Carbon

SAFETY DATA SHEET

1. Identification

Product identifier **EPU 46 Black, Part A**

Other means of identification None.

Recommended use 3D printing resin.

This product is part of a liquid resin system in which it is reacted/cured and transformed to create an article/part. This SDS is relevant to the resin in its liquid state prior to curing. For additional information regarding the composition of standard geometrical articles/parts, please contact Productstewardship@carbon3d.com.

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Supplier CARBON TECHNOLOGIES (CANADA) INC.

Address c/o Gowling WLG
attn: David Petras
Suite 2300
Bentall 5
550 Burrard Street
Vancouver, BC, Canada
V6C 2B5

General information +16042290549

Manufacturer Carbon, Inc.

Address 1089 Mills Way
Redwood City, CA 94063 USA

General information 1-650-285-6307

Email Productstewardship@carbon3d.com

Emergency telephone number

CHEMTREC For Dangerous Goods Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:

USA, Canada (+)1-800-424-9300

International (+)1-703-741-5970

2. Hazard identification

Physical hazards Not classified.

Health hazards	Serious eye damage/eye irritation	Category 2
	Sensitization, skin	Category 1
	Reproductive toxicity	Category 1B
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 3
	Hazardous to the aquatic environment, long-term hazard	Category 3

Label elements

Signal word Danger

Hazard statement	May cause an allergic skin reaction. Causes serious eye irritation. May damage fertility or the unborn child. Harmful to aquatic life with long lasting effects.
Precautionary statement	
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid breathing mist/vapours. Wash thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response	IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. IF exposed or concerned: Get medical advice/attention. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
Storage	Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Supplemental information	None.
Other hazards	None known.

3. Composition/information on ingredients

Mixtures

Chemical name	Common name and synonyms	CAS number	%
Polyurethane, methacrylate blocked		-	< 75
Polyethylene glycol dimethacrylate		25852-47-5	< 15
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide		75980-60-8	< 2
Trimethylolpropane trimethacrylate		3290-92-4	< 2

Composition comments

All concentrations are in percent by weight unless otherwise indicated.
Components not listed are either non-hazardous or are below reportable limits.

Under controlled conditions the product may be heated up to 40 °C (104 °F). Generation of free isocyanate and other non-reacted resin components are expected in the oven during curing or during any accidental heating of this product above 50 °C (>122 °F). During these conditions, additional personal protective measures should be taken to protect against potential exposure to isocyanate including but not limited to: chemical impervious gloves and clothing and a need for increased respiratory protection measures, which is dependent upon the amount of isocyanate present.

4. First-aid measures

Inhalation	Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Rinse mouth. Get medical attention if symptoms occur.
Most important symptoms/effects, acute and delayed	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause an allergic skin reaction. Dermatitis. Rash.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.
General information	If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed. Combustion products may include: carbon oxides, nitrogen oxides, acrylates, hydrogen cyanide.

Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Move containers from fire area if you can do so without risk. Dike and collect water used to fight fire. Avoid discharge into drains, water courses or onto the ground.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	In case of fire, toxic and irritating gases may be formed.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist/vapours. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Retain and dispose of contaminated wash water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Avoid breathing mist/vapours. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Observe good industrial hygiene practices. Generation of free isocyanate and other non-reacted resin components are expected in the oven during curing or during any accidental heating of this product above 50 °C (>122 °F). During these conditions, additional personal protective measures should be taken to protect against potential exposure to isocyanate including but not limited to: chemical impervious gloves and clothing and a need for increased respiratory protection measures, which is dependent upon the amount of isocyanate present. See section 8 for protective measures that may be necessary to eliminate hazardous exposure to.
Conditions for safe storage, including any incompatibilities	Store locked up. Store in tightly closed container. Store away from incompatible materials (see section 10 of the SDS). At lower temperatures (<20 °C/<68 °F), the product may crystallize. Storing the product in a warm environment is recommended. Generation of free isocyanate and other non-reacted resin components are expected in the oven during curing or during any accidental heating of this product above 50 °C (>122 °F). See section 8 for protective measures that may be necessary to eliminate hazardous exposure to.

8. Exposure controls/personal protection

Occupational exposure limits	No exposure limits noted for ingredient(s).
Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide eyewash station. Emergency showers are recommended.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear approved chemical safety goggles. Risk of splashes: Face shield is recommended.
Skin protection	
Hand protection	Wear chemical-resistant, impervious gloves. Suitable gloves can be recommended by the glove supplier. Recommended use: Splash contact: Glove material: nitrile; Layer thickness: 0.13 mm; Breakthrough time: >480 min. Contaminated gloves should be replaced.
Other	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment. Wear NIOSH approved respirator appropriate for airborne exposure at the point of use. Appropriate respirator selection should be made by a qualified professional. Recommended use: Chemical respirator with organic vapour cartridge and full facepiece. Under controlled conditions the product may be heated up to 40 °C (104 °F). Generation of free isocyanate and other non-reacted resin components are expected in the oven during curing or during any accidental heating of this product above 50 °C (>122 °F). During these conditions, additional personal protective measures should be taken to protect against potential exposure to isocyanate including but not limited to: chemical impervious gloves and clothing and a need for increased respiratory protection measures, which is dependent upon the amount of isocyanate present. In case of insufficient ventilation or under conditions when exposure to isocyanate is possible, wear suitable respiratory equipment. The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure or continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator program. Further, if an APR is selected the airborne concentration must be no greater than 10 times the TLV or PEL. If exposure to oven off-gases is expected, use of a positive pressure or continuous flow SAR is recommended.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Observe any medical surveillance requirements. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Liquid.
Colour	Black.
Odour	Not determined.
Odour threshold	Not determined.
pH	9.4
Melting point/freezing point	-14.4 - -11.3 °C (6.08 - 11.66 °F)
Initial boiling point and boiling range	336 °C (636.8 °F) Decomposes.
Flash point	115 °C (239 °F)
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%)	Not determined.
Explosive limit – upper (%)	Not determined.
Vapour pressure	2.2 Pa (20 °C (68 °F))
Vapour density	Not determined.
Relative density	1.04
Solubility(ies)	
Solubility (water)	< 1 mg/l
Partition coefficient (n-octanol/water)	Not applicable for mixtures.
Auto-ignition temperature	301 °C (573.8 °F)
Decomposition temperature	336 °C (636.8 °F)
Viscosity	12856 mm²/s (20 °C (68 °F))

Other information

Density	1.04 g/ml
Explosive properties	Not explosive.
Kinematic viscosity	12856 mm²/s (20 °C (68 °F))
Oxidising properties	Not oxidising.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Excessive heat or cold. Contact with incompatible materials.
Incompatible materials	Strong oxidising agents.
Hazardous decomposition products	Processing or heat may generate isocyanate.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Prolonged inhalation may be harmful.
Skin contact	May cause an allergic skin reaction.
Eye contact	Causes serious eye irritation.
Ingestion	May cause discomfort if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause an allergic skin reaction. Dermatitis. Rash.

Information on toxicological effects

Acute toxicity Not expected to be acutely toxic.

Components	Species	Test Results
Polyurethane, methacrylate blocked (CAS -)		
Acute		
Oral		
LD50	Rat (female)	> 2000 mg/kg
Trimethylolpropane trimethacrylate (CAS 3290-92-4)		
Acute		
Oral		
LD50	Rat	10750 mg/kg

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Corrosivity

Polyurethane, methacrylate blocked	OECD TG 404 Result: Non-irritant Species: Rabbit Notes: New Zealand White, male

Serious eye damage/eye irritation Causes serious eye irritation.

Eye

Polyurethane, methacrylate blocked	OECD TG 405 Result: Non-irritant Species: Rabbit Notes: New Zealand White, male

Respiratory or skin sensitisation

Respiratory sensitisation	Not a respiratory sensitiser.
Skin sensitisation	May cause an allergic skin reaction.

Skin Sensitisation

Polyurethane, methacrylate blocked	OECD TG 442B Result: sensitising Species: Mouse Notes: Mouse (CBA/J)

Germ cell mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Germ cell mutagenicity: Ames test

Polyurethane, methacrylate blocked	OECD TG 471 Result: Negative Species: Salmonella typhimurium Notes: S. typhimurium TA 98, TA 100, TA 1535, TA 1537, E. coli WP2 uvr A

Carcinogenicity Not classifiable as to carcinogenicity to humans.

Reproductive toxicity May damage fertility or the unborn child.

Specific target organ toxicity - single exposure Not classified.

Specific target organ toxicity - repeated exposure Not classified.

Aspiration hazard Not an aspiration hazard.

Chronic effects Prolonged exposure may cause chronic effects.

Further information May be absorbed through the skin in harmful amounts.

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available.

Mobility in soil The product is slightly soluble in water. Expected to be slightly to moderately mobile in soil.

Other adverse effects No data available.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Waste should be disposed of via accredited third party for incineration only. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Waste should be disposed of via accredited third party for incineration only.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Waste should be disposed of via accredited third party for incineration only.

14. Transport information

TDG

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

15. Regulatory information

Canadian regulations This product has been classified in accordance with the hazard criteria of the HPR and the SDS contains all the information required by the HPR.

Controlled Drugs and Substances Act

Not regulated.

Export Control List (CEPA 1999, Schedule 3)

Not listed.

Greenhouse Gases

Not listed.

Precursor Control Regulations

Not regulated.

International regulations

Stockholm Convention

Not applicable.

Rotterdam Convention

Not applicable.

Kyoto Protocol

Not applicable.

Montreal Protocol

Not applicable.

Basel Convention

Not applicable.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Industrial Chemicals (AICIS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

Issue date 29-June-2023

Revision date -

Version No. 01

Further information Adopted date: July 29, 2023.

Disclaimer Carbon, Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.