# GPS Safety Summary
## p-phenylenediamine

Reference number: AIL-GPS-133 Issue date: 26/06/2025 Version: 1.0 **CL-4: PUBLIC**

## 1. General Statements

p-phenylenediamine is a white to slightly purple crystalline solid. It is a combustible substance, poorly flammable.Soluble in water.Acute or chronic health hazards result from the substance.The substance is hazardous to the aquatic environment.

## 2. Chemical identification.

Name :p-phenylenediamine
CAS number(s) :106-50-3
EC number :203-404-7
Molecular formula :C6H8N2
Structure :


## 3. Uses and Benefits

p-phenylenediamine is a key ingredient in many permanent hair dye formulations. It is used as a precursor to azo dyes for coloring fabrics and leather.

## 4. Physical / chemical properties

| Property | Value |
|---|---|
| Physical state : | Solid |
| Colour : | Colourless to white On exposure to air: red-brown |
| Odour : | Mild odour Characteristic odour |
| pH : | 9 at 20 °C |
| Melting point : | 142.0°C |
| Boiling point : | 274.0°C |
| Flash point : | 156 °C Closed cup |
| Density : | 1.135 g/cm3 |
| Solubility in Water: | Moderately soluble in water. |

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## 5. Health Effects

| Effect Assessment | Result |
|---|---|
| **Acute toxicity (Oral / inhalation / dermal )** | Toxic if swallowed, in contact with skin or if inhaled |
| **Irritation / corrosion<br>Skin / eye/ respiratory tract** | Causes serious eye irritation |
| **Respiratory or skin sensitisation** | May cause an allergic skin reaction |
| **Toxicity after repeated exposure<br>Oral / inhalation / dermal** | Causes damage to organs. |
| **Genotoxicity / Mutagenicity** | NA |
| **Carcinogenicity** | NA |
| **Toxicity for reproduction** | NA |

## 6. Environmental Effects

| Effect Assessment | Result |
|---|---|
| **Aquatic toxicity** | Yes |
| **Fate and behavior** | **Result** |
| **Persistence and degradability** | Non degradable in the soil. Not readily biodegradable in water. |
| **Bioaccumulative potential** | Not bioaccumulative. |

## 7. Exposure

**Human health**

p-Phenylenediamine (PPDA) is a hazardous chemical that poses several health risks upon exposure. It is toxic if swallowed, inhaled, or if it comes into contact with the skin. Exposure to PPD can lead to serious eye irritation and may also cause allergic skin reactions, particularly in individuals who are sensitive or repeatedly exposed. Prolonged or repeated exposure can result in damage to internal organs, making it essential to handle this substance with care.The exposure must be kept as minimum as possible by the use of appropriate risk management measures suitable collective and personal protective equipment, good industrial hygiene practices and risk communication through appropriate training of workers.Careless handling or accidental spillage of the chemical could result in exposure to potential hazardous levels of chemicals.Industrial workers should ensure that they follow the advice found in the extended safety data sheet (SDS).

**Environment:**

Care should be taken to avoid releases of these products to sewage, drainage systems and water bodies. Spillage shall be quickly collected in the event of an accidental release. More information about release measures and accidental release measures are available in the extended safety data sheet.

## 8. Risk Management Recommendations

### Human health measures.

| | | |
|---|---|---|
| **Organizational** | A basic standard of occupational hygiene is recommended. Ensure operatives are well informed of the hazards and trained to minimise exposures. Ensure regular inspection and maintenance of equipment and machines. Handle and store according to the indications of the Safety Data Sheet. | |
| **Protection** | Eye protection : | Safety glasses |
| | Skin and body protection: | Wear suitable protective clothing |
| | Respiratory protection: | [In case of inadequate ventilation] wear respiratory protection. |
| **Engineering controls** | Ensure good ventilation of the work station. | |
| **Environment protective measures** | | |
| Avoid release to the environment | | |

## 9. First-aid measures

**First-aid measures after inhalation :** Remove the person to fresh air and keep them comfortable for breathing. Take medical advice.

**First-aid measures after skin contact :** Wash skin with plenty of water. Remove/Take off immediately all contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention.

**First-aid measures after eye contact :** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

**First-aid measures after ingestion :**Rinse mouth. Call a physician immediately.

**Extinguishing media**
**Suitable extinguishing media :** Water spray. Dry powder. Foam.

**Unsuitable extinguishing media :** Quick-acting BC powder extinguisher. Quick-acting CO2 extinguisher.

**Special hazards arising from the substance or mixture**

**Hazardous decomposition products in case of fire :** On burning: release of toxic and corrosive gases/vapours (nitrous vapours, carbon monoxide -

**Precautionary measures fire :** Exposure to fire/heat: keep upwind. Exposure to fire/heat: consider evacuation. Exposure to fire/heat: have neighbourhood close doors and windows.

**Firefighting instructions :** Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection.

## 11. Accidental release measures

**Protective equipment :** Protective gloves. Wear recommended personal protective equipment.Gloves (EN 374). Face shield (EN 166). Protective clothing (EN 14605 or EN 13034). Dust cloud production: self-contained breathing apparatus (EN 136 + EN 137). Dust cloud production: dust-tight suit (EN 13982).

**Environmental precautions :** Avoid release to the environment.

**For containment :** Collect spillage.

## 12. Disposal consideration

**Regional legislation (waste)** : Disposal must be done according to official regulations.

**Waste treatment methods** : Dispose of contents/container in accordance with licensed collector's sorting instructions.

**Sewage disposal recommendations** : Disposal must be done according to official regulations.

## 13. Handling and storage

**Precautions for safe handling :**Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Wear personal protective equipment. Use only outdoors or in a well-ventilated area.

**Hygiene measures :**Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

## 14. Classification and Labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Danger

Hazard statements (GHS US) : H301+H311+H331 - Toxic if swallowed, in contact with skin or if inhaled
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H370 - Causes damage to organs.
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects

| | | |
|---|---|---|
| Precautionary statements (GHS US) | : | P260 - Do not breathe dust, fume, gas, mist, spray, vapors.<br>P264 - Wash hands, forearms and face thoroughly after handling.<br>P270 - Do not eat, drink or smoke when using this product.<br>P271 - Use only outdoors or in a well-ventilated area.<br>P272 - Contaminated work clothing must not be allowed out of the workplace.<br>P273 - Avoid release to the environment.<br>P280 - Wear protective clothing, eye and face protection, protective gloves.<br>P301+P310 - If swallowed: Immediately call a POISON CENTER, a doctor.<br>P302+P352 - If on skin: Wash with plenty of water.<br>P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.<br>P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.<br>P308+P311 - If exposed or concerned: Call a poison center or doctor.<br>P311 - Call a POISON CENTER, a doctor.<br>P312 - Call a POISON CENTER, a doctor if you feel unwell.<br>P321 - Specific treatment (see supplemental first aid instruction on this label).<br>P330 - Rinse mouth.<br>P333+P313 - If skin irritation or rash occurs: Get medical advice or attention.<br>P337+P313 - If eye irritation persists: Get medical advice or attention.<br>P361+P364 - Take off immediately all contaminated clothing and wash it before reuse.<br>P362+P364 - Take off contaminated clothing and wash it before reuse.<br>P391 - Collect spillage.<br>P403+P233 - Store in a well-ventilated place. Keep container tightly closed.<br>P405 - Store locked up.<br>P501 - Dispose of hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulations. |

## 15. Conclusion

p-Phenylenediamine (PPDA) is a white to slightly purple crystalline solid used primarily in the production of permanent hair dyes and as a precursor in the synthesis of azo dyes for textiles and leather. While it offers significant benefits in these industries, its use comes with serious health and environmental hazards. PPD is toxic if swallowed, inhaled, or absorbed through the skin, and it can cause severe eye irritation and allergic skin reactions. Repeated or prolonged exposure may result in organ damage. Therefore, strict occupational hygiene and the use of appropriate personal protective equipment (PPE) are essential to minimize exposure.From an environmental perspective, PPDA is hazardous to aquatic life and is not readily biodegradable, raising concerns about its persistence in the environment. Spillages must be handled immediately and prevented from entering water systems. Disposal should always follow regional regulatory guidelines.

## 16. Contact Information within company

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information, consult the appropriate Safety Data Sheet (SDS) prior to use of the material named herein.