.
- **Sensitization:** Sensitization possible through skin contact.
- **Additional toxicological information:**
- **Interactive effects** No interactive effects between components are known.
- **Carcinogenic categories**
- **IARC (International Agency for Research on Cancer)** Substance is not listed.
- **NTP (National Toxicology Program)** Substance is not listed.
- **OSHA-Ca (Occupational Safety & Health Administration)** Substance is not listed.
- **Alternative sources for toxicological information**
- No non-standard sources for toxicological information where used.

12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects**
- **Remark:** Very toxic for fish
- **Additional ecological information:**
- **General notes:**
- Water hazard class 3 (Assessment by list): extremely hazardous for water
- Do not allow product to reach ground water, water course or sewage system, even in small quantities.
- Danger to drinking water if even extremely small quantities leak into the ground.
- Also poisonous for fish and plankton in water bodies.
- Very toxic for aquatic organisms

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
- Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- **UN-Number**
- **DOT, IMDG, IATA** UN3077

(Contd. on page 8)

US

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 7)

- UN proper shipping name
- DOT, IATA

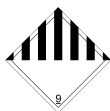
Environmentally hazardous substance, solid, n.o.s. (6-PPD)

- IMDG

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (6-PPD)

- Transport hazard class(es)

- DOT



- Class
- Label

9 Miscellaneous dangerous substances and articles
9

- IMDG, IATA



- Class
- Label

9 Miscellaneous dangerous substances and articles
9

- Packing group
- DOT, IMDG, IATA

III

- Environmental hazards:
- Marine pollutant:
- Special marking (IATA):

Symbol (fish and tree)
Symbol (fish and tree)

- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

- Transport/Additional information:

- DOT
- Quantity limitations

On passenger aircraft/rail: 400 kg
On cargo aircraft only: 400 kg

- IMDG
- Limited quantities (LQ)
- Excepted quantities (EQ)

5 kg
Code: E1
Maximum net quantity per inner packaging: 30 g
Maximum net quantity per outer packaging: 1000 g

- IATA
- Remarks:

When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

- Special precautions for user

Warning: Miscellaneous dangerous substances and articles

- Hazard identification number (Kemler code): 90

(Contd. on page 9)

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 8)

· EMS Number:	F-A,S-F
· Stowage Category	A
· Stowage Code	SW23 When transported in BK3 bulk container, see 7.6.2.12 and 7.7.3.9.
· UN "Model Regulation":	UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (6-PPD), 9, III

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.
- **Sara**
- **Section 355 (extremely hazardous substances):** Substance is not listed.
- **Section 313 (Specific toxic chemical listings):** Substance is not listed.
- **TSCA (Toxic Substances Control Act):** ACTIVE
- **Hazardous Air Pollutants** Substance is not listed.
- **Chemicals known to cause cancer:** Substance is not listed.
- **Chemicals known to cause reproductive toxicity for females:** Substance is not listed.
- **Chemicals known to cause reproductive toxicity for males:** Substance is not listed.
- **Chemicals known to cause developmental toxicity:** Substance is not listed.
- **Carcinogenic categories**
- **EPA (Environmental Protection Agency)** Substance is not listed.
- **TLV (Threshold Limit Value)** Substance is not listed.
- **NIOSH-Ca (National Institute for Occupational Safety and Health)** Substance is not listed.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

- **Department issuing SDS:** Environment protection department.
- **Contact:** -
- **Date of previous version** 03/23/2023
- **Date of preparation** 11/25/2025
- **Abbreviations and acronyms:**
 IMDG: International Maritime Code for Dangerous Goods
 DOT: US Department of Transportation
 IATA: International Air Transport Association
 EINECS: European Inventory of Existing Commercial Chemical Substances
 CAS: Chemical Abstracts Service (division of the American Chemical Society)
 NFPA: National Fire Protection Association (USA)
 HMIS: Hazardous Materials Identification System (USA)
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent
 PBT: Persistent, Bioaccumulative and Toxic
 vPvB: very Persistent and very Bioaccumulative
 NIOSH: National Institute for Occupational Safety

(Contd. on page 10)

Safety Data Sheet

acc. to OSHA HCS

Date of issue: 11/25/2025

Revision date 11/25/2025

Trade name: 6-PPD

(Contd. from page 9)

OSHA: Occupational Safety & Health

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

Acute toxicity - oral 4: Acute toxicity – Category 4

Skin irritation 2: Skin corrosion/irritation – Category 2

Eye irritation 2A: Serious eye damage/eye irritation – Category 2A

Sensitization - skin 1: Skin sensitisation – Category 1

Reproductive toxicity 1B: Reproductive toxicity – Category 1B

Specific target organ toxicity (single exposure) 3: Specific target organ toxicity (single exposure) – Category 3

Specific target organ toxicity (repeated exposure) 2: Specific target organ toxicity (repeated exposure) – Category 2

Aquatic Acute 1: Hazardous to the aquatic environment - acute aquatic hazard – Category 1

Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1

· *** Data compared to the previous version altered.**

US