SAFETY DATA SHEET

VT-4B* (* = Replaced by 1/2/3/5/5sp/5L/7/7sp/9/C/D, etc)

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

1.1. Product identifier

Trade name

VT-4B* (* = Replaced by 1/2/3/5/5sp/5L/7/7sp/9/C/D, etc)

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

Relevant identified uses of the substance or mixture

Production of printed circuit board materials
Restricted to professional users.

Uses advised against

None known.

1.3. Details of the supplier of the safety data sheet

Company and address

Ventec-Europe Limited
Unit 1, Trojan Business Centre,
Tachbrook Park Estate
CV34 6RH Warwick
United Kingdom
+44 (0) 1926 889822
www.ventec-europe.com/

E-mail

sales@ventec-europe.com

Revision

02/05/2025

SDS Version

1.0

1.4. Emergency telephone number

Healthcare professionals: Dial 0344 892 0111 to reach The National Poisons Information Service (NPIS) (24 hour service)
General public:
England - Dial 111 to reach NHS 111 (24 hour service)
Scotland - Dial 112 to reach NHS 24 (24 hour service)
Wales - Dial 111 or 0845 4647 to reach NHS Direct (24 hour service)
See section 4 “First aid measures”.

SECTION 2: Hazards identification

Classified according to Regulation (EC) No. 1272/2008 (CLP) as retained and amended in UK law.

2.1. Classification of the substance or mixture

Flam. Sol. 1; H228, Flammable solid.
Water-react. 2; H261, In contact with water releases flammable gases.
Skin Irrit. 2; H315, Causes skin irritation.

2.2. Label elements

Hazard pictogram(s)

Signal word

Danger

Hazard statement(s)

Flammable solid. (H228)
In contact with water releases flammable gases. (H261)
Causes skin irritation. (H315)

Precautionary statement(s)

General

-

Prevention

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210)
Do not allow contact with water. (P223)
Wash hands and exposed skin thoroughly after handling. (P264)
Wear eye protection/protective gloves. (P280)

Response

IF ON SKIN: Brush off loose particles from skin. Immerse in cool water. (P302+P335+P334_special)
In case of fire: Use powder/carbon dioxide to extinguish. (P370+P378)

Storage

-

Disposal

-

Hazardous substances

Does not contain any substances required to report

Additional labelling

Not applicable.

2.3. Other hazards

Additional warnings

Generally, aluminum powders with a particle size of 40 mesh (420 microns) or smaller present a fire and explosion hazard.
Dust from flammable solids can be explosive, even if they are not hazardous substances.
This mixture/product does not contain any substances known to fulfil the criteria for PBT and vPvB classification.
This product does not contain any substances considered to be endocrine disruptors in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2023/707.

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable. This product is a mixture.

3.2. Mixtures

Product/substance	Identifiers	% w/w	Classification	Note
aluminium powder (pyrophoric)	CAS No.: 7429-90-5 EC No.: 231-072-3 UK-REACH: Index No.: 013-001-00-6	80-95%	Flam. Sol. 1, H228 Water-react. 2, H261 Skin Irrit. 2, H315	
Copper Foil	CAS No.: 7440-50-8 EC No.: 231-159-6 UK-REACH: Index No.:	5-10%		
Epoxy Resin - Proprietary Formulation - CCL/PP	CAS No.: 26265-08-7 EC No.: 607-901-3 UK-REACH: Index No.:	5-10%	Skin Irrit. 2, H315	

See full text of H-phrases in section 16. Occupational exposure limits are listed in section 8, if these are available.

Other information

-

Composition comments: Tested on 0.047" 1/1 (OA) material.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In the case of accident: Contact a doctor or casualty department – take the label or this safety data sheet.
Contact a doctor if in doubt about the injured person's condition or if the symptoms persist. Never give an unconscious person water or other drink.

Inhalation

Upon breathing difficulties or irritation of the respiratory tract: Bring the person into fresh air and stay with him/her.

Skin contact

IF ON SKIN: Wash with plenty of water and soap.
Remove contaminated clothing and shoes. Ensure to wash exposed skin thoroughly with water and soap. DO NOT use solvents or thinners.
If skin irritation occurs: Get medical advice/attention.

Eye contact

If in eyes: Flush eyes with water or saline water (20-30 °C) for at least 5 minutes. Remove contact lenses. Seek medical assistance and continue flushing during transport.

Ingestion

If the person is conscious, rinse the mouth with water and stay with the person. Never give the person anything to drink.
In case of malaise, seek medical advice immediately and bring the safety data sheet or label from the product. Do not induce vomiting, unless recommended by the doctor. Have the person lean forward with head down to avoid inhalation of or choking on vomited material.

Burns

Rinse with water until pain stops then continue to rinse for 30 minutes.

4.2. Most important symptoms and effects, both acute and delayed

Irritation effects: This product contains substances, which may cause irritation upon exposure to skin, eyes or lungs.
Exposure may result in an increased absorption potential of other hazardous substances at the area of exposure.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

Information to medics

Bring this safety data sheet or the label from this product.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Dry powder (Class D), sodium chloride (granulate) or dry sand.
Unsuitable extinguishing media: DO NOT USE WATER!

5.2. Special hazards arising from the substance or mixture

Fire will result in dense smoke. Exposure to combustion products may harm your health. Closed containers, which are exposed to fire, should be cooled with water. Do not allow fire-extinguishing water to enter the sewage system and nearby surface waters.
If the product is exposed to high temperatures, e.g. in the event of fire, dangerous decomposition compounds are produced. These are:
Some metal oxides
Prevent formation of dust. Contact with water liberates extremely flammable gas (hydrogen).

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective clothing to prevent contact. Upon direct exposure contact The National Poisons Information Service (dial 111, 24 h service) in order to obtain further advice.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Remove flammable materials if conditions allow it. Ensure sufficient ventilation.
Avoid direct contact with spilled substances.
Ensure adequate ventilation, especially in confined areas.
Contaminated areas may be slippery.

6.2. Environmental precautions
Avoid discharge to lakes, streams, sewers, etc.
Keep unauthorized persons away from the spill

6.3. Methods and material for containment and cleaning up
Cleaning up the material must be done only with squeegees or soft natural bristle brushes. Scoops used to pick up the material must be conductive and non-sparking. Synthetic bristle brushes and plastic or other non-conductive scoops must not be used, since they tend to accumulate strong static charges.
Do not flush with water or use water-based cleaning agents.

6.4. Reference to other sections
See section 13 “Disposal considerations” on handling of waste.
See section 8 "Exposure controls/personal protection" for protective measures.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Keep all containers sealed except when opened for removal of material. Reseal containers immediately after each use to prevent contamination or, in the case of pastes, loss of solvent.
May form combustible dust concentrations in air.
Take action to prevent static discharges.
Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces.
Smoking, drinking and consumption of food is not allowed in the work area.
See section 8 "Exposure controls/personal protection" for information on personal protection.

7.2. Conditions for safe storage, including any incompatibilities
Keep all containers sealed except when opened for removal of material. Reseal containers immediately after each use to prevent contamination or, in the case of pastes, loss of solvent.
The use of an inert gas to replace air can greatly increase the safety of many operations, particularly where it may be impossible to ensure that all sources of ignition are eliminated.
Powder trickling out onto the floor or onto other containers must be prevented.
Must be stored in a cool and well-ventilated area, away from possible sources of ignition.
Store in a dry place. Store in a closed container.

Recommended storage material
As recommended under the TDS

Storage conditions
As recommended by TDS

Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reducing agents.

7.3. Specific end use(s)
This product should only be used for applications quoted in section 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters
aluminium powder (pyrophoric)
Long term exposure limit (8 hours) (mg/m^3): 10(inhalable)/4(respirable)

Copper Foil
Long term exposure limit (8 hours) (mg/m^3): 0,2(fume)/1(dust)
Short term exposure limit (15 minutes) (mg/m^3): 2 (dusts, mists)

The Control of Substances Hazardous to Health Regulations 2002. SI 2002/2677 The Stationery Office 2002.
EH40/2005 Workplace exposure limits (Fourth Edition 2020).

DNEL
aluminium powder (pyrophoric)

Duration:	Route of exposure:	DNEL:
Long term – Local effects - Workers	Inhalation	3.72 mg/m^3
Long term – Systemic effects - Workers	Inhalation	3.72 mg/m^3

Copper Foil

Duration:	Route of exposure:	DNEL:
Long term – Systemic effects - Workers	Dermal	137 mg/kg bw/day
Short term – Systemic effects - Workers	Dermal	273 mg/kg bw/day
Long term – Local effects - Workers	Inhalation	1 mg/m³
Short term – Local effects - Workers	Inhalation	1 mg/m³

PNEC

aluminium powder (pyrophoric)

Route of exposure:	Duration of Exposure:	PNEC:
Sewage treatment plant		20 mg/L

Copper Foil

Route of exposure:	Duration of Exposure:	PNEC:
Freshwater		6.3 µg/L
Freshwater sediment		87 mg/kg
Marine water		5.2 µg/L
Marine water sediment		676 mg/kg
Sewage treatment plant		230 µg/L
Soil		65 mg/kg

8.2. Exposure controls

Compliance with the given occupational exposure limits values should be controlled on a regular basis.

General recommendations

When transferring the materials, dust clouds should be kept at an absolute minimum. Handling should be slow and deliberate. The materials should be transferred from one container to another using a non-sparking, conductive metal scoop.
When mixing the material with other dry ingredients, frictional heat should be avoided. The best type of mixer for a dry mixing operation is one that contains no moving parts, but rather affects a tumbling action, such as a conical blender. Introduction of an inert atmosphere in the blender is highly recommended since dust clouds are generated. All equipment must be well grounded.
Smoking, drinking and consumption of food is not allowed in the work area.

Exposure scenarios

There are no exposure scenarios implemented for this product.

Exposure limits

Professional users are subjected to the legally set maximum concentrations for occupational exposure. See occupational hygiene limit values above.

Appropriate technical measures

Airborne gas and dust concentrations must be kept at a minimum. Provide efficient mechanical ventilation. If not possible use suitable respiratory equipment.
It is recommended that all dust control equipment such as local exhaust ventilation contain an explosion suppression system.
All electrical wiring, -lights and -equipment must meet minimum safety requirements of the workplace and equipment used in explosive atmosphere as described by national regulations and/or standards.
Airborne gas and dust concentrations must be kept at a minimum and below current limit values (see above).
Installation of a local exhaust system if normal air flow in the work room is not sufficient is recommended. Ensure emergency eyewash and showers are clearly marked.

Hygiene measures

Take off contaminated clothing and wash it before reuse.

Measures to avoid environmental exposure

No specific requirements.

Individual protection measures, such as personal protective equipment

Generally

Work clothing should be made of smooth, closely woven fire resistant/fire retardant fabrics which tend not to accumulate static electric charges. Trousers should have no cuffs where the material might accumulate. Pockets, if present, should be designed in such a way as to eliminate the accumulation of dust.
Use only UKCA marked protective equipment.

Respiratory Equipment

Type	Class	Colour	Standards
No special when used as intended.			

Skin protection

Recommended	Type/Category	Standards
No special when used as intended.	-	-

Hand protection

Material	Glove thickness (mm)	Breakthrough time (min.)	Standards
No special when used as intended	-	-	-

Eye protection

Type	Standards
No special when used as intended.	-

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state
Solid

Colour
White

Odour / Odour threshold
None

pH
No data available.

Density (g/cm^3)
-

Relative density
2.0-2.2

Kinematic viscosity
Does not apply to solids.

Particle characteristics
No data available.

Phase changes

Melting point/Freezing point (°C)
No data available.

Softening point/range (°C)
Does not apply to solids.

Boiling point (°C)
Does not apply to solids.

Vapour pressure
No data available.

Relative vapour density
Does not apply to solids.

Decomposition temperature (°C)
380-400

Data on fire and explosion hazards

Flash point (°C)
Does not apply to solids.

Flammability (°C)
The material is ignitable.

Auto-ignition temperature (°C)
No data available.

Lower and upper explosion limit (% v/v)
Does not apply to solids.

Solubility

Solubility in water
No data available.

n-octanol/water coefficient (LogKow)
No data available.

Solubility in fat (g/L)
No data available.

9.2. Other information

Oxidizing properties
No data available.

Other physical and chemical parameters
No data available.

SECTION 10: Stability and reactivity

10.1. Reactivity
No data available.

10.2. Chemical stability
The product is stable under the conditions, noted in section 7 “Handling and storage”.

10.3. Possibility of hazardous reactions
In contact with water releases flammable gases.
Hydrogen development in the event of contact with water, acids and alkalis.

10.4. Conditions to avoid
Accumulation of dust
Generation of dust

10.5. Incompatible materials
Strong acids, strong bases, strong oxidizing agents, and strong reducing agents.

10.6. Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008 as retained and amended in UK law

Acute toxicity
Based on available data, the classification criteria are not met.

Skin corrosion/irritation
Causes skin irritation.

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

Respiratory sensitisation
Based on available data, the classification criteria are not met.

Skin sensitisation
Based on available data, the classification criteria are not met.

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

Carcinogenicity
Based on available data, the classification criteria are not met.

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

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

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

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

11.2. Information on other hazards

Long term effects
Irritation effects: This product contains substances, which may cause irritation upon exposure to skin, eyes or lungs. Exposure may result in an increased absorption potential of other hazardous substances at the area of exposure.

Endocrine disrupting properties
This mixture/product does not contain any substances known to have hormone-disrupting properties in relation to health.

Other information
None known.

SECTION 12: Ecological information

12.1. Toxicity
Based on available data, the classification criteria are not met.

12.2. Persistence and degradability
Based on available data, the classification criteria are not met.

12.3. Bioaccumulative potential
Based on available data, the classification criteria are not met.

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
This mixture/product does not contain any substances known to fulfil the criteria for PBT and vPvB classification.

12.6. Endocrine disrupting properties
This mixture/product does not contain any substances considered to have endocrine-disrupting properties in relation to the environment.

12.7. Other adverse effects
None known.

SECTION 13: Disposal considerations

Waste treatment methods
Product is covered by the regulations on hazardous waste. (*)
HP 3 - Flammable
HP 4 - Irritant (skin irritation and eye damage)
Dispose of contents/container to an approved waste disposal plant.
Regulation (EU) No 1357/2014 of 18 December 2014 on waste as retained and amended in UK law.

EWC code
16 02 Wastes from electrical and electronic equipment

Specific labelling

Contaminated packing
Packaging containing residues of the product must be disposed of similarly to the product.

SECTION 14: Transport information

	14.1 UN / ID	14.2 UN proper shipping name	14.3 Hazard class(es)	14.4 PG*	14.5 Env**	Other information:
ADR	-	-	-	-	-	-
IMDG	-	-	-	-	-	-
IATA	-	-	-	-	-	-

* Packing group

** Environmental hazards

Additional information
This product is within scope of the regulations of transport of dangerous goods.

14.6. Special precautions for user
Not applicable.

14.7. Maritime transport in bulk according to IMO instruments
No data available.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
Restrictions for application
Restricted to professional users.
Demands for specific education
No specific requirements.
Control of Major Accident Hazards (COMAH) - Categories / dangerous substances
Not applicable.
Regulation on explosives precursors
aluminium powder (pyrophoric) (Annex II)
UK-REACH, Annex XVII
aluminium powder (pyrophoric) is subject to UK-REACH restrictions (entry 40).
Additional information
No Polybrominated-Biphenyls or Polybrominated-Biphenyl-Oxides used as flame retardant in the resin system.
Sources
Regulation (EU) No 1357/2014 of 18 December 2014 on waste as retained and amended in UK law.
Council Regulation (EC) No 2019/1148 on explosives precursors as retained and amended in UK law.
Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP) as retained and amended in UK law.
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as retained and amended in UK law.

15.2. Chemical safety assessment
No

SECTION 16: Other information

Full text of H-phrases as mentioned in section 3
H228, Flammable solid.
H261, In contact with water releases flammable gases.
H315, Causes skin irritation.

Abbreviations and acronyms
ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS = Chemical Abstracts Service
CE = Conformité Européenne (European conformity)
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
CSA = Chemical Safety Assessment
CSR = Chemical Safety Report
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial chemical Substances
ES = Exposure Scenario
EUH statement = CLP-specific Hazard statement
EuPCS = European Product Categorisation System
EWC = European Waste Catalogue
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
GWP = Global warming potential
IARC = International Agency for Research on Cancer (IARC)
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)

OECD = Organisation for Economic Co-operation and Development
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SCL = A specific concentration limit
SVHC = Substances of Very High Concern
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
STOT-SE = Specific Target Organ Toxicity - Single Exposure
TWA = Time weighted average
UN = United Nations
UVBC = Unknown or variable composition, complex reaction products or of biological materials
VOC = Volatile Organic Compound
vPvB = Very Persistent and Very Bioaccumulative

Additional information

The classification of the substance/mixture in regard of health hazards are in accordance with the calculation methods given by Regulation (EC) No. 1272/2008 (CLP) as retained and amended in UK law.
The classification of the mixture in regard to physical hazards has been based on experimental data.

The safety data sheet is validated by

Sunny Kwok

Other

A change (in proportion to the last essential change (first cipher in SDS version, see section 1)) is marked with a triangle.
The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.
It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.
Country-language: GB-en