



Kenya Petroleum Refineries Ltd
Material Safety Data Sheet

Bitumen 60/70

MSDS No: KPRL/MSDS/B/09;
Date Issued: 31st October, 2007

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Bitumen 60/70
Other names : Asphalt
Product Use : Bitumen for road paving, waterproofing, adhesives, coatings

Company : **Kenya Petroleum Refineries Ltd,**
PO Box 90401 – 80100,
Mombasa, KENYA.

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2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Concentration
Asphalt (Bitumen)	8052-42-4	100 %

3. HAZARDS IDENTIFICATION

Appearance and Odor: Black viscous liquid at high temperatures, solid at ambient temperatures.

Safety Hazards:

Bitumen is normally handled at temperatures up to 160 °C. The major hazard is heat burns on skin in direct contact with hot bitumen. If bitumen is overheated, flammable decomposition products may be formed, resulting into fire and explosion. Boil over of tanks due to presence of water. In confined spaces, hydrogen sulfide may accumulate and reach hazardous levels. Pyrophoric deposits may develop in bitumen tanks which may self-ignite.

Health Hazards:

Routes of exposure: Inhalation, ingestion, skin or eye contact.

Skin Contact:

Severe thermal burns (up to third degree). Shock. Other than heat burns, the hazards associated with skin contact are negligible. Where long and physical contact with bitumen occurs, expert medical advice should be sought to the need of periodic skin examination and in case of any skin abnormality.

Ingestion:

May cause gastric irritation

Eye Contact:

May cause irritation

Inhalation:



Inhalation of vapors (generated at elevated temperatures) or oil mists can cause irritation to the nose and the throat as well as nausea. It is possible for hydrogen Sulphide to accumulate to lethal concentrations above hot bitumen in the vapor space of bulk storage tanks.

4. FIRST AID MEASURES

Inhalation:

In case of problems due to excess fumes exposure, move victim to fresh air and provide oxygen if breathing is difficult. Get medical attention. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting or unresponsive, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

Skin Contact:

Burns from hot bitumen: remove heat by immediately treating/plunging the affected part with cold running water for 10 minutes. After cooling, NO attempt should be made to remove the bitumen adhering to the skin since the cold bitumen forms a sterile protective layer on the burnt area. If for any reason the bitumen must be removed, this can be done using slightly warmed medicinal paraffin. Seek medical assistance or hospitalization in all cases of serious burns.

Eye Contact:

Flood eyes with plenty of water for at least 15 minutes, blinking as often as possible. Remove deposits around the eye, eyelashes and eyebrows by wiping carefully with a soft cloth soaked with medicinal paraffin oil. Do not force eyelids open. If irritation persists, obtain medical attention.

Ingestion:

DO NOT induce vomiting, get medical advice. Give milk or water to drink. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquid into the lungs. Do not give anything by mouth to an unconscious person.

First aid facilities

Eye wash fountains and safety showers should be available for emergency use

Advise to Doctor

When it is absolutely necessary to remove adhering bitumen from the skin, liberal amounts of warm medicinal paraffin can be used. If solvent treatment is required, washing with soap and water and then the application of a proprietary re-fattening or skin cleansing cream should follow.

5. FIRE FIGHTING MEASURES

Fire hazards

CAUTION! Product is Combustible. It will not burn unless preheated. Isolate from sources of heat, naked flames and sparks. The vapor pressure of this product is expected to be too low at ambient temperatures and pressures for the lower explosion limit to be reached. This product is a hazardous substance when heated beyond 100 °C. Petroleum products are flammable (explosive) in proportions between approximately 1% and 10% of vapor in air by volume at ambient temperatures and pressures. Earth and bond all process equipment including tanks and drums. Boil over of tanks may occur due to presence of water.

Hazardous Combustion Products



If bitumen is over heated, decomposition products may be formed resulting into a fire or explosion hazard. H₂S may be released if the product is heated, particularly in the presence of water. Pyrophoric deposits may develop in bitumen tanks which may self-ignite.

Extinguishing Media

Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO₂) to extinguish flames. Do not use water except as a fog. Do not use a direct stream of water.

Additional Advice

Clear fire area of all non-emergency personnel. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure, Self-contained breathing apparatus. Cool surrounding equipment, fire-exposed containers, pipelines and structures with water. Container areas exposed to direct flame contact should be cooled with large quantities of water to prevent weakening of container structure. Do not apply water directly.

6. ACCIDENTAL RELEASE MEASURES

Protective Measures

CAUTION! Product is combustible. Eliminate all potential sources of ignition. Keep away from heat, naked flames and sparks. Stop leak if safe to do so. Wear appropriate personal protective equipment.

Clean Up Methods

Contain residual material at affected sites to prevent material from entering sewers; ditches and waterways. Dike and contain land spills. For small spills, contain the spills with earth, sand or other absorbent. For large liquid spills, pump up excess liquid and absorb residue with earth, sand or other absorbent. Clean contaminated area with water and detergent.

Additional Advice

Maritime spillages should be dealt with using Shipboard Oil Pollution Emergency Plan (SOPEP), as required by MARPOL Annex1 Regulation 26.

7. HANDLING AND STORAGE

General Precautions

CAUTION! Combustible. Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Store in a well ventilated area. Ground all handling equipment to prevent sparking. This product is a hazardous substance when heated above 100 °C.

Handling

Avoid contact with eyes, skin, clothing and foodstuffs. Wash thoroughly after handling. Launder contaminated clothing prior to use; use good personal hygiene.

Storage

Keep product away from ignition sources such as heat, sparks and flame. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapors has dissipated. Store in a cool, dry and well ventilated area. Keep containers closed at all times.



8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Material	Source	Type	ppm	mg/m3	Notation
Bitumen fume, as benzene soluble aerosol	ACGIH	TWA		0.5	
Bitumen fume, as benzene soluble aerosol	ACGIH	Notations			A4

Engineering controls

Bulk storage tank ventilation is required due to the accumulation of fumes at operating conditions. Tanks, equipment and pipelines containing hot bitumen or heating medium, such as hot oil, should be adequately insulated to prevent accidental contact by personnel. Any surface that will reach a temperature of 70 °C must be insulated for personal protection. For personnel into confined spaces (e.g. bulk storage tanks), a proper confined space entry procedure must be followed, including ventilation and testing of tank atmosphere. Install eye washes and showers for emergency use.

Water should not be allowed into contact with hot bitumen.

Protective Clothing :

Avoid contact with the skin and the eyes, and avoid breathing vapors or mists. Use chemical resistant gloves/gauntlets, boots, and apron. For spillage clean up use chemical resistant knee length boots. Where risk of splashing or in spillage clean up, use chemical resistant one-piece overall buttoned at neck and wrist, with an integral hood, of PVC.

Respiratory Protection

If engineering controls do not maintain airborne concentrations to a level adequate to protect the worker's health, an approved cartridge respirator with a replaceable organic vapor filter must be worn. Types to be considered include supplied air respirator, air purifying respirator for organic vapors, and self-contained breathing apparatus for use in environments with unknown concentrations or emergency situations.

Hand Protection

Materials should provide suitable chemical protection: impervious PVC, Neoprene or nitrile rubber. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, and dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.

Eye Protection

Safety glasses with side shields or chemical splash goggles and/or full face shield to protect eyes and face if contact is likely. Provide an eye station in the area.

Skin Protection

Chemically resistant impervious gloves, boots, suits and other items should preferably be PVC, Neoprene or Nitrile Rubber to be used. Safety showers should be available for use.



Work/Hygiene Practices

If contamination occurs, change clothing and discard internally contaminated gloves and footwear. Launder contaminated clothing before reuse. Ensure a high level of personal hygiene is maintained. Always wash hands before eating, drinking, smoking or using the toilet.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	:	Black viscous liquid at high temperatures, solid at ambient temperatures
Flash point, Cleveland COC	:	250 °C minimum.
Boiling point	:	> 450 °C
Softening Point	:	48 - 56 °C
Penetration	:	60 – 70, 0.1 mm at 25 °C
Vapor pressure	:	< 0.75 mmHg @ 180 °C
Specific gravity (Water =1)	:	1.00 – 1.06
Water solubility	:	Negligible
Trichloroethylene Solubility	:	99.5 % wt minimum
Flammability limits	:	LEL: 0.7 % v/v; UEL: 6.0 % v/v
Auto ignition temperature	:	400 °C by ASTM Method
Vapor density (air =1)	:	< 1
Chemical stability	:	Stable. Reacts with oxidizing agents.

10. STABILITY AND REACTIVITY

Stability	:	Chemically stable under normal conditions of use.
Conditions to Avoid	:	Heat, formation of vapors and naked flames.
Materials to Avoid	:	Strong oxidizing agents. Avoid accidental contact of hot material with water as this can cause violent eruptions.

Hazardous Decomposition Products:

If bitumen is over heated, decomposition products may be formed resulting into a fire or explosion hazard. H₂S may be released if the product is heated, particularly in the presence of water. Pyrophoric deposits may develop in bitumen tanks which may self-ignite.

11. TOXICOLOGICAL INFORMATION

Routes of Exposure	:	Exposure will most likely occur through skin or eye contact. Inhalation is only possible if the product is heated or mists are generated.
Carcinogenicity and Mutagenicity	:	According to the International Agency for Research and Cancer (IARC), this product is not classifiable as a human carcinogen. It may contain a variety of Polycyclic Aromatic Hydrocarbons (PAH), some of which are associated with the potential of inducing skin cancer. Increasing amounts of PAH may be released if this product is heated above 200°C.
Chronic effects	:	Prolonged or repeated contact with Polycyclic Aromatic Hydrocarbons (PAH) may cause skin cancer where there is



poor personal hygiene.

12. ECOLOGICAL INFORMATION

Biodegradability : Not readily biodegradable. Potential for bioaccumulation.

13. DISPOSAL CONSIDERATIONS

Material Disposal : Waste management priorities (depending on the volumes and concentrations of waste) are:

1. Recover or recycle (process) if possible. Contain spill with sand or earth or absorb with absorbent material. Place used absorbent in suitable sealed containers for disposal.
2. Energy recovery (cement kilns, thermal power generation).
3. Incineration.
4. Disposal at a licensed waste facility.

Local Legislation : Disposal in Kenya should be in accordance with the *Environmental Management and Coordination (Waste Management) Regulations, 2006*.

12. ECOLOGICAL INFORMATION

Biodegradability : Not readily biodegradable. Potential for bioaccumulation

13. DISPOSAL CONSIDERATIONS

Material Disposal : Dispose of used absorbent in an approved landfill or municipal tip in accordance with local regulations. Cold material is biologically inert. Do not contaminate rivers, streams, or watercourses.

Local Legislation : Disposal in Kenya should be in accordance with the *Environmental Management and Coordination (Waste Management) Regulations, 2006*.

14. TRANSPORT INFORMATION

Identification number	UN 3257
Proper shipping name	Bitumen
DG Class / Division	9 (Miscellaneous Dangerous Substances)
Hazchem code	2 W
Packing Group	III



15. REGULATORY INFORMATION

Reference is made to the Kenyan *Factories & Other Place of Work (Hazardous Substances) Regulations, 2007*. Other regulations may apply to this material.

16. OTHER INFORMATION

- MSDS Revisions** : None.
- MSDS Regulation** : The contents in the MSDS are in fulfillment of the requirements of the *Factories & Other Place of Work (Hazardous Substances) Regulations, 2007*.
- Disclaimer:** : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.