

Section 1 IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND THE COMPANY

1.1 Product identifier
Solar Sharc® Lite

1.2 Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture
Coating

1.3 Details of the supplier of the safety data sheet

Company Name: Opus Materials Technologies Ltd
Address: St John's Innovation Centre, Cowley Rd, Cambridge, UK, CB4 0WS
Telephone: +44 (0) 1223 772222
Email (Contact person): dhannan@opusmaterials.com
Website: www.opusmaterialstechnologies.com

1.4 Emergency telephone number
+44 (0) 1223 772222 (Transport Code: MICROCHEM29003-NCEC)

Section 2 HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture(*)
Classification according to Regulation (EC) No 1272/2008 (CLP)**

Hazard class and hazard category	Hazard statements
Flammable liquids, Category 2	H225
Acute toxicity, Category 4	H302
Skin corrosion (category 1B)	H314
Skin irritation (category 2)	H315
Serious eye damage, Category 1	H318
Specific target organ toxicity - single exposure (Category 3), Central nervous system,	H336
Chronic aquatic toxicity, Category 3	H412

2.2 Label elements

2.2.1 Labelling according to Regulation (EC) No 1272/2008 (CLP)**

Hazard components for labelling

n-butyl acetate
Organic polysiloxane compound
3-aminopropyltriethoxysilane

Signal Word: Danger

Hazard Pictograms



Hazard Statements

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation
H318	Causes serious eye damage

H336 May cause drowsiness or dizziness.
 H412 Harmful to aquatic life with long lasting effects.

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P260 Do not breathe dust/fume/gas/mist/vapours/spray.
 P264 Wash hands and face thoroughly after handling.
 P280 Wear protective gloves/protective clothing/eye protection/face protection.
 P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P310 Immediately call a POISON CENTRE/doctor.

2.3 Other Hazards









No information available

Section 3 COMPOSITION / INFORMATION ON INGREDIENTS

3.2 Mixtures

Chemical characterisation

Polysilazanes in organic solvents (halogen-free).

Hazardous ingredients	Conc.	CAS	EINECS/EC-No	Symbols	Risk phrases
Organic polysilazane compound	30 - <50%	475645-84-2			H: H225 H302 H314 H412 P: ***
3-aminopropyl triethoxysilane	≥1 - <3%	919-30-2	213-048-4	 	H: H302, H314, H318, H317 P: P260, P280, P301 + P312 + P330, P303 + P361 + P353, P305 + P351 + P338, P304 + P340 + P310, ***
n-butyl acetate	50-70%	123-86-4	204-658-1	 	H: 226, H336 P: P210, P370 + P378***
Toluene	0.3 - <1%	108-88-3	203-625-9	  	H: H225, H361, H304, H373, H315, H336, P: P260, P280, P301 + P310 P370 + P378 P403 + P235 ***

Section 4 FIRST AID MEASURES

4.1 Description of first aid measures

Skin contact

Wash off immediately with plenty of soap and copious amounts of water. Remove contaminated clothing. Seek medical attention if irritation or symptoms persist.

Eye contact

Rinse immediately with copious amounts of water for 15 minutes occasionally lifting the upper and lower eyelids; also assure adequate flushing by separating the eyelids with fingers. Seek medical attention.

Inhalation

Remove the exposed person to fresh air. If not breathing, give artificial respiration. Seek medical attention.

Ingestion

DO NOT INDUCE VOMITING. If swallowed wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Seek medical advice.

Self-protection of the first aider

Pay attention to self-protection! Remove contaminated, saturated clothing immediately. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

4.2 Most important symptoms and effects

Irritation.
Headache.
Cough.
Has a degreasing effect on the skin.
Narcotic effects.

4.3 Indication of any medical attention and special treatment needed

Treat symptomatically.

Section 5 FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguish media

Carbon dioxide (CO₂).
Dry chemical.
Alcohol resistant foam.

Unsuitable extinguish media

Never use water.

5.2 Special hazards arising from the substance or mixture

In case of fire the following may be liberated: Carbon dioxide (CO₂), Carbon Monoxide (CO), Nitrogen Oxides (NO_x).
Hazardous combustion product: Burning produces irritating, toxic and obnoxious fumes.

5.3 Advice for firefighters

Protective equipment: Self-contained breathing apparatus. Wear protective clothing.

Additional information

Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.
Dispose according to legislation.

Section 6 ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protection equipment.

6.2 Environmental precautions

Do not allow product to enter drains or surface water. Prevent further spillage if safe. Advise local authorities if large spills cannot be contained. Discharge into the environment must be avoided.

6.3 Methods and material for containment and cleaning up

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid or universal binding agents). Collect in closed and suitable containers for disposal. Clean contaminated articles and floor according to the environmental legislation.

6.4 Reference to other sections

Safe handling: see section 7
 Personal protection equipment: see section 8
 Disposal: see section 13

Section 7 HANDLING AND STORAGE

7.1 Precautions for safe handling

Advice on safe handling

Do not breathe gas/fumes/vapour/spray. Do not get in eyes or on skin or clothing. Wear suitable protective clothing, gloves and eye/face protection. Provide adequate ventilation as well as local exhaustion at critical locations.

Advice on protection against fire and explosion

Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Provide earthing of containers, equipment, pumps and ventilation facilities.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Keep/Store only in original container. Open containers in periodic time intervals to relieve pressure, which may have been generated (ammonia).

Hints on joint storage

Keep away from food, drink and animal feedstuffs.

Further information on storage conditions

Keep container tightly closed in a cool, well-ventilated place. Keep container dry. Protect from sunlight. Do not store at temperatures above 25°C.

7.3 Specific end use(s)

Coating.

Section 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component	CAS-No	Value Form of exposure	Control parameters	Basis
n-Butyl acetate	123-86-4	STEL	200 ppm 966 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
		TWA	150 ppm 724 mg/m ³	UK. EH40 WEL - Workplace Exposure Limits
		AGW	62 ppm 300 mg/m ³	DE TRGS 900. Category short-time exposure : 2;(I).
	Remarks	AGS: Commission for dangerous substances. When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child		
Component	CAS-No	Value Form of exposure	Control parameters	Basis
Toluene	108-88-3	AGW	50 ppm 191 mg/m ³	DE TRGS 900 Category short-time exposure : 4;(II).
	Remarks	DFG: Senate commission for the review of compounds at the work place dangerous for the health (MAK commission). European Union (The EU has established a limit value: deviations in value and peak limit are possible) Skin Absorption: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child.		
		AGW	200 mg/m ³	DE TRGS 900 Category short-time exposure : 2;(II)



	Remarks	Group-AGW: Group exposure limit for hydrocarbon solvent Mixtures Commission for dangerous substances See also No. 2.9 of the TRGS 900
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Biological occupational exposure limits

Component	CAS-No	Control parameters	Sampling time	Basis
toluene	108-88-3	CLA-TD-4283: 600 µg/l (Blood)	Immediately after exposition or after working hours	TRGS 903

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

n-butyl acetate:	End Use: Workers Exposure routes: Inhalation Potential health effects: Acute effects Value: 960 mg/m ³ End Use: Workers Exposure routes: Inhalation Potential health effects: Chronic effects Value: 480 mg/m ³ End Use: Consumers Exposure routes: Inhalation Potential health effects: Acute effects Value: 859.7 mg/m ³ End Use: Consumers Exposure routes: Inhalation Potential health effects: Chronic effects Value: 102.34 mg/m ³
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Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

n-butyl acetate:	Fresh water Value: 0.18 mg/l Marine water Value: 0.018 mg/l Fresh water sediment Value: 0.981 mg/kg Marine sediment Value: 0.0981 mg/kg Soil Value: 0.0903 mg/kg
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8.2 Exposure controls

Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. Ensure adequate ventilation of the working area.

Personal protective equipment

Eye and face protection	Approved safety goggles tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU)..
Skin protection	Use suitable protective clothing according to the concentration and amount of dangerous substances, and to



Hand protection	the specific work-place. Flame retardant antistatic protective clothing. Protective clothing Category 3, type 3 - liquid-tight. Protective clothing Category 3, type 4 - spray-tight.
Respiratory protection	Chemical resistant gloves satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Break through time: > 10 min Glove thickness: >= 0,5 mm. In case of contact through splashing. Solvent-resistant gloves (butyl-rubber)
Thermal hazards	Wear suitable respiratory equipment when necessary. Combination filter A2 B2 E2 K2 Hg/P3, to standard DIN EN371/372. Dust mask should conform to EN 143 fitted with a P3 particle filter. Control parameters 6mg/m3 – inhalable dust. 2.4mg/m3 - respirable dust (TWA:EH40 WEL) NA

Environmental exposure control

No data available. Prevent further leakage or spillage if safe to do so. Do not let product enter drains

Section 9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	Test method
Appearance	Liquid, colourless
Odour	Ammonia
pH:	Not applicable
Initial boiling point and boiling range	124°C (information relates to solvent)
Flash point	16°C
Evaporation rate	
Flammability (solid, gas)	Not determined
Upper/lower flammability or explosive limits	Not determined
Ignition temperature	420°C (information relates to solvent)
Auto-ignition temperature	Not determined
Decomposition temperature	Not determined
Vapour pressure	Not determined
Vapour density	Not determined
Evaporation rate	Not determined
Density	0.93gcm ⁻³
Solubility in water	Reacts with water
Solubilities in other solvents	Not determined
Partition coefficient	Not determined
Solid content	Not determined

Section 10 Stability and reactivity

10.1 Reactivity

The product hydrolyses quickly in the presence of water to: Hydrogen, Ammonia (NH₃), siloxanes.

10.2 Chemical stability

The product hydrolyses quickly in the presence of water to: Hydrogen, Ammonia (NH₃), siloxanes. Due to gaseous decomposition products, overpressure can occur in tightly sealed containers.

10.3 Possibility of hazardous reactions

Reacts vigorously with water, including moisture in the air. Reacts with : Alcohol, Amines; Decomposition under formation of: Ammonia.

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect against direct sunlight.

10.5 Incompatible materials

Oxidising agents: Bases, Acids, Halogenated constituents.

10.6 Hazardous decomposition products

Hydrogen, Ammonia.

Section 11 Toxicological information

11.1 Information on toxicological effect

This product has not been tested.

Acute toxicity:

n-Butyl acetate (123-86-4)

LD50 Oral - Rat - female - 10,760 mg/kg

(OECD Test Guideline 423)

LC50 Inhalation - Rat - male and female - 4 h - > 21 mg/l

(OECD Test Guideline 403)

LD50 Dermal - Rabbit - male and female - > 14,112 mg/kg

(OECD Test Guideline 402)

Organic polysilazane compound (475645-84-2)

LD50: > 300 - 2.000 mg/kg, Rat, OECD 423, Observation time: 14 d

3-aminopropyltriethoxysilane (919-30-2)

Acute Toxicity Estimate (ATE): 500 mg/kg, Converted acute toxicity point estimate

Skin corrosion/irritation:

n-Butyl acetate (123-86-4)

Skin - Rabbit

Result: No skin irritation - 4 h

(OECD Test Guideline 404)

Organic polysilazane compound (475645-84-2)

Rabbit, Result: Causes burns., OECD 404, Exposure time: 1 h

3-aminopropyltriethoxysilane (919-30-2)

Rabbit, Classification: Corrosive

Serious eye damage/irritation

n-Butyl acetate (123-86-4)

Eyes - Rabbit

Result: No eye irritation

(OECD Test Guideline 405)

3-aminopropyltriethoxysilane (919-30-2)

Rabbit, Classification: Risk of serious damage to eyes.

Respiratory or skin sensitisation:

3-aminopropyltriethoxysilane (919-30-2)

Guinea pig, Result: Causes Sensitisation. Classification: May cause sensitisation by skin contact.

Toluene (108-88-3)

Guinea pig maximization test, Guinea pig, Result: No evidence of sensitizing properties., Classification: Does not cause skin sensitisation., Directive 67/548/EEC, Annex V, B.6., GLP: yes

Germ cell mutagenicity:

n-Butyl acetate (123-86-4)

Ames test
S. typhimurium
Result: negative

Organic polysilazane compound (475645-84-2)

Genotoxicity in vitro: Ames test, with and without metabolic activation, Result: negative, Mutagenicity (Escherichia coli - reverse mutation assay)

Carcinogenicity:

n-Butyl acetate (123-86-4)

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

Reproductive toxicity:

n-Butyl acetate (123-86-4)

Developmental Toxicity - Rat – Inhalation
No adverse effect has been observed in chronic toxicity tests.

STOT - single exposure:

n-Butyl acetate (123-86-4)

May cause drowsiness or dizziness. - Central nervous system

Practical experience

Solvent (n-butyl acetate) has degreasing effect on skin

Section 12 ECOLOGICAL INFORMATION

12.1 Ecological information

This product is not ecotoxic

Toxicity:

n-Butyl acetate (123-86-4)

Toxicity to fish: flow-through test LC50 - Pimephales promelas (fathead minnow) - 18 mg/l - 96h (OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates: static test EC50 - Daphnia (water flea) - 44 mg/l - 48 h

Toxicity to algae static test EC50 - Desmodesmus subspicatus (Scenedesmus subspicatus) - 674.7 mg/l - 72 h

Organic polysilazane compound (475645-84-2)

Toxicity to fish: LC50 (Danio rerio (zebra fish)): 57,1 mg/l. Exposure time: 96 h. Method: OECD 203.



Toluene (108-86-3)

Toxicity to fish: flow-through test LC50 – Carassius auratus - 13 mg/l - 96h
Acute toxicity to algae static test EC50 - Desmodesmus subspicatus (Scenedesmus subspicatus) – 12.5 mg/l - 72 h

12.2 Persistence and degradability:

This product has not been tested.

n-Butyl acetate (123-86-4)

Biodegradability aerobic - Exposure time 28 d
Result: 83 % - Readily biodegradable (OECD Test Guideline 301D)

12.3 Bioaccumulative potential:

This product has not been tested.

n-Butyl acetate (123-86-4)

Remarks: Does not accumulate in organisms.

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB** assessment**

n-Butyl acetate (123-86-4)

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher and does not meet the PBT/vPvB criteria of RAECH, Annex X111.

12.6 Other adverse effects

No data available

Further information

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

Section 13 Disposal considerations

13.1 Waste treatment methods

Advice on disposal

Do not mix with aqueous wastes or wastes containing protic substances. Disposal in conformity with the standards of a suitable and authorized waste disposal site. Optionally keep consultation with the disposal or the competent authority. Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

Contaminated packaging

Handle contaminated packages in the same way as the substance itself.

Section 14 Transport information

Land Transport (ADR/RID)

14.1 UN Number:

UN-No.: 2924

14.2 UN proper shipping name:

FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Organic polysiloxane compound, n-butyl acetate).



Special provisions:	274
Limited quantity:	1L
Excepted quantity:	E2
EmS:	F-E, S-C

Air Transport (ICAO-TI/IATA-DGR)

14.1 UN Number:

UN-No.: 2924

14.2 UN proper shipping name:

FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Organic polysiloxane compound, n-butyl acetate).

14.3 Transport hazard class(es):

Class: 3

14.4 Packing group:

Packaging group:	II
Hazard Label:	3+8



Special provisions:	A3
Limited quantity Passenger:	0.5L
Passenger LQ:	Y430
Excepted quantity:	E2
IATA packing instructions - Passenger	352
IATA max. quantity - Passenger:	1L
IATA packing instructions - Cargo.:	363
IATA max. quantity - Cargo:	5L

14.5 Environmental hazards:

Environmentally hazardous: No

Section 15 Regulatory information

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

EU regulatory information

Restrictions on use (REACH, annex XVII):

Entry 3: n-butyl acetate

Entry 48: toluene

National regulatory information

Water contaminating class (D): 2 - clearly water contaminating

15.2 **Chemical safety assessment**

Chemical safety assessments for substances in this mixture were not carried out.

Section 16 Other information

Abbreviations and acronyms



ADR: Accord européen sur le transport des marchandises dangereuses par Route
(European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%

Classification for mixtures and used evaluation method according to Regulation (EC) No. 1272/2008 [CLP]

Classification

Flam. Liq. 2; H225 On basis of test data
Acute Tox. 4; H302 Calculation method
Skin Corr. 1B; H314 Calculation method
Eye Dam. 1; H318 Calculation method
STOT SE 3; H336 Calculation method
Aquatic Chronic 3; H412

Classification procedure

Flam. Liq. 2; H225 On basis of test data
Acute Tox. 4; H302 Calculation method
Skin Corr. 1B; H314 Calculation method
Eye Dam. 1; H318 Calculation method
STOT SE 3; H336 Calculation method
Aquatic Chronic 3; H412 Calculation method

Relevant H and EUH statements (number and full text)

H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation
H336	May cause drowsiness or dizziness.
H361d	Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H412	Harmful to aquatic life with long lasting effect.
EUH066	Repeated exposure may cause skin dryness or cracking.

Further information

Observe, in addition, all relevant national regulations.

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new mixture/preparation.