SAFETY DATA SHEET

Kumanox-3C

Date of issue: 2013-06-13 **Revision date: 2018-08-30** **Version: R0003.0001**

1. IDENTIFICATION

A. Product name

- Kumanox-3C

B. Recommended use and restriction on use

- General use : Antioxidant for tire, belt, insulated wire, industrial product (Effective prevention of daylight and ozone cracking)
- Restriction on use : Not available

C. Manufacturer / Supplier / Distributor information

○ **Manufacturer information**

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

○ **Supplier/Distributer information**

- Company name :
- Address :
- Emergency telephone number :

2. HAZARD IDENTIFICATION

A. GHS Classification

- Acute toxicity (oral) : Category4
- Serious eye damage/irritation : Category2A
- Skin sensitization : Category1
- Acute aquatic toxicity : Category3
- Chronic aquatic toxicity : Category3

B. GHS label elements

○ **Hazard symbols**

○ **Signal words**

- Warning

○ **Hazard statements**

- H302 Harmful if swallowed
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H402 Harmful to aquatic organisms.
- H412 Harmful to aquatic life with long lasting effects

○ **Precautionary statements**

1) Prevention

- P261 Avoid breathing dust/fume.
- 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.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P321 Specific treatment
- P330 Rinse mouth.
- P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
- P337+P313 If eye irritation persists: Get medical advice/attention.
- P363 Wash contaminated clothing before reuse.

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 : 2, Flammability : 1, Reactivity : 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Trade names and Synonyms	CAS No.	Content(%)
N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine	IPPD	101-72-4	≥ 95
Impurities	-	Not applicable	≤ 3.5
p-Aminodi- phenylamine	-	101-54-2	≤ 1
N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine	N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine	793-24-8	≤ 0.3
N-Phenylbenzenamine	Benzenamine, N-phenyl	122-39-4	≤ 0.2

4. FIRST AID MEASURES

A. Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.
- Go to the hospital immediately if symptoms(flare, irritate) occur.
- Remove contact lenses if worn.

B. Skin contact

- Flush skin with plenty of water 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

- Please be advised by doctor whether induction of vomit is demanded or not.
- 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

- Cool containers with water until well after fire is out.
- 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.
- Keep containers cool with water spray.

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 skin contact and inhalation.

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.
- Small liquid state spills: Appropriate container for disposal of spilled material collected.
- For disposal of spilled material in appropriate containers collected and clear surface.
- 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.

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/m^3

○ **OSHA PEL**

- Not available

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(Pellets)
- Color	Brown tinged with purple
B. Odor	Aromatic
C. Odor threshold	Not available
D. pH	Not available
E. Melting point/Freezing point	75 ℃
F. Initial Boiling Point/Boiling Ranges	161 ℃
G. Flash point	166 ℃
H. Evaporation rate	Not available
I. Flammability(solid, gas)	Not available
J. Upper/Lower Flammability or explosive limits	Not available
K. Vapour pressure	0.00343 mmHg at 90 ℃
L. Solubility	Soluble(alcohol, acetone), Insoluble(water)
M. Vapour density	Not available
N. Specific gravity(Relative density)	Not available
O. Partition coefficient of n-octanol/water	4
P. Autoignition temperature	Not available

Q. Decomposition temperature	Not available
R. Viscosity	Not available
S. Molecular weight	226.3

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

- Not available

E. Hazardous decomposition products

- May emit flammable vapour if involved in fire.

11. TOXICOLOGICAL INFORMATION

A. Information on the likely routes of exposure

○ **(Respiratory tracts)**

- Not available

○ **(Oral)**

- Harmful if swallowed

○ **(Eye·Skin)**

- Causes serious eye irritation
- May cause an allergic skin reaction

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

○ **Acute toxicity**

*** Oral**

- Product (ATEmix) : 300mg/kg < ATEmix ≤ 2,000mg/kg
- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : LD50 = 555 mg/kg Rat
- [p-Aminodi- phenylamine] : LD50 = 1,000 mg/kg Rat
- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : LD50 = 3,580 mg/kg Rat
- [N-Phenylbenzenamine] : LD50 = 1,120 mg/kg Rat

*** Dermal**

- Product (ATEmix) : >5,000mg/kg
- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : LD50 = 7,500 mg/kg Rabbit
- [p-Aminodi- phenylamine] : LD50 > 5,000 mg/kg Rabbit
- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : LD50 = 7,940 mg/kg Rabbit
- [N-Phenylbenzenamine] : LD50 = 2,000 mg/kg Rabbit

*** Inhalation**

- Not available

○ **Skin corrosion/irritation**

- Not available

○ **Serious eye damage/irritation**

- Causes serious eye irritation

○ **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**

- [p-Aminodi- phenylamine] : LC50 = 75.233 mg/L 96 hr (Estimate)
- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : LC50 = 0.028 mg/L 96 hr Oryzias Latipes (NITE: SIDS, 2005)
- [N-Phenylbenzenamine] : LC50 = 3.79 mg/L 96 hr

○ **Crustaceans**

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

○ **Algae**

- [p-Aminodi- phenylamine] : EC50 = 2.4 mg/L 72 hr
- [N-Phenylbenzenamine] : ErC50 = 0.36 mg/L 72 hr (NITE)

B. Persistence and degradability

○ **Persistence**

- [p-Aminodi- phenylamine] : log Kow 1.82
- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : log Kow 5.4 (ICSC)

○ **Degradability**

- Not available

C. Bioaccumulative potential

○ **Bioaccumulative potential**

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

○ **Biodegration**

- [N-(1-Methylethyl)-N'-phenyl-1,4-benzenediamine] : BOD degradability: 2.2% (NITE)
- [N-(1,3-Dimethylbutyl)-N´-phenyl-1,4-phenylendiamine] : BOD: 2 (%) (NITE: Existing Chemical Safety Inspections Data, 1995)
- [N-Phenylbenzenamine] : BOD: 0% (NITE)

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.

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 CODE/IATA DGR)

- Not applicable

B. Proper shipping name

- Not applicable

C. Hazard Class

- Not applicable

D. IMDG CODE/IATA DGR Packing group

- Not applicable

E. Marine pollutant

- Not 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 : Not available
- EmS SPILLAGE SCHEDULE : Not available
- Air transport(IATA): Not subject to IATA regulations.

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] : H302, H317, H410
- [N-Phenylbenzenamine] : H331, H311, H301, H373, H410

○ **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

- 2013-06-13

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).