MATERIAL SAFETY DATA SHEET

for

ASPHALT

(unhardened and hardened asphalt)

Section I - Product and Company Identification

Material Identity (Trade Names): Asphalt (a mixture of 93-97 % aggregate, 4-7% asphalt, and 0.01-0.04 % antistripping agent)

Section II - Hazardous Ingredients/Identity Information

Hazardous Components (Chemical Identity/Common Names)	CAS No.	OSHA PEL	ACGIH TLV	MSHA PEL	%
Asphalt (hot liquid)	8052-42-4	Not Listed	0.5 mg/m^3 (Fume) (as benzene-soluble aerosol or equivalent method)	5 mg/m^3 (Fume)	4-7%
Crystalline silica (Quartz) (contained in aggregate)	14808-60-7	30/(%SiO_2 +2) mg/m^3 (Total) 10/(%SiO_2 +2) mg/m^3 (Respirable)	0.05 mg/m^3 (Respirable quartz)	30/(%SiO_2+ 3) mg/m^3 (Total) 10/(%SiO_2 +2) mg/m^3 (Respirable)	0-95%
Particulates not otherwise classified	--------	15 mg/m^3 (Total) 5 mg/m^3 (Respirable)	10 mg/m^3 (Inhalable) 3 mg/m^3 (Respirable)	10 mg/m^3 (Total)	0-95%

Section III - Physical/Chemical Characteristics

Boiling Point	Not Applicable	**Specific Gravity (H_20 = 1)**	Variable
Vapor Pressure (mm Hg)	Not Applicable	**Melting Point**	N/A
Vapor Density (Air = 1)	Not Applicable	**Evaporation Rate (Butyl Acetate = 1)**	N/A

Solubility in Water: N/A.

Section IV - Fire and Explosion Hazard Data

Flash Point: > 450° F (liquid asphalt)	**Flammable Limits:** Not Flammable	**LEL:** N/A	**UEL:** N/A

Extinguishing Media: Use foam, dry chemical, or carbon dioxide to fight fire.

Special Fire Fighting Procedures: Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in the pressure-demand or positive pressure mode. Wear protective clothing and face and eye protection when handling hot asphalt. If feasible, move containers from fire hazard since they may explode in the heat of the fire. Otherwise, use water spray to cool fire-exposed containers. Be aware of runoff from fire control methods. Do not release to sewers or waterways since it may create a fire hazard and cause pollution.

Unusual Fire and Explosion Hazards: Hot asphalt is a slight fire hazard when exposed to heat, flame, or fluorine. Vapors may travel to an ignition source and flash back.

Section V - Reactivity Data

Stability: Stable	**Conditions to Avoid:** Avoid contact of hot asphalt with heat, flame, or fluorine. Asphalt cooled in a closed tank can evolve high concentrations of hydrogen sulfide gas, carbon monoxide, and other aliphatic hydrocarbons.

Incompatibility (Materials to Avoid): When mixed with naphtha or other volatile solvents, asphalt may readily ignite.

Hazardous Decomposition or Byproducts: Thermal oxidative decomposition of asphalt can produce carbon monoxide, various aliphatic hydrocarbons, and hydrogen sulfide. Inhalation of carbon monoxide and hydrogen sulfide produces tissue hypoxia (insufficient oxygen). The various aliphatic hydrocarbons can also produce asphyxia.

Hazardous Polymerization: Will Not Occur	**Conditions to Avoid:** Hazardous polymerization cannot occur. Avoid excessive dust/fume generation and contact with incompatible materials listed above.

Section VI - Health Hazard Data

Route(s) of Entry:	**Inhalation?** Yes	**Skin?** Yes	**Ingestion?** Unlikely

Health Hazards:

Acute Effects: Inhalation of hot asphalt fumes can cause headache, nausea, eye, and respiratory tract irritation, and nervousness due to formation of hydrogen sulfide gas. Inhalation of hydrogen sulfide gas can cause upper respiratory tract irritation and, if exposure is prolonged at levels above the OSHA PEL, pulmonary edema and even coma or death. Direct skin contact with hot asphalt produces a scald-like lesion. The asphalt tends to adhere to the skin but may come off in blistered areas. Patchy areas of full thickness skin loss are common. Eye exposure to hot asphalt also produces a direct thermal burn.

Cutting, grinding, crushing, or drilling hardened asphalt may generate dust containing crystalline silica. Acute effects of exposure to such dust may include:

EYE CONTACT: Direct contact with dust may cause irritation by mechanical abrasion.

SKIN CONTACT: Direct contact may cause irritation by mechanical abrasion.

SKIN ABSORPTION: Not expected to be a significant route of exposure.

INGESTION: Expected to be relatively non-toxic. Ingestion of large amounts may cause gastrointestinal irritation and blockage.

INHALATION: Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion. Coughing, sneezing, and shortness of breath may occur following exposures in excess of recommended exposure limits.

Use of asphalt for construction purposes is not believed to cause additional acute toxic effects. However, repeated overexposures to very high levels of respirable crystalline silica (quartz, cristobalite, tridymite) for periods as short as six months have caused acute

silicosis. Acute silicosis is a rapidly progressive, incurable lung disease that is typically fatal. Symptoms include

Section VI - Health Hazard Data (continued)

(but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain.

Chronic Effects: On prolonged or repeated exposure, asphalt fumes can cause dermatitis, acne-like lesions, mild keratosis (a skin disease marked by an overgrowth of horny tissue), melanosis, and photosensitization. Chronic inhalation exposure can cause chronic pneumonitis and bronchitis**.**

Cutting, grinding, crushing, or drilling hardened asphalt can produce exposure to dust containing crystalline silica (quartz), which is a cancer hazard if inhaled. Cancer risk depends on level and duration of exposure. Prolonged exposure to crystalline silica can also cause silicosis, a progressive pneumoconiosis (lung disease).

Respirable dust containing newly broken silica particles has been shown to be more hazardous to animals in laboratory tests than respirable dust containing older silica particles of similar size. Respirable silica particles which had aged for sixty days or more showed less lung injury in animals than equal exposures of respirable dust containing newly broken particles of silica.

There are reports in the literature suggesting that excessive crystalline silica exposure may be associated with adverse health effects involving the kidney, scleroderma (thickening of the skin caused by swelling and thickening of fibrous tissue) and other autoimmune disorders. However, this evidence has been obtained primarily from case reports involving individuals working in high exposure situations or those who have already developed silicosis; and therefore, this evidence does not conclusively prove a causal relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate an increased risk in developing lung cancer, a risk that increases with duration of exposure. Many of these studies of silicotics do not account for lung cancer confounders, especially smoking.

Carcinogenicity: The IARC, NTP and OSHA do not list asphalt as a carcinogen. However, liquid petroleum asphalt may contain carcinogenic compounds. In general, oxidation of polycyclic aromatic hydrocarbons destroys their carcinogenic potential. Petroleum asphalt, shale oil asphalts, and coal tars show distinct variations in their relative carcinogenicity for experimental animals. Diluting with natural asphalts or converting to air-blown asphalt can reduce petroleum asphalt's carcinogenicity. NIOSH describes asphalt as a carcinogen with no further categorization.

Asphalt mix contains aggregate products which may contain crystalline silica. In October 1996, IARC classified respirable crystalline silica from occupational sources as carcinogenic (Group 1). The NTP indicates that crystalline silica (respirable size) is a known human carcinogen (Group 1). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica.

Signs and Symptoms of Exposure: See acute and chronic health effects. Chronic exposure to respirable dust containing crystalline silica in excess of applicable OSHA PELs , MSHA PELs, and ACGIH TLVs has caused silicosis, a progressive lung disease. Chronic tobacco smoking may further increase the risk of developing chronic lung problems. Not all individuals with silicosis will exhibit symptoms (signs) of the disease. However, silicosis is progressive, and symptoms can appear at any time, even years after exposures have ceased. Symptoms of silicosis may include (but are not limited to): shortness of breath, difficulty breathing with or without exertion, coughing, diminished work capacity, diminished chest expansion, reduction of lung volume, right heart enlargement and/or failure. Persons with silicosis have an increased risk of pulmonary tuberculosis infection.

Medical Conditions Generally Aggravated by Exposure: Individuals with chronic respiratory disorders or skin diseases should minimize inhalation and skin contact with asphalt. Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) or dysfunction. Exposure to dust may aggravate existing skin and/or eye conditions.

Physicians Note: Remove hardened asphalt and treat as a thermal burn. Apply liberal amounts of polysorbate over the affected area, cover with wet dressings, and allow to remain for 6 hours. Consider applying commercially available sterile surfactant such as De-Solv-It or Shur-Clens to wash away remaining asphalt. Skin grafting may be necessary.

Section VI - Health Hazard Data (continued)

Emergency and First Aid Procedures:

Eyes: For hot asphalt in eyes, gently lift the eyelids and flush immediately and continuously with flooding amounts of water until transported to an emergency medical facility. Consult a physician immediately. For hardened asphalt dust in eyes, flush immediately and continuously with running water for 15 minutes. Consult a physician if irritation persists.

Skin: Quickly remove contaminated clothing. Immerse asphalt covered skin in cool water until the material cools and hardens. Transport to a medical facility immediately. For asphalt dust, wash skin thoroughly with soap and water. Consult a physician if irritation persists.

Inhalation of dust or fume: Remove exposed person to fresh air and support breathing as needed. For dust inhalation, encourage victim to cough, spit out, and blow nose to remove dust. Consult a physician immediately if irritation persists or later develops.

Ingestion: Oral ingestion of cool asphalt is relatively nontoxic. Never give anything by mouth to an unconscious or convulsing person. Consult a physician immediately.

Section VII - Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled: If hot asphalt is spilled, notify safety personnel, evacuate all unnecessary personnel, remove all heat and ignition sources, and provide maximum explosion-proof ventilation. Cleanup personnel should protect against vapor inhalation and skin or eye contact. Use water spray to reduce vapors. For small spills, take up with sand or some noncombustible inert material and place in appropriate containers for disposal. Dike far ahead of larger liquid spills and contain for later disposal.

Waste Disposal Method: Follow applicable Federal, State, and local regulations. The material is not listed as a hazardous waste under designations by the EPA or DOT.

Precautions to Be Taken in Handling and Storing: Store liquid asphalt in tightly closed containers in a cool, dry, well-ventilated area away from heat and ignition sources. To prevent static sparks, electrically ground and bond all containers and equipment used in shipping, receiving, or transferring operations in production and storage areas. Prevent containers from physical damage. Use protective clothing and respirators, if needed, to minimize contact with material. See Section VIII.

Silica-containing respirable dust particles may be generated by handling, crushing, cutting, grinding, or drilling hardened asphalt. Follow protective controls defined in Section VIII when handling these products.

Section VIII - Control Measures

Respiratory Protection: When exposed or likely to be exposed to fume, vapor, or dust (from cutting, grinding, crushing or drilling hardened asphalt) above recommended limits, wear a suitable NIOSH-approved respirator with a protection factor appropriate for the level of exposure. Seek guidance from a qualified industrial hygienist, safety professional, or other suitably knowledgeable individual prior to respirator selection and use. For emergency or nonroutine operations (e.g., confined spaces), additional precautions or equipment may be required. Respirator use must comply with applicable MSHA or OSHA standards, which include provisions for a user training program, respirator repair and cleaning, respirator fit testing, and other requirements.

Ventilation	**Local Exhaust:** Provide general or local explosion-proof ventilation systems, as needed, to maintain airborne dust and fume concentrations below the OSHA PELs, MSHA PELs, and ACGIH TLVs. Local exhaust ventilation is preferred since it prevents release of contaminants into the work area by controlling it at the source.	**Other:** Respirable dust and quartz levels from cutting, grinding, crushing or drilling hardened asphalt should be monitored regularly. Dust and quartz levels in excess of applicable OSHA PELs, MSHA PELs, and ACGIH TLVs should be reduced by all feasible engineering controls including (but not limited to) wet suppression, ventilation, process enclosure, and enclosed employee work stations.
	Mechanical (General): See above recommendations.	**Special:** None reported

Protective Gloves: Wear impervious gloves, boots, aprons, and gauntlets to prevent skin contact. Wash skin thoroughly with soap and water after handling.	**Eye Protection:** Wear safety glasses with side shields when working around hot asphalt. When handling hot asphalt, wear face shields.

Other Protective Clothing or Equipment: Wear suitable protective clothing, as needed, to prevent skin contact. Make available (if necessary) the use of eyewash stations, quick drench showers, and suitable washing facilities.

Work/Hygienic Practices: Avoid inhalation of dusts, fumes, and vapors, and direct contact of hot asphalt with skin and eyes. Wear gloves, impervious boots, and other protective gear when handling hot asphalt. If respiratory protection is used, institute a respiratory protection program that includes regular training, inspection, maintenance, and evaluation. Practice good personal hygiene and housekeeping procedures when using this product. After using the material, especially before eating, drinking, smoking, lavatory use, and applying cosmetics, wash contaminated skin thoroughly with soap and water.

DISCLAIMER:

The information contained in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process. The information set forth herein is based on technical data that the Company believes to be accurate. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside the Company's control, the Company makes no warranties, expressed or implied, and assumes no liability in connection with any use of this information.

HEALTH INFORMATION

EXPOSURE BY ROUTE OF ENTRY	EXPOSURE CHARACTERISTICS AND FIRST AID	
INHALATION	EFFECTS	Acute: Nasal and respiratory irritation.
	FIRST AID	Move exposed person to fresh air. If breathing has stopped, perform artificial respiration. Get medical attention as soon as possible.
SKIN	EFFECTS	Acute: Irritation, thermal burn.
	FIRST AID	If clothing soaked, immediately remove clothing and wash skin with soap and water. Launder clothing before wearing. For thermal burn: cool, flush with water, wrap with sterile dressing and apply cold pack. Get medical attention promptly.
EYES	EFFECTS	Acute: Irritation, thermal burn.
	FIRST AID	Immediately flush eyes with water for a minimum of 15 minutes, occasionally lifting the lower and upper lids. Get medical attention promptly.
SWALLOWING INGESTION	EFFECTS	Acute: Irritation, thermal burn.
	FIRST AID	Call a physician immediately, ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person

Medical conditions Generally Agravated by Exposure: N/AV

EMPLOYEE PROTECTION

RESPIRATORY PROTECTION (NIOSH APPROVED RESPIRATORS SEE OSHA STD. 1910.134)

Up to 50 mg/m3, half-mask dust respirator. Up to 250mg/m3, full-face dust respirator or full-face supplied air respirator. Greater than 250 mg/m3, fire-fighting, or unknown concentration, self-contained breathing apparatus with positive pressure.

	EYE Safety glasses, chemical goggles or face shield as appropriate.
	SKIN Gloves, long-sleeved shirt and cuffless trousers to protect from heated asphalt.

VENTILATION

Maintain local or dilution ventilation to keep air concentration below 5 mg/m3. Loading, unloading, tank gauging, etc., remain upwind. Request assistance of safety and industrial hygiene personnel in determining air concentrations.