## 1 Identification

**Product identifier**

**Product name: p-Phenylenediamine**

**Stock number:** A15680, L02688
**CAS Number:**
106-50-3
**EC number:**
203-404-7
**Index number:**
612-028-00-6
**Relevant identified uses of the substance or mixture and uses advised against.**
**Identified use:** SU24 Scientific research and development

**Details of the supplier of the safety data sheet**
**Manufacturer/Supplier:**
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com
**Information Department:** Health, Safety and Environmental Department
**Emergency telephone number:**
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

## 2 Hazard(s) identification

**Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)**


GHS06 Skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed.
Acute Tox. 3 H311 Toxic in contact with skin.
Acute Tox. 3 H331 Toxic if inhaled.


GHS07

Eye Irrit. 2A H319 Causes serious eye irritation.
Skin Sens. 1 H317 May cause an allergic skin reaction.
**Hazards not otherwise classified** No information known.

**Label elements**
**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
**Hazard pictograms**


GHS06

**Signal word** Danger
**Hazard statements**
H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
**Precautionary statements**
P261 Avoid breathing dust/fume/gas/mist/vapors/spray
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
**WHMIS classification**
D1B - Toxic material causing immediate and serious toxic effects
D2B - Toxic material causing other toxic effects

**Classification system**
**HMIS ratings (scale 0-4)**
**(Hazardous Materials Identification System)**

Health (acute effects) = 2
Flammability = 1
Physical Hazard = 1

**Other hazards**
**Results of PBT and vPvB assessment**
**PBT:** Not applicable.
**vPvB:** Not applicable.

## 3 Composition/information on ingredients

**Chemical characterization: Substances**
**CAS# Description:**
106-50-3 p-Phenylenediamine
**Concentration:** ≤100%

(Contd. on page 2)

**Product name: p-Phenylenediamine**

(Contd. of page 1)

**Identification number(s):**
**EC number:** 203-404-7
**Index number:** 612-028-00-6

## 4 First-aid measures

**Description of first aid measures**
**General information**
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.
**After inhalation**
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
**After skin contact**
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
**After eye contact** Rinse opened eye for several minutes under running water. Then consult a doctor.
**After swallowing** Do not induce vomiting; immediately call for medical help.
**Information for doctor**
**Most important symptoms and effects, both acute and delayed**
Toxic in contact with skin.
Causes serious eye irritation.
Toxic if inhaled.
Toxic if swallowed.
May cause an allergic skin reaction.
**Indication of any immediate medical attention and special treatment needed** No further relevant information available.

## 5 Fire-fighting measures

**Extinguishing media**
**Suitable extinguishing agents** Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
**Special hazards arising from the substance or mixture**
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)
**Advice for firefighters**
**Protective equipment:**
Wear self-contained respirator.
Wear fully protective impervious suit.

## 6 Accidental release measures

**Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
**Environmental precautions:** Do not allow material to be released to the environment without proper governmental permits.
**Methods and material for containment and cleaning up:**
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.
**Prevention of secondary hazards:** No special measures required.
**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.
**Protective Action Criteria for Chemicals**
**PAC-1:** 0.3 mg/m3
**PAC-2:** 6.8 mg/m3
**PAC-3:** 41 mg/m3

## 7 Handling and storage

**Handling**
**Precautions for safe handling**
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Open and handle container with care.
**Information about protection against explosions and fires:** No information known.

**Conditions for safe storage, including any incompatibilities**
**Storage**
**Requirements to be met by storerooms and receptacles:** No special requirements.
**Information about storage in one common storage facility:** Store away from oxidizing agents.
**Further information about storage conditions:**
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
**Specific end use(s)** No further relevant information available.

## 8 Exposure controls/personal protection

**Additional information about design of technical systems:**
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

**Control parameters**

| **Components with limit values that require monitoring at the workplace:** | |
|---|---|
| **106-50-3 p-Phenylenediamine (100.0%)** | |
| PEL (USA) | Long-term value: 0.1 mg/m³<br>Skin |
| REL (USA) | Long-term value: 0.1 mg/m³<br>Skin |
| TLV (USA) | Long-term value: 0.1 mg/m³ |

(Contd. on page 3)

(Contd. of page 2)

| | |
|---|---|
| EL (Canada) | Long-term value: 0.1 mg/m³<br>S |
| EV (Canada) | Long-term value: 0.1 mg/m³<br>Skin |

**Additional information:** No data

**Exposure controls**
**Personal protective equipment**
**General protective and hygienic measures**
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.
**Breathing equipment:** Use self-contained respiratory protective device in emergency situations.
**Recommended filter device for short term use:**
Use a respirator with type P100 (USA) or P3 (EN 143) cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards.
**Protection of hands:**
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
**Material of gloves** Nitrile rubber, NBR
**Penetration time of glove material (in minutes)** 480

**Glove thickness:** 0.11 mm
**Eye protection:** Safety glasses with side shields / NIOSH (US) or EN 166(EU)
**Body protection:** Protective work clothing.

## 9 Physical and chemical properties

**Information on basic physical and chemical properties**
**General Information**
**Appearance:**

| | |
|---|---|
| **Form:** | Crystalline |
| **Odor:** | Weak |
| **Odor threshold:** | Not determined. |
| **pH-value:** | Not applicable. |
| **Change in condition** | |
| **Melting point/Melting range:** | 138-142 °C (280-288 °F) |
| **Boiling point/Boiling range:** | 267-271 °C (513-520 °F) |
| **Sublimation temperature / start:** | Not determined |
| **Flash point:** | 156 °C (313 °F) |
| **Flammability (solid, gaseous)** | Not determined. |
| **Ignition temperature:** | 620 °C (1148 °F) |
| **Decomposition temperature:** | Not determined |
| **Auto igniting:** | Not determined. |
| **Danger of explosion:** | Product does not present an explosion hazard. |
| **Explosion limits:** | |
| **Lower:** | 1.3 Vol % |
| **Upper:** | 9.8 Vol % |
| **Vapor pressure at 100 °C (212 °F):** | 1.4 hPa (1 mm Hg) |
| **Density:** | Not determined |
| **Relative density** | Not determined. |
| **Vapor density** | Not applicable. |
| **Evaporation rate** | Not applicable. |
| **Solubility in / Miscibility with** | |
| **Water at 25 °C (77 °F):** | 47 g/l |
| **Partition coefficient (n-octanol/water):** | Not determined. |
| **Viscosity:** | |
| **dynamic:** | Not applicable. |
| **kinematic:** | Not applicable. |
| **Other information** | No further relevant information available. |

## 10 Stability and reactivity

**Reactivity** No information known.
**Chemical stability** Stable under recommended storage conditions.
**Thermal decomposition / conditions to be avoided:** Decomposition will not occur if used and stored according to specifications.
**Possibility of hazardous reactions** Reacts with strong oxidizing agents
**Conditions to avoid** No further relevant information available.
**Incompatible materials:** Oxidizing agents
**Hazardous decomposition products:**
Carbon monoxide and carbon dioxide
Nitrogen oxides
Possibly Hydrogen cyanide (HCN)

## 11 Toxicological information

**Information on toxicological effects**
**Acute toxicity:**
Toxic in contact with skin.
Toxic if inhaled.
Toxic if swallowed.
Danger through skin absorption.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.

(Contd. on page 4)

**Product name: p-Phenylenediamine**

(Contd. of page 3)

**LD/LC50 values that are relevant for classification:**

| | | |
|---|---|---|
| Oral | LD50 | 80 mg/kg (rat) |
| Inhalative | LC50/4H | 920 mg/m3/4H (rat) |

**Skin irritation or corrosion:** Irritant to skin and mucous membranes.
**Eye irritation or corrosion:** Irritating effect.
**Sensitization:** May cause an allergic skin reaction.
**Germ cell mutagenicity:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.
**Carcinogenicity:**
IARC-3: Not classifiable as to carcinogenicity to humans.
ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this substance.

**Reproductive toxicity:** No effects known.

**Specific target organ system toxicity - repeated exposure:** No effects known.

**Specific target organ system toxicity - single exposure:** No effects known.

**Aspiration hazard:** No effects known.
**Subacute to chronic toxicity:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

## 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.
**Ecotoxical effects:**
**Remark:** Very toxic for aquatic organisms
**Additional ecological information:**
**General notes:**
Do not allow material to be released to the environment without proper governmental permits.
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.
May cause long lasting harmful effects to aquatic life.
Avoid transfer into the environment.
Very toxic for aquatic organisms
**Results of PBT and vPvB assessment**
**PBT:** Not applicable.
**vPvB:** Not applicable.
**Other adverse effects** No further relevant information available.

## 13 Disposal considerations

**Waste treatment methods**
**Recommendation** Consult state, local or national regulations to ensure proper disposal.
**Uncleaned packagings:**
**Recommendation:** Disposal must be made according to official regulations.

## 14 Transport information

| | |
|---|---|
| **UN-Number** | |
| **DOT, IMDG, IATA** | UN1673 |
| **UN proper shipping name** | |
| **DOT** | Phenylenediamines |
| **ADR** | 1673 Phenylenediamines |
| **IMDG, IATA** | PHENYLENEDIAMINES |
| **Transport hazard class(es)** | |
| **DOT** | |
|  | |
| **Class** | 6.1 Toxic substances |
| **Label** | 6.1 |
| **ADR** | |
|  | |
| **Class** | 6.1 (T2) Toxic substances |
| **Label** | 6.1 |
| **IMDG, IATA** | |
|  | |
| **Class** | 6.1 Toxic substances |
| **Label** | 6.1 |
| **Packing group** | |
| **DOT, ADR, IMDG, IATA** | III |
| **Environmental hazards:** | |
| **Marine pollutant (IMDG):** | No |
| **Special precautions for user** | Warning: Toxic substances |
| **EMS Number:** | F-A,S-A |
| **Stowage Category** | A |

(Contd. on page 5)

**Product name: p-Phenylenediamine**

(Contd. of page 4)

**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: 100 kg<br>On cargo aircraft only: 200 kg |
| **Marine Pollutant (DOT):** | No |

**IMDG**

| | |
|---|---|
| **Limited quantities (LQ)** | 5 kg |
| **Excepted quantities (EQ)** | Code: E1<br>Maximum net quantity per inner packaging: 30 g<br>Maximum net quantity per outer packaging: 1000 g |
| **UN "Model Regulation":** | UN 1673 PHENYLENEDIAMINES, 6.1, III |

## 15 Regulatory information

**Safety, health and environmental regulations/legislation specific for the substance or mixture**
**GHS label elements** The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
**Hazard pictograms**

GHS06

**Signal word** Danger
**Hazard statements**
H301+H311+H331 Toxic if swallowed, in contact with skin or if inhaled.
H319 Causes serious eye irritation.
H317 May cause an allergic skin reaction.
**Precautionary statements**
P261 Avoid breathing dust/fume/gas/mist/vapors/spray
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.
**National regulations**
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

**SARA Section 313 (specific toxic chemical listings)**

| | |
|---|---|
| 106-50-3 | p-Phenylenediamine |

**California Proposition 65**
**Prop 65 - Chemicals known to cause cancer** Substance is not listed.
**Prop 65 - Developmental toxicity** Substance is not listed.
**Prop 65 - Developmental toxicity, female** Substance is not listed.
**Prop 65 - Developmental toxicity, male** Substance is not listed.
**Information about limitation of use:** For use only by technically qualified individuals.
**Other regulations, limitations and prohibitive regulations**
**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.** Substance is not listed.
**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**
Substance is not listed.
**Annex XIV of the REACH Regulations (requiring Authorisation for use)** Substance is not listed.
**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department
**Date of preparation/Revision:** Print date, revision date and version number are in the header of each page.
**Abbreviations and acronyms:**
RID: Réglement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
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)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
Acute Tox. 3: Acute toxicity – Category 3
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Skin Sens. 1: Skin sensitisation – Category 1