SAFETY DATA SHEET

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In accordance with Schedule 1 of the Hazardous Products Regulations (HPR) (WHMIS 2015)

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name	Barrier E
Other Means of Identification	None

Recommended use and restrictions

Recommended use	Strain gauge installation
Restrictions on use	For professional users only.

Initial Supplier Identifier

Company Identification	VISHAY MEASUREMENTS GROUP, INC. Post Office Box 27777 Raleigh, NC 27611 USA
Telephone	(+1) 800.204.6278
E-Mail (competent person)	mm.us@vishaypg.com

Emergency telephone number

Emergency Phone No.	1-800-424-9300	CHEMTREC (24 hours)
Languages spoken	English	

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

In accordance with Schedule 1 of the Hazardous Products Regulations (HPR) (WHMIS 2015)	Carcinogenicity - Category 2

Label elements

Hazard Pictogram(s)

Signal Word(s)	WARNING
Hazard Statement(s)	Suspected of causing cancer by inhalation.
Precautionary Statement(s)	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. IF exposed or concerned: Call a POISON CENTER/doctor. Store locked up. Dispose of contents in accordance with local, state or national legislation.
Other hazards	15 percent of the mixture consists of ingredient(s) of unknown toxicity. See Section: 3.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures

GHS Classification

Chemical Name	CAS No.	Concentration (%W/W)	Common name(s), synonym(s) of the substance	Hazard classification
Distillates (petroleum), C3-6, Piperylene-rich, polymers with Isobutylene*	152698-66-3	<10	N/A	Not classified
Polyester*	Unknown	<5	N/A	Unknown
Carbon black*	1333-86-4	<5	N/A	Not classified
Antimony trioxide	1309-64-4	<1	Diantimony trioxide	Carcinogenicity - Category 2 Aquatic Chronic - Category 3

* See Section: 11

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Self-protection of the first aider	Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Avoid all contact. Avoid contact with heated or molten product. Molten material can cause severe burns. Contaminated clothing should be laundered before reuse.
Inhalation	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Keep warm and at rest. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. IF exposed or concerned: Call a POISON CENTER/doctor.
Skin Contact	IF ON SKIN: Remove contaminated clothing immediately. Wash affected skin with soap and water. In the event of burns from the molten liquid, do not attempt to remove adhering material. Remove contaminated clothing and wash clothing before reuse. If irritation (redness, rash, blistering) develops, get medical attention.
Eye Contact	IF IN EYES: Flush eyes with water for at least 15 minutes while holding eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if eye irritation develops or persists.
Ingestion	IF SWALLOWED: Do NOT induce vomiting. Rinse mouth. Drink two glasses of water. Do not give milk or alcoholic beverages. Do not give anything by mouth to an unconscious person. IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.
Most important symptoms and effects, both acute and delayed	Suspected of causing cancer by inhalation. Molten material can cause severe burns. 15 percent of the mixture consists of ingredient(s) of unknown toxicity. Do not handle until all safety precautions have been read and understood.
Indication of any immediate medical attention and special treatment needed	Treat symptomatically. IF exposed or concerned: Call a POISON CENTER/doctor.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media	As appropriate for surrounding fire. In case of fire use carbon dioxide or dry agent.
Unsuitable extinguishing Media	Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide, Hydrogen chloride, Hydrogen Sulphide, Oxides of antimony and Oxides of sulfur.
Special protective equipment and precautions for fire fighters	Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Molten material can cause severe burns. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures
Ensure adequate ventilation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact. Avoid contact with heated or molten product. Use personal protective equipment as required. See Section: 8.

Environmental precautions
Avoid release to the environment. Do not allow to enter drains, sewers or watercourses.

Methods and material for containment and cleaning up
Small spillages: Sweep up and shovel into waste drums or plastic bags. Transfer to a container for disposal. Dispose of this material and its container as hazardous waste.

Large spillages: Use vacuum cleaner to collect spilt material. Sweep up and shovel into waste drums or plastic bags. Ventilate the area and wash spill site after material pick-up is complete. Dispose of this material and its container as hazardous waste.

Reference to other sections
See Section: 8, 13

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling
Ensure adequate ventilation. Avoid all contact. Avoid contact with heated or molten product. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work.

Conditions for safe storage, including any incompatibilities
Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Keep away from direct sunlight.

Storage temperature
Ambient. <100 ℃

Incompatible materials
Keep away from: Oxidizing agents.

Specific end use(s)
Strain gauge installation

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational Exposure Limits

SUBSTANCE	CAS No.	ACGIH® TLV® (mg/m³)		OSHA PEL (ppm)		Note
		TWA	STEL	TWA	STEL	
Antimony trioxide (Production)^	1309-64-4	-	-	-	-	ACGIH, A2
Carbon black	1333-86-4	3.5* 0.1 mg PAHs/m3	- -	- -	- -	NIOSH
		3.5	-	-	-	OSHA
		3	-	-	-	ACGIH, A3 Inhalable Dust
Limestone (calcium carbonate)	1317-65-3	10 5	- -	- -	- -	NIOSH Total Dust Respirable Dust
		15 5	- -	- -	- -	OSHA Total Dust Respirable Dust
Kaolin	1332-58-7	- -	10 5	- -	- -	NIOSH Total Dust Respirable Dust
		- -	15 5	- -	- -	OSHA Total Dust Respirable Dust
		-	2	-	-	ACGIH, A4 Respirable Dust

Source: ACGIH: American Conference of Governmental Industrial Hygienists (ACGIH) TLV: Threshold Limit Value (ACGIH) OSHA PELs 1910.1000
* In the presence of PAHs: limit PAHs to 0,1 mg/m3 TWA (detected as cyclohexane soluble extract)
A2: Suspected Human Carcinogen: Human data are accepted as adequate in quality but are conflicting or insufficient to classify the agent as a confirmed human carcinogen; OR, the agent is carcinogenic in experimental animals at dose(s) , by route(s) of exposure, at site(s), of histological type(s), or by mechanism(s) considered relevant to worker exposure. The A2 is primarily when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals with relevance to humans.
A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans: The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histological type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiological studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.
A4: Not Classifiable as a Human Carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of the lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

Alberta: Occupational Health And Safety Code, 2009; Quebec: Health and Safety Work Act, 2016

SUBSTANCE	CAS No.	8-hour Occupational Exposure Limits			15-minute or ceiling Occupational Exposure Limits		Note
		ppm	mg/m³	f/cc	STEL (ppm)	STEL (mg/m³)	
Antimony trioxide^	1309-64-4	-	0.5	-	-	-	OEL
Carbon black	1333-86-4	-	3.5	-	-	-	Alberta
		-	3.5	-	-	-	OEL
Limestone (Calcium carbonate)	1317-65-3	-	3*	-	-	-	Alberta
		-	10^	-	-	-	OEL, Total Dust
Kaolin	1332-58-7	-	2	-	-	-	Alberta
		-	5^	-	-	-	OEL, Respirable Dust

Source: Alberta: Occupational Health And Safety Code, 2009 OEL: Quebec Work Health and Safety Regulations, Health and Safety Work Act, (chapter S - 2.1, a. 223)
* Occupational exposure limit is based on irritation effects and its adjustment to compensate for unusual work schedules is not required
^ Value is for particulate matter containing Asbestos and <1% Crystalline Silica

British Coloumbia: Occupational Health and Safety Guidelines, 2015; Northwest Territories: Occupational Health & Safety Regulations, 2012

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Antimony trioxide^	1309-64-4	-	-	-	-	WEL, Production
		-	-	-	-	NW, Schedule R
Carbon black	1333-86-4	-	3	-	-	WEL, Inhalable fraction
		-	3.5	-	7	NW
Polyvinyl chloride	9002-86-2	-	1	-	-	WEL, Respirable Dust
Limestone (Calcium carbonate)	1317-65-3	-	10*	-	20	WEL
		-	10	-	20	NW
Kaolin	1332-58-7	-	2	-	-	WEL
		-	2	-	4	NW, Respirable Dust

Source: WEL: Occupational Health and Safety Guidelines Part 5: Chemical Agents and Biological Agents (British Columbia)
NW: WSCC, Occupational Health & Safety Regulations, Northwest Territories Volume 3, Schedule R: Advice on Additional Personal Protection (APP)
^ Exposure by all routes should be carefully controlled to levels as low as possible
* Total Dust

` Value is for particulate matter containing no Asbestos and <1% Crystalline Silica

Saskatchewan: The Occupational Health and Safety Regulations, 1996.

SUBSTANCE	CAS No.	Time Weighted Average (TWA) (mg/m³)	STEL (mg/m³)	Note
Carbon black	1333-86-4	3.5	7	SK
Limestone (Calcium carbonate)	1317-65-3	10	20	SK
Kaolin	1332-58-7	2	4	SK, Respirable Dust

Source: Saskatchewan (SK): The Occupational Health and Safety Act, 1993. O-1.1 REG 1 The Occupational Health and Safety Regulations, 1996.

Biological limit value — Not established.

Exposure controls

Appropriate engineering controls — Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Control dust formation.

Individual protection measures, such as personal protective equipment (PPE) — Keep good industrial hygiene. Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier. Avoid all contact. Wash contaminated clothing before reuse. Do not eat, drink or smoke at the work place.

Eye/face protection

Wear eye protection with side protection.
Recommended: Class 2B goggles

Skin protection

Hand protection:
Wear impervious gloves. Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Body protection:
Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection

Work in well ventilated zones or use proper respiratory protection. In case of inadequate ventilation wear respiratory protection.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Solid - Black roll with paper release liner
Odour	No odour.
Odour threshold	Not available.
pH	Not applicable.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	Not available.
Flash point	Not applicable.
Evaporation rate (Water = 1)	Not applicable.
Flammability (solid, gas)	Non-flammable.
Upper/lower flammability or explosive limits	Not applicable.
Vapour pressure	Not applicable.
Vapour density	Not applicable.

Relative density	1.25 (H2O = 1)
Solubility(ies)	Not available.
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not applicable.
Explosive properties	Not explosive.
Oxidising properties	Not oxidising.

Other information None known.

SECTION 10: STABILITY AND REACTIVITY

Reactivity Stable under normal conditions.

Chemical stability Stable under normal conditions.

Possibility of hazardous reactions Hazardous polymerisation will not occur. Reaction with hydrogen releases antimony hydride (stibine).

Conditions to avoid Keep away from heat and direct sunlight.

Incompatible materials Keep away from: Oxidizing agents.

Hazardous decomposition product(s) May decompose in a fire giving off toxic fumes. Decomposition products: Carbon monoxide, Carbon dioxide, Hydrogen chloride, Hydrogen Sulphide, Oxides of antimony and Oxides of sulfur.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity - Ingestion 15 percent of the mixture consists of ingredient(s) of unknown acute oral toxicity. Based upon the available data, the classification criteria are not met.
Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.

Acute toxicity - Inhalation 15 percent of the mixture consists of ingredient(s) of unknown acute inhalation toxicity. Based upon the available data, the classification criteria are not met.
Acute Toxicity Estimate Mixture Calculation: Estimated LC50 (Dust) > 5.0 mg/l.

Acute toxicity - Skin Contact 15 percent of the mixture consists of ingredient(s) of unknown acute dermal toxicity. Based upon the available data, the classification criteria are not met.
Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.

Skin corrosion/irritation Based upon the available data, the classification criteria are not met.

Serious eye damage/irritation Based upon the available data, the classification criteria are not met.

Respiratory or skin sensitization Based upon the available data, the classification criteria are not met.

Germ cell mutagenicity Based upon the available data, the classification criteria are not met.

Carcinogenicity Carcinogen - Category 2; Suspected of causing cancer.

Antimony trioxide Carcinogen - Category 2 Harmonised Classification

Carbon Black Carbon black is listed by IARC as a Group 2B substance (possibly carcinogenic), but IARC mongraphs Vol. 65 and 93 state that there is inadequate evidence to classify carbon black as carcinogenic to humans. Additionally, IARC monograph Vol. 93 states that no significant exposure to carbon black is thought to occur during the use of products in which carbon black is bound to other materials, such as rubber, printing ink or paint. Carbon black in this mixture is in a bound form.

Reproductive toxicity Based upon the available data, the classification criteria are not met.

STOT - single exposure Based upon the available data, the classification criteria are not met.

STOT - repeated exposure Based upon the available data, the classification criteria are not met.

Aspiration hazard Based upon the available data, the classification criteria are not met.

Other information 15 percent of the mixture consists of ingredient(s) of unknown toxicity: Polyester, Distillates (petroleum), C3-6, Piperylene-rich, polymers with Isobutylene.
Distillates (petroleum), C3-6, Piperylene-rich, polymers with Isobutylene: Expert judgement - The vast majority of hazardous monomers are likely to have been

consumed in the polymerisation process, resulting in the polymer being non-hazardous. It was agreed with VPG to use this classification.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity	Based upon the available data, the classification criteria are not met.
Antimony trioxide	Aquatic Chronic - Category 3 Harmonised Classification Aquatic acute: LC50 (Fathead minnow) mg/l 14.4 (96 hour). (Unnamed, 1986) Aquatic chronic: Read across: NOEC (Fathead minnow (Pimephales promelas)) 4.5 mg/l (28 Day). (Unnamed, 1978).
Persistence and degradability	No data for the mixture as a whole.
Bioaccumulative potential	No data for the mixture as a whole.
Mobility in soil	The product is predicted to have high mobility in soil (Highly volatile. May evaporate quickly.)
Other adverse effects	Not classified as PBT or vPvB. None of the substances in this product fulfil the criteria for being regarded as a PBT or vPvB substance.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Dispose of this material and its container as hazardous waste. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation.

SECTION 14: TRANSPORT INFORMATION

Not classified according to the United Nations 'Recommendations on the Transport of Dangerous Goods'.

		ADR/RID	IMDG	IATA/ICAO
14.1	**UN number**	Not classified	Not classified	Not classified
14.2	**UN proper shipping name**	Not classified	Not classified	Not classified
14.3	**Transport hazard class(es)**	Not classified	Not classified	Not classified
14.4	**Packing group**	Not classified	Not classified	Not classified
14.5	**Environmental hazards**	Not classified	Not classified as a Marine Pollutant.	Not classified
14.6	**Special precautions for user**	Not applicable		
14.7	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	See Section: 2		

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations

CEPA, Domestic Substances List	Kaolin: Yes Limestone (Calcium carbonate): Yes Asphalt: Yes Distillates (petroleum), C3-6, Piperylene-rich, polymers with Isobutylene: Yes Polyvinyl chloride: Yes Carbon black: Yes Antimony trioxide: Yes
CEPA, National Pollutant Release Inventory	Antimony trioxide (Pure element): Threshold Category: Part 1A, Mass Threshold: 10 tonnes Concentration threshold: 1%

Non-Regional

IARC Monographs**,** List of Classifications	Polyvinyl chloride: Group 3 Carbon black: Group 2B Antimony trioxide: Group 2B

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Not applicable – V1.0

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References:
Existing Safety Data Sheet (SDS).
EU: Harmonised Classification(s) for Antimony trioxide (CAS No. 1309-64-4). Existing ECHA registration(s) for Asphalt (CAS No. 64742-93-4), Carbon black (CAS No. 1333-86-4), Antimony trioxide (CAS No. 1309-64-4) and the Classification and Labelling Inventory for Kaolin (CAS No. 1332-58-7), Limestone (Calcium carbonate) (CAS No. 1317-65-3), and Polyvinyl chloride (CAS No. 9002-86-2).

Literature References:

1. Hayes JR, Condie LW Jr, Egle JL Jr and Borzelleca JF. 1987. The acute and subchronic toxicity in rats of trans-1,2-dichloroethylene in drinking water. J. Am. Coll. Toxicol., 6:471-478.
2. US EPA. Ambient Water Quality Criteria for Dichloroethylenes. Office of Water Regulations and Standards Criteria and Standards Division. Washington DC 20460. 1980. EPA 440/5-80-041. p.B5.

LEGEND

LTEL: Long Term Exposure Limit	STEL: Short Term Exposure Limit
DNEL: Derived No Effect Level	PNEC: Predicted No Effect Concentration
PBT: Persistent, Bioaccumulative and Toxic	vPvB: very Persistent and very Bioaccumulative
ACGIH: American conference of Governmental Industrial Hygiene	BEI: Biological Exposure Indices (ACGIH)
TLV: Threshold Limit Value (ACGIH)	TWA: Time Weighted Average
OSHA = Occupational Safety and Health Administration	NIOSHTIC: National Institute for Occupational Safety and Health Technical Information Center
IARC: International Agency for Research on Cancer	CEPA (Canadian Environmental Protection Act)
VOC: Volatile Organic Compound	EU: European Union
PAH: Polyaromatic hydrocarbon	

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