SAFETY DATA SHEET

SECTION 1: IDENTIFICATION

1.1 Name of Substance: **Asphalt Emulsion**

1.2 Product Names: Emulsified Asphalt (Anionic), Tack Coat

1.3 Intended Use: Road maintenance operations including slurry seal; Road paving.

1.4 Manufacturer Name: Komohana Emulsion Plant

1.5 Address: 91-073 Malakole Street
Kapolei, Hawaii 96707

1.6 Telephone: (808) 682-6081

1.7 Emergency Telephone: (808) 682-6081

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
OSHA HCS (29 CFR 1910.1200) / GHS Classification

GHS Classifications: Not classified as dangerous for supply/use under GHS

Other Hazards: Liquid can cause eye and skin irritation
Avoid prolonged contact with eyes, skin, and clothing
Contact with hot product will cause thermal burns
Fumes from hot product can cause irritation to eyes, skin, and respiratory system

Label Elements

Hazard Pictograms:

Signal Word: **Warning**

Hazard Statement(s): H315 Causes skin irritation

H319 Causes serious eye irritation

H332 Harmful if inhaled

H331 May release toxic hydrogen sulfide gas that could accumulate at toxic concentrations inside containers of heated asphalt emulsion.

H335 May cause respiratory irritation.

Precautionary Statement(s):

P260 Avoid breathing dust/fume/gas/mist/vapors/spray.

P264 Wash hands thoroughly after handling.

P271 Use only outdoors or in a well ventilated area.

P280 Wear protective gloves/protective clothing/ eye protection/ face protection.

Response Statement(s)

If on Skin
P307 +311 If exposed: get medical attention.

If on Skin (or hair): P303 + 361 + 353. See Section 4 for additional skin contact first aid measures.

If Inhaled: P304 + 340 Remove person to fresh air and keep comfortable for breathing.

If in Eye: P305 +351 + 338 Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.

If on clothing: P306 + 360. Rinse immediately contaminated clothing and skin with plenty of water before removing clothes.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance/Mixture: Asphalt Mixture

3.2 CAS number/other identifiers: Not available. Mixture.

3.3 Product code: Not available

Component Information:

Component	CAS number/Unique Identifier	Weight %	Hazard Classification
Asphalt	8052-42-4	25 - 75%	Hazard Classification: *Harmful, Irritant*
Water	7732-18-5	25 - 75%	Hazard Classification: None Risk Phrase: None

Proprietary Emulsifiers (Meadwestvaco Indulin® W-5 contains surfactant, natural polymer derivative, and fatty amine derivative used in anti-stripping adhesion promoters)	Proprietary	0.1 – 5%	Hazard Classification: *Harmful, Irritant*

Additional Additives Information:

Potential Additives	CAS number/Unique Identifier	Weight %	Hazard Classification
Ecostar Science & Technology, Inc ER 582 Emulsion Additive	Proprietary	0.1 – 5%	Hazard Classification: *Corrosive*
Sodium Hydroxide 50% (Univar USA Inc.)	1310-73-2	<0.1%	Hazard Classification: *Corrosive*

3.4 Composition comments:

- Trace ingredients (if any) are present in <1% concentration, (<0.1% for potential carcinogens, reproductive toxins, respiratory tract mutagens, and sensitizers). None of the trace ingredients contribute significant additional hazards at the concentrations that may be present in this product. The composition of the asphalt cement varies depending on the source of crude petroleum and the specifications of the final product.
- Asphalt cement contains: <0.05% of 3 -7 ring Polycyclic Aromatic Hydrocarbons (PAHs).
- Other substances in the product which may present a health or environmental hazard, or which have been assigned occupational exposure limits, are detailed below. Please see Section 8 of this SDS for more details.
    - Contains <0.1% hydrogen sulfide.
    - Hydrogen sulfide gas can accumulate in the head space of containers.
    - Heated product releases asphalt fumes.

SECTION 4: FIRST AID MEASURES

4.1 Description of First Aid Measures

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

Skin Contact: Remove contaminated clothing. Flush burned area with cold water after contact with hot product until emergency personnel arrive. Do not attempt to remove solidified material that adheres to skin before obtaining medical assistance, because removal may cause further tissue injury.

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. Mineral oil may be used to remove cold asphalt emulsion. For best results, work the mineral oil into the skin around the

material and allow the material to "float" off.

Ingestion: Ingestion of hot asphalt emulsion may cause burns in the mouth, throat, and esophagus. If cold asphalt emulsion is swallowed, immediately call a physician.

Eye Contact: For contact with hot asphalt emulsion, hold eyelids apart and flush eyes gently with cool water for at least 15 minutes or until eye is clear. Seek immediate medical attention.

4.2 Most Important Symptoms and Effects

Acute: Hot asphalt emulsion may cause severe skin burns. Inhalation of vapor could cause headache, irritation to nose and throat, dizziness, weakness, and nausea.

Chronic: Prolonged or repeated exposure to high vapor concentrations may cause skin burns, permanent eye damage (corneal burns), damage to kidneys, liver, lungs, blood, or central nervous system. Repeated ingestion may cause gastrointestinal irritation and liver damage.

4.3 Recommendations for Any Immediate Medical Attention and Special Treatment

If burning of eyes, skin, or respiratory system occurs, seek immediate medical attention.

SECTION 5: FIRE FIGHTING MEASURES

5.1 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 large fires, water spray, fog, or foam (AFFF/ATC) can be used.

5.2 Unsuitable Extinguishing Media: Do not use water jet.

5.3 Specific Hazards Arising from the Chemical: This product is not a combustible liquid in accordance with the OSHA Hazard Communication Standard, but will ignite and burn at temperatures exceeding the flash point.

5.4 Special Protective Equipment and Precautions for Fire-Fighters: Firefighting should be attempted only by those who are adequately trained and equipped with proper protective equipment. SCBA is recommended to limit exposure to combustion products when fighting a fire. Flammable and toxic hydrogen sulfide may form in closed tank headspaces. Toxic gases produced in a fire include but are not limited to CO, CO_2, and H_2S.

Water spray and foam (AFFF/ATC) must be applied carefully to avoid frothing and splattering and from as far a distance as possible. Avoid using straight water streams. Avoid excessive water spray application. Keep run-off water out of sewers and water sources.

5.5 NFPA Rating	Health: **2**	Flammability: **1**	Reactivity: **0**	Other: **--**
	(0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Extreme).			

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, Protective Equipment and Emergency Procedures:

This material may burn, but will not ignite readily. Keep all sources of ignition away from release. Avoid contact with skin and eyes. Keep unauthorized personnel away. Stay upwind. Shut off source if safe to do so.

6.2 Environmental Precautions:

If safe, contain spill to prevent runoff into drains and waterways. If the product has entered a water course or sewer, advise appropriate authorities and the **National Response Center** (**800-424-8802**).

6.3 Methods and Material for Containment and Clean-Up:

Stop spill if it can be done safely. Contain liquid with sand or soil by dyking and allowing to cool. Material can be picked up as a solid after. Do not flush to sewer or allow to enter waterways.

SECTION 7: HANDLING & STORAGE

7.1 Precautions for Safe Handling:

Comply with applicable EPA, OSHA, NFPA, state, and local requirements. Do not handle until all safety precautions have been read and understood. Handle with care and use appropriate control measures. Avoid contact with skin, eyes, and clothing. Wear appropriate PPE as described in Section 8. Use additional precautions when handling hot asphalt emulsion. Exercise good personal hygiene following asphalt-handling activities, including washing hands before eating, drinking, or smoking.

Significant concentrations of hydrogen sulfide can be present in vapor space or storage tanks and transport compartments. Avoid breathing fumes or vapor from heated material. Stay upwind when opening hatched and vents.

7.2 Conditions for Safe Storage, Including any Incompatibilities:

Keep container closed and upright to prevent leakage. Store in properly closed containers that are appropriately labeled and in a well-ventilated area. For external use only. Do not expose to heat, open flames, strong oxidizers, or other sources of ignition.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters

Component	Exposure Limits
Asphalt	TLV (ACGIH): 0.5 mg/m^3 (8 hr TWA) for asphalt fumes PEL (OSHA): None established NIOSH: 5 mg/m^3 (REL) during any 15-min period for asphalt fumes
Hydrogen Sulfide (H_2S)	TLV (ACGIH): 10 ppm (8 hr. TWA); 15 ppm (STEL) PEL (OSHA): 10 ppm (8 hr. TWA); 20 ppm (ceiling); 50 ppm (peak) (Maximum duration: 10 minutes once only if no other measurement of exposure occurs. NIOSH: 10 ppm (15 mg/m^3) (REL); 100 ppm (150 mg/m^3) IDLH
Polycyclic Aromatic Hydrocarbons	TLV (ACGIH): Exposure by all routes (for benz[a]anthracene) should be carefully controlled to levels as low as possible. PEL (OSHA): 0.2 mg/m^3 (8 hr TWA)[(l)] NIOSH: None established
Other Potential Additives listed in Section 2	None established

[(l)] Inhalable benzene-soluble fraction.

ACGIH	American Conference of Industrial Hygienists
IDLH	Immediately Dangerous to Life or Health
OSHA	Occupational Safety and Health Administration
REL	Recommended Exposure Level
STEL	Short-Term Exposure Limit.
TLV	Threshold Limit Value.
TWA	8 hour time-weighted average.

8.2 Engineering Controls: Use ventilation adequate to keep exposures below recommended exposure limits. Local or general exhaust is required in an enclosed area or where there is inadequate ventilation.

8.3 Personal Protective Equipment [PPE]

Eye/Face Protection: Wear a safety glasses or chemical goggles in compliance with OSHA regulations as appropriate to prevent eye contact. Keep a suitable eye wash station immediately available to the work area.

Hand Protection: When handling product at ambient temperatures, wear chemical-resistant gloves (heavy nitrile rubber) if frequent or prolonged contact is expected. Wear leather or thick textile gloves and long-cuffed insulated gloves to prevent skin contact when handling hot asphalt emulsion.

Skin and Body Protection: To prevent repeated or prolonged skin contact, wear long sleeved shirts and long pants, and boots. When handling hot asphalt emulsion, wear insulated, heat-resistant clothing appropriate to withstand contact with

heated product (e.g., nomex or equivalent).

Respiratory Protection: Respiratory protection is not required under normal conditions and with adequate ventilation. If workplace exposure limit(s) are exceeded for the product or any component, a NIOSH/MSA approved air-purifying particulate respirator suitable for fumes should be used. Respirator selection must be based on known or anticipated exposure limits for the hazards and the safe working limits of the respirator.

Other Protective Recommendations: Provide an eye wash station and washing facilities in areas of storage, use, handling, and loading and unloading of asphalt emulsion.

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES

9.1 Physical State:	Viscous Liquid
9.2 Color:	Black-brown
9.3 Odor:	Asphaltic
9.4 Odor Threshold:	Mild
9.5 pH:	Not Available
9.6 Melting Point:	Not Applicable
9.7 Boiling Point:	>200 °F
9.8 Flash point:	>400 °F
9.9 Evaporation Rate:	Not Available
9.10 Flammable Lower Limit:	Not Available
9.11 Flammable Upper Limit	Not Available
9.12 Vapor Pressure:	Not Available
9.13 Vapor Density:	>1 (Air = 1)
9.14 Specific Gravity:	0.8 - 1.1 (Water = 1)
9.15 Water Solubility:	Water: Miscible
9.16 Octanol/Water Partition Coefficient:	Not Available
9.17 Auto-ignition Temperature:	Not Applicable
9.18 Decomposition Temperature:	Not Applicable
9.19 Viscosity:	Varies with temperature

SECTION 10: STABILITY & REACTIVITY

10.1 Chemical Stability: Stable under normal storage conditions.

10.2 Possibility of Hazardous Reaction: Hazardous polymerization will not occur.

10.3 Conditions to Avoid: Excessive heat, sources of ignition, open flame, incompatible materials.

10.4 Incompatible Materials: Strong oxidizers such as nitrates, chlorates, and peroxides; Anionic emulsions

10.5 Hazardous Decomposition Byproducts: Combustion may yield fumes, smoke, carbon monoxide, carbon dioxide, oxides of sulfur and/or nitrogen, unburned hydrocarbons. At elevated temperatures hydrogen sulfide and other sulfur gases may be produced.

SECTION 11: TOXICOLOGICAL INFORMATION

Exposure routes: Skin Contact, Inhalation, Eye Contact.

Target Organs: Skin, eyes, gastrointestinal tract, respiratory system, nervous system.

11.1 Information on Toxicological Effects: Toxicity data are not available for asphalt mixtures. Current data are considered insufficient for quantifying the acute and chronic health risks of exposure to asphalt or asphalt fumes and vapors. The complex chemical composition of asphalt makes it difficult to identify the specific component(s) responsible for adverse health effects observed in exposed workers.

Acute Toxicity: Asphalt fumes have been associated with irritation of eyes, nose, and throat, headache, and coughing. These health effects appear to be mild in severity and transient in nature. Also, lower respiratory effects have been reported.

LD50 (rat): >5000 mg/kg body weight

LD50 (dermal): >2000 mg/kg body weight

LD50 (inhalation, fume): >94.4 mg/m^3

Inhalation: Asphalt fumes may cause eye and respiratory tract irritation. Symptoms may include coughing, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain. This product contains H_2S which may accumulate in confined spaces. Inhalation of H_2S may cause loss of sense of smell, major irritation of the respiratory tract, headache, nausea, vomiting, dizziness, fluid buildup in the lungs (pulmonary edema), which can be fatal, and acute poisoning. Prolonged breathing of 50 to 100 ppm H_2S vapors can produce eye and respiratory tract irritation. At 300 ppm, unconsciousness may occur after 20 minutes. From 300 to 500 ppm, death can occur within 1 to 4 hours of continuous exposure. At 500 ppm the respiratory system is paralyzed, the victim collapses almost instantaneously, and death can occur after exposure of only 30 to 60 minutes. Above 500 ppm, H_2S may cause immediate loss of consciousness; death is rapid, and possibly immediate.

Ingestion:	Hot product will cause severe burns to the nose, mouth, throat, and digestive tract. Ingestion of hot asphalt emulsion is unlikely. If significant amounts of cold asphalt emulsion are swallowed, immediately call a physician.
Skin:	Exposure to hot asphalt emulsion will cause severe burns if splashed onto exposed skin. Exposure to asphalt fumes may cause dermatitis and photosensitization. Once cured, the inert semi-solid material is considered non-hazardous.
Eye:	Contact with hot asphalt emulsion will result in eye burns. Exposure to asphalt fumes may cause irritation, redness, swelling, pain, tearing, and blurred or hazy vision.
Irritation/ Corrosivity:	May cause irritation to skin, eyes and respiratory system.
Sensitization:	Not to be expected.
Repeated Dose Toxicity:	NOAEL (rat): 28 mg/m^3 LOAEL (rat): 149 mg/m^3
Carcinogenicity:	Data regarding the potential carcinogenicity of paving asphalt fumes in humans are limited. Data from studies of humans indicate that some workers exposed to asphalt fumes are at an elevated risk of lung cancer; however, it is uncertain whether this excess risk is related to asphalt or to other carcinogens in the workplace. Asphalt fumes generated at high temperatures are probably more likely to generate carcinogenic PAHs than fumes generated at lower temperatures. The International Agency for Research on Cancer [IARC] concluded that there is inadequate evidence in humans for the carcinogenicity of occupational exposures to bitumen emissions during road paving and in experimental animals for the carcinogenicity of straight-run bitumens and fume condensates from straight-run bitumens. In 2011, The IARC rated the asphalt fumes for paving asphalt in Group 2B as possibly carcinogenic to humans. Skin-painting studies have demonstrated that certain high temperature asphalt fume condensates can produce cancers in mice. The agent is thought to be 4- to 6- ring polycyclic aromatic hydrocarbons. These compounds have been identified in asphalt fumes generated at temperatures exceeding normal storage and application temperatures of paving asphalt.

Carcinogenicity Classifications

OSHA	IARC	NTP	ACGIH
-	Group 2B: Possibly carcinogenic to humans	-	A4 - Not classifiable as a human carcinogen

Mutagenicity: Insufficient data available to classify as a mutagen.

Reproductive Toxicity: Not to be expected.

11.2 Effects of Chronic Exposure: Can cause damage to organs through prolonged or repeated exposure. Prolonged or repeated contact can lead to skin irritation, cracking, and dermatitis. Additional studies of workers exposed to asphalt fumes or vapors are needed to better characterize exposures and to evaluate the risk of chronic disease, including lung cancer.

Chronic Toxicity from Short-Term Exposure: Exposure to asphalt fumes for short periods of time can cause irritation of the eyes and upper respiratory tract (i.e., nose and throat). Irritation, if it does occur, is usually mild and temporary. Other effects sometimes reported by workers include headache, nausea, decreased appetite, fatigue, skin irritation, and acute lower respiratory tract (i.e., lungs) effects such as coughing, wheezing, and shortness of breath.

Chronic Toxicity from Long-Term Exposure: Long-term exposure to hot asphalt may cause rashes and other skin conditions, possibly including skin cancers. Chronic lower respiratory tract effects such as chronic bronchitis have been reported in a few studies of workers exposed to hot asphalt, but conflicting results have been found in animal studies. Most regulatory and authoritative scientific bodies say the available data are limited and at present do not support the conclusion that long-term exposures to asphalt fumes produce these effects.

Epidemiology: Pre-existing skin conditions including dermatitis might be aggravated by exposure to contact with this asphalt at ambient temperature and hot asphalt fumes.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Ecotoxicity (aquatic/terrestrial): If spilled, hot asphalt emulsion could harm plant life. The material is inert when cured, and should not present an environmental hazard under normal conditions.

12.2 Persistence and Degradability: Poorly biodegradable.

12.3 Bioaccumulation Potential:	This product is not expected to bioaccumulate through food chains in the environment.
12.4 Mobility in Water and Soil:	Emulsifies in water. Spills are unlikely to penetrate the soil.
12.5 Other Adverse Effects:	Prevent contamination of drains or waterways.

SECTION 13: DISPOSAL INFORMATION

13.1 Disposal Considerations:	This material as supplied and by itself, when discarded or disposed of, is not an EPA RCRA hazardous waste. This material could become a hazardous waste if mixed with or contaminated by a hazardous waste or other hazardous substance(s). It is the responsibility of the user to determine if disposal material is hazardous according to federal, state, and local regulations.

SECTION 14: TRANSPORT INFORMATION

14.1 Transport Information:	This material when transported via U.S. commerce is regulated by DOT Regulations [49 CFR 172.101]. This product is deemed as non-hazardous when shipped at ambient temperatures. It is classified as a hazardous material under U.S. DOT regulations when shipped at temperatures above 212 °F (100 °C).
14.2 Shipping Name:	Non-regulated material
14.3 Hazard Class:	None
14.4 Packing Group:	None
14.5 Marine Pollutant:	Not a DOT Marine Pollutant per 49 CFR 171.18
14.6 Special Precautions for User in Terms of Compliance During Transport:	This material must not be transported when heated at or above its flash point.

SECTION 15: REGULATORY INFORMATION

15.1 Health, Safety, and Environmental Regulations Specific for the Substance/Mixture:

US Federal Regulatory Information:

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

CERCLA/Superfund: This product is not listed as a CERCLA hazardous substance.

EPA Superfund Amendment & Reauthorization Act [SARA]:

SARA Section 302: This product does not contain components that have been listed on the EPA's Extremely Hazardous Substances [EHS] List.

SARA Section 304: This product does not contain components identified either as an EHS or a CERCLA hazardous substance that in case of a spill or release, may be subject to SARA reporting requirements.

SARA Section 311/312: This product is not classified under the SARA 311/312 Hazard Categories.

SARA Section 313: This product contains the following component that may be subject to reporting on the Toxic Release Inventory [TRI] Form R:

Asphalt:	= 0.1% de minimis concentration
	= 1.0 % de minimis concentration

RCRA: If discarded in its purchased form, this product would not be a hazardous waste either by listing or characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste.

State Regulatory Information:

Hawaii Emergency Planning and Community Right-To-Know [HEPCRA]. The following component(s) of this material are identified on the regulatory lists below:

Asphalt:	Not listed
Proprietary polymer blend:	Not listed
Sodium Hydroxide:	Listed

SECTION 16: OTHER INFORMATION

16.1 Additional Information:

The pronounced and easily-recognized rotten egg odor of hydrogen sulfide (H_2S) gas can be detected at concentrations as low as 0.003 to 0.13 ppm. Because higher H_2S concentrations (100 to 200 ppm) cause olfactory fatigue and other hydrocarbon odors can mask H_2S, the sense of smell cannot be used as a reliable indicator of H_2S exposure.

Revision Date: New 5/25/2016.

Abbreviations:

ACGIH	American Conference of Governmental Industrial Hygienists
AFFF/ ATC	Aqueous Film Forming Foams/Alcohol Type Concentrate
CAS No.	Chemical Abstract Service number
CERCLA	Comprehensive, Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations

CO	Carbon Monoxide
CO_2	Carbon Dioxide
CPR	Cardiopulmonary Resuscitation
DOT	U.S. Department of Transportation
EHS	Extremely Hazardous Substances
EPA	Environmental Protection Agency
°F	Fahrenheit
GHS	Globally Harmonized System
H_2S	Hydrogen Sulfide
HEPCRA	Hawaii Emergency Planning and Community Right-To-Know
IARC	International Agency for Research on Cancer
IDLH	Immediately Dangerous to Life and Health
LD5O	Lethal dose
LOAEL	Lowest Observed Adverse Effect Level
mg/m^3	Miligrams per cubic meter
NFPA	National Fire Protection Association
NOAEL	No Observed Adverse Effect Level
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicological Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Level
NTP	National Toxicological Program
PAH	Polycyclic Aromatic Hydrocarbon
pH	Negative log of hydrogen ion
PPE	Personal Protective Equipment
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
REL	Recommended Exposure Limit
SARA	Superfund Amendments and Reauthorization Act
SCBA	Self-Contained Breathing Apparatus
STEL	Short-Term Exposure Limit
UN	United Nations
TLV	Threshold Limit Value
TRI	Toxic Release Inventory
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average

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