MATERIAL SAFETY DATA SHEET

Product Name	:	**CUT BACK BITUMEN**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name : Cut Back Bitumen MC 30,MC 70,MC 250,MC 800
MC 3000,RC 70,RC 250,RC800,RC3000

Company Name : Benzene International Pte Ltd

Address : 10 Bukit Batok Crescent
#04-04 The Spire, Singapore 658079
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2.COMPOSITION /INFORMATION ON INGREDIENTS

Medium cure Asphalt is asphalt mixed with varying proportions of kerosene. Composition varies depending on source of crude and specifications of final product .May contain minor amounts of sulfur, nitrogen and oxygen containing compounds .Different asphalt grades may also contain an anti –strip additive.

Product Information:

Name	CAS Number	Weight %	ACGIH Exposure Limits:	OSHA-Vacated PELs-Time Weighted Ave	Other:
Medium Cure Asphalt	Mixture	100	=0.5 mg/m^3 TWA		

Component Information:

Name	CAS Number	Weight%	ACGIH Exposure Limits:	OSHA-Vacated PELs-Time Weighted Ave	Other:
Asphalt	8052-42-4	40-90	=0.5mg/m^3 TWA(inhalable fraction,as benzene-soluble aerosol)		
Kerosene	8008-20-6	10-60	=200mg/m^3 TWA Application restricted to conditions in which there are negligible aerosol exposures skin-		

			potential for cutaneous absorbtion (as total hydrocarbon vapour)		
Sulfur Compounds	Mixture	0-3			
Anti-Stripping Additive	Mixture	0-1.5			
Naphthalene	91-20-3	0.01-0.3	Skin-Potential Significant contribution to overall exposure by the cutaneous route =10ppm TWA =15ppm STEL	=10 ppm TWA =50 mg/m^3TWA =15 ppmSTEL =75 mg/m^3STEL	
Hydrogen Sulfide	7783-06-4	0-0.5	=10 ppm TWA =15 ppm STEL	=10 ppm TWA =14 mg/m^3TWA =15 ppm STEL =21 mg/m^3STEL	

Notes: The Manufacturer has voluntarily elected to reflect exposure limits contained in OSHA'S 1989 air contaminants standard in its MSDS'S ,even though certain of those exposure limits were vacated in 1992.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

BLENDED ASPHALT PRODUCTS ARE DARK BROWN TO BLACK,SOLID OR SEMI-SOLID LIQUIDS.ASPHALT IS MOLTEN ABOVE 200 DEGREES F AND SKIN CONTACT WILL CAUSE THERMAL BURNS .WHEN HEATED THIS MATERIAL MAY VENT TOXIC LEVELS OF HYDROGEN SULFIDE (H2S) VAPORS THAT ACCUMULATE IN THE VAPOR SPACES OF STORAGE AND TRANSPORT COMPARTMENTS .H2S VAPORS CAN CAUSE EYE, SKIN,AND RESPIRATORY TRACT IRRITATION AND ASPHYXIATION . AVOID SKIN CONTACT.LONG TERM SKIN EXPOSURE TO COMPONENTS OF THIS PRODUCT HAS CAUSED CANCER IN LABORATORY ANIMALS .THIS PRODUCT IS CONSIDERED TO BE A COMBUSTIBLE LIQUID PER THE OSHA HAZARD COMMUNUCATION STANDARD AND SHOULD BE KEPT AWAY FROM HEAT,FLAME AND SOURCES OF IGNITION.

OSHA WARNING LABEL:

WARNING. HOT ASPHALT
COMBUSTIBLE LIQUID.MAY PRODUCE SEVERE BURNS.
MAY VENT HARMFUL CONCENTRATIONS OF HYDROGEN SULFIDE (H2S) GAS WHICH CAN CAUSE RESPIRATORY IRRITATION AND ASPHYXIATION.
LONG-TERM SKIN EXPOSURE TO COMPONENTS OF THIS PRODUCT HAS CAUSED CANCER IN LABORATORY ANIMALS.

CONSUMER WARNING LABEL:

A CONSUMER WARNING LABEL IS NOT APPLICABLE FOR THIS PRODUCT.

Inhalation:	Vapors and fumes can cause respiratory and nasal irritation .Significant Concentrations of hydrogen sulphide gas can be present in the vapour space Of storage tanks and bulk transport compartments (see sections 7,8 & 11).
Ingestion:	Product would be expected to have a low order of acute toxicity.
Skin Contact:	Hot product causes severe burns. Frequent or prolonged contact with cold Material may cause irritation.
Eye Contact:	Hot product causes severe burns.

Carcinogenic Evaluation

Product Information:

Name	IARC Carcinogens:	NTP Carcinogens:	ACGIH-Carcinogens:	OSHA-Select Carcinogens:
Medium Cure Asphalt Mixture	NE			

Notes: The International Agency for Research on Cancer(IRAC) has determined that there is sufficient evidence for the carcinogenicity of extracts of steam-refined bitumen (asphalts),air-refined bitumen and pooled mixtures of steam – and air-refined bitumen in experimental animals .IARC has determined that there is inadequate evidence that bitumen alone are carcinogenic to humans.

Component Information:

Name	IARC Carcinogens:	NTP Carcinogens:	ACGIH Carcinogens:	OSHA-Select Carcinogens:
Asphalt 8052-42-4	Supplement 7,1987;Monograph 35,1985;(extracts of steam and air refined bitumens)		A4-Not Classifiable as a Human Carcinogen(as benzene-soluble aerosol)	
Kerosene 8008-20-6			A3-Animal Carcinogen(as total hydrocarbon vapour)	
Naphthalene	Monograph 82,2002	Reasonably Anticipated to be a Carcinogen Listed	A4-Not Classifiable as a Human Carcinogen	Present

Notes:The International Agency for Research on Cancer (IARC) has determined that there is inadequate evidence for the carcinogenicity of diesel fuel/fuel oil in humans .IARC determined that there was limited evidence for the carcinogenicity of marine diesel fuel in animals .Distillate (light)diesel fuels were not classifiable as to their carcinogenicity to humans(Group 3 A)The International Agency for Research on Cancer (IARC) and the Environmental Protection Agency(EPA) have determined that naphthalene could be a possible human carcinogen.

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4. FIRST AID MEASURES

Inhalation: If affected, move person to fresh air .If breathing is difficult, administer oxygen. If not breathing or if no heartbeat, give artificial respiration or cardiopulmonary resuscitation (CPR).Immediately call a physician .if symptoms or irritation occur with any exposure, call a physician.

Skin contact: For contact with hot molten material, immerse or flush skin with cold water for at least 15 minutes. Call a physician. Do not attempt to remove solidified material since removal may cause further tissue injury. Cold material over a burn should not be removed except by a Physician. Remove cold material (not associated with a burn) with waterless hand cleaner and then wash with soap and water. If symptoms or irritation occur, call a physician.

Ingestion: Ingestion not likely. If large amounts are swallowed, immediately call a physician.

Eye contact: For contact with hot molten material, flush with large amounts of tepid water for at-least 15 minutes. Immediately call a physician.

For contact with vapors or dust, flush with large amounts of tepid water for at least 15 minutes .if symptoms or irritation occur, call a physician.

Notes to Physician: Recommended practice is to not attempt to remove hot material associated with a burn. Allow the solidified material to remain in place until cooled so it can naturally fall off. Natural separation will occur in 48-72 hours. If removal is attempted, mineral oil may be used to remove asphalt once it is cooled. For best results, work it into the skin around the material and allow the material to “float” off.

Medical conditions Pre-existing skin, eye and respiratory disorders may be aggravated by

Aggravated by exposure: exposure to components of this product.

5.FIRE FIGHTING MEASURES

Suitable extinguishing media: For small fires ,Class B fire extinguishing media such as CO_2 Dry Chemical foam(AFFF/ATC) or water spray can be used .For l large fires, water spray, fog or foam(AFFF/ATC)can be used Fire fighting should be attempted only by those who are adequately trained and equipped with proper protective equipment.

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Specific Hazards:	This product has been determined to be a combustible liquid per the OSHA Hazard Communication Standard and should be handled accordingly. For additional fire related information, see NFPA 30, or the North American Emergency Response Guide 128.
Special protective equipment for Fire-Fighters:	Avoid using straight water streams. Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and from as far a distance as possible Avoid excessive water sp -ray application. Keep run-off water out of sewers and water sources.
Flash Point:	>100F
Auto ignition Temperature:	No data available.
Flammable limits in air-lower (%):	0.7
Flammable limits in air-upper (%):	5.0(alimenter du petrole)
NFPA rating:	**HMIS classification:**
Health: 2	Health:2
Flammability: 2	Flammability: 2
Reactivity: 1	Reactivity: 1
Other: -	Special: *See Section 8 for guidance in selection of personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Personal Precaution:	Keep public away. Isolate and evacuate area. Shut off source if safe to do so. Advise authorities and National Response Center (800-424-8802) if substance has entered a watercourse or sewer. Notify local health and pollution control agencies, if appropriate. Contain liquid with sand or soil. Recover and return product to source.

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7. HANDLING AND STORAGE

Handling:

Comply with all applicable EPA, OSHA, NFPA and consistent state and local requirements. Use appropriate grounding and bonding practices. Store in properly closed containers that are appropriately labeled and in a cool well-ventilated area. Do not expose to heat, open flames, strong oxidizers or other sources of ignition. Do not cut, drill, grind or weld on empty containers since they may contain explosive residues.

Significant concentrations of hydrogen sulfide (H2S) gas can be generated and accumulate in storage tanks and bulk transport compartments which may require additional precautions and procedures during loading/unloading. When opening covers and outlet caps on storage tanks, use face shield and gloves to avoid possible injury from pressurized product. Stay upwind and vent open hatches before unloading. Keep heating coils and flues in storage tanks, trucks and kettles covered with product (8"). Do not overheat.

Avoid skin contact. Exercise good personal hygiene including removal of soiled clothing and prompt washing with soap and water.

8. EXPOSURE CONTROLS /PERSONAL PROTECTION

PERSONAL PROTECTIVE EQUIPMENT

Engineering Measures:	Local or general exhaust required in an enclosed area or when there is inadequate ventilation.
Respiratory Protection:	Not required under normal conditions and adequate ventilation When H2S vapour exceeds permissible limits ,i.e., in confined spaces or bulk transport loading/unloading , a positive pressure atmosphere supplying respirator is recommended .Self – Contained breathing apparatus should be used for fire fighting.
Skin and body Protection:	Insulated gloves when handling hot material.
Eye Protection:	Goggles and face shield when handling hot material.
Hygiene measures:	Rubberized suits or coats may be needed for some maintenance operations without material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Black –brown Solid or Semi –Solid
Physical state (Solid/Liquid/Gas):	Liquid
Substance type(Pure/Mixture):	Mixture
Color:	Black-Brown

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Odor:	Tar
Molecular Weight:	Not determined.
pH:	Neutral
Boiling point/range(5-95%):	>350 F
Melting point/range:	>80 F
Decomposition temperature:	Not Applicable.
Specific Gravity:	Not determined.
Density:	7.5-8.7lbs/gal
Bulk Density:	No data available
Vapor Density:	No data available
Vapor Pressure:	1-10mm Hg @ 100F
Evaporation rate:	No data available
Solubility:	Not determined
Solubility in other solvents:	No data available
Partition coefficient(n-octanol/water):	No data available
VOC content(%):	No data available
Viscosity:	No data available

10. STABILITY AND REACTIVITY

Stability:	The material is stable at 70 F, 760mm pressure.
Polymerization:	Will not occur.
Hazardous decomposition products:	Combustion produces toxic oxides of sulfur, carbon monoxide, sulfur dioxide, Hydrogen sulphide and hydrocarbons.
Materials to avoid:	Strong oxidizers such as nitrates, chlorates, peroxides.
Conditions to avoid:	Excessive heat, sources of ignition, open flame.

11. TOXICOLOGICAL INFORMATION
Acute toxicity:

Product Information:

Name	CAS Number	Inhalation:	Dermal:	Oral:
Marathon Medium Cure Asphalt	Mixture	No data available	No data available	No data available

Some epidemiologic studies conducted on workers exposed to asphalt fume have shown no increased incidence of cancer while other studies have reported a slightly increased incidence of lung, other respiratory tract or gastrointestinal cancers. In those studies in which elevated cancer incidences were reported, concurrent or previous exposure to coal-tar products have been documented. therefore, it cannot be concluded that cancer incidence is related to exposure to asphalt fume.

Although early studies have some technical shortcomings, long term inhalation exposures to asphalt aerosols or fumes did not produce evidence of carcinogenicity even though chronic inflammatory changes similar to those produced by nonspecific respiratory irritants were observed. Inhalation of 150 mg/m3 asphalt fume (particulate + vapor) 6 hours/day, 5 days/week for 13 weeks, did not produce toxicity except for reduced body weight and irritation in nasal passages in exposed rats.

Laboratory animals administered subcutaneous or intramuscular injections of asphalt preparations or repeated skin applications of hot (212 F) undiluted asphalt has occasionally produced a low incidence of skin tumours at the site of application. These findings are of questionable validity since repeated tissue trauma (and/or burns) at the application site can induce tumours. Solvent dilutions of different types of asphalts have been tested in chronic skin painting studies. Some of the studies have reported a low incidence of skin tumours. The use of diluents may enhance bioavailability or metabolic activation of chemicals in the mixture in a fashion not representative of occupational exposure. Skin painting studies in mice have been conducted using condensates from fumes generated at temperatures >450 F diluted in solvent. Asphalt fume condensate preparations have produced skin tumors. Experimental conditions (temperature and dose) were grossly exaggerated over that likely to occur in humans.

Extracts of whole asphalts tested in a modified Ames assay gave negative or slightly positive findings (mutagenicity index<1.5). Fume condensates derived from heating asphalts to high temperatures (>450 F) were moderately active (MI 4-9).Fumes generated from coal tar pitch were >1000 times more active. Asphalt fume samples collected under actual field conditions did not show any significant mutagenic activity.

Summary of health effect data on asphalt components:

This product can contain a toxicologically significant concentration of hydrogen sulfide (H2S). Hydrogen sulfide gas (H2S)is toxic by inhalation. Prolonged breathing of 50-100 ppm H2S vapours can produce eye and respiratory tract irritation. Higher concentrations (250-600 ppm) for 15-30 minutes can produce headache, dizziness, nervousness, nausea and pulmonary edema or bronchial pneumonia.

Concentrations of >1000 ppm will cause immediate unconsciousness and death through respiratory paralysis. Rats and mice exposed to 80 ppm H2S, 6 hrs/day, 5 days/week for 10 weeks, did not produce any toxicity except for irritation of nasal passages. H2S did not affect reproduction and development (birth defects or neurotoxicity) in rats exposed to concentrations of 75-80 ppm or 150 ppm H2S, respectively. Over the years a number of acute cases of H2S poisonings have been reported. Complete and rapid recovery is the general rule. However, if the exposure was sufficiently intense and sustained causing cerebral hypoxia (lack of oxygen to the brain), neurologic effects such as amnesia, intention tremors or brain damage are possible.

This product may contain Kerosene at a level of >1.0%. Lifetime skin painting studies in animals with similar middle distillate fuel oils and gas oils have produced tumours following prolonged and repeated skin contact. Some middle distillates and/or light gas oils, when tested at non-irritating dose levels, did not show any significant carcinogenic activity indicating that this tumorigenic response may be related to chronic irritation and not to dose. Repeated dermal application has produced severe irritation and systemic toxicity in sub-acute toxicity studies. Some components of this product, i.e., paraffins and olefins, have been shown to produce a species specific sex hormonal dependent kidney lesion in male rats from repeated oral or inhalation exposure. Subsequent research has shown that the kidney damage develops via the formation of alpha-2u-globulin, a mechanism unique to the male rat. Humans do not form alpha-2uglobulin, therefore, the kidney effects resulting from this mechanism are not relevant in humans. Some components were found to be positive in a few mutagenicity tests while negative in the majority of others. The exact relationship between these results and human health is not known.

This product may contain >0.1% naphthalene. Exposure to naphthalene at 30 ppm for two years caused lung tumours in female mice. Male mice with the same exposure did not develop tumors. Exposure to 10-60 ppm naphthalene for 2 years caused tumours in the tissue lining of the nose and respiratory tract in male and female rats. Oral administration of 133-267 mg/kg/day of naphthalene in mice for up to 90 days did not produce mortality, systemic toxicity, adversely affect organ or body weight or produce changes in blood. Repeated oral administration of naphthalene produced an anemia in dogs. Repeated intra-peritoneal doses of naphthalene produced lung damage in mice. Repeated high doses of naphthalene has caused the formation of cataracts and retinotoxicity in the eyes of rats and rabbits due to accumulation of 1,2-naphthoquinone, a toxic metabolite. Effects in human eyes are uncertain and not well documented. Pregnant rats administered intra-peritoneal doses of naphthalene during gestation gave birth to offspring that had delayed heart and bone development. Pregnant mice given near lethal doses of naphthalene showed no significant maternal toxicity and a reduction in the number of pups per litter, but no gross abnormalities in offspring. Suppressed spermatogenesis and progeny development have been reported in mice, rats and guinea pigs after exposure to high concentrations of naphthalene in their drinking water. Certain groups or individuals, i.e., infants, Semites, Arabs, Asians and Blacks, with a certain blood enzyme deficiency (glucose-6-phosphate dehydrogenase) are particularly susceptible to hemolytic agents and can rapidly develop hemolytic anemia and systemic poisoning from ingestion or inhalation of naphthalene.

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12. ECOLOGICAL INFORMATION

Eco-toxicity effects: If spilled, hot product and /or the coating action of the oil components could harm plant life. This product does not concentrate or accumulate in the food chain .This product is not expected to cause any acute or chronic toxicity to aquatic organisms due to its extremely low water solubility.

13. DISPOSAL CONSIDERATIONS

Cleanup Considerations: This product as produced is not specifically listed as an EPARCRA hazardous waste according to federal regulations (40CFR 261). However, when discarded or disposed of, it may meet the criteria of an "characteristic" hazardous waste. This material could become a hazardous waste if mixed or contaminated with a hazardous waste or other substance(s).It is the responsibility of the user to determine if disposal material is hazardous according to federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT:

Transport Information:	This material when transported via US commerce would be regulated by DOT Regulations. Comments: For domestic shipments only, the Proper Shipping Name "Asphalt Cutback" may be used.
Proper shipping name:	Tars, Liquid
UN/Identification No:	UN 1999
Hazard Class:	3
Packing group:	II
DOT reportable quantity (lbs):	Not applicable.

TDG (Canada):

Proper shipping name:	Tars, Liquid
UN/Identification No:	UN 1999
Hazard Class:	3
Packing group:	II
Regulated substances:	Not applicable.

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15. REGULATORY INFORMATION

Federal Regulatory Information:

US TSCA Chemical Inventory Section 8(b): This product and/or its components are listed on the TSCA Chemical Inventory.

OSHA Hazard Communication Standard: This product has been evaluated and determined to be hazardous as defined in OSHA's Hazard Communication Standard.

EPA Superfund Amendment & Reauthorization Act (SARA):

SARA Section 302: This product contains the following component(S) that have been listed on EPA's Extremely Hazardous Substance (EHS) List:

Name	CERCLA/SARA-Section 302 Extremely Hazardous Substances and TPQs
Asphalt	NA
Kerosene	NA
Sulphur Compounds	NA
Anti-Stripping Additive	NA
Naphthalene	NA
Hydrogen Sulphide	Hydrogen sulphide

SARA Section 304: This product contains the following component(s) identified either as an EHS or CERCLA Hazardous substance which in case of a spill or release may be subject to SARA reporting requirements

Name	CERCLA/SARA-Hazardous Substances and their Reportable Quantities
Asphalt	NA
Kerosene	NA
Sulphur Compounds	NA
Anti-Stripping Additive	NA
Naphthalene	= 0.454 kg final RQ = 1 lb final RQ = 100 lb final RQ = 45.4 kg final RQ
Hydrogen Sulphide	= 100 lb final RQ = 45.4 kg final RQ

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SARA Section 311/312:	The following EPA hazard categories apply to this product: Acute Health Hazard Chronic Health Hazard Fire Hazard

SARA Section 313:	This product contains the following component(s) that may be subject to reporting on the Toxic Release Inventory (TRI) from R:

Name	CERCLA/SARA-313 Emission Reporting
Asphalt	None
Kerosene	None
Sulphur Compounds	None
Anti-Stripping Additive	None
Naphthalene	=0.1 % de minimise concentration
Hydrogen Sulphide	None

Community Right-To-Know Regulations:

The following component(s) of this material are identified on the regulatory lists below:

Asphalt	Present
Kerosene	Not Listed
Sulfur Compounds	Not Listed
Anti-Stripping Additive	Not Listed
Regulated Carcinogens:	Not Listed
RTK-Special Hazardous	Not Listed
Special Hazardous Substances	Not Listed
Environmental Hazardous Substances	Not Listed
Toxic Air Contaminants	Not Listed
Reporting of releases Part 597-	Not Listed
Hydrogen Sulphide:	Not Listed

Name	Canada-WHMIS:Classification of Substances	Canada-WHMIS:Ingredient Disclosure
Kerosene	B3;D2B	
Naphthalene	B4;D2A	1%
Hydrogen Sulphide	A;B1;D1A;D2B	1%(English item 851,French item 1550)

16. OTHER INFORMATION

Additional Information:

The pronounced and easily-recognized rotten egg odor of hydrogen sulfide gas (H2S) can be detected at concentrations as low as 0.003-0.13 ppm. Since higher H2S concentrations (100-200 ppm) cause olfactory fatigue and other hydrocarbon odors can "mask" H2S, the sense of smell cannot be used as a reliable indicator of H2S exposure.

The information and recommendations contained herein are based upon tests believed to be reliable. However, Benzene International Pte Ltd does not guarantee their accuracy or completeness nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose. Adjustment to conform to actual conditions of usage maybe required. MPC assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied.

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