

**MATERIAL SAFETY DATA SHEET****ISSUE DATE: May 2009****Product Name : PENETRATION GRADE BITUMEN****1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER**

**Product Name** : Penetration Grade Bitumen 40/50, 60/70, 80/100  
**Company Name** : Benzene International Pte Ltd  
**Address** : 10 Bukit Batok Crescent  
#04-04 The Spire, Singapore 658079  
Tel: +65-63372735; Fax: +65-63372734

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

**Preparation description** : A blend of components derived from crude petroleum oil.  
**Additional Information** : Crude petroleum oil may contain trace levels of Hydrogen sulphide (H<sub>2</sub>S).

**3. HAZARDS IDENTIFICATION****EC Classification**

Not classified as dangerous under EC criteria.

**Health Hazards**

Not expected to be a health hazard at ambient temperature. Hydrogen sulphide (H<sub>2</sub>S), an extremely flammable and toxic gas, and other hazardous vapours may evolve and collect in the headspace of storage tanks, transport vessels and other enclosed containers. Hydrogen sulphide is highly toxic and may be fatal if inhaled. May dull the sense of smell, so do not rely on odour as an indication of hazard. Contact with hot material can cause thermal burns which may result in permanent skin damage. Hot product may cause severe eye burns and/or blindness.

**Signs and Symptoms**

H<sub>2</sub>S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odour threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary oedema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H<sub>2</sub>S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H<sub>2</sub>S will accumulate in the body tissue after repeated exposure.

**Safety Hazards**

Not classified as flammable but will burn. Typically stored and handled above 100°C. Contact with water will result in violent expansion and splashing or boil-over may occur.

**Environmental Hazards**

Not classified as dangerous for the environment

**4. FIRST AID MEASURES****General Information**

DO NOT DELAY. Keep victim calm. Obtain medical treatment immediately.

**Inhalation**

If inhalation of mists, fumes or vapour causes irritation to the nose or throat, remove to fresh air. If rapid recovery does not occur, obtain medical attention. Casualties suffering ill effects as a result of exposure to hydrogen sulphide should be removed to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardio pulmonary Resuscitation (CPR) as required and transport to the nearest medical facility.

**Skin Contact**

If contact with hot product, cool the burn area by flushing with large amounts of water. Do not attempt to remove anything from the burn area or apply burn creams or ointments. Cover the burn area loosely with a sterile dressing, if available. Transport to the nearest medical facility for additional treatment. It should be noted this product contracts on cooling. Where a limb is encased, care should be taken to avoid the development of a tourniquet effect. In the event of this occurring the adhering product must be softened and/or split to prevent restriction of blood flow. All burns should receive medical attention.

**Eye Contact**

Hot product - If contact with hot product, cool the burn area by flushing with large amounts of water. Do not attempt to remove anything from the burn area or apply burn creams or ointments. Cover the burn area loosely with a sterile dressing, if available. Transport to the nearest medical facility for additional treatment. All burns should receive medical attention. Cold product - Flush eye with copious quantities of water. If persistent irritation occurs, obtain medical attention.

**Ingestion**

Under normal conditions of use, this is not expected to be a primary route of exposure.

**Advice to Physician**

Do not attempt to remove the product from the skin as it provides an airtight sterile covering, which will eventually fall away with the scab as the burn heals. If removal is attempted, mineral oil (not mineral spirits) or a mineral oil based ointment may be applied to help soften the product to facilitate removal. Hydrogen sulphide (H<sub>2</sub>S) - CNS asphyxiant. May cause rhinitis, bronchitis and occasionally pulmonary edema after severe exposure. CONSIDER: Oxygen therapy. Consult a Poison Control Center for guidance.

## 5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

### Specific Hazards

Hazardous combustion products may include: A complex mixture of airborne solid and liquid particulates and gases (smoke). Carbon monoxide. Unidentified organic and inorganic compounds. Boil-over of tanks and violent eruptions may occur in the presence of water.

### Extinguishing Media

Foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only.

### Unsuitable Extinguishing Media

Do not use water in a jet.

### Protective Equipment for Firefighters

Proper protective equipment including breathing apparatus must be worn when approaching a fire in a confined space.

## 6. ACCIDENTAL RELEASE MEASURES

Avoid contact with spilled or released material. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet.

### Protective measures

Avoid contact with skin, eyes and clothing. Hot product should be handled so that there is no risk of burns. Use compressed air or fresh air respiratory equipment in confined spaces. Prevent from spreading or entering into drains, ditches or rivers by using sand, earth, or other appropriate barriers.

### Clean Up Methods

**Small spillage:** Allow product to cool and solidify. Shovel into a suitable clearly marked container for disposal or reclamation in accordance with local regulations.

**Large spillage:** Prevent from spreading by making a barrier with sand, earth or other containment material. Treat residues as for small spillage.

### Additional Advice

Local authorities should be advised if significant spillages cannot be contained.

## 7. HANDLING AND STORAGE

### General Precautions Handling

Avoid contact with hot liquid to prevent thermal burns. For quality, health and safety reasons do not exceed the recommended storage and handling temperature. Clean, dry and heat resistant hoses (free of twists, etc.) should be used. Do not use steam to empty pipelines and hoses. Use compressed air to blow product from the system or apply a vacuum to suck the product from the system. Do not use solvents to clear obstructions of pipelines.

### Storage

Keep dry. Keep container in a well-ventilated place. Prevent all contact with water and with moist atmosphere. In case of long term storage, deposits may develop on walls and roofs of storage tanks. These deposits, (carbonaceous materials and iron sulphides), may be pyrophoric and self-ignite when brought into contact with air (opening of tank). Hydrogen sulphide may accumulate in tanks during long term storage at high temperatures. For this reason, tank vapour spaces should be regarded as hazardous.

### Storage Temperature

Temperature should be kept at least 30°C below flash point and should never exceed the industry recommended maximum safe working temperature of 200°C.

### Recommended Materials

For containers or container linings, use stainless steel.

### Unsuitable Materials

For containers or container linings avoid PVC, polyethylene or high density polyethylene.

### Precautions during discharge from bitumen tanks

Tanks may be heated by hot oil, steam, electricity or flame tubes. When pumping product from a storage or road tank, care should be taken to avoid the risk of fire or explosion as result of exposing hot heater tubes. The tubes should be covered by a minimum of 150mm of hot product, unless the heat has been switched off for a period of sufficient cooling. Bulk temperature should be kept as low as possible, to enable efficient discharge. A check should be made to ensure that the receiving tank has sufficient ullage space to accommodate the load.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Occupational Exposure Limits

Material	Source	Type	ppm	mg/m <sup>3</sup>	Notation
Asphalt, fumes	ACGIH	TWA [Inhalable fraction.]		0.5 mg/m <sup>3</sup>	as benzene soluble
Asphalt, fumes	SG OEL	TWA [Fume.]		5 mg/m <sup>3</sup>	
Hydrogen Sulphide	ACGIH	TWA	10 ppm		
Hydrogen Sulphide	ACGIH	STEL	15 ppm		
Hydrogen Sulphide	SG OEL	TWA	10 ppm	14 mg/m <sup>3</sup>	
Hydrogen Sulphide	SG OEL	STEL	15 ppm	21 mg/m <sup>3</sup>	

**Additional Information**

Product has a low volatility and at ambient temperature fume formation will be low. Avoid vapours from heated materials to prevent exposure to potentially toxic/irritating fumes.

**Material Source Hazard Designation**

Asphalt, fumes ACGIH Not classifiable as a human carcinogen.

**Exposure Controls**

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances.

Appropriate measures include: Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Where material is heated, sprayed or mist formed, there is greater potential for airborne concentrations to be generated Eye washes and showers for emergency use.

**Personal Protective Equipment**

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

**Respiratory Protection**

No respiratory protection is ordinarily required under normal conditions of use. Use self contained breathing apparatus in places where hydrogen sulphide vapours may accumulate.

**Hand Protection:** When handling heated product wear heat resistant gloves. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact. Always seek advice from glove suppliers.

**Eye Protection**

For normal operations with hot material wear safety hat with visor.

**Protective Clothing:** For normal operations with hot material wear heat resistant coveralls, (with cuffs over gloves and legs over boots), and heavy-duty boots, e.g. leather for heat resistance. The use of a neck apron is recommended.

**Environmental Exposure Controls**

Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance** : Brown to black. Liquid at high temperatures.

**Odour** : Characteristic.

**Softening point** : > 42 °C / 108 °F

**Flash point** : > 230 °C / 446 °F (Cleveland Open Cup)

**Auto-ignition temperature** : > 300 °C / 572 °F

**Density** : ca. 0.990 - 1.300 g/cm<sup>3</sup> at 25 °C / 77 °F

**Water solubility** : Negligible.

**Solubility in other solvents** : Soluble.

**Vapour density (air=1)** : Not applicable.

**Hygroscopicity** : Negligible.

**10. STABILITY AND REACTIVITY****Stability**

Stable under normal conditions of use.

**Conditions to Avoid**

Heating above the maximum recommended storage and handling temperature, will cause degradation and evolution of flammable vapours.

**Materials to Avoid**

Do not allow molten material to contact water or liquids as this can cause violent eruptions, splatter hot material, or ignite flammable material. Reacts with strong oxidising agents. Avoid contamination of thermal insulation near hot surfaces by oil and bitumen and replace lagging where necessary, with a non-absorbent type of insulation. Self-heating, leading to auto ignition at the surfaces of porous or fibrous materials impregnated with bitumen or condensates from bituminous fumes, can occur at temperatures below 100°C.

**Hazardous Decomposition Products**

Hydrogen sulphide.

**11. TOXICOLOGICAL INFORMATION****Basis for Assessment:**

Toxicological data have not been determined specifically for this product.

Information given is based on data on the components and the toxicology of similar products.

**Acute Oral Toxicity**

Expected to be of low toxicity: LD50 >2000 mg/kg , Rat Acute Dermal Toxicity : Expected to be of low toxicity: LD50 >2000 mg/kg , Rabbit

**Acute Inhalation Toxicity**

Not considered to be an inhalation hazard under normal conditions of use. Avoid vapours from heated materials to prevent exposure to potentially toxic/irritating fumes.

**Skin Irritation**

Expected to be slightly irritating. Contact with hot material can cause thermal burns which may result in permanent skin damage.

**Eye Irritation**

Expected to be slightly irritating. Hot product may cause severe eye burns and/or blindness.

**Respiratory Irritation**

Inhalation of vapours or mists may cause irritation to the respiratory system.

**Sensitisation**

Not expected to be a skin sensitizer.

**Mutagenicity**

Not considered a mutagenic hazard.

**Carcinogenicity**

Bitumen's are not classified as dangerous under EC criteria. Bitumens contain low concentrations of Polycyclic Aromatic Compounds (PACs). In undiluted bitumen's these PACs are not considered to be bio-available. However, if bitumen's are mixed with diluents to obtain a low viscosity at ambient temperatures, it is believed that such materials may become bio-available. Despite the known presence of PACs there is no evidence that exposure to undiluted bitumen's or their fumes is harmful.

**Reproductive and Developmental Toxicity**

Data not available

**12. ECOLOGICAL INFORMATION**

Ecotoxicological data have not been determined specifically for this product. Information given is based on knowledge of the components and the ecotoxicology of similar products.

**Acute Toxicity**

Poorly soluble mixture. May cause physical fouling of aquatic organisms. Expected to be practically non toxic: LL/EL/IL50 >100 mg/l (to aquatic organisms) (LL/EL50 expressed as the nominal amount of product required to prepare aqueous test extract).

**Mobility**

Adsorbs to soil and has low mobility. In water will either float or sink, showing little tendency to disperse, the product will adsorb to the sediment.

**Persistence/degradability**

Expected to be not inherently biodegradable.

**Bioaccumulation**

Has the potential to bio accumulate. In practice, the very low water solubility's and high molecular weights of these substances are such that their bioavailability to aquatic organisms is limited and therefore bioaccumulation is unlikely.

**Other Adverse Effects**

Not expected to have ozone depletion potential, photochemical ozone creation potential or global warming potential.

**13. DISPOSAL CONSIDERATIONS****Material Disposal**

Recover or recycle if possible. Dispose in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. Do not dispose into the Bit Pen Grade (71112SXI) environment, in drains or in water courses.

**Container Disposal**

Comply with any local recovery or waste disposal regulations.

**Local Legislation**

Disposal should be in accordance with applicable regional, national, and local laws and regulations.

**14. TRANSPORT INFORMATION****IMDG**

**Identification number** : UN1999  
**Proper shipping name** : ELEVATED TEMPERATURE LIQUID, N.O.S.  
**Class / Division 9** : Packing group III  
**Marine pollutant** : No  
**Additional Information** : IATA - Forbidden for transport on passenger and cargo aircraft in molten state. Not dangerous for conveyance under UN, IMO, ADR/RID, IATA codes if transported at ambient temperature  
Packed in drums at ambient conditions is non- dangerous.

**16. OTHER INFORMATION****R-phrases(s)**

Not classified.

**MSDS Version Number** : 1.

**MSDS Effective Date** : JUNE 2009

**MSDS Revisions** : A vertical bar (|) in the left margin indicates an amendment from the previous version.

**Uses and Restrictions** : This product must not be used in applications other than those recommended in Section 1, without first seeking the advice of the supplier.

**MSDS Distribution**

The information in this document should be made available to all who may handle the product.

**Disclaimer**

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.