

MATERIAL SAFETY DATA SHEET

According to Regulation (EC) No 1972/2008 (CLP)

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1 Identification of the substance or preparation

Identification on the label / trade name: KUMANOX 13

Additional identification: Not available

REACH Registration No: 01-2119485839-15-****

1.2 Use of substance/preparation

1.2.1 Identified uses: Antioxidant for tire, belt, insulated wire, industrial product
Prevents products from crack due to ozone and sunlight

1.2.2 Uses advised against: Not available

1.3 Company/undertaking identification

Supplier (manufacturer/importer/downstream user/distributor):

Kumho Petrochemical

E-Mail (competent person):

Information contact:

Production Technology Team / Yeosu Specialty Chemical Plant

National contact

#356, Hwachi-Dong, Yeosu-City, Cheonnam 555-280, Korea

1.4 Emergency telephone : +82-61-688-3932 (9:00-18:00 M-F)

2. HAZARDS IDENTIFICATION

2.1 Classification

2.1.1 Classification according to Regulation (EC) No 1272/2008:

Hazard Category

Acute oral: Category 4

Skin Sensitizer: Category 1

Acute Aquatic Hazard: Category 1

Chronic Aquatic Hazard: Category 1

Hazard symbols



Signal word

- WARNING

Hazard statement

- H302 Harmful if swallowed
- H317 May cause an allergic skin reaction
- H400 Very toxic to aquatic life
- H410 Very toxic to aquatic life with long lasting effects

Precautionary statement

1) Prevention

- Wash hand thoroughly after handling.
- Do not eat, drink or smoke when using this product.
- Avoid breathing dust/fume/gas/mist/vapours/spray.
- Contaminated work clothing should not be allowed out of the workplace.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Avoid release to the environment.

2) Response

- IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- Rinse mouth.
- IF ON SKIN: Wash with plenty of soap and water.
- If skin irritation or rash occurs: Get medical advice/attention.
- Wash contaminated clothing before reuse.
- Collect spillage.

3) Storage

- Not available

4) Disposal

- Dispose of contents/container in accordance with local/regional/national/international regulation

2.1.2 Classification according to EU Directive 67/548/EEC:

Classification; Xn; R22Harmful

R43;

N; R50/53 Dangerous for the environment

Symbols



2.2 Information pertaining to special dangers for human and environment:

Adverse physicochemical effects:

Not available

Adverse human health effects and symptoms:

May cause allergic skin reaction.

Hot material causes thermal burns to eyes and skin.

Accidental ingestion of the material may be damaging to the health of the individual.

The substance and/or its metabolites may bind to hemoglobin inhibiting normal uptake of oxygen. This condition, known as "methaemoglobinemia", is a form of oxygen starvation (anoxia). Symptoms include cyanosis (a bluish discoloration skin and mucous membranes) and breathing difficulties.

Dermal contact and inhalation are expected to be the primary routes of occupational to KUMMANOX 13 antiozont. Repeated contact with this material may cause allergic skin reaction in expected to produce significant adverse human health effects when safety precautions recommended to minimize exposure are followed.

Adverse environmental effects:

Very toxic to aquatic life.

Very toxic to aquatic life with long lasting effects.

Other adverse hazards:

Not available

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Preparation related information

Description: This substance is identified as a hazardous chemical under the criteria of the EU REGULATION (EC) No 1272/2008

3.2 Hazard ingredients

Chemical name	CAS No.	EC No.	REACH Registration No.	Value (%)	Classification according to directive 67/548/EEC		Classification according to regulation (EC) No 1272/2008 [CLP] Classification
					Hazards Characteristics	R-Phrases	
N-(1,3-Dimethylbutyl)-N'-phenyl-1,4-phenylene diamine	793-24-8	212-344-0	01-211948583 9-15-****	98.5%	N; Xi	R22, R43, R50/53	Acute oral: Cat. 4 Skin Sensitizer: Cat. 1 Acute Aquatic Hazard: Cat 1 Chronic Aquatic Hazard: Cat 1
Others	-	-	-	~1.5	-	-	-

3.3 Additional information:

Identification of PBT / vPvB substances / mixtures: No data available

4. FIRST AID MEASURES

4.1 General information:

Do not breathe dust.
Avoid contact with skin.
To clean the floor and all objects contaminated by this material, use water and detergent.
This material and its container must be disposed of in a safe way.
If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre.
Use appropriate container to avoid environmental contamination.
Avoid release to the environment. Refer to special instructions/Safety data sheets.
This material and its container must be disposed of as hazardous waste.

4.2 In case of inhalation:

If fumes or combustion products are inhaled remove from contaminated area.
Other measures are usually unnecessary.

4.3 In case of skin contact:

Immediately wash with soap and plenty of water.
If splashed by molten material, cool skin quickly with water, use first aid for burns and call a physician.

4.4 In case of eye contact:

Immediately flush with plenty of water.
Remove contaminated clothing.
Wash clothing before reuse.

4.5 In case of ingestion:

If swallowed do NOT induce vomiting.
If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
Observe the patient carefully.
Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
Seek medical advice.

4.6 Self-protection of the first aider:

IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

Call a POISON CENTER or doctor/physician if you feel unwell.
If skin irritation or rash occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.

4.7 Information to physician:

Symptoms and Treatment:

Initial attention should be directed at oxygen delivery and assisted ventilation if necessary. Hyperbaric oxygen has not demonstrated substantial benefits.

Hypotension should respond to Trendelenburg's position and intravenous fluids; otherwise dopamine may be needed.

Symptomatic patients with methaemoglobin levels over 30% should receive methylene blue. (Cyanosis, alone, is not an indication for treatment). The usual dose is 1-2 mg/kg of a 1% solution (10 mg/ml) IV over 50 minutes; repeat, using the same dose, if symptoms of hypoxia fail to subside within 1 hour.

Thorough cleansing of the entire contaminated area of the body, including the scalp and nails, is of utmost importance.

5. FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Water spray, foam, dry chemical, carbon dioxide or any Class B extinguishing agent.

5.2 Extinguishing media which must not be used for safety reasons:

There is no restriction on the type of extinguisher which may be used.

5.3 Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases:

If strongly heated, this material may catch fire and release toxic fumes of nitrogen oxides and carbon monoxide.

5.4 Special protective equipment for fire-fighters:

Firefighters and others exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus.

Equipment should be thoroughly decontaminated after use.

5.5 Additional information:

Use water spray to keep exposed containers cool.

Move containers from fire area if you can do it without risk.

Do not scatter spilled material with high pressure water streams.

Dike fire-control water for later disposal.

Some may burn but none ignite readily.

Containers may explode when heated.

Some may be transported hot.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions:

Refer to protective measures listed in sections 7 and 8.
Use personal protective equipments.

6.2 Environmental precautions:

Do not discharge into the drains/surface waters/groundwater. Do not discharge into the subsoil/soil

6.3 Methods for cleaning up:

MINOR SPILLS

Clean up all spills immediately. Avoid contact with skin and eyes. Control personal contact by using protective equipment. Use dry clean up procedures and avoid generating dust.

MAJOR SPILLS

Advise personnel in area. If flakes or pastilles, vacuum or sweep up material and place into dry, clean, covered containers. If liquid, absorb on sand, earth or sawdust and shovel into containers. Contaminated area should be washed. Keep this material out of sewers, watersheds and waterways.

7. HANDLING AND STORAGE

7.1 HANDLING

Advices on safe handling:

Protective measures:

When using this substance: (a) avoid breathing the substance; (b) avoid ingestion; (c) use respiratory protection when in dust or mist form. Wear chemical goggles, resistant gloves and protective clothing to prevent contact.

Technical measures:

Measures to prevent aerosol and dust generation:

Use in a well ventilated area. Avoid contact with incompatible materials. Keep containers securely sealed when not in use. Avoid physical damage to containers.
Provide appropriate exhaust ventilation at places where dust is formed.

Measures required to protect the environment:

Avoid release to the environment. Use appropriate container to avoid environmental contamination. Prevent, by any means available, spillage from entering drains or water courses.

Specific requirements or handling rules:

When handling, does not eat, drink or smoke. Wash hands thoroughly with soap and water after handling. Avoid contact with eyes and skin, and avoid breathing dust or vapors.

Precautions against fire and explosion:

Use spark-proof tools and explosion proof equipment.

7.2 Storage

Technical measures and storage conditions:

Store in original containers.

Keep containers securely sealed.

Store in a cool, dry area protected from environmental extremes.

Store away from incompatible materials and foodstuff containers.

Protect containers against physical damage and check regularly for leaks.

Packaging materials:

Use a nitrogen blanket when bulk storage time at maximum temperature is greater than one month.

Requirements for storage rooms and vessels:

Store in a cool, dry area protected from environmental extremes.

Hints on storage assembly:

Storage class: Not available

Further information on storage conditions:

Observe manufacturer's storing and handling recommendations. Keep out of sewers and waterways.

7.3 Specific uses:

Recommendations:

Keep container closed. Do NOT store above 65 deg C. for prolonged periods to avoid oxidation and thus loss of activity. In sealed drums KUMANOX 13 antiozonant has excellent storage stability at storage temperatures below 35 °C/95F.

Storage area should be dry and protected from excessive heat and excessive exposure to air, to prevent degradation. Keep partially used containers closed. Shelf life is dependent on the temperature of storage and extent of exposure to air.

Industrial sector specific solutions:

Not available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure limit values

Occupational exposure limits:

Although OSHA and ACGIH have not established specific exposure limits for this material, they have established the following limits for nuisance dusts:

OSHA PEL/8-hour Time-weighted average: Total 15mg/m³, Respirable 5mg/m³

ACGIH TLV/8-hour Time-weighted average: Total 10mg/m³, Respirable 5mg/m³

Biological limit values: Not available

8.2 Exposure controls

8.2.1 Occupational exposure controls:

The use of local exhaust ventilation is usually required. If risk of overexposure exists, wear an approved respirator. Respiratory protection - For most conditions, no respiratory protection should be needed ; however, in dusty atmospheres or insufficient ventilation. Wear a suitable respiratory equipment or NIOSH//OSHA approved respirator to protect from dust. Provide adequate ventilation on warehouse or closed storage area. Use explosion proof ventilation equipment.

Product related measures to prevent exposure:

To be provide after registration

Instructual measures to prevent exposure:

To be provide after registration

Organisational measures to prevent exposure:

To be provide after registration

Personal protection equipment:

Respiratory protection:

Under conditions of frequent use or heavy exposure, Respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use. Use appropriate NIOSH-certified respirators. Comply with OHSA respiratory protection requirements.

Hand protection:

Wear appropriate protective gloves that provide a barrier. Consult glove manufacturer to determine appropriate type glove for given application. Wash thoroughly after handling.

Eye protection:

KUMANOX 13 antiozonant causes only slight eye irritation. No special protection is required. Avoid eye contact as good industrial practice.

Body protection:

Wear appropriate protective clothing to prevent skin contact. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse.

8.2.2 Environmental exposure controls:

Do not allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

Product related measures to prevent exposure:

To be provide after registration

Instructual measures to prevent exposure:

To be provide after registration

Organisational measures to prevent exposure:

To be provide after registration

Technical measures to prevent exposure:

Follow local, state and national regulations for aqueous emissions.(refer to section 15)

8.2.3 Consumer exposure control

Measures related to consumer uses of the substance (as such or in preparations):

To be provide after registration

Measures related to the service life of the substance in articles:

To be provide after registration

8.3. DNEL, PNEC, OEL, EQS and DMEL

Worker DNEL acute/short-term systemic dermal: $1 \text{ mg/kg bw/day} \times 8 = 8 \text{ mg/kg bw/day}$

Worker DNEL acute/short-term systemic inhalation: $7.1 \text{ mg/m}^3 \times 8 = 56.8 \text{ mg/m}^3$.

Worker DNEL long-term for oral route-systemic: 1 mg/kg bw/day

Worker DNEL long-term for dermal route-systemic: 1 mg/kg bw/day

Worker DNEL long-term for inhalation route-systemic: 7.1 mg/m^3

9. PHYSICAL AND CHEMICAL PROPERTIES

However, some conclusions can be drawn from toxicity studies with acute and repeated application: The appearance of systemic toxicity after oral and dermal exposure shows the principal bioavailability of 6PPD via these routes.

Biomonitoring of workers in the rubber industry detected 6PPD in urine thereby demonstrating that the substance can be resorbed from the respiratory tract and possibly after dermal contact (Rimatori and Castellino, 1989).

11.2 Acute effects (toxicity tests)

	Effect dose	Species	Method	Remark
Acute oral toxicity	LD50:500-1000 mg/kg	rats	OECD TG 401	-
Acute dermal toxicity	LD50 >3000 mg/kg	rabbits	-	-
Acute inhalative toxicity	Not available	-	-	-

Specific symptoms in animal studies:

In case of ingestion : The oral LD50 values in rats were 893 mg/kg bw for females and 1005 mg/kg bw for males. Signs of intoxication were hypoactivity, diarrhea, bradypnea, hypothermia and a prone position accompanied by pathological lesions in digestive organs and respiratory system.

In case of skin contact: In view of possible vehicle effects on the observed irritant action and further limitations of the study of Herve-Bazin et al. (1977) the assessment of skin irritation is based on the first two studies (Randall and Bannister, 1990; Younger, 1962) that studied the irritant effect of pure 6PPD. These studies gave evidence of a very low skin irritating potential of 6PPD.

In case of inhalation: Not available

In case of eye contact: 6PPD was slightly irritating to the eye.

Irritant and corrosive effects:

	Exposure time	Species	Evaluation	Method	Remark
Primary irritation to the skin:	24 hours	rabbits	Not irritant	Draize method	-
Irritation to eyes	24 hours	rabbits	slightly irritating	Draize method	-

Irritation to respiratory tract:

Not available

Sensitization

In case of skin contact: 6PPD was found to induce dermal sensitization in guinea pigs.

(Herve-Bazin et al., 1977).

In case of inhalation: Not available

Repeated dose toxicity (sub-acute, sub-chronic, chronic)

	Effect dose	Exposure time period	Species	Method	Evaluation	Remark
Chronic oral	NOAEL : 6 mg/kg bw/day LOAEL : 25 mg/kg bw/day	28 to 48 days	Rats	-	the liver (increase of weight, fatty and vacuolar degeneration) and the blood cells (anemia, lymphocytopenia, and thrombocytosis).	-
Chronic dermal	Not available	-	-	-	-	-
Chronic inhalation	Not available	-	-	-	-	-

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction).

Carcinogenicity: The underlying insufficiently documented studies with long-term application of 6PPD gave no indication for a carcinogenic potential of 6PPD in rats.

in-vitro Mutagenicity: 6PPD showed no mutagenic activity in bacterial and in mammalian cell test systems in vitro.

in-vivo Mutagenicity: Not available

Genotoxicity: Cytogenetic assay, Sprague-Dawley rat,

- MORTALITY: 1,300 mg/kg bw: males 1/1 on day 2, females 1/1 on day 3
1,790 mg/kg bw: males 1/1 on day 2, females 1/1 on day 2
negative

Toxicity for reproduction: In rats, up to oral doses of 100 mg/kg bw/day no impairment of reproductive performance was observed and there are no indications for teratogenic or developmental effects up to oral doses of 250 mg/kg bw/day (highest dose tested).

Exposure during the gestation period demonstrated the absence of a developmental or teratogenic potential and of maternal toxicity in rabbits for doses up to 30 mg/kg bw/day (highest dose tested).

Summarized evaluation of the CMR properties:

6PPD showed no CMR properties

11.3 Experiences made in practice : Not available

11.4 General remarks: Not available

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Aquatic toxicity	Effect dose	Exposure time	Species	Method	Evaluation	Remark
Acute fish toxicity	LC50 : 0.028 mg/l	96h	Oryzias latipe		effective	
Acute daphnia toxicity	EC50 : 0.23 mg/l	48h	Daphnia magna		effective	
Acute algae toxicity	EC50 : 0.6 mg/l	96h	Selenastrum capricornutum			

Predicted No Effect (PNEC) Concentrations;

	Value	Assessment factor	Remarks/Justification
PNEC aqua (freshwater)			
PNEC aqua-freshwater (mg/L)	0.000371	50	According to the Guidance Document R.10 (ECHA, 2008) an assessment factor of 50 applies to the lowest of two long term results covering two trophic levels as the results have been generated covering that level showing the lowest effective concentrations in the short-term tests. The PNECaqua (freshwater) is based on the 30-d NOEC of 0.0037 mg/L as the chronic toxicitx to fish was shown to be the most sensitive endpoint.
PNEC aqua - marine water (mg/L)	0.0000371	500	In the absence of any data on saltwater species, the PNECaqua (marine) was derived on the basis effects towards freshwater species. According to the Guidance Document R.10 (ECHA, 2008), an assessment factor of 500 applies to the lowest of two long term results covering two trophic levels as the results have been generated covering those trophic levels showing the lowest effective concentrations in the short-term tests with these species.
PNEC aqua - intermittent releases (mg/L)	0.00028	100	According to the Guidance Document R.10, an assessment factor of 100 applies to the most sensitive short-term test of three trophic levels. The calculation of PNEC aqua (intermittent releases) is based on the EC50(96 h) of 0.028 mg/L as the acute toxicity to fish was shown to be the most sensitive endpoint.
PNEC aqua (TWP)			
PNEC aqua - freshwater	0.0233	1000	According to the Guidance Document R.10 (ECHA, 2008) an assessment factor of 1000

(mg/L)			applies to the lowest of three acute studies with tyre wear particles covering three trophic levels. The PNECaqua (TWP) is based on the 48-h EC50 of 23.3 mg/L (expressed in 6PPD equivalents).
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12.2 Mobility

Known or predicted distribution to environmental compartments:

Results Compartment	Calculated distribution
Air	0.8 %
Water	2.2 %
Soil	94.7 %
Sediment	2.1 %
Susp. Sediment	0.1 %
Fish	< 0.1 %

PNEC

	Value	Assessment factor	Remarks/Justification
PNEC sediment			
PNEC sediment (mg/kg d.w.)	0.21	-	In the absence of any ecotoxicological data for sediment dwelling organisms, a provisional PNEC sediment is derived by calculations based on the equilibrium partitioning method in accordance to TGD (EU, 2003) and REACH guidance document R16 (2008). A Koc of 5623, a Henrys Law constant of 0.00034 Pa m ³ /mole, and the PNEC water of 0.37 µg/l were used for calculation. Based on wet weight, the PNEC sediment is 0.0457 mg/kg.
PNEC marine sediment (mg/kg d.w.)	0.021	-	In the absence of any ecotoxicological data for sediment dwelling organisms, a provisional PNEC sediment is derived by calculations based on the equilibrium partitioning method in accordance to TGD (EU, 2003) and REACH guidance document R16 (2008). A Koc of 5623, a Henrys Law constant of 0.00034 Pa m ³ /mole, and the PNEC marine water of 0.037µg/l were used for calculation. Based on wet weight, the PNEC sediment is 0.0457 mg/kg.
PNEC sediments (TWP)			
PNEC Sediment(TWA) (mg/kg d.w.)	2.87	1000	In the absence of any ecotoxicological data for sediment dwelling organisms, a provisional PNEC sediment (TWP) is derived by

			calculations based on the equilibrium partitioning method in accordance to TGD (EU, 2003) and REACH guidance document R16 (2008). A Koc of 5623, a Henrys Law constant of 0.00034 Pa m ³ /mole, and the PNEC aqua (TWP) of 0.0233 mg/l were used for calculation.
PNEC sewage treatment plant			
PNEC stp (mg/L)	4.2	100	

12.3 Persistence and degradability

Inoculum	Procedure	Result
Activated sludge, non-adapted	OECD TG 301C	Biodegradation within 28 d BOD ca. 2 % 6PPD removal (HPLC) ca. 92 % degradation products identified p-hydroxydiphenylamine, phenylbenzoquinone imine, 1,3-dimethylbutylamine aniline, p-benzoquinone
non adapted mixed microbial inoculum	Modified MITI I test according to OECD TG 301C	13 -40 % mineralization within 28 d, 10 d window was not fulfilled
Activated sludge, adapted	shake flask test comparable to an US EPA 40 CFR	7 % mineralization
Mississippi river water (= biologically active river water) (controls with sterile river water and with deionized water)	River die-away assay	During 2 h (22 h), the concentration of 6PPD decreased by 57 % (97 %) in the active river water, by 30 % (96 %) in the sterile river water, and by 12 % (88 %) in the deionized water. The estimated half-lives are 2.9 h in active river water, 3.9 h in sterile river water, and 6.8 h in sterile deionized water.

Adsorption/desorption

Due to the rapid hydrolysis of the original substance, the adsorption/desorption coefficient was determined for the main hydrolysis product.

In accordance with REACH Annex XI, the study does not need to be conducted as the substance is hydrolytically unstable (half-life is 8 h).

A calculated value for 6PPD is in the range of 3.8 to 4.8. 6PPD is hydrolytically unstable (half-life 8h at 26°C). The main hydrolysis product is 4-hydroxydiphenylamine. The estimated LogKoc values for 4-hydroxydiphenylamine, using different accepted calculation methods are in the range of 2.6 to 3.5 (Currenta, 2009).

The following information is taken into account for any environmental exposure assessment:

In accordance with column 2 of REACH Annex IX, the study does not need to be conducted as the substance is hydrolytically unstable (half-life is 8 h at 26°C).

Bioaccumulative potential

Due to the rapid hydrolysis of 6PPD (half life 8 hour at 26°C) in aqueous media, a bioaccumulation potential is not expected. However a bioconcentration factor of 4-(Phenylimino) cyclohexa-2,5-dien-1-one and 1,3-Dimethylbutylamine, which were breakdown products from N-(1,3-dimethylbutyl)-N'-phenylbenzene-1,4-diamine (6PPD) was determined according to OECD Guideline 305 C. The bioconcentration factor ranges from <1.2 - 23 using *Cyprinus carpio* as test organism. (MITI, 1995)

Bioconcentration factor (BCF):

Value	Species	Method	Evaluation	Remark
< 1.2 - 23 µg/l	<i>Cyprinus carpio</i> (Fish, fresh water)	OECD TG 305 C	Bioconcentration factor (6 weeks): Level 1 = <1.2 and 17	Since 6PPD is not stable enough for bioconcentration measurements, the biodegradation product N-phenyl-p-benzoquinone monoimine was measured

Longterm-ecotoxicity:

Not available

12.4 Results of PBT assessment:

Persistence assessment

6PPD is not readily biodegradable with 2 % biodegradation in 28 days (CERI 1994), and hence it is classified as preliminary persistent according to screening criteria.

Bioaccumulation Assessment

Due to the rapid hydrolysis of 6PPD (half life 8 hour at 26°C) in aqueous media, a bioaccumulation potential is not expected. Measured bioconcentration factors (BCF) for 6PPD are not available. 6PPD hydrolyses rapidly in the presence of water with a half life of approximately 8 hours. Therefore a risk estimation regarding the bioaccumulation potential of 6PPD on the basis of a log Kow, determined by QSAR, is misleading. A calculated theoretical log Kow value of 4.68 reflects the unreacted molecule without influence of water. The substance is not persistent in water due to the rapid hydrolysis. Therefore it is not bio-available. Possible hydrolysis products are less lipophilic. On the basis of these information it can not be expected that bioaccumulation of 6PPD occurs. The following hydrolysis products 4-Hydroxydiphenylamine, 4-(Phenylimino) cyclohexa-2,5-dien-1-one and 1,3-Dimethylbutylamine. The first 2 compounds are regarded to be similar as they reflect different oxidised forms of the same compound.

Bioconcentration factors of 4-(Phenylimino) cyclohexa-2,5-dien-1-one and 1,3-Dimethylbutylamine were determined according to OECD Guideline 305 C. The bioconcentration factor ranges from <1.2 - 23 using *Cyprinus carpio* as test organism. (MITI, 1995). Therefore the B and vB criterion is not fulfilled.

Toxicity Assessment

There are long-term aquatic toxicity tests available for algae and for fish. The most sensitive organisms were fish with a 30d-NOEC of 0.0037 mg/l (MITI 2003). Furthermore, the substance is not classified as carcinogenic, mutagenic or toxic for reproduction or R48. For these reasons, the substance does not meet the T-criterion.

Overall Conslusions on PBT or vPvB properties

A substance only is identified as a PBT substance if it fulfils all criteria described above. According to information summarized above, the T criterion was fulfilled and the P criteria was preliminarily fulfilled. Hence 6PPD is not PBT.

A substance only is identified as a vPvB substance if it fulfils both vPvB criteria described above. The P criterion is preliminarily fulfilled, the B criterion is not fulfilled. Therefore, 6PPD is not vPvB.

12.5 Other adverse effects:

Not available

12.6 Further ecological information:

Aromatic amines (arylamines), particularly primary aromatic amines, covalently and irreversibly bind to humic substances present in most natural waters.

All metabolites with moieties of: anilines, benzidines and toluidines are of environmental concern. Anilines and benzidines are both acutely toxic and toxic depending on the specific aquatic species (except algae). Toluidines represent a similar concern, It has been speculated that aqueous solutions of aromatic amines can be oxidised by organic radicals, but there are no actual data on reaction rates. Based on a study of reaction rate data for these compounds an estimate of the half-life of aromatic amines in water is approximately 100 days, assuming a peroxy radical concentration of 10-10 mole/L in sunlit, oxygenated water.

13. DISPOSAL CONSIDERATION

13.1 Appropriate disposal / Product:

The user of this product must properly characterize the waste generated from the use of this product in accordance with all applicable federal, state and/or local laws and regulations in order to determine the proper disposal of the waste in accordance with all applicable federal, state and/or local laws and regulations. For small quantities, cautiously dissolve in water. Neutralize with sodium carbonate or if product does not dissolve completely add a small quantity of hydrochloric acid followed by sodium carbonate. Add excess calcium chloride to precipitate the fluoride and /or carbonate. Remove solids to site approved for hazardous wastes. Recycle wherever possible or consult manufacturer for recycling options. Bury residue in an authorized landfill. Recycle containers where possible, or dispose of in an authorized landfill.

13.2 Waste codes / waste designations according to EWC / AVV:

Not available

13.3 Appropriate packaging:

Glass container is suitable for laboratory quantities
Polyethylene or polypropylene container.
Check all containers are clearly labelled and free from leaks.

13.4 Additional information:

Not available

14. TRANSPORT INFORMATION

14.1 Land transport (ADR/RID/GGVSE):

Official transport designation: ENVIRONMENTALLY HAZARDOUS SUBSTANCE,
SOLID, N.O.S.(contains N-(1,3-dimethylbutyl)-N'-phenyl-
p-phenylenediamine)

Class: 9

Classification Code:

UN-No.: 3077

Packing group: III

Hazard label: -

Tunnel restriction code: -

Special provisions: -

14.2 Sea transport (IMDG-Code/GGVSee):

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE,
SOLID, N.O.S. *(CONTAINS N-(1,3-DIMETHYLBUTYL)-
N'-PHENYL-P-PHENYLENEDIAMINE)

Class: 9

UN-No.: 3077

Packing group: III

EmS: F-A, S-F

Marine Pollutant: Not determined

Special provisions: 274 909 944

14.3 Air transport (ICAO-IATA/DGR):

Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE,
SOLID, N.O.S. (contains N-(1,3-dimethylbutyl)-N'-
phenyl-p-phenylenediamine)

Class: 9

UN-No.: 3077

Packing group: III

Special provisions: A97

15. REGULATORY INFORMATION

15.1 EU regulations

Chemical Safety Assessment:

Labelling(67/548/EEC or 1999/45/EC)

Hazard symbols and hazard statements: N; Dangerous for the environment
Xi; Irritant

Symbols



R-Phrases: R22, R43, R50/53

S-Phrases: S24, S37, S60

Labelling(Regulation EC No 1272/2008)

Signal word: Warning

Hazard Pictogram

GHS07 : exclamation mark



GHS09: environment



Hazard statement

- H302 Harmful if swallowed
- H317 May cause an allergic skin reaction
- H400 Very toxic to aquatic life
- H410 Very toxic to aquatic life with long lasting effects

Precautionary statement

- P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P501: Dispose of contents/container to ... a hazardous waste facility in accordance with local/national regulation.

Authorizations and/or restrictions on use:

Not available

Other EU regulations:

Not available

15.2 National regulations

US Toxic Substances Control Act (TSCA) - Inventory

POPs Management Law : Not applicable

Rotterdam Convention on Harmful Chemicals & Pesticides : Not applicable

Stockholm Convention on Persistent Organic Pollutants : Not applicable

Montreal Protocol on Substances That Deplete the Ozone Layer : Not applicable

16. OTHER INFORMATION

16.1 Relevant R-phrases (Number and full text):

R22: Harmful if swallowed.

R43 : May cause SENSITISATION by skin contact.

R50/53 : Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment

S24 - avoid contact with skin

S37 - wear suitable gloves

S61 - avoid release to the environment. refer to special instructions/safety data sheets

16.2 Training instructions:

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16.3.1 Uses- and exposure categories (overview):

To be provide after registration

16.4 Further information:

Not available

16.5 Data sources: Chemical Safety Report for 6PPD of REACH registration