SAFETY DATA SHEET

Kumanox-13

Date of issue: 2010-04-26 **Revision date: 2018-08-30** **Version: R0003.0001**

1. IDENTIFICATION

A. Product name

- Kumanox-13

B. Recommended use and restriction on use

- General use : Antioxidant for tire, belt, insulated wire, industrial product. Prevents products from crack due to ozone and sunlight
- Restriction on use : Not available

C. Manufacturer / Supplier / Distributor information

○ **Manufacturer information**

- Company name : Kumho Petrochemical Co., Ltd.
- Address : 227 Yeosusandan 2-ro, Yeosu-si, Jeollanam-do, Korea
- Dept. : Production technology team
- Telephone number : +82-61-688-3920
- Emergency telephone number : +82-61-3931-~4
- Fax number : +82-61-688-3939
- E-mail address : kwseo08@kkpc.com

○ **Supplier/Distributer information**

- Company name
- Address
- Dept.
- Telephone number
- Emergency telephone number
- Fax number
- E-mail address

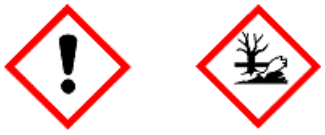
2. HAZARD IDENTIFICATION

A. GHS Classification

- Acute toxicity (oral) : Category4
- Skin sensitization : Category1
- Acute aquatic toxicity : Category1
- Chronic aquatic toxicity : Category1

B. GHS label elements

○ **Hazard symbols**



○ **Signal words**

- Warning

○ **Hazard statements**

- 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 statements**

1) Prevention

- P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 Wash hands thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P272 Contaminated work clothing should not be allowed out of the workplace.
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.

2) Response

- P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P302+P352 IF ON SKIN: Wash with plenty of soap and water.
- P321 Specific treatment
- P330 Rinse mouth.
- P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
- P363 Wash contaminated clothing before reuse.
- P391 Collect spillage.

3) Storage

- Not applicable

4) Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation

C. Other hazards which do not result in classification : (NFPA Classification)

○ **NFPA grade (0 ~ 4 level)**

- Health : 1, Flammability : 0, Reactivity : 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine	N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine ; N-phenyl-N'-(1,3-dimethyl butyl)-para-phenylenediamine ; P-phenylenediamine, N-(1,3-dimethylbutyl)-N'-phenyl- ;	793-24-8	>98.5
p-Aminodi- phenylamine	-	101-54-2	<0.7
N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine	N-Isopropyl-N'-phenyl-1,4-phenylenediamine ; 4-(Isopropylamino)diphenylamine ; N-(1-Methylethyl)-N-phenyl-1,4-benzenediamine ; N-Isopropyl-N'-Phenyl-p-phenylenediamine ; 1,4-Benzenediamine, N1-(1-methylethyl)-N4-phenyl- ; 1,4-Benzenediamine, N-(1-methylethyl)-N'-phenyl- ; 1,4-Benzenediamine, N-(1-methylethyl)-N'-phenyl- ; PHENYLENE-1,4-DIAMINE, N-PHENYL-N'-ISOPROPYL- ; N-(1-METHYLETHYL)-N'-PHENYL-1,4-BENZENEDIAMINE ; 4-(Isopropylamino)diphenylamine ;	101-72-4	<0.7
N-Phenylbenzenamine	Benzenamine, N-phenyl- ; N-Phenylbenzenamine ; N-Phenylaniline ; Amino diphenyl ; Anilinobenzene ; Benzene, (phenylamino)- ; N,N-Diphenylamine ;	122-39-4	<0.1

4. FIRST AID MEASURES

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15minutes and call a doctor/physician.

B. Skin contact

- Flush skin with plenty of wter for at least 15 minutes while removing contaminated clothing and shoes.
- Laundering enough contaminated clothing before reuse.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Wash thoroughly after handling.

C. Inhalation contact

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.

D. Ingestion contact

- About whether I should induce vomiting Take the advice of a doctor.
- Rinse your mouth with water immediately.

E. Delayed and immediate effects and also chronic effects from short and long term exposure

- Not available

F. Notes to physician

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

5. FIREFIGHTING MEASURES

A. Suitable (Unsuitable) extinguishing media

- Dry chemical, carbon dioxide, regular foam extinguishing agent, spray
- Avoid use of water jet for extinguishing

B. Specific hazards arising from the chemical

- Not available

C. Special protective actions for firefighters

- Keep unauthorized personnel out.
- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- Notify your local firestation and inform the location of the fire and characteristics hazard.
- Using a unattended and water devices in case of large fire and leave alone to burn if you do not imperative.
- Keep containers cool with water spray.
- Fine powder may cause ignition.

6. ACCIDENTAL RELEASE MEASURES

A. Personal precautions, protective equipment and emergency procedures

- Ventilate closed spaces before entering.
- Move container to safe area from the leak area.
- Remove all sources of ignition.
- Handling the damaged containers or spilled material after wearing protective equipment.
- Avoid dust formation.
- Moist with water to prevent dust scattering.
- Avoid skin contact and inhalation.
- Cleanup and disposal under expert supervision is advised.

B. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.

C. Methods and materials for containment and cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notification to central government, local government. When emissions at least of the standard amount
- Dispose of waste in accordance with local regulation.
- Appropriate container for disposal of spilled material collected.
- Dust spills : Cover dust spills with plastic sheet or waterproof cloth to minimize spreading and avoid contact with water.
- Small liquid state spills: Appropriate container for disposal of spilled material collected.
- For disposal of spilled material in appropriate containers collected and clear surface.
- Avoid entering to sewers or water system.
- Prevent the influx to waterways, sewers, basements or confined spaces.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Avoid direct physical contact.
- Comply with all applicable laws and regulations for handling
- Do not handle until all safety precautions have been read and understood.
- Operators should wear antistatic footwear and clothing.
- Minimize occurrence of dust and accumulation.`

B. Conditions for safe storage, including any incompatibilities

- Check regularly for leaks.
- Do not use damaged containers.
- Do not apply direct heat.
- Save applicable laws and regulations.
- Collected them in sealed containers.
- Do not eat, drink or smoke when using this product.
- Store away from water and sewer.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limits

○ **ACGIH TLV**

- [N-Phenylbenzenamine] : TWA, 10 mg/m3

○ **OSHA PEL**

- [N-Phenylbenzenamine] : TWA, 10 mg/m3

B. Engineering controls

- A system of local and/or general exhaust is recommended to keep employee exposures above the Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. The use of local exhaust ventilation is recommended to control emissions near the source.

C. Individual protection measures, such as personal protective 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.
- Dust, mist, fume-purifying respiratory protection
- Any air-purifying respirator with a corpuscle filter of high efficiency
- Any respiratory protection with a electromotion fan(for dust, mist, fume-purifying)
- Self-contained breathing apparatus with a corpuscle filter of high efficiency
- For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

○ **Eye protection**

- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
- Provide an emergency eye wash station and quick drench shower in the immediate work area.

○ **Hand protection**

- Wear appropriate glove.

○ **Skin protection**

- Wear appropriate clothing.

○ **Others**

- Not available

9. PHYSICAL AND CHEMICAL PROPERTIES

A. Appearance	
- Appearance	Solid
- Color	Purple
B. Odor	Aromatic odor
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	49℃
F. Initial Boiling Point/Boiling Ranges	163-165℃ (0.133kPa)
G. Flash point	202℃ (Closed cup)
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	0.0000066 hPa (25 ℃)
L. Solubility	1 mg/L (50℃, water), hydrocarbons : soluble
M. Vapour density	Not available
N. Specific gravity(Relative density)	0..995 (50℃)
O. Partition coefficient of n-octanol/water	Not available
P. Autoignition temperature	ca. 500℃ (for powder)
Q. Decomposition temperature	Not available
R. Viscosity	27-38 mPa.s (60℃)(Dynamic)
S. Molecular weight	268.4

10. STABILITY AND REACTIVITY

A. Chemical Stability

- This material is stable under recommended storage and handling conditions.

B. Possibility of hazardous reactions

- Hazardous Polymerization will not occur.

C. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Flames and hot surfaces

D. Incompatible materials

- Strong oxidizing agent

E. Hazardous decomposition products

- Carbon monoxide, nitrogen oxides.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

○ **(Respiratory tracts)**

- Not available

○ **(Oral)**

- Harmful if swallowed

○ **(Eye·Skin)**

- May cause an allergic skin reaction

B. Delayed and immediate effects and also chronic effects from short and long term exposure

○ **Acute toxicity**

*** Oral - ATE MIX : 300mg/kg~2000mg/kg**

- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : LD50 893 ㎎/㎏ Rat
- [p-Aminodi- phenylamine] : LD50 1000 ㎎/㎏ Rat
- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : LD50 555 ㎎/㎏ Rat
- [N-Phenylbenzenamine] : LD50 1120 ㎎/㎏ Rat

*** Dermal - ATE MIX : >5000mg/kg**

- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : LD50 7940 ㎎/㎏ Rabbit
- [p-Aminodi- phenylamine] : LD50 > 5000 ㎎/㎏ Rabbit
- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : LD50 7500 ㎎/㎏ Rabbit
- [N-Phenylbenzenamine] : LD50 2000 ㎎/㎏ Rabbit

*** Inhalation - ATE MIX : Not available**

- Not available

○ **Skin corrosion/irritation**

- Not available

○ **Serious eye damage/irritation**

- Not available

○ **Respiratory sensitization**

- Not available

○ **Skin sensitization**

- May cause an allergic skin reaction

○ **Carcinogenicity**

*** IARC**

- Not available

*** OSHA**

- Not available

*** ACGIH**

- [N-Phenylbenzenamine] : A4

*** NTP**

- Not available

*** EU CLP**

- Not available

○ **Germ cell mutagenicity**

- Not available

○ **Reproductive toxicity**

- Not available

○ **STOT-single exposure**

- Not available

○ **STOT-repeated exposure**

- Not available

○ **Aspiration hazard**

- Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

○ **Fish**

- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : LC50 0.14 ㎎/ℓ 96 hr
- [p-Aminodi- phenylamine] : LC50 75.233 ㎎/ℓ 96 hr
- [N-Phenylbenzenamine] : LC50 3.79 ㎎/ℓ 96 hr

○ **Crustaceans**

- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : EC50 0.82 ㎎/ℓ 48 hr
- [p-Aminodi- phenylamine] : EC50 0.370 ㎎/ℓ 48 hr Daphnia magna

○ **Algae**

- [p-Aminodi- phenylamine] : EC50 2.4 ㎎/ℓ 72 hr
- [N-Phenylbenzenamine] : ErC50 0.36 ㎎/ℓ 72 hr

B. Persistence and degradability

○ **Persistence**

- [p-Aminodi- phenylamine] : log Kow 1.82 (Estimates)

○ **Degradability**

- Not available

C. Bioaccumulative potential

○ **Bioaccumulative potential**

- [p-Aminodi- phenylamine] : BCF 5
- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : BCF 170
- [N-Phenylbenzenamine] : BCF 253

○ **Biodegration**

- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : 26.5 (%) 28 day ((Aerobic, Mainly domestic wastewater))
- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : 98 (%) 0.917 day ((Aerobic, Mississippi River water, 98 % primary degradation both in sterile and biologically active river water))

D. Mobility in soil

- [p-Aminodi- phenylamine] : Koc 486.41

E. Other adverse effects

- Not available

13. DISPOSAL CONSIDERATIONS

A. Disposal methods

- Since more than two kinds of designated waste is mixed, it is difficult to treat seperately, then can be reduction or stabilization by incineration or similar process.
- If water separation is possible, pre-process with Water separation process.
- Dispose by incineration.
- Do disposal as neutralization, hydrolysis and oxidation-reduction.
- High temperature incinerating, high-temperature melt processing will be landfilled
- Solidification processing.

B. Special precautions for disposal

- The user of this product must disposal by oneself or entrust to waste disposer or person who other’s waste recycle and dispose, person who establish and operate waste disposal facilities.
- Dispose of waste in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

A. UN No. (IMDG)

- 3077

B. Proper shipping name

- Environmentally hazardous substances, solid, n.o.s.

C. Hazard Class

- 9

D. IMDG Packing group

- Ⅲ

E. Marine pollutant

- Applicable

F. Special precautions for user related to transport or transportation measures

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : F-A (General fire schedule)

- EmS SPILLAGE SCHEDULE : S-F (Water-soluble marine pollutants)

15. REGULATORY INFORMATION

A. National and/or international regulatory information

○ **POPs Management Law**

- Not applicable

○ **Information of EU Classification**

*** Classification**

- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : Xn; R22 R43 N; R50-53
- [N-Phenylbenzenamine] : T; R23/24/25 R33 N; R50-53

*** Risk Phrases**

- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : R22, R43, R50/53
- [N-Phenylbenzenamine] : R23/24/25, R33, R50/53

*** Safety Phrase**

- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : S2, S24, S37, S60, S61
- [N-Phenylbenzenamine] : S1/2, S28, S36/37, S45, S60, S61

○ **U.S. Federal regulations**

*** OSHA PROCESS SAFETY (29CFR1910.119)**

- Not applicable

*** CERCLA Section 103 (40CFR302.4)**

- Not applicable

*** EPCRA Section 302 (40CFR355.30)**

- Not applicable

*** EPCRA Section 304 (40CFR355.40)**

- Not applicable

*** EPCRA Section 313 (40CFR372.65)**

- [N-Phenylbenzenamine] : Applicable

○ **Rotterdam Convention listed ingredients**

- Not applicable

○ **Stockholm Convention listed ingredients**

- Not applicable

○ **Montreal Protocol listed ingredients**

- Not applicable

16. OTHER INFORMATION

A. Reference

- The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.
- This Safety Data Sheet was compiled with data and information from the following sources: KOSHA, NITE, ESIS, NLM, SIDS, IPCS

B. Issue date

- 2010-04-26

C. Revision number and Last date revised

- 2 times, 2018-08-30

D. Other

- This SDS is prepared according to the Globally Harmonized System (GHS).