



MATERIALSAFETYDATASHEET

1. IDENTIFICATION

A. PRODUCT NAME

? KUMHO KBR 01

B. Recommended Use and Restriction on Use

? General use : Raw materials for tires, shoes, rubber hoses, golf ball

? Restriction on Use : Not available

C. Information of Manufacturer/Supplier/distributor

- Manufacturer

? Company name : Korea Kumho Petrochemical Co., Ltd.

? Address : 287-1, Pyeongyeo-Dong, Yeosu-si, Jeollanam-do, Korea

? Dept. : Quality Assurance Team

? Person in charge :

? Telephone number :

? Fax number :

? Emergency :

- Supplier/distributor

? Company name :

? Address :

? Dept. :

? Person in charge :

? Telephone number :

? Fax number :

? Emergency :

2. HAZARD IDENTIFICATION

A. GHS Classification : Not applicable

B. Hazard identification

- ? Hazard symbols : Not applicable
- ? Signal word : Not applicable
- ? Hazard statement : Not applicable



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? Precautionary statements : Not applicable

C. Other hazards which do not result in classification :

- NFPA rating: (0-4 steps) : Health=0, Flammability=0, Reactivity=0

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	CAS No./ECL No./EINECS No.	Contents (%)
Butadiene polymer	9003-17-2/KE-03724/-	99.5
Antioxidant(BHT)	128-37-0/KE-03079/204-881-4	0.3 ~ 0.6

? Reference No. : ECL(Registration number of Korean Existing Chemical List)

EINECS(Registration number of Europe Existing Chemical List)

4. FIRST-AID MEASURES

A. Eye Contact :

- Flush the eye with plenty of water or saline solution at least 15 minutes.
- Get medical attention if necessary.

B. Skin Contact :

- Wash the contaminated skin area with plenty of water at least 15 minutes.
- All contaminated clothing and shoes remove and laundry thoroughly before reuse.
- If skin contact with hot substances is happened, immerse or wash the affected area.
- If prolonged contacts with no symptoms of skin irritation persist, flush with flowing water or showers.
- If irritation develops or symptom persists, seek medical attention.

C. Inhalation :

- If inhaled fume or vapor, remove to fresh air.
- If not breathing, give artificial respiration.



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- Use respirator when breathing is difficult.
- Get medical attention if necessary.

D. Ingestion :

- Rinse mouth with water if conscious. Give water.
- Do not drink anything to an unconscious person.
- Do not induce vomiting. If vomiting occurs, head lower than hips to prevent blocking the airway.
- Get medical attention if necessary.

E. Delay and immediate effects and also chronic effects from short and long term exposure : Not available

F. Notice to Physician :

- Treatment may vary with condition of victim and specifics of incident.

5. FIRE FIGHTING

MEASURE

A. Suitable (Unsuitable) extinguishing media :

- ? Extinguishing media: Dry chemicals, CO₂, water spray or regular foam
- ? Unsuitable Extinguishing media : Waterjet
- ? Large Fire : Water spray, fog, regular foam

B. Specific hazards arising from the chemical :

- ? Thermal decomposition products : CO₂, toxic gas, smoke and carbon oxides
- ? Fire and Explosion Hazards : Not available

C. Fire fighting procedures and equipments :

- Wear appropriate personal protective equipment (see section 8.

EXPOSURE CONTROLS/PERSONAL PROTECTION).

- Move containers from fire area, if you can do without the risk.

- Avoid with heats, flames, sparks and other sources of ignition.
- Handle carefully
- Stay upwind and keep out of low areas.
- Fight fire from a safe distance/protected location.



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6. ACCIDENTAL RELEASE MEASURES

A. Personal Precautions, Protective Equipment and Emergency procedures :

- Perform in accordance with? See section 8 . EXPOSURE CONTROLS / PERSONAL PROTECTION? . Put on appropriate personal protective equipment.

B. Environmental Precautions :

- Avoid dispersal of spilt material and runoff and contact with waterways, drains and sewers. If large spills, advise emergency services.

C. Methods and materials for containment and cleaning up :

- Re-packaging dismantled rubber and if possible re-use.
- Collect as much as possible in a clean container for (preferable) reuse or disposal.
- Prevent scattering of dust.
- Dispose of in compliance with all federal, state and local regulations.

7. HANDLING AND STORAGE

A. Handling :

- Wear appropriate personal protective equipment(see section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION).
- Do not ingestion or inhalation.
- Avoid contact with eyes, skin and clothing.
- Avoid long-term or repeated exposure.
- Handle at normal temperature.
- Avoid direct sunlight. Store in dry, well-ventilated and clean place.
- Avoid contact with overheats, flames.
- Wash thoroughly after handling.
- Contaminated clothing eliminate and laundry thoroughly before reuse.
- Ventilate adequately.

- Minimize occurrence of dust and accumulation.

B. Storage Precautionary Statements :

- Store at normal temperature.
- Save in cool, dry and well ventilated place.



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- Avoid contact with severe heat, direct sunlight, other sources of ignition.
- Store in outdoor.
- Store under nitrogen gas.
- Save the seals if not in use.
- Do not keep with incandescent and mercury lamps that emit ultraviolet light.
- Do not keep at high temperature.
- Store in place local exhaust ventilation is installed.
- Ventilation facilities will be equipped with explosion-proof equipment.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. Exposure limit

- ? Exposure limit under ISHL :
 - Butadiene polymer : Not applicable
 - Antioxidant(BHT) : TWA 2 mg/m³
- ? ACGIH :
 - Butadiene polymer : Not applicable
 - Antioxidant(BHT) : TWA 2 mg/m³ (Inhalable fraction and vapor)
- ? Biological exposure limits : Not applicable

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. Personal Protective Equipment :

- ? Respiratory Protection : Use the respirator be given official approval by Korea Occupational Safety & Health Agency. 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.

? When take shelter

- Dust, mist, fume-purifying respiratory protection



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- Any air-purifying respirator with a corpuscle filter of high efficiency
- Any respiratory protection with a electromotion fan(for dust, mist, fume-purifying)
- High-efficiency particulate filter respirator attached self-service protector.
- ? For Unknown Concentration or Immediately Dangerous to Life or Health
 - Supplied-air respirator (Hybrid air-line mask).
 - Supplied-air respirator with full facepiece
- ? Eye Protection : Wear appropriate protective gloves.
- ? Hand Protection : Wear appropriate protective gloves.
- ? Body Protection : Wear appropriate chemical resistant protected clothing.

Wear appropriate face
protection.

9. PHYSICAL AND CHEMICAL
PROPERTIES

- A. Appearance : State – Solid, Color - Not available
- B. Odor : Mild odor
- C. Odor threshold : Not available
- D. pH : Not applicable
- E. Melting point/Freezing point : Not applicable
- F. Initial Boiling Point/Boiling Ranges : Not applicable
- G. Flash point : Not available
- H. Evapourating Rate : Not

applicable

I. Flammability(solid, gas) : Not available

J. Upper/Lower Flammability or explosive limits : Not available

K. Vapour pressure : Not applicable

L. Solubility : Insoluble

M. Vapour density(Air=1) : Not applicable

N. Specific gravity : 0.91

O. Partition coefficient of n-octanol/water : Not applicable

P. Autoignition Temperature : 316 ? (600

?) Q. Decomposition Temperature : Not

available R. Viscosity : Not applicable

S. Molecular weight : Approx. 450,000.



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10. STABILITY AND REACTIVITY

A. Stability :

- This material is stable under normal temperature and pressure.

B. Possibility of Hazardous Reaction :

- Will not occur.

C. Conditions to Avoid :

- Direct sunlight, oxidation conditions, above 50 °C, dust

D. Materials to Avoid :

- (Strong) oxidizers, acid chloride, acid anhydrides, peroxides, (strong) acids, (strong) bases, metal, steel, copper(alloy)

E. Hazardous Decomposition Products

- CO, CO₂, irritating and toxic fume and gas

11. TOXICOLOGICAL
INFORMATION

A. Information on the likely routes of exposure

- ? (Respiratory tracts) : Not available
- ? (Oral) : Not available
- ? (Eye · Skin) : Not available

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

? Acute toxicity :

- Acute oral toxicity :
 - Butadiene polymer : Not available
 - Antioxidant(BHT) : LD50 (rat) 1559 mg/kg
- Acute dermal toxicity :

- Butadiene polymer : Not available
- Antioxidant(BHT) : LD50 (rat) > 2000mg/kg
- Acute Inhalation toxicity : Not available
- ? Skin corrosion/irritation :



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- Butadiene polymer : Cause irritation of the skin (human)
- Antioxidant(BHT) : Slight irritation to humans
- ? Serious eye damage/irritation :
 - Butadiene polymer : Cause irritation of the eyes (human)
 - Antioxidant(BHT) : Mild inflammations (rabbit)
- ? Respiratory sensitization :
 - Butadiene polymer : Not available
 - Antioxidant(BHT) : No anaphylaxis (guinea pig)
- ? Skin sensitization :
 - Butadiene polymer : Not available
 - Antioxidant(BHT) : Skin sensitization (human)
- ? Carcinogenicity :
 - Not classify to be carcinogenic substance(A1) and carcinogenic substance of presumed(A2) in Public notice.
 - Butadiene polymer : Not available
 - Antioxidant(BHT) : IARC group 3, ACGIH group 4
- ? Germ cell mutagenicity :
 - Butadiene polymer : Not available
 - Antioxidant(BHT) :
 - In vitro Ames Test, Cytogenetic assay – Negative,
 - In vivo Cytogenetic assay, Micronucleus assay - Negative
- ? Reproductive toxicity :
 - Butadiene polymer : Not available
 - Antioxidant(BHT) : Reproductive and developmental toxicity was not observed
- ? Specific target organ toxicity(single exposure) :
 - Butadiene polymer : Not available
 - Antioxidant(BHT) : Cause nervous system effects, weakness, vomiting, fatigue, mental confusion, short-term unconsciousness to Women.
- ? Specific target organ toxicity(repeated exposure) :
 - Butadiene polymer : Not available
 - Antioxidant(BHT) : Affect lung, liver, thyroid gland to mouse.

? Aspiration hazard : Not available

C. Calculation the classification of the mixture (acute toxicity estimate calculation)



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etc.) :

? Acute oral, dermal and inhalation Toxicity

Acute toxicity estimate(ATEmix) :

100-(? Cunknown if>10%)/ATEmix=SCI/ATEi

- Acute oral toxicity estimate : ATEmix =

1559 mg/kg, Category 4

(Contain about above 10% chemical substances of unknown toxicity)

(It is not classified because the amount is less than 1% in the product)

- Acute dermal toxicity estimate : ATEmix >

2000 mg/kg, Not classified

(Contain about above 10% chemical substances of unknown toxicity)

- Acute inhalation toxicity estimate : Not available

12. ECOLOGICAL INFORMATION

A. Ecotoxicity

? Acute aquatic toxicity

- Fish : Not available

- Invertebrate : Not available

- Algae : Not available

- Butadiene polymer : Not available

- Antioxidant(BHT) : EC50 6mg/L/72hr, Scenedesmus subspicatus

B. Persistence and degradability

? Persistence :

- Butadiene polymer : Not available

- Antioxidant(BHT) : log pow 4.17 @ 37 °C

? Degradability : Not available

C. Bioaccumulative potential

? Bioaccumulation :

- Butadiene polymer : Not available

- Antioxidant(BHT) : BCF 230-2500 (fish, after 56d), 2-17 (fish, after 28d),
30 (snails, 28d), 38 (algae, 28d)



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Biodegradability:

y:

- Butadiene polymer : Not available
- Antioxidant(BHT) : Not readily biodegradable (4.5% degradation after 28d)

D. Mobility in soil : Not available

E. Other adverse effects : Not available

13. DISPOSAL

CONSIDERATION

A. Disposal methods

- The user of this product must properly characterize the waste/container 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.

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 local regulation.

14. TRANSPORT

INFORMATION

A. UN number : Not regulated for transport of dangerous

goods. B. Proper shipping name : Not available

C. Hazard class : Not available

D. Packing group : Not available

E. Marine pollutant : Not applicable



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

- 1) EmS FIRE SCHEDULE : Not applicable
- 2) EmS SPILLAGE SCHEDULE : Not applicable

15. REGULATORY INFORMATION

A. Korea Industry Safety and Health Law (ISHL) :

- ? This product is not subject to the chemical for classification and labeling under ISHL Article 41.

B. The Toxic Chemical Control Act in Korea(TCCA)

- ? This product is not classified as Toxic chemical and Observational chemical under TCCA Article 2.3. and 2.4.
- ? Toxic Release Inventory(TRI) Chemicals: Not regulated

C. Dangerous goods Safety Management Law in Korea : Not applicable

D. US regulations

- ? OSHA regulation (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) : Not applicable

E. Other local or international regulation

- ? 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
- ? Information of EU Classification : Not classified

16. OTHER INFORMATION

A. Reference

- This MSDS is prepared in accordance with ISHL Article 41 and MOL Notification



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No. 09-68 in Korea and consider the internal regulations by Korea Kumho Petrochemical Co., Ltd.

- KOSHA (Korea Occupational Safety & Health Agency) GHS MSDS Database
- OECD Existing Chemicals Database
- European chemical Substances Information System
- NITE (National Institute of Technology and Evaluation) in Japan

B. Issue date : 2010. 5. 18

C. Revision number and Lastrevised : Not applicable

D. Other information : Not available

This Material Safety Data Sheet is provided courtesy of Astlett Rubber Inc.
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for more information.