SAFETY DATA SHEET

Barrier E

Vishay Measurements Group GmbH

Version No: **4.0**
Safety Data Sheet - Authored according to GB/T 16483(2008), GB/T 17519 (2013), and GB30000.1 (2024)

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S.GHS.CHN.EN

SECTION 1 Identification of the substance / mixture and of the company / undertaking

Product Identifier

Product name	Barrier E
Chemical Name	Not Applicable
Chemical English Name	Not Applicable
Synonyms	Not Available
Chemical formula	Not Applicable
Other means of identification	This product is an article and is not classified as a hazardous chemical.

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Strain gauge installation.

Details of the manufacturer or importer of the safety data sheet

Registered company name	**Vishay Measurements Group GmbH**
Address	Tatschenweg 1 Heilbronn 74078 Germany
Telephone	+49 (0) 7131 39099-0
Fax	+49 (0) 7131 39099-229
Website	www.VPGSensors.com
Email	mm.de@vpgsensors.com

Emergency telephone number

Association / Organisation	**Velocity EHS**
Emergency telephone number(s)	400-120-0751
Other emergency telephone number(s)	1-813-248-0585

SECTION 2 Hazards identification

Classification of the substance or mixture

Summary of Hazard in an Emergency Situation

Solid.Combustible.
Harmful by inhalation.
Harmful if swallowed.
Irritating to eyes.

Classification [1]	Skin Corrosion/Irritation Category 3
Legend:	1. Classified by Chemwatch; 2. China Catalogue of Hazardous Chemicals; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI

Label elements

Hazard pictogram(s)	Not Applicable
Signal word	**Warning**

Hazard statement(s)

H316	Causes mild skin irritation.

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorized hazardous or special waste collection point in accordance with any local regulations.

Page 1 continued...

Not Applicable

Physical and Chemical Hazard

Solid.Combustible.
Toxic smoke/fumes in a fire.

Health Hazards

Inhaled	The material is not classified as causing respiratory irritation under Regulation (EC) No 1272/2008 (CLP), as amended. Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be implemented in an occupational setting.
Ingestion	The material is not expected to produce harmful effects following ingestion based on the available information. However, the material may still cause adverse health effects following ingestion, particularly in individuals with pre-existing organ damage (e.g. liver or kidney impairment). Gastrointestinal discomfort may occur and may result in nausea and vomiting. In an occupational setting, ingestion of incidental quantities should be avoided, and good hygiene practices should be followed to prevent ingestion. Swallowing pieces of the bitumen may produce obstruction at the junction of the stomach and the intestine. This is due to accumulation in the stomach and formation of a stony concretion.
Skin Contact	Skin contact is not expected to result in harmful health effects and the material is not classified as hazardous by the dermal route under Regulation (EC) No 1272/2008 (CLP), as amended. However, the material may cause harm following entry through wounds, lesions or abrasions. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. The material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.
Eye	Although the material is not classified as an eye irritant under Regulation (EC) No 1272/2008 (CLP), as amended, direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result. The material may produce foreign body irritation in certain individuals. Workers exposed to fumes of blown bitumens developed inflammation of the cornea and conjunctiva.
Chronic	Studies show that inhaling this substance for over a long period (e.g. in an occupational setting) may increase the risk of cancer. Chronic dust inhalation of kaolin, can cause kaolinosis from kaolin deposition in the lungs causing distinct lung markings, abnormal inflation of air sacs, and chronic lung diseases (nodular pneumoconiosis).This condition is made worse by long duration of occupational exposure and pre-existing chest infection. Pre-employment screening is recommended. Pure calcium carbonate does not cause the disease pneumoconiosis probably due to its rapid elimination from the body. However, its unsterilised particulates can infect the lung and airway to cause inflammation. High blood concentrations of calcium ion may give rise to dilation of blood vessels and depress heart function, leading to low blood pressure and fainting (syncope). Calcium ions enhance the effects of digitalis on the heart, and may precipitate digitalis poisoning. Calcium salts also reduce the absorption of tetracyclines. In newborns, giving calcium during treatment has resulted in calcification of soft tissue. Long-term exposure to bitumen or asphalt fumes, over extended periods, may cause central nervous system depression and liver and kidney changes. Chronic bitumen/asphalt poisoning may result in a decrease in the number of white and red blood cells. Prolonged contact with bitumens may produce irritation, inflammation, dermatitis, acne-like lesions, keratoses, melanosis and sensitivity to light. Animal testing for cancer-causing effects of bitumen was inconclusive, and no difference was found between the health of asphalt workers and of groups of controls in oil refineries. There has been concern that this material can cause cancer or mutations, but there is not enough data to make an assessment.

Environmental Hazards

See Section 12

Other hazards

Cumulative effects may result following exposure*.
Possible skin sensitizer*.
Repeated exposure potentially causes skin dryness and cracking*.
Vapours potentially cause drowsiness and dizziness*.
*LIMITED EVIDENCE

No further product hazard information.

SECTION 3 Composition / information on ingredients

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
1332-58-7	15-25	kaolin
1317-65-3	15-25	calcium carbonate
64742-93-4	5-10	bitumen (blown)
9002-86-2	<=5	polyvinyl chloride
1333-86-4	<=5	carbon black
1309-64-4	<=1	antimony trioxide
Not Available	25-35	Mixed rubber blend
152698-66-3	<=10	piperylene-rich/ isobutene copolymer
Legend:	1. Classified by Chemwatch; 2. China Catalogue of Hazardous Chemicals; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available	

SECTION 4 First aid measures

Description of first aid measures

Eye Contact	If this product comes in contact with eyes: ‣ Wash out immediately with water.

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	‣ If irritation continues, seek medical attention. ‣ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	‣ Immediately drench burn area in cold running water. ‣ If hot bitumen adheres to the skin, **DO NOT** attempt to remove it (it acts as a sterile dressing). ‣ For burns to the head and neck and trunk, apply cold wet towels to the burn area, and change frequently to maintain cooling. ‣ Cooling should be maintained for no longer than thirty minutes. ‣ When hot bitumen completely encircles a limb, it may have a tourniquet effect and should be split as it cools. ‣ Transport to hospital or doctor. If skin contact occurs: ‣ Immediately remove all contaminated clothing, including footwear. ‣ Flush skin and hair with running water. ‣ Seek medical attention in event of irritation.
Inhalation	‣ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ‣ Other measures are usually unnecessary.
Ingestion	‣ Immediately give a glass of water. ‣ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Advise for rescue team (PPE requirement for rescue personnel)

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.
Burns : No attempt should be made to remove the bitumen (it acts as a sterile dressing). Cover the bitumen with tulle gras and leave for two days when any detached bitumen can be removed. Re-dress and leave for a further week. If necessary refer to a burns unit. [Manufacturer]

SECTION 5 Firefighting measures

Extinguishing media

‣ There is no restriction on the type of extinguisher which may be used.
‣ Use extinguishing media suitable for surrounding area.

Special hazards arising from the substance or mixture

Fire Incompatibility	‣ Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result

Advice for firefighters

Fire Fighting	‣ Alert Fire Brigade and tell them location and nature of hazard. ‣ Wear breathing apparatus plus protective gloves in the event of a fire. ‣ Prevent, by any means available, spillage from entering drains or water courses. ‣ Use fire fighting procedures suitable for surrounding area. ‣ **DO NOT** approach containers suspected to be hot. ‣ Cool fire exposed containers with water spray from a protected location. ‣ If safe to do so, remove containers from path of fire. ‣ Equipment should be thoroughly decontaminated after use.
Fire/Explosion Hazard	‣ Solid which exhibits difficult combustion or is difficult to ignite. ‣ Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. ‣ Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust (420 micron or less) may burn rapidly and fiercely if ignited; once initiated larger particles up to 1400 microns diameter will contribute to the propagation of an explosion. ‣ A dust explosion may release large quantities of gaseous products; this in turn creates a subsequent pressure rise of explosive force capable of damaging plant and buildings and injuring people. ‣ Usually the initial or primary explosion takes place in a confined space such as plant or machinery, and can be of sufficient force to damage or rupture the plant. If the shock wave from the primary explosion enters the surrounding area, it will disturb any settled dust layers, forming a second dust cloud, and often initiate a much larger secondary explosion. All large scale explosions have resulted from chain reactions of this type. ‣ Dry dust can also be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport. ‣ Build-up of electrostatic charge may be prevented by bonding and grounding. ‣ Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting. ‣ All movable parts coming in contact with this material should have a speed of less than 1-metre/sec. Combustion products include: , ‣ carbon monoxide (CO) , ‣ carbon dioxide (CO2) , sulfur oxides (SOx) , sulfur dioxide (SO2) , metal oxides , ‣ other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes.

SECTION 6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

See section 8

Measures for Preventing Secondary Contamination

Refer to section above

Continued...

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	▸ Clean up all spills immediately. ▸ Avoid breathing dust and contact with skin and eyes. ▸ Wear protective clothing, gloves, safety glasses and dust respirator. ▸ Use dry clean up procedures and avoid generating dust. ▸ Sweep up, shovel up or ▸ Vacuum up (consider explosion-proof machines designed to be grounded during storage and use). ▸ Place spilled material in clean, dry, sealable, labelled container.
Major Spills	Moderate hazard. ▸ **CAUTION**: Advise personnel in area. ▸ Alert Emergency Services and tell them location and nature of hazard. ▸ Control personal contact by wearing protective clothing. ▸ Prevent, by any means available, spillage from entering drains or water courses. ▸ Recover product wherever possible. ▸ **IF DRY:** Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. **IF WET:** Vacuum/shovel up and place in labelled containers for disposal. ▸ **ALWAYS:** Wash area down with large amounts of water and prevent runoff into drains. ▸ If contamination of drains or waterways occurs, advise Emergency Services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 Handling and storage

Precautions for safe handling

Safe handling	Ensure adequate ventilation. Although the substance has no acute toxicity, it is advised to avoid contact with skin, eyes, and clothing. Avoid all contact. Avoid breathing dust. 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.
Other information	▸ Store in original containers. ▸ Keep containers securely sealed. ▸ Store in a cool, dry area protected from environmental extremes. ▸ Store away from incompatible materials and foodstuff containers. ▸ Protect containers against physical damage and check regularly for leaks. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS. For major quantities: ▸ Consider storage in bunded areas - ensure storage areas are isolated from sources of community water (including stormwater, ground water, lakes and streams}. ▸ Ensure that accidental discharge to air or water is the subject of a contingency disaster management plan; this may require consultation with local authorities.

Conditions for safe storage, including any incompatibilities

Suitable container	Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Keep away from direct sunlight.
Storage incompatibility	Storage temperature: Ambient. Storage life: Stable under normal conditions. Incompatible materials: Keep away from: Oxidizing agents.

SECTION 8 Exposure controls / personal protection

Control parameters

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust	kaolin	Particles not otherwise regulated	8 mg/m3	Not Available	Not Available	(Name (a - refers to dust with free SiO2 less than 10 %, free of asbestos and toxic substances, and no occupational exposure limit has been established.))
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust	calcium carbonate	Marble dust	8 mg/m3	Not Available	Not Available	Not Available
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust	calcium carbonate	Limestone dust	8 mg/m3	Not Available	Not Available	Not Available
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust	polyvinyl chloride	Polyvinyl chloride (PVC) dust	5 mg/m3	Not Available	Not Available	Not Available
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust	carbon black	Carbon black dust	4 mg/m3	Not Available	Not Available	G2B
China Occupational Exposure Limits for Hazardous Agents in the Workplace	antimony trioxide	Antimony and compounds ,as Sb	0.5 mg/m3	Not Available	Not Available	Not Available

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Exposure controls

Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood-local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Individual protection measures, such as personal protective equipment

Eye and face protection

- Safety glasses with side shields.
- Chemical goggles.[AS/NZS 1337.1, EN166 or national equivalent]
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

Skin protection

See Hand protection below

Hands/feet protection

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.
· Contaminated gloves should be replaced.
As defined in ASTM F-739-96 in any application, gloves are rated as:
· Excellent when breakthrough time > 480 min
· Good when breakthrough time > 20 min
· Fair when breakthrough time < 20 min
· Poor when glove material degrades
For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.
It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task.
Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:

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	· Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of. · Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present. ▸ polychloroprene. ▸ nitrile rubber. ▸ butyl rubber. ▸ fluorocaoutchouc. ▸ polyvinyl chloride. Gloves should be examined for wear and/ or degradation constantly.
Body protection	See Other protection below
Other protection	▸ Overalls. ▸ P.V.C apron. ▸ Barrier cream. ▸ Skin cleansing cream. ▸ Eye wash unit.

Respiratory protection

Type A-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A P1 Air-line*	- -	A PAPR-P1 -
up to 50 x ES	Air-line**	A P2	A PAPR-P2
up to 100 x ES	-	A P3	-
		Air-line*	-
100+ x ES	-	Air-line**	A PAPR-P3

* - Negative pressure demand ** - Continuous flow
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

· Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
· The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
· Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
· Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
· Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU)
· Use approved positive flow mask if significant quantities of dust becomes airborne.
· Try to avoid creating dust conditions.
Where significant concentrations of the material are likely to enter the breathing zone, a Class P3 respirator may be required.
Class P3 particulate filters are used for protection against highly toxic or highly irritant particulates.
Filtration rate: Filters at least 99.95% of airborne particles
Suitable for:
· Relatively small particles generated by mechanical processes eg. grinding, cutting, sanding, drilling, sawing.
· Sub-micron thermally generated particles e.g. welding fumes, fertilizer and bushfire smoke.
· Biologically active airborne particles under specified infection control applications e.g. viruses, bacteria, COVID-19, SARS
· Highly toxic particles e.g. Organophosphate Insecticides, Radionuclides, Asbestos
Note: P3 Rating can only be achieved when used with a Full Face Respirator or Powered Air-Purifying Respirator (PAPR). If used with any other respirator, it will only provide filtration protection up to a P2 rating.

SECTION 9 Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Black roll with paper release liner (solid)

Physical state	Solid	**Relative density (Water = 1)**	1.25
Odour	No Odour	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (℃)**	Not Available
pH (as supplied)	Not Applicable	**Decomposition temperature (℃)**	Not Available
Melting point / freezing point (℃)	Not Available	**Viscosity (mm2/s)**	Not Applicable
Initial boiling point and boiling range (℃)	Not Available	**Molecular weight (g/mol)**	Not Available
Flash point (℃)	Not Applicable	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Applicable	**Surface Tension (dyn/cm or mN/m)**	Not Applicable

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Lower Explosive Limit (%)	Not Applicable	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Applicable	**Gas group**	Not Available
Solubility in water	Immiscible	**pH as a solution (1%)**	Not Applicable
Vapour density (Air = 1)	Not Applicable	**VOC g/L**	Not Available
Heat of Combustion (kJ/g)	Not Available	**Ignition Distance (cm)**	Not Applicable
Flame Height (cm)	Not Applicable	**Flame Duration (s)**	Not Applicable
Enclosed Space Ignition Time Equivalent (s/m3)	Not Available	**Enclosed Space Ignition Deflagration Density (g/m3)**	Not Available

SECTION 10 Stability and reactivity

Reactivity	See section 7
Chemical stability	▸ Unstable in the presence of incompatible materials. ▸ Product is considered stable. ▸ Hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 Toxicological information

a) Acute Toxicity	Based on available data, the classification criteria are not met.
b) Skin Irritation/Corrosion	There is sufficient evidence to classify this material as skin corrosive or irritating.
c) Serious Eye Damage/Irritation	Based on available data, the classification criteria are not met.
d) Respiratory or Skin sensitisation	Based on available data, the classification criteria are not met.
e) Mutagenicity	Based on available data, the classification criteria are not met.
f) Carcinogenicity	Based on available data, the classification criteria are not met.
g) Reproductivity	Based on available data, the classification criteria are not met.
h) STOT - Single Exposure	Based on available data, the classification criteria are not met.
i) STOT - Repeated Exposure	Based on available data, the classification criteria are not met.
j) Aspiration Hazard	Based on available data, the classification criteria are not met.

Barrier E	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
kaolin	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
calcium carbonate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (Rodent - rabbit): 750ug/24H - Severe
	Inhalation (Rat) LC50: >3 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin (Rodent - rabbit): 500mg/24H - Moderate
		Skin: no adverse effect observed (not irritating)[1]
bitumen (blown)	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >5000 mg/kg[2]	Skin: no adverse effect observed (not irritating)[1]
piperylene-rich/ isobutene copolymer	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
polyvinyl chloride	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
carbon black	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]

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antimony trioxide	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >8000 mg/kg[1]	Eye (Rodent - rabbit): 100mg - Mild
	Inhalation (Rat) LC50: >5.2 mg/l4h[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (Rat) LD50: >34600 mg/kg[2]	Skin: no adverse effect observed (not irritating)[1]

Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

Barrier E	Exposure to titanium dioxide is via inhalation, swallowing or skin contact. When inhaled, it may deposit in lung tissue and lymph nodes causing dysfunction of the lungs and immune system. Absorption by the stomach and intestines depends on the size of the particle. It penetrated only the outermost layer of the skin, suggesting that healthy skin may be an effective barrier. There is no substantive data on genetic damage, though cases have been reported in experimental animals. Studies have differing conclusions on its cancer-causing potential.
KAOLIN	For bentonite clays: Bentonite (CAS No. 1302-78-9) consists of a group of clays formed by crystallization of vitreous volcanic ashes that were deposited in water. The expected acute oral toxicity of bentonite in humans is very low. However, when bentonite had been used as a prophy paste, larger amounts caused severe eye injury, including abscesses behind the cornea. In animals, large amounts caused decreased growth, muscle weakness and death with marked changes in both calcium and phosphorus metabolism. Bentonite, in animals, caused lung scarring if instilled into the windpipe. Bentonite clay dust is believed to be responsible for asthma in workers in an American processing plant. Swallowing bentonite without adequate liquids may result in intestinal obstruction in humans. Chronically swallowing bentonite has been reported to cause muscle inflammation.
CALCIUM CARBONATE	No evidence of carcinogenic properties. No evidence of mutagenic or teratogenic effects. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
BITUMEN (BLOWN)	as extracts of steam-refined and air-refined bitumens:
POLYVINYL CHLORIDE	The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.
CARBON BLACK	Inhalation (rat) TCLo: 50 mg/m3/6h/90D-I Nil reported
ANTIMONY TRIOXIDE	(intermittent) [CCINFO] Reproductive effector The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
KAOLIN & BITUMEN (BLOWN) & PIPERYLENE-RICH/ ISOBUTENE COPOLYMER & POLYVINYL CHLORIDE & CARBON BLACK	No significant acute toxicological data identified in literature search.
CALCIUM CARBONATE & POLYVINYL CHLORIDE & ANTIMONY TRIOXIDE	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.
BITUMEN (BLOWN) & CARBON BLACK & ANTIMONY TRIOXIDE	**WARNING:** This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.

Acute Toxicity	✗	**Carcinogenicity**	✗
Skin Irritation/Corrosion	✓	**Reproductivity**	✗
Serious Eye Damage/Irritation	✗	**STOT - Single Exposure**	✗
Respiratory or Skin sensitisation	✗	**STOT - Repeated Exposure**	✗
Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ – Data either not available or does not fill the criteria for classification
✓ – Data available to make classification

SECTION 12 Ecological information

Toxicity

Barrier E	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available
kaolin	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	Not Available	Not Available	Not Available	Not Available	Not Available
calcium carbonate	**Endpoint**	**Test Duration (hr)**	**Species**	**Value**	**Source**
	EC50	72h	Algae or other aquatic plants	>14mg/l	2

Continued...

	NOEC(ECx)	1h	Fish	4-320mg/l	4
	LC50	96h	Fish	>165200mg/L	4

bitumen (blown)

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

piperylene-rich/ isobutene copolymer

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

polyvinyl chloride

Endpoint	Test Duration (hr)	Species	Value	Source
Not Available	Not Available	Not Available	Not Available	Not Available

carbon black

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	>0.2mg/l	2
EC50	48h	Crustacea	33.076-41.968mg/l	4
NOEC(ECx)	24h	Crustacea	3200mg/l	1
LC50	96h	Fish	>100mg/l	2

antimony trioxide

Endpoint	Test Duration (hr)	Species	Value	Source
EC50	72h	Algae or other aquatic plants	67mg/l	1
EC50	48h	Crustacea	>1000mg/l	1
EC50(ECx)	72h	Algae or other aquatic plants	67mg/l	1
EC50	96h	Algae or other aquatic plants	0.61mg/l	2
LC50	96h	Fish	0.93mg/l	2

Legend: Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. US EPA, Ecotox database - Aquatic Toxicity Data 4. ECETOC Aquatic Hazard Assessment Data 5. NITE (Japan) - Bioconcentration Data 6. METI (Japan) - Bioconcentration Data 7. Vendor Data 8. User defined data

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
polyvinyl chloride	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
piperylene-rich/ isobutene copolymer	LOW (LogKOW = 16.46)
polyvinyl chloride	LOW (LogKOW = 1.6233)

Mobility in soil

Ingredient	Mobility
polyvinyl chloride	LOW (Log KOC = 23.74)

Other adverse effects

No evidence of ozone depleting properties were found in the current literature.

SECTION 13 Disposal considerations

Waste treatment methods

Waste chemicals:	▸ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority.
Contaminated packing materials:	Refer to section above
Precautions for Transport:	Refer to section above

SECTION 14 Transport information

Labels Required

Marine Pollutant	NO

Land transport (UN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Continued...

14.7. Maritime transport in bulk according to IMO instruments

14.7.1. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.7.2. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
kaolin	Not Applicable
calcium carbonate	Not Applicable
bitumen (blown)	Not Applicable
piperylene-rich/ isobutene copolymer	Not Applicable
polyvinyl chloride	Not Applicable
carbon black	Not Applicable
antimony trioxide	Not Applicable

14.7.3. Transport in bulk in accordance with the IGC Code

Product name	Ship Type
kaolin	Not Applicable
calcium carbonate	Not Applicable
bitumen (blown)	Not Applicable
piperylene-rich/ isobutene copolymer	Not Applicable
polyvinyl chloride	Not Applicable
carbon black	Not Applicable
antimony trioxide	Not Applicable

Precautions for Transport

Suitable Containers

See section 7

SECTION 15 Regulatory information

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

kaolin is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
China Catalogue of Categorized Occupational Disease Hazard Factors (Chinese)
China Inventory of Existing Chemical Substance
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust
China Regulations on the Safe Management of Hazardous Chemicals (Chinese)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

calcium carbonate is found on the following regulatory lists

China Catalogue of Categorized Occupational Disease Hazard Factors (Chinese)
China Inventory of Existing Chemical Substance
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust
China Regulations on the Safe Management of Hazardous Chemicals (Chinese)
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

bitumen (blown) is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
China Inventory of Existing Chemical Substance
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

piperylene-rich/ isobutene copolymer is found on the following regulatory lists

China Inventory of Existing Chemical Substance

polyvinyl chloride is found on the following regulatory lists

China Catalogue of Categorized Occupational Disease Hazard Factors (Chinese)
China Inventory of Existing Chemical Substance
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust
China Regulations on the Safe Management of Hazardous Chemicals (Chinese)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Not Classified as Carcinogenic
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

carbon black is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
China Catalogue of Categorized Occupational Disease Hazard Factors (Chinese)
China Inventory of Existing Chemical Substance
China Occupational Exposure Limits for Hazardous Agents in the Workplace - Dust
China Regulations on the Safe Management of Hazardous Chemicals (Chinese)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

Continued...

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans
International WHO List of Proposed Occupational Exposure Limit (OEL) Values for Manufactured Nanomaterials (MNMS)

antimony trioxide is found on the following regulatory lists

Chemical Footprint Project - Chemicals of High Concern List
China Inventory of Existing Chemical Substance
China List of Dangerous Goods (GB12268-2025) (Chinese)
China Occupational Exposure Limits for Hazardous Agents in the Workplace
China Regulations on the Safe Management of Hazardous Chemicals (Chinese)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

Additional Regulatory Information

Not Applicable

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (kaolin; bitumen (blown); piperylene-rich/ isobutene copolymer; polyvinyl chloride; carbon black; antimony trioxide)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (piperylene-rich/ isobutene copolymer; polyvinyl chloride)
Japan - ENCS	No (kaolin; piperylene-rich/ isobutene copolymer)
Korea - KECI	Yes
New Zealand - NZIoC	Yes
Philippines - PICCS	No (piperylene-rich/ isobutene copolymer)
USA - TSCA	TSCA Inventory 'Active' substance(s) (kaolin; calcium carbonate; bitumen (blown); polyvinyl chloride; carbon black; antimony trioxide); No (piperylene-rich/ isobutene copolymer)
Taiwan - TCSI	Yes
Mexico - INSQ	No (bitumen (blown); piperylene-rich/ isobutene copolymer)
Vietnam - NCI	Yes
Russia - FBEPH	No (piperylene-rich/ isobutene copolymer)
UAE - Control List (Banned/Restricted Substances)	No (kaolin; calcium carbonate; bitumen (blown); piperylene-rich/ isobutene copolymer; polyvinyl chloride; carbon black; antimony trioxide)
Legend:	Yes = All CAS declared ingredients are on the inventory No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.

SECTION 16 Other information

Revision Date	08/19/2026
Initial Date	11/29/2025

Other information

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Disclaimer

The information in the SDS applies only for the specified product and does not include mixtures of this product with other substances and mixtures. The SDS provides product safety information for personnel trained to use this product only.

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end of SDS

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