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MATERIAL SAFETY DATA SHEET

Effective Date: 5-08
 Replaces: 6/10/99

I – PRODUCT AND COMPANY IDENTIFICATION		
CHEMICAL NAME Hot Mixed Asphalt (Bituminous Concrete)	CHEMICAL FORMULA Not Applicable	MOLECULAR WEIGHT Not Applicable
TRADE NAME Asphalt		
SYNONYMS Hot Mix		DOT IDENTIFICATION NO. None

II – COMPOSITION/INFORMATION ON INGREDIENTS				
COMPONENT(S) CHEMICAL NAME	CAS REGISTRY NO	% by weight (approx)	MSHA/OSHA PEL	ACGIH TLV-TWA
Asphalt Cement (Bitumen)	8052-42-4	4.5	--	(I) 0.5 mg/m ³ ‡
Limestone (Mineral Aggregates)*	1317-65-3	95.5	(T) 15 mg/m ³ / (R)5 mg/m ³	-
Quartz (Crystalline Silica SiO ₂)**	14808-60-7	varies	(R) 10 mg/m ³ / (%SiO ₂ +2) §	(R) 0.025 mg/m ³

* Particulates (Not Otherwise Regulated). **: Content of this material varies naturally. The composition of SiO₂ may be up to 100% crystalline silica. (R): Respirable (T): Total (I): Inhalable ‡: as benzene-soluble aerosol. §: Crystalline silica is normally measured as respirable dust. The OSHA standard also presents a formula for calculation of the PEL based on total dust: 30 mg/m³ / (% SiO₂+2). †: Particulate matter containing no asbestos and <1% crystalline silica.

III – HAZARDS IDENTIFICATION
<p>Hot Mix Asphalt or HMA, often referred to as simply "Asphalt" is a combination of aggregates, filler (cement, hydrated lime or stone dust) and a bituminous binder called asphalt cement. It consists of angular dark gray to black particles ranging in size from powder to small stones. It has a mild petroleum odor.</p> <p>The IARC, NTP and OSHA do not list asphalt as a carcinogen. In general, the oxidation of polycyclic aromatic hydrocarbons destroys their carcinogenic potential. Petroleum asphalt, shale oil asphalts and coal tars show distinct variation in their relative carcinogenicity for experimental animals. NIOSH describes asphalt as a carcinogen with no further categorization. Crystalline silica, a component of this product, has been designated as a Group I carcinogen by IARC. The NTP has listed respirable crystalline silica as a known human carcinogen and the ACGIH has listed respirable crystalline silica as a suspected human carcinogen (A-2 designation). OSHA does not list crystalline silica as a carcinogen.</p>
<p>Health Effects: The information below represents an overview of health effects caused by overexposure to one or more components in hot mixed asphalt and hardened hot asphalt. The individual effects are described in Section XI.</p> <p><u>Hot Asphalt</u> Contact with hot asphalt can cause severe thermal burns. Vapors can irritate the eyes or skin. Inhalation of fumes from hot asphalt can cause nausea and irritation of the nose and throat. Exposure to asphalt fumes can cause dermatitis and can photosensitize the skin, making it more susceptible to the adverse effects of sunlight.</p>

Hardened Asphalt

Cutting, grinding, crushing or drilling hardened asphalt may generate dust containing crystalline silica.

Primary route(s) of exposure: ■ Inhalation ■ Skin ■ Ingestion

EYE CONTACT: Exposure to hot asphalt produces a direct thermal burn. Exposure to asphalt fumes when the hot mixed asphalt is heated may cause irritation, redness or pain. Direct contact with asphalt dust may cause irritation by mechanical abrasion. Conjunctivitis may occur.

SKIN CONTACT: 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. Direct contact with asphalt dust may cause irritation by mechanical abrasion or corrosiveness of product.

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

INGESTION: Ingestion of hot asphalt produces a direct thermal burn to the mouth and throat. Small amounts (a tablespoonful) of hardened asphalt/asphalt dust swallowed during normal handling operations are not likely to cause injury. Ingestion of large amounts of hardened asphalt/asphalt dust may cause gastrointestinal irritation and blockage.

INHALATION: Inhalation of hot asphalt fumes can cause headache, nausea, and respiratory tract irritation, and nervousness due to the 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 of 20ppm (ceiling), pulmonary edema and even coma or death. Asphalt dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion or corrosive action. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits. Repeated excessive exposure may cause pneumoconiosis, such as silicosis and other respiratory effects.

Silicosis:

Use of hot mixed asphalt for construction purposes is not believed to cause additional acute toxic effects. Repeated overexposures to respirable crystalline silica (quartz, cristobalite, tridymite) for periods as short as 6 months has caused acute silicosis.

Symptoms of acute silicosis include (but are not limited to): shortness of breath, cough, fever, weight loss, and chest pain. Acute silicosis is a rapidly progressive, incurable lung disease and is typically fatal.

Chronic exposure to respirable quartz-containing dust in excess of appropriate exposure limits has caused silicosis, a progressive pneumoconiosis (lung disease). Restrictive and/or obstructive lung function changes may result from chronic exposure.

Lung Cancer:

Crystalline silica is classified by the International Agency For Research on Cancer (IARC) as a carcinogenic to humans (Group 1). Prolonged and repeated breathing of silica may cause lung cancer.

Tuberculosis:

Silicosis increases the risk of tuberculosis.

Autoimmune and Chronic Kidney Disease:

Some studies show excess number of cases of scleroderma, connective tissue disorders, lupus, rheumatoid arthritis, chronic kidney diseases and end-stage kidney disease in worker exposed to respirable crystalline silica.

Non-Malignant Respiratory Diseases (other than Silicosis):

Some studies show an increased incidence in chronic bronchitis and emphysema in workers exposed to crystalline silica.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions. Exposure to dust may aggravate existing skin and/or eye conditions. Smoking and obstructive/restrictive lung diseases may also exacerbate the effects of excessive exposure to this product.

IV – FIRST AID MEASURES

EYES: If hot asphalt splashes into the eyes, immediately flush with copious amounts of water. **DO NOT** attempt to remove asphalt particles from eyes. **OBTAIN MEDICAL ATTENTION IMMEDIATELY.** For hardened asphalt dust in eyes, flush immediately and continuously with running water for at least 15 minutes, while holding the eyelid(s) open. Seek medical attention if irritation persists.

SKIN: Quickly remove contaminated clothing. If molten asphalt contacts the skin, cool immediately by quenching with cold water. For extensive burns, cover with sterile dressing. **DO NOT** use solvents to remove asphalt from skin. **OBTAIN MEDICAL ATTENTION IMMEDIATELY.** For asphalt dust, wash skin thoroughly with soap and water. Seek medical attention if irritation persists.

INGESTION: Direct contact with heated material can produce thermal burns on contacted tissues. Hot mixed asphalt has a low toxicity when ingested. However, petroleum distillates may be absorbed from the gastrointestinal tract, with possible systemic effects (gastrointestinal irritation, vomiting, diarrhea, and CNS depression) and possible aspiration into the lungs. Aspiration of petroleum distillates has caused pulmonary edema and chemical pneumonitis. Oral ingestion of cool asphalt is relatively nontoxic. If person is conscious, give a large quantity of water and induce vomiting; however, never attempt to make an unconscious person drink or vomit. Seek medical attention.

INHALATION: Remove to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm and quiet. **OBTAIN MEDICAL ATTENTION IMMEDIATELY.** Dust in throat and nasal passages should clear spontaneously. Seek medical attention if irritation persists or develops later.

V – FIRE FIGHTING MEASURES

FLASHPOINT >450°F	FLAMMABLE LIMITS IN AIR Not Flammable
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EXTINGUISHING AGENT
Dry chemical, carbon dioxide, regular foam or water fog. Water may be ineffective in fighting such fires but may be used to keep the fire-exposed containers cool.

SPECIAL FIRE FIGHTING PROCEDURES
Since fire may produce toxic fumes, wear a self-contained breathing apparatus (SCBA) with a full face-piece operated in the pressure-demand or positive mode.

UNUSUAL FIRE AND EXPLOSION HAZARD
Water may cause frothing. Contact with powerful oxidizing agents may cause fire and/or explosions (see Section X of this MSDS). When product is heated or comes in contact with sparks or flames, the vapors formed may result in explosive mixtures with air. Vapors may travel to source of ignition and flash back. Fires may produce irritating, corrosive and/or toxic gases. The health effects of these products are further discussed in Section XI.

VI – ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Persons involved in cleaning should first follow the precautions defined in Section VII of the MSDS.

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.

Spilled materials, where dust can be generated, may overexpose cleanup personnel to respirable quartz-containing dust. Wetting of spilled material and/or use of respiratory protective equipment may be necessary. Do not dry sweep spilled material.

This product is not subject to the reporting requirements of Title III of SARA, 1986, and 40 CFR 372.

VII – HANDLING AND STORAGE

Follow protective controls set forth in Section VIII of this MSDS when handling this product.

Use in well-ventilated areas. Avoid inhalation of fumes! Contact with hot asphalt can cause severe burns! Keep ignition sources away from vents and openings and do not breathe gases when opening hatches and dome covers. Do not store near heat, sparks, flame or strong oxidants. Dusts created by drilling or grinding cured asphalt may irritate the eyes and respiratory tract. For such operations use approved respirators and avoid breathing dusts.

VIII – EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure and flammability limits. If a person breathes large amounts of this material, move the exposed person to fresh air at once and seek medical attention immediately.

Other control measures: Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure, and enclosed employee work stations.

EYE/FACE PROTECTION

Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. Contact lenses should not be worn when working with this material.

SKIN PROTECTION

When handling heated material, avoid direct contact with skin by using heat insulated gloves and protective clothing.

RESPIRATORY PROTECTION

Respirator Recommendations:

For respirable quartz levels that exceed or are likely to exceed appropriate exposure limits, a NIOSH-approved 100 series particulate filter respirator must be worn. If respirable quartz levels exceed or are likely to exceed an 8 hour-TWA of 0.5 mg/m^3 , a NIOSH-approved air purifying, full-face respirator with a 100 series particulate filter must be worn.

If asphalt fumes exceeding appropriate exposure limits are expected to be present, use any self-contained breathing apparatus that has a full face-piece and is operated in a pressure-demand or positive pressure mode or any supplied-air respirator that has a full face-piece and is operated in a pressure-demand or positive pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Supplied-air respirators must be used if the standard for hydrogen sulfide is exceeded or when entering confined or enclosed spaces where H_2S may be present.

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. For additional information contact NIOSH at 1-800-356-4674.

Emergency or planned entry into unknown concentrations or IDLH conditions: Any self-contained breathing apparatus that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode or any supplied-air respirator that has a full-face piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

Escape from unknown or IDLH conditions: Any air-purifying, full-face piece respirator with a high-efficiency particulate filter or any appropriate escape-type, self-contained breathing apparatus. If presence of asphalt fumes are expected, use with a combination of mounted organic vapor canister having a high-efficiency particulate filter.

GENERAL HYGIENE CONSIDERATIONS

Following the guidelines in this MSDS are recognized as good industrial hygiene practices. Avoid breathing dust. Avoid skin and eye contact. Wash dust-exposed skin with soap and water before eating, drinking, smoking, and using toilet facilities. Wash work clothes after each use.

IX – PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR Black semi-solid tar-like material with dispersed aggregate. Characteristic asphalt odor.	SPECIFIC GRAVITY. 1.03
BOILING POINT Approx. 900°F	VAPOR DENSITY IN AIR (AIR = 1) > 5
VAPOR PRESSURE <0.1 (@20°C)	% VOLATILE, BY VOLUME N/D
EVAPORATION RATE (ether = 1): <0.01	SOLUBILITY IN WATER Negligible

X – STABILITY AND REACTIVITY

STABILITY Stable	CONDITIONS TO AVOID Contact with incompatible materials (see below).
INCOMPATIBILITY (Materials to avoid) Contact with powerful oxidizing agents such as fluorine, boron trifluoride, chlorine trifluoride, manganese trifluoride, and oxygen difluoride may cause fire and/or explosions. Silica dissolves in hydrofluoric acid producing a corrosive gas- silicon tetra fluoride.	
HAZARDOUS DECOMPOSITION PRODUCTS Thermal decomposition of the material may release carbon monoxide, carbon dioxide, hydrogen sulfide, nitrogen dioxide, ozone and other organic and inorganic compounds into the atmosphere. Some thermal decomposition may occur during paving operations using hot mix asphalt. The health effects of the decomposition products are discussed in Section XI.	
HAZARDOUS POLYMERIZATION Not known to occur.	

XI – TOXICOLOGICAL INFORMATION

This product is a mixture of components. The composition percentages are listed in Section II. Toxicological information for each component is listed below:

Hot Mixed Asphalt

Prolonged or repeated exposure to asphalt fumes can cause dermatitis, acne-like lesions, mild keratosis, melanosis and photosensitization. Chronic inhalation exposure can cause chronic pneumonitis and bronchitis.

Asphalt Bitumen:

Exposure route: Inhalation, ingestion, skin/eye contact.

Target organs: Eyes, skin and respiratory system

Acute effect: If product is heated or comes in contact with heated surfaces, exposure to asphalt fumes may increase. Asphalt fumes can cause ocular and respiratory irritation leading to coughing, shortness of breath, and headaches. Ingested asphalt has low toxicity however chewing of asphalt can cause gastric masses and stomach obstructions. Contact with hot asphalt can cause second and third degree burns.

Chronic effect/carcinogenicity: Not classifiable as a human carcinogen.

In the event of significant heating, thermal decomposition or a fire, various gases may be released. Use of hot mixed asphalt in paving operations may also result in the release of some of the following products. The health effects of these products are described below:

Carbon Monoxide: TLV (25 ppm (TWA)) PEL (50 ppm (TWA))

Exposure route: Inhalation.

Target organs: Respiratory system, cardiovascular system, blood, central nervous system.

Acute effect: Inhalation of carbon monoxide causes cell oxidation to be inhibited which results in a reduction of the oxygen carrying capacity to all organs of the body. Resulting acute effects may include confusion, dizziness, headache, nausea, unconsciousness and weakness. High level exposures can result in death.

Chronic effect/carcinogenicity: Prolonged exposure may have effects on the nervous system and the cardiovascular system. Suspected to cause reproductive effects such as neurological problems, low birth weight, increased still births and congenital heart problems.

Carbon Dioxide: TLV (5000 ppm (TWA)) PEL (5000 ppm (TWA))

Exposure route: Inhalation.

Target organs: Respiratory system, cardiovascular system.

Acute effect: Inhalation of carbon dioxide may cause dizziness, headache, and elevated blood pressure. Inhalation of high concentrations of this gas may cause hyperventilation and unconsciousness.

Chronic effect/carcinogenicity: Information on chronic effect of prolonged exposure to this substance is not documented.

Hydrogen Sulfide: TLV (10 ppm) PEL (20 ppm (C))

Exposure route: Inhalation, skin/eye contact

Target organs: Eyes, respiratory system, central nervous system.

Acute effect: Inhalation, even at small levels can cause fatigue, headache, apnea, lung edema, coma, insomnia, irritability of the eyes and respiratory system, dizziness and central nervous system effects. In some cases respiratory paralysis leading to death can occur.

Chronic effect/carcinogenicity: Prolonged exposure to this material can cause toxicosis in people exposed to large concentrations. Not classifiable as a human carcinogen.

Under certain circumstances, Hydrogen sulfide, a highly flammable and toxic gas, may be released from molten asphalt. H₂S is a colorless gas with an odor similar to rotten eggs. Odor cannot be relied on as a means of detection because the olfactory nerves (sense of smell) rapidly become insensitive to it. In addition, the H₂S odor may be masked by the general odor of hot asphalt. Low concentrations (50 – 100 ppm) of H₂S can irritate the eyes and respiratory tract, and may cause nervousness, cough, nausea, and headache. Prolonged exposure to concentrations between 250 – 600 ppm, may cause pulmonary edema (fluid in the lungs) and bronchial pneumonia. Brief exposure to concentrations above 500 ppm can cause unconsciousness and may be fatal. The OSHA PEL is 20 ppm (ceiling). The ACGIH TLV is 10 ppm with a STEL of 15 ppm. H₂S may accumulate in an enclosed space. Persons should stand upwind and avoid breathing the gas when opening hatches and dome covers.

Nitrogen Dioxide: TLV (3 ppm (TWA)) PEL (5 ppm (C))

Exposure route: Inhalation, ingestion, skin/eye contact

Target organs: Eyes, skin, cardiovascular system and respiratory system.

Acute effect: Inhalation can cause burning of the respiratory tract, sore throat, cough, lung edema, dizziness, headache, apnea, weakness and vomiting. Contact with the skin and/or eyes will cause redness, pain and possibly severe burns. Exposure to very high concentrations may lead to death.

Chronic effect/carcinogenicity: Not classifiable as a human carcinogen. Prolonged exposure to this material may cause increased susceptibility to respiratory infection may aggravate asthma and allergic disorders.

Ozone: TLV (0.05 ppm for heavy work, 0.08 ppm for moderate work, 0.1 ppm for light work and 0.2 ppm for work <2 hours (TWA)) PEL (0.1ppm (TWA))

Exposure routes: Inhalation, skin/eye contact.

Target organs: Eyes, skin and respiratory system.

Acute effect: Inhalation may cause irritation of the respiratory tract, cough, headache, shortness of breath, asthmatic reactions and sore throat. Contact with the eyes will result in irritation, pain and redness and may result in loss of vision. It may cause effects on the central nervous system resulting in headache and impaired vigilance and performance.

Chronic effect/carcinogenicity: Not classifiable as a human carcinogen.

Sulfur Dioxide: TLV (2 ppm) PEL (5 ppm)

Exposure route: Inhalation, skin/eye contact.

Target organs: Eyes, skin and respiratory system.

Acute effect: Inhalation may cause irritation of the respiratory tract, asthma-like reactions, reflex spasm of the larynx, cough, shortness of breath, sore throat and lung edema. It is possible that respiratory arrest may occur which can lead to death. Contact with eyes can cause irritation, redness, pain and severe burns.

Chronic effect/carcinogenicity: Not classifiable as a human carcinogen. Repeated or prolonged exposure may aggravate asthma.

Hardened Hot Mixed Asphalt

If the hardened product is subjected to mechanical force (such as in demolition work) which generate dust particles, exposure to respirable quartz dust is possible. Chronic exposure to respirable dust in excess of appropriate exposure limits has caused pneumoconiosis (lung disease). Chronic exposure to respirable quartz-containing dust in excess of appropriate exposure limits has caused silicosis, a progressive pneumoconiosis. Chronic tobacco smoking may further increase the risk of developing chronic lung problems.

Limestone:

Exposure Route: Eyes, skin, inhalation, ingestion.

Target Organs: Eyes, skin, respiratory system.

Acute Effect: Direct eye and skin contact with dust may cause irritation by mechanical abrasion. Dusts may irritate the nose, throat, and respiratory tract by mechanical abrasion or corrosive action. Coughing, sneezing, chest pain, shortness of breath, inflammation of mucous membrane, and flu-like fever may occur following exposures in excess of appropriate exposure limits. Small amounts (a tablespoonful) swallowed during normal handling operations are not likely to cause injury. Ingestion of large amounts may cause gastrointestinal irritation and blockage.

Chronic Effect: Repeated exposure to respirable dust in excess of appropriate exposure limits has caused silicosis, a progressive pneumoconiosis (lung disease) and lung cancer. Restrictive and/or obstructive lung function changes may result from chronic exposure. Chronic tobacco smoking may further increase the risk of developing chronic lung problems.

Crystalline Silica: It is comprised of amorphous and crystalline forms of silica. In some batches, crystalline silica may represent up to 100% of silicon dioxide.

Respirable crystalline silica (quartz):

ACGIH TLV= (R) 0.025 mg/m³

MSHA and OSHA PEL:

Crystalline quartz (respirable): PEL-TWA 10 mg/m³/ (%SiO₂ + 2).

Other Particulates: TLV = 10 mg/m³ (inhalable/total particulate, not otherwise classified), TLV = 3 mg/m³ (respirable particulate, not otherwise classified), OSHA PEL = 15 mg/m³ (total particulate, not otherwise regulated), OSHA PEL = 5 mg/m³ (respirable particulate, not otherwise regulated)

ACGIH, MSHA, and OSHA have determined that adverse effects are not likely to occur in the workplace provided exposure levels do not exceed the appropriate exposure limits. Lower exposure limits may be appropriate for some individuals including persons with pre-existing medical conditions such as those described below.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Inhaling respirable dust and/or crystalline silica may aggravate existing respiratory system disease(s) and/or dysfunctions.

Exposure to dust may aggravate existing skin and/or eye conditions.

Occupational exposure to free silica is known to produce silicosis, a chronic, disabling lung disease characterized by the formation of silica-containing nodules of scar tissue in the lungs. Simple silicosis, in which the nodules are less than 1 cm in diameter is generally asymptomatic but can be slowly progressive, even in the absence of continued exposure.

Silicosis leads to conditions such as lung fibrosis and reduced pulmonary function. The form and severity in which silicosis manifests itself depends in part on the type and extent of exposure to silica dusts: chronic, accelerated and acute forms are all recognized. In later stages the critical condition may become disabling and potentially fatal. Restrictive and/or obstructive changes in lung function may occur due to exposure. A risk associated with silicosis is development of pulmonary tuberculosis (silico-tuberculosis). Respiratory insufficiencies due to massive fibrosis and reduced pulmonary function, possibly with accompanying heart failure, are other potential causes of death due to silicosis.

Symptoms of Silicosis: 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.

Respirable dust containing newly broken 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 pieces 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 casual relationship between silica or silicosis and these adverse health effects. Several studies of persons with silicosis also indicate increased risk of developing lung cancer, a risk that increases with the duration of exposure. Many of these studies of silicosis do not account for lung cancer confounders, especially smoking. In October 1996, an IARC Working group re-assessing crystalline silica, a component of this product, designated crystalline silica as carcinogenic (Group 1). The NTP indicates that crystalline silica is reasonably anticipated to be a carcinogen (Group 2). These classifications are based on sufficient evidence of carcinogenicity in certain experimental animals and on selected epidemiological studies of workers exposed to crystalline silica. Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 (California Proposition 65) as a chemical known to the state to cause cancer or reproductive toxicity.

XII – ECOLOGICAL INFORMATION

No data available

XIII – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

The material is not listed as a hazardous waste under designations by the EPA or DOT. Dispose of waste materials only in accordance with applicable federal, state, and local laws and regulations.

XIV – TRANSPORT INFORMATION

DOT HAZARD CLASSIFICATION

None

PLACARD REQUIRED

None

LABEL REQUIRED

Label as required by the OSHA Hazard Communication standard {29 CFR 1910.1200(f)}, and applicable state and local regulations.

XV – REGULATORY INFORMATION

Crystalline silica, a component of this product, is on the NTP and IARC carcinogen lists, but not on the OSHA carcinogen list. In October 1996, an IARC Working group re-assessing crystalline silica, a component of this product, designated crystalline silica as a human carcinogen (Group 1 carcinogen). Light catalytic cracked distillate, a component of Flux oil has been designated by IARC as probable human carcinogen (2A) based on sufficient evidence in experimental animals but not by NTP, OSHA and ACGIH.

Crystalline silica in October 1996 was listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 (California Proposition 65) as chemical known to the state to cause cancer or reproductive toxicity. Untreated and mildly treated oils, components of flux oil are listed on the Safe Drinking Water and Toxic Enforcement ACT of 1986 (California Proposition 65) as chemicals known to the state to cause cancer, birth defects or reproductive harm.

XVI – OTHER INFORMATION

ACGIH: American Conference of Governmental Industrial Hygienists

C: Ceiling limit; the concentration that should not be exceeded during any part of the working exposure

CFR: US Code of Federal Regulations

DOT: US Department of Transportation

IARC: International Agency for Research on Cancer

IDLH: Immediately Dangerous to Life and Health

NIOSH: National Institute for Occupational Safety and Health, US Department of Health and Human Services

NTP: National Toxicology Program

OSHA: Occupational Safety and Health Administration, US Department of Labor

PEL: Permissible Exposure Limit

SARA Title III: Title III of the Superfund Amendments and Reauthorization Act, 1986

TLV: Threshold Limit Value

TWA: Time-weighted Average

FOR FURTHER INFORMATION

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DATE OF PREPARATION 5/08

NOTICE: Martin Marietta Materials believes that the information contained on this Material Safety Data Sheet is accurate. The suggested precautions and recommendations are based on recognized good work practices and experience as of the date of publication. They are not necessarily all-inclusive or fully adequate in every circumstance as not all use circumstances can be anticipated. Also, the suggestions should not be confused with nor followed in violation of applicable laws, regulation, rules or insurance requirement. However, product must not be used in a manner which could result in harm.

NO WARRANTY, EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE IS MADE

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