SAFETY DATA SHEET

According to
HSNO Hazardous Substances (Safety Data Sheets) Notice 2017

Section 1. Identification of the material and the supplier

Product:	**Flexiphalt® E – Part B**
Other names:	Epoxy Bitumen, Part B Epoxy Asphalt, Part B
Product Use:	Flexiphalt® E, Part B is reacted with a diglycidyl ether of Bisphenol A epoxy resin (Part A) to produce epoxy modified asphalt and EMOGPA in hot mix asphalt plants.
Restriction of Use:	Refer to Section 15
New Zealand Supplier:	**Higgins Bitumen Manufacturing**
Address:	26 Waitangi Road Awatoto Napier, New Zealand
Telephone:	+64 6 834 1589
E-mail:	HBM@higgins.co.nz
Emergency Telephone:	**0800 764 766 (National Poison Centre)**
Date of SDS Preparation:	17 May 2021

Section 2. Hazards Identification

This substance is NOT hazardous according to the EPA Hazardous Substances (Classification) Notice 2020.

Other Hazards
Risk of burns when handled, stored and transported at elevated temperatures.
There is a risk of water vapour pressure explosion if heated above 100ºC in the presence of water.
Toxic levels of hydrogen sulphide and other poisonous gases/vapors can accumulate in the head spaces of tanks and over confined spaces when handling hot bitumen.

Section 3. Composition / Information on Ingredients

Ingredients	Wt%	CAS NUMBER.
Bitumen	>60	8052-42-4
Other ingredients that do not contribute to hazard classifications	<40	

Section 4. First Aid Measures

Routes of Exposure:

If in Eyes: If hot material contacts the eyes, immediately cool the affected area under cold water for at least 10 minutes. **DO NOT** attempt to remove the product from burnt areas. Refer to the CCNZ Bitumen Burns Card (see Section 16) and seek immediate medical assistance. Excessive exposure to

fumes may cause eye irritations including redness, swelling, stinging and tearing in susceptible individuals. Remove affected person to a ventilated area.

If on Skin — If hot material contacts the skin, immediately cool the affected area under cold water for at least 10 minutes. **DO NOT** attempt to remove the product from burnt areas. Refer to the CCNZ Bitumen Burns Card (see Section 16) and seek immediate medical assistance. Material that contacts the skin at ambient temperatures **and does not** result in burns can be removed using vegetable based oils, or industrial hand cleaners. Do not use thinners or solvents. Repeated skin contact may cause skin irritations or dermatitis in susceptible individuals.

If Swallowed — Do not induce vomiting, wash out month thoroughly. If symptoms develop seek medical assistance.

If Inhaled — Remove affected person to a ventilated area. If symptoms persist, seek medical advice. If not breathing, apply artificial respiration and seek urgent medical advice.

Most important symptoms and effects, both acute and delayed

Symptoms: Various studies have concluded that there is no evidence of long-term health affects arising from the use of asphalt. Ingestion may cause pain, nausea or gastrointestinal irritations. Do not induce vomiting, give water to drink and seek immediate medical assistance. Inhalation of fumes may cause nausea, headaches, or dizziness. Remove affected persons to a well-ventilated area. If symptoms persist, seek medical advice. If not breathing, apply artificial respiration and seek urgent medical advice.

Section 5. Fire Fighting Measures

Hazard Type	The unadulterated product is unlikely to cause a fire or explosion hazard under normal conditions of use up to temperatures of 200°C. If the product is blended with flammable solvents such as kerosene, the product should be treated as cutback bitumen and may emit flammable vapors during hot storage. Kerosene vapors may spontaneously ignite and explode during heating or in the presence of an ignition source. There is a significant risk of violent explosion if this product is heated above 100°C in the presence of water.
Hazards from products	Complete or incomplete combustion can produce oxides of carbon, sulfur and nitrogen, hydrogen sulphide and polyaromatic hydrocarbons.
Suitable Extinguishing media	For large fires use foam, or water fog For small fires use CO_2, dry powder, foam, sand or soil Do not use: Do not use high-pressure water hoses as these may cause the bitumen to react explosively and/or spread the burning material.
Precautions for firefighters and special protective clothing	Fire fighters should wear full protective clothing and self-contained breathing apparatus.
HAZCHEM CODE	2Y (if transport in temperatures $>100^0$C)

Section 6. Accidental Release Measures

Wear suitable personal protective clothing as described in Section 8 to prevent skin or eye contact with the material. Whenever possible isolate the cause of the spill (i.e. close valves, empty ruptured vessels etc). Remove any possible ignition sources.

Small Spills:

Use absorbent material such as sand or soil to contain the spill. Allow the material to cool and solidify before removing using a shovel or other suitable equipment.

Large Spills:
If the spill occurs on land, use absorbent material such as sand or soil to create a bund and contain the spill. Allow the material to cool and solidify before removing using earth moving or excavation equipment. The product will not mix with water and will form a solid mat on contact with cold water. Therefore, spillages to an aquatic environment should be contained and can easily be cleaned by removing the mat.

Environmental Impact:
Due to the product's high viscosity and low vapour pressure at ambient temperature and pressure, and its immiscibility with water, this product presents a negligible hazard to the environment. However, the viscosity of the product is lowered in the presence of heat and solvents and will become fluid if heated or diluted with solvent sufficiently.

Waste Disposal:
This product can be disposed of as clean fill in Local Authority waste disposal facilities. The product's immiscibility with water and high viscosity will minimise leaching of contaminants from the product.

Section 7. Handling and Storage

Precautions for Handling:

- This product may be pumped at temperatures greater than 100°C.
- Wear personal protective clothing when handling (see Section 8).
- When transferring product, ensure that the receiving vessel is clean and does not contain water.
- If the product is blended with flammable solvents such as kerosene, the flash point and auto-ignition temperature of the blended product will be reduced and may present a significant explosion and fire hazard.
- Treat the blended product as if it were cutback bitumen.
- Eliminate all ignition sources in the presence of cutback bitumen.
- "Code of Practice RNZ9904: The Safe Handling of Bituminous Materials used in Roading" provides more information on the safe handling and storage of bituminous materials.

Precautions for Storage:

- Material can be stored at temperatures up to 160°C for up to 24 hours before significant product degradation begins to occur.
- It is advisable to reduce the holding temperature to less than 120°C if storing for prolonged periods of time.
- Do not heat above 160°C.
- Store in clean steel tanks.
- Protect the storage vessel from water ingress.
- Do not allow water to come into contact with hot bitumen as boil over and explosion can occur.
- Provide adequate ventilation in enclosed spaces because it is possible for bitumen fumes and gases such as hydrogen sulphide, carbon dioxide and carbon monoxide to accumulate to dangerous levels.

Section 8 Exposure Controls / Personal Protection

WORKPLACE EXPOSURE STANDARDS (provided for guidance only)

Bitumen Fumes:	5mg/m^3	8 Hour TWA	(NZ/Australian/UK)
	10mg/m^3	10 min TWA	(UK)
	ACGIH (proposed):	0.5mg/m^3 Cyclohexane Soluble Fraction (CHSF)	
Carbon Monoxide:	25ppm (400ppm Ceiling)	8 Hour TWA	(NZ)
	200ppm	15 min STEL	(NZ)
	100ppm	30 min STEL	(NZ)

	50ppm	60 min STEL	(NZ)
Carbon Dioxide:	5,000ppm (9000mg/m^3) 8 Hour TWA		(NZ)
	30,000ppm (54,000mg/m^3)	15 min STEL	(NZ)
Hydrogen Sulphide:	10ppm (14mg/m^3)	8 Hour TWA	(NZ)
	15ppm (21mg/m^3)	15 min STEL	(NZ)

Workplace Exposure Standard – Time Weighted Average (WES-TWA). The time-weighted average exposure standard designed to protect the worker from the effects of long-term exposure. Workplace Exposure Standard – Short-Term Exposure Limit (WESSTEL). The 15-minute average exposure standard. Applies to any 15- Minute period in the working day and is designed to protect the worker against adverse effects of irritation, chronic or irreversible tissue change, or narcosis that may increase the likelihood of accidents. The WES-STEL is not an alternative to the WES-TWA; both the short-term and time-weighted average exposures apply. Workplace Exposure Standards and Biological Exposure Indices NOV 2019 11TH EDITION.

Notes:
It is unlikely that the product will form mists or aerosols during use. However, it may generate decomposition products under heating, which may have specific exposure limits. The decomposition products may include oxides of carbon, nitrogen and sulfur, hydrogen sulfide, and PCAs and PAHs.

Engineering Controls
Provide adequate ventilation to ensure fumes remain at a minimum level. Ensure product cannot be heated above 160°C.

Personal Protection Equipment

Eyes	Full face shields are required when transferring hot bitumen between vessels using flexible hoses, or when filling mobile tanks.
Hands and Skin	Wear PVC or other impervious and heat resistant gloves to prevent burns and splashes when handling hot valves and hoses. Wear full length overalls that fully cover the arms and legs. The overalls must be zipped up. It is advisable to wear a hat to prevent hot bitumen splashes causing burns to the head. The head should be covered when handling bitumen to prevent burns from splashes or accidental release. Wear safety boots that are oil resistant and have slip resistant soles. Overalls should cover the top of the boot.
Respiratory	Respiratory protection or breathing apparatus are not usually required unless engineering controls are inadequate for providing sufficient ventilation.

Section 9 Physical and Chemical Properties

Appearance	Black semi-solid material at room temperature. Becomes more fluid as it is heated.
Odour	Slight odour at room temperature. Odour may become more pungent as the product is heated.
Odour Threshold	Not available
pH	Not available
Boiling Point	> 200°C
Melting Point	Not available
Freezing Point	Not available
Flash Point	>140^{0}C
Flammability	Not flammable, but combustible if heated strongly in the presence of an ignition source
Upper and Lower Explosive Limits	Not available
Vapour Pressure	< 0.75mm Hg @ 180°C

Vapour Density	Not available
Density @ 25^{0}C **@ 165^{0}C**	0.95 – 1.02 g/cm^3 (ASTM D70) 0.88 – 0.94 g/cm^3
Solubilities	Insoluble/Not miscible
Solubility in Trichloroethylene	99.5% (ASTM D2042)
Partition Coefficient: N octanol/water	Not available
Auto-ignition Temperature	> 200°C
Decomposition Temperature	Not available
Viscosity (165^{0}C)	< 200 mPa.s (ASTM D4402)
Particle Characteristics	Not applicable

Section 10. Stability and Reactivity

Stability of Substance	This product is stable under normal conditions.
Reactivity	Violent, explosive reaction when heated above 100°C in the presence of water.
Conditions to Avoid	Ensure temperature does not exceed 160°C as oxidation and degradation will occur. Avoid heating in the presence of water.
Incompatible Materials	The product can form explosive mixtures when contacted with water at temperatures above 100°C. **DO NOT** use high pressure water hoses to fight fires. Other materials to avoid are strong oxidizing and reducing agents, such as acids and alkalis.
Hazardous Decomposition Products	Normal combustion forms CO_2, H_2O, NO_x, and SO_x. Incomplete combustion may produce CO, H_2S, PCA, PAH, and volatile hydrocarbon and particulate matter.

Section 11 Toxicological Information

Acute Effects:

Swallowed	Not triggered however Ingestion may cause pain, nausea or gastrointestinal irritations. Ingestion of hot bitumen can cause serious burns. LD50: >5000 mg/kg.
Dermal	Not triggered.
Inhalation	Not triggered however inhalation of fumes may cause nausea, headaches, or dizziness. Symptoms are usually alleviated once the victim is removed to a well-ventilated area.
Eye	Not triggered however excessive exposure to fumes may cause slight to moderate eye irritation including redness, tearing, swelling and stinging. Irritation quickly subsides once removed from the fumes. Contact with hot bitumen can cause serious burns.
Skin	Not triggered however Repeated skin contact may cause skin irritations and dermatitis. However, this is possibly caused by use of oils, soaps and detergents that are used to remove material from skin. Contact with hot bitumen can cause serious burns.

Chronic Effects:

Carcinogenicity	Not triggered.
Reproductive Toxicity	Not triggered.
Germ Cell Mutagenicity	Not triggered.
Aspiration	Not triggered.
STOT/SE	Not triggered.

STOT/RE	Not triggered.
Chronic	Prolonged and/or repeated skin exposure can cause irritation and dermatitis in some people. Numerous studies have concluded that bitumen does not cause any increase in the occurrence of carcinogenic, mutagentic or reproductive toxicity effects in workers.

Section 12. Ecotoxicological Information

May be harmful to aquatic environment when present in sufficiently large quantities.

Persistence and degradability	Based on its use as a road surfacing material, bitumen is expected to be highly persistent and not degradable in the environment.
Bioaccumulation	No data Available
Mobility in Soil	Insoluble in water. Semi-solid at ambient temperature.
Other adverse effects	No data available

Section 13. Disposal Considerations

Disposal Method:
Dispose of in accordance with local authority regulations. Steel tanks and other packaging can often be recycled.

Disposal methods to avoid: None known.

Section 14 Transport Information

This product is **NOT** classified as a Dangerous Good for transport in NZ ; NZS 5433:2012 **when temperature is below 100ºC.**

At temperatures above 100ºC the following is applicable**:**
This product is classified as a Dangerous Good for transport in NZ ; NZS 5433:2012

Road, Rail, Sea and Air Transport

UN No	**3257**
Class - Primary	**9**
Packing Group	**III**
Proper Shipping Name	**ELEVATED TEMPERATURE LIQUID, N.O.S.**
Marine Pollutant	**No**
Hazchem Code	**2Y**

Section 15 Regulatory Information

This substance is NOT hazardous according to the EPA Hazardous Substances (Classification) Notice 2020.

Section 16 Other Information

Glossary

Cat	Category
EC_{50}	Median effective concentration.
EEL	Environmental Exposure Limit.
EPA	Environmental Protection Authority
HSNO	Hazardous Substances and New Organisms.
LC_{50}	Lethal concentration that will kill 50% of the test organisms inhaling or ingesting it.
LD_{50}	Lethal dose to kill 50% of test animals/organisms.
LEL	Lower explosive level.
OSHA	American Occupational Safety and Health Administration.
TEL	Tolerable Exposure Limit.

TLV	Threshold Limit Value-an exposure limit set by responsible authority.
UEL	Upper Explosive Level
WES	Workplace Exposure Limit

References:

1. EPA Hazardous Substances (Safety Data Sheets) Notice 2017
2. Workplace Exposure Standards and Biological Exposure Indices Nov 2017 edition.
3. Assigning a hazardous substance to a HSNO Approval (Aug 2013).
4. Transport of Dangerous goods on land NZS 5433:2012
5. HSW (Hazardous Substances) Regulations 2017

Disclaimer

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Please contact the New Zealand distributor, if further information is required.

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