

## 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 A**

Other names: Epoxy Resin - Part A, Bisphenol A resin, diglycidyl ether of Bisphenol A

Product Use: Flexiphalt® E, Part A is reacted with Flexiphalt® E, Part B to produce epoxy modified asphalt and EMOGPA in hot mix asphalt plants.

Restriction of Use: Refer to Section 15

New Zealand Supplier:  
Address: **Higgins Bitumen Manufacturing**  
26 Waitangi Road  
Awatoto  
Napier 4110, New Zealand

Telephone: +64 6 834 0264  
E-mail: HBM@Higgins.co.nz

**Emergency Telephone: 111 (FIRE POLICE AMBULANCE)**  
**021 784 057 (National Bitumen Burns Centre)**  
**0800 764 766 (National Poison Centre)**

Date of SDS Preparation: 8 May 2026

### Section 2. Hazards Identification

**This substance is hazardous according to the EPA Hazardous Substances (Classification) Notice 2020.**

**EPA Approval No: Surface Coatings and Colourants (subsidiary) – HSR002670**

#### Pictograms



Irritant



Ecotoxic

Signal Word: **Warning**

GHS Classification and Category	Hazard Code	Hazard Statement
Skin irritation Cat. 2	H315	Causes skin irritation.
Eye irritation Cat. 2	H319	Causes serious eye irritation.
Skin sensitisation Cat. 1	H317	May cause an allergic skin reaction.
Hazardous to the aquatic environment chronic Cat. 2	H411	Toxic to aquatic life with long lasting effects.

Prevention Code	Prevention Statement
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P103	Read label before use.
P261	Avoid breathing fumes, vapours and spray.
P264	Wash hands thoroughly after handling.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.
P280	Wear protective clothing as detailed in Section 8.

Response Code	Response Statement
P362	Take off contaminated clothing and wash before re-use.
P391	Collect spillage.
P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
P305 + P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.

Storage Code	Storage Statement
None allocated	

Disposal Code	Disposal Statement
P501	Dispose of according to Local Regulations or Authorities

### Section 3. Composition / Information on Ingredients

Ingredients	Wt%	CAS NUMBER.
Reaction product: Bisphenol-A-(epichlorhydrin); Epoxy resin (number average molecular weight ≤700).	100	25068-38-6

### Section 4. First Aid Measures

Routes of Exposure:

If in Eyes	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
If on Skin	Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it or wear gloves. Continue to rinse for at least 10 minutes. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse. If skin irritation or rash occurs: Get medical advice/attention.
If Swallowed	Wash out mouth with water. Remove dentures if any. Move exposed person to fresh air. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
If Inhaled	Remove person to fresh air. Remove contaminated clothing and loosen remaining clothing. Allow person to assume most comfortable position and keep warm. Keep at rest until fully recovered. Get medical advice if breathing becomes difficult.

## Most important symptoms and effects, both acute and delayed

Symptoms:

Ingestion:	Not applicable.
Inhaled:	Not applicable.
Skin:	Causes skin irritation. May cause an allergic skin irritation.
Eye:	Causes serious eye irritation.

### Section 5. Fire Fighting Measures

<b>Hazard Type</b>	Non Flammable
<b>Hazards from products</b>	In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long-lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. No specific data on thermal decomposition products.
<b>Suitable Extinguishing media</b>	For large fires use foam, water spray or water fog For small fires use CO <sub>2</sub> , 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.
<b>Precautions for firefighters and special protective clothing</b>	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
<b>HAZCHEM CODE</b>	<b>3Z</b>

### Section 6. Accidental Release Measures

Wear protective equipment as detailed in Section 8. Clear area of any unprotected personnel. Ensure adequate ventilation.

Try to prevent the material from entering drains or water courses.

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Keep in suitable, closed containers for disposal. Dispose of according to Section 13.

### Section 7. Handling and Storage

#### Precautions for Handling:

- Read label before use.
- Avoid breathing fumes, vapours and spray.
- Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed.
- Workers should wash hands and face before eating, drinking and smoking.
- Persons with a history of skin sensitisation problems should not be employed in any process in which this product is used.
- Do not get in eyes or on skin or clothing.
- Do not ingest.
- Avoid breathing vapour or mist.
- Keep in the original container or in an approved alternative made from a compatible material, kept tightly closed when not in use.
- Empty containers retain product residue and can be hazardous. Do not reuse container.
- Contaminated work clothing should not be allowed out of the workplace.
- Avoid release to the environment.
- Wear protective clothing as detailed in Section 8.

#### Precautions for Storage:

- Store in accordance with local regulations.
- Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use.

- Containers that have been opened must be carefully resealed and kept upright to prevent leakage.
- Do not store in unlabelled containers.
- Use appropriate containment to avoid environmental contamination.
- Store in original containers.

**Section 8 Exposure Controls / Personal Protection**

**WORKPLACE EXPOSURE STANDARDS (provided for guidance only)**

Substance	TWA		STEL	
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>

No ingredients have exposure limits

Workplace Exposure Standard – Short-term exposure limit (WES-STEL). The 15-minute time weighted 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. Exposures at concentrations between the WES-TWA and the WESSTEL should be less than 15 minutes, should occur no more than four times per day, and there should be at least 60 minutes between successive exposures in this range. Workplace Exposure Standards and Biological Exposure Indices. February 2025, Edition 15.

**Derived No-Effect Levels (DNELs)**

Exposure/Effects	DNELs	Population
Short-Term Dermal/Systemic	8.3 mg/kg bw/day	Workers
Short-Term Inhalation/Systemic	12.3 mg/m <sup>3</sup>	Workers
Long-Term Dermal/Systemic	8.3 mg/kg bw/day	Workers
Long-Term Inhalation/Systemic	12.3 mg/m <sup>3</sup>	Workers
Short-Term Dermal/Systemic	3.6 mg/kg bw/day	General
Short-Term Inhalation/Systemic	0.75 mg/m <sup>3</sup>	General
Short-Term Oral/Systemic	0.75 mg/kg bw/day	General
Long-Term Dermal/Systemic	3.6 mg/kg bw/day	General
Long-Term Inhalation/Systemic	0.75 mg/m <sup>3</sup>	General
Long-Term Oral/Systemic	0.75 mg/kg bw/day	General

**Predicted No-Effect Concentrations (PNECs)**

Compartment Detail	PNECs
Fresh Water	3µg/l
Marine	0.3µg/l
Sewage Treatment Plant	10mg/l
Fresh Water Sediment	0.5mg/kg dwt
Marine Water Sediment	0.5mg/kg dwt
Sediment	0.5mg/kg dwt
Intermittent Releases	0.013mg/l

**Engineering Controls**

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

**Personal Protection Equipment**



<b>Eyes</b>	Full face shields are required when transferring hot bitumen between vessels using flexible hoses, or when filling mobile tanks.
<b>Hands and Skin</b>	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.
<b>Respiratory</b>	Respiratory protection or breathing apparatus are not usually required unless engineering controls are inadequate for providing sufficient ventilation.

### Workplace Standards:

Bisphenol A, Diglycidyl Ether Resin No Data Available 8 Hour TWA (NZ/UK)

Bisphenol A, Diglycidyl Ether Resin 90mg/m<sup>3</sup> TEEL-1

Bisphenol A, Diglycidyl Ether Resin 990mg/m<sup>3</sup> TEEL-2

Bisphenol A, Diglycidyl Ether Resin 5900mg/m<sup>3</sup> TEEL-3

### Notes:

It is unlikely that the product will form mists or aerosols during use. However, it may generate fumes or decomposition products under heating, which may have specific exposure limits. The type and magnitude of these decomposition products has not been established.

## Section 9 Physical and Chemical Properties

<b>Appearance</b>	Light yellow, liquid
<b>Odour</b>	Not available
<b>Odour Threshold</b>	Not available
<b>pH</b>	7 (Estimated)
<b>Boiling Point</b>	> 200 °C
<b>Melting Point</b>	Not available
<b>Freezing Point</b>	Not available
<b>Flash Point</b>	>150°C
<b>Flammability</b>	The product is not flammable.
<b>Upper and Lower Explosive Limits</b>	Not available
<b>Vapour Pressure</b>	< 10 mPa.s @ 20°C
<b>Vapour Density</b>	similar to water
<b>Relative Density</b>	Not available
<b>Solubilities</b>	0.009 kg/m <sup>3</sup> @ 23°C (estimated)
<b>Partition Coefficient: N octanol/water</b>	Log P <sub>ow</sub> = 3 (n-octanol/water)
<b>Auto-ignition Temperature</b>	> 300°C
<b>Decomposition Temperature</b>	Not available
<b>Viscosity</b>	12 – 14 Pas 25 °C
<b>Particle Characteristics</b>	Not applicable

## Section 10. Stability and Reactivity

<b>Stability of Substance</b>	This product is stable under normal conditions.
<b>Reactivity</b>	Reacts with strong oxidizing agents. Polymerises exothermically with amines, mercaptans and Lewis acids at ambient temperature and above. Polymerises in contact with caustic soda. Reacts exothermically with bases (e.g. caustic soda), ammonia, primary and secondary amines, alcohols, water and acids.
<b>Conditions to Avoid</b>	Caustic soda (sodium hydroxide) can induce vigorous polymerization at temperatures around 200°C.
<b>Incompatible Materials</b>	Reactive or incompatible with the following materials: strong oxidizing agents, sodium hydroxide.
<b>Hazardous Decomposition Products</b>	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11 Toxicological Information

**Acute Effects:**

<b>Swallowed</b>	Not applicable. LD50: 30 000 mg/kg (rat). Not acutely toxic in multiple mouse and rat studies, LD50>2000mg/kg of body weight.
<b>Dermal</b>	Not applicable. LD50: Rat > 1,200mg/kg; In a rat OCED no.402 study the dermal LD50 was >2000mg/kg. In multiple rabbit acute dermal studies the LD50 was > 2000mg/kg. One rabbit study reported an LD50 value of 23 grams/kg.
<b>Inhalation</b>	Not applicable.
<b>Eye</b>	Causes serious eye irritation.
<b>Skin</b>	Causes skin irritation. In an OECD NO.404 study conducted on the rabbit with a 4 hour occlusive exposure scores for erythema and oedema were minimal. Therefore, BADGE is not a skin irritant. In other studies conducted with the rabbit a 4 hour occlusive exposure was used. Maximum erythema and oedema scores observed under these extreme conditions were 1.5-2 and 1-1.5 respectively. <b>Skin Sensitisation</b> - May cause an allergic skin irritation. In an OECD NO429 mouse LLNA study the estimated EC3 was a concentration of 5.7% suggesting that BADGE is a moderate skin sensitiser in this test system. In an OECD NO.406 guinea pig Maximisation study BADGE induced positive dermal reaction in 100% of the test animals at a 50% concentration challenge dose. Therefore, BADGE is an "Extreme" skin sensitiser under the conditions of this study. Badge was also positive for skin sensitisation in an OECD NO.406 guinea pig Buehler method study.

**Chronic Effects:**

<b>Carcinogenicity</b>	Not triggered. In a rat oral gavage OECD no. 453 there was no evidence of carcinogenicity up to the high dose level of 100 mg/kg/day. OECD Test Guideline no.453 dermal exposure studies were conducted on male mice and female rats. No evidence of carcinogenicity was observed in male mice treated up to the high dose of 100 mg/kg/day and female rats exposed up to a high dose level of 1000 mg/kg/day.
<b>Reproductive Toxicity</b>	No adverse reproductive effects were observed in an OECD Test Guideline no. 416 GLP two-generation rat oral gavage study conducted up to a high dose level of 750 mg/kg/day that resulted in adult body weight decrements.
<b>Germ Cell Mutagenicity</b>	Not triggered. BADGE induced gene-mutation in Ames/Salmonella tester strains TA1535 and TA100 in multiple studies. Generally, mutagenic activity was greater without liver S9 metabolic activation. Induced gene-mutation in L5178Y mouse lymphoma cells. Induced gene-mutation and chromosome damage in Chinese hamster V79 cells. Induced cell transformation in Syrian hamster BHK cells based on clonal growth in soft agar. Did not induce evidence of chromosome damage in a mouse dominant lethal oral gavage study conducted up to a high dose level of 10 grams/kg and in a mouse dominant lethal oral gavage study conducted up to a high dose level of 10 grams/kg and in a mouse micronucleus test conducted up to a high dose of 5000 mg/kg. Negative in a male mouse spermatocyte cytogenetic assay with treatment for 5 days by oral gavage up to a high dose of 3000 mg/kg. Did not induce an increase in the frequency of chromosome damage in a Chinese hamster bone marrow cytogenetic test by oral gavage up to a high dose of 3300 mg/kg. Failed to induce an increase of DNA strand breaks in rat liver cells following oral gavage treatment with 500mg/kg as measured by alkaline elution.
<b>Aspiration</b>	Not triggered.
<b>STOT/SE</b>	Not triggered.
<b>STOT/RE</b>	In a rat OECD test guideline no. 408 sub chronic oral study the

	NOAEL was 50 mg/kg/day. Significant dose-related evidence of hematotoxicity was observed at doses of 250 and 1000 mg/kg/day. There was a significant increase of blood urea nitrogen at 250 and 1000 mg/kg/day and slight histopathological evidence of kidney involvement at the high dose of 1000 mg/kg/day. Histological examination identified slight to moderate degeneration of the seminiferous tubules at 1000 mg/kg/day and possible uterine effects at the same dose. The NOAEL for a rat 90-day dermal (5 days/week) study was 100 mg/kg/day due to body weight decrements at 1000 mg/kg/day. Based on chronic dermatitis the LOAEL for adverse dermal effects in this study was 10 mg/kg/day. No evidence of neurotoxicity was observed in a rat 90-day dermal OECD Test Guideline no. 411 GLP study conducted up to a high dose level of 1000 mg/kg/day with FOB, motor activity and neurohistopathological assessments.
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## Section 12. Ecotoxicological Information

Toxic to aquatic life with long lasting effects.

### **Toxicity**

FISH - The acute 96 hr static exposure LC50 for trout based on the results of OECD NO. 203 studies is 1.3 mg/L. DAPHNIA - The acute 48 hr acute static exposure EC50 value for Daphnia based on the outcome of OECD No.202 studies is 2.1 mg/L. A NOEC of 0.3 mg/L was observed in a Daphnia 21-day semi-static OECD No. 211 Reproduction study. Daphnia survival, growth and reproduction were significantly reduced at concentrations of 1 mg/L and higher. ALGAE - The 72 hr algal LC50 value is >11mg/L. The activated sewage sludge respiration inhibition 3 hr EC50 value based on an EC test method was >100 mg/L. The growth inhibitory concentration for Pseudomonas in an 18 hr static exposure study was >42.6 mg/L.

<b>Persistence and degradability</b>	The level of biodegradation in an "enhanced" OECD 301F study was 5% within the 28 day contact period. Biodegradation reached 6 - 12% after 28 days of contact in an OECD test guidelines no. 301B study. Therefore, BADGE is not readily biodegradable under the conditions of the studies.
<b>Bioaccumulation</b>	The OASIS CATALOGIC QSAR estimated Bioconcentration Factor of 3 - 31 and Log Pow of 3.24 @ 25 C suggest low potential to bioaccumulate in aquatic organisms.
<b>Mobility in Soil</b>	The KOCWIN QSAR estimated adsorption/desorption coefficient Log Koc = 2.65 suggesting moderated sorption to organic matter and limited soil mobility.
<b>Other adverse effects</b>	No data available

Do not allow to enter waterways.

## Section 13. Disposal Considerations

**Disposal Method:** Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements

**Disposal methods to avoid:** Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

## Section 14 Transport Information

**This product is classified as a Dangerous Good for transport in NZ ; NZS 5433:2020**



## **Road, Rail, Sea and Air Transport**

UN No	3082
Class - Primary	9
Packing Group	III
Proper Shipping Name	<b>Environmentally Hazardous Substance, Liquid, N.O.S. (Liquid Epoxy Resin)</b>
Marine Pollutant	Yes
Special Provisions	If the product's is transported in containers with a volume less than 5L, it can be transported as a non-DG as long as the product packaging is still labelled as per DG requirements and the driver is given safety information in accordance with Chapter 3.4 of the UNRTDG.

### **Section 15 Regulatory Information**

EPA Approval Code: Surface Coatings and Colourants (subsidiary) – HSR002670

<b>HSWA &amp; EPA Controls</b>	<b>Trigger Quantity</b>
Certified Handler	Not required
Location Certificate	Not required
Tracking Trigger Quantities	Not required
Signage Trigger Quantities	1000 L
Emergency Response Plan	1000 L
Secondary Containment	1000 L
Restriction of Use	None

### **Section 16 Other Information**

#### **Glossary**

Cat	Category
EC <sub>50</sub>	Median effective concentration.
EEL	Environmental Exposure Limit.
EPA	Environmental Protection Authority
HSNO	Hazardous Substances and New Organisms.
LC <sub>50</sub>	Lethal concentration that will kill 50% of the test organisms inhaling or ingesting it.
LD <sub>50</sub>	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. EPA Hazardous Substances (Hazard Classification) Notice 2020.
3. Workplace Exposure Standards and Biological Exposure Indices, February 2025 edition 15.
4. Protective Action Criteria (PAC) / Temporary Emergency Exposure Limit (TEEL) Database.
5. Assigning a hazardous substance to HSNO Approval (June 2014).
6. Transport of Dangerous Goods on land NZS 5433:2020.
7. HSW (Hazardous Substances) Regulations 2017.
8. CCNZ, BPG01 - Best Practice Guideline: Safe Handling of Bituminous Materials Used for Rooding.

## Disclaimer

This document has been prepared by TCC (NZ) Ltd and serves as the suppliers Safety Data Sheet ('SDS'). It is based on information concerning the product which has been provided to TCC (NZ) Ltd or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer. While TCC (NZ) have taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, TCC (NZ) Ltd accept no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS

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

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