

SAFETY DATA SHEET

Ultracur3D® ST 45 M

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

1.1 Product identifier

Product name : Ultracur3D® ST 45 M
UFI : J410-R0RX-Q00K-E7R7
Other means of identification : Not available.

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

Product use : 3D Printing.

1.3 Details of the supplier of the safety data sheet

Mass Additive Manufacturing GmbH
Airport Boulevard B 120
77836 Rheinmünster
Germany

e-mail address of person responsible for this SDS : sales@forward-am.com

1.4 Emergency telephone number

Supplier

Telephone number : +1-352-323-3500

Lieferant / Supplier:
Carl Roth GmbH + Co KG
Schoemperlenstr. 3-5
76185 Karlsruhe, Germany
+49 721 5606 0
sicherheit@carlroth.de

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Acute Tox. 4, H302
Skin Irrit. 2, H315
Eye Dam. 1, H318
Skin Sens. 1, H317
Repr. 1B, H360FD
STOT RE 2, H373
Aquatic Chronic 1, H410

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms



Signal word

: Danger

Hazard statements

: H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H318 - Causes serious eye damage.
H360FD - May damage fertility. May damage the unborn child.
H373 - May cause damage to organs through prolonged or repeated exposure.
H410 - Very toxic to aquatic life with long lasting effects.

SECTION 2: Hazards identification**Precautionary statements**

Prevention	: P201 - Obtain special instructions before use. P280 - Wear protective gloves, protective clothing and eye or face protection. P273 - Avoid release to the environment. P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
Response	: P391 - Collect spillage. P308 + P313 - IF exposed or concerned: Get medical attention. P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
Storage	: Not applicable.
Disposal	: Not applicable.
Hazardous ingredients	: 4-(1-oxo-2-propenyl)-morpholine (octahydro-4,7-methano-1H-indenediyl)bis(methylene) diacrylate 4-(1,1-dimethylethyl)cyclohexyl acrylate diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide 2-hydroxyethyl acrylate
Supplemental label elements	: Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Restricted to professional users.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	: This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
Other hazards which do not result in classification	: None known.

SECTION 3: Composition/information on ingredients**3.2 Mixtures** : Mixture

Product/ingredient name	Identifiers	%	Classification	Type
4-(1-oxo-2-propenyl)-morpholine	REACH #: 01-2120102080-83 EC: 418-140-1 CAS: 5117-12-4 Index: 613-222-00-3	≥50 - ≤75	Acute Tox. 4, H302 Eye Dam. 1, H318 Skin Sens. 1, H317 STOT RE 2, H373 (oral)	[1]
2-Oxepanone, polymer with 1,1'-methylenebis [4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol], 2-hydroxyethyl acrylate-blocked	CAS: 68585-11-5	≥25 - ≤50	Skin Irrit. 2, H315 Eye Irrit. 2, H319	[1]
(octahydro-4,7-methano-1H-indenediyl)bis(methylene) diacrylate	EC: 255-901-3 CAS: 42594-17-2	≤5	Skin Sens. 1B, H317 Repr. 1B, H360D Aquatic Chronic 1, H410	[1]
4-(1,1-dimethylethyl)cyclohexyl acrylate	REACH #: 01-2120735441-62 EC: 282-104-8 CAS: 84100-23-2 Index: 607-133-00-9	≤5	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1A, H317 STOT SE 3, H335 Aquatic Acute 1, H400	[1]

SECTION 3: Composition/information on ingredients

diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	EC: 278-355-8 CAS: 75980-60-8 Index: 015-203-00-X	<1	Aquatic Chronic 2, H411 Skin Sens. 1B, H317 Repr. 1B, H360Fd Aquatic Chronic 2, H411	[1] [3]
2-hydroxyethyl acrylate	EC: 212-454-9 CAS: 818-61-1 Index: 607-072-00-8	<0.1	Acute Tox. 3, H311 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Acute 1, H400	[1] [2]
cyclohexane	EC: 203-806-2 CAS: 110-82-7 Index: 601-017-00-1	<0.1	Flam. Liq. 2, H225 Skin Irrit. 2, H315 STOT SE 3, H336 Asp. Tox. 1, H304 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 See Section 16 for the full text of the H statements declared above.	[1] [2]

Product/ingredient name	Specific Conc. Limits, M-factors and ATEs
4-(1-oxo-2-propenyl)-morpholine	ATE [Oral] = 588 mg/kg
2-Oxepanone, polymer with 1,1'-methylenebis[4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol], 2-hydroxyethyl acrylate-blocked	-
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	M [Chronic] = 10
4-(1,1-dimethylethyl)cyclohexyl acrylate	STOT SE 3, H335: C ≥ 10% M [Acute] = 1
diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	-
2-hydroxyethyl acrylate	ATE [Dermal] = 300 mg/kg Skin Sens. 1, H317: C ≥ 0.2% M [Acute] = 1
cyclohexane	M [Acute] = 1 M [Chronic] = 1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

- [1] Substance classified with a health or environmental hazard
 [2] Substance with a workplace exposure limit
 [3] Substance with carcinogenic, mutagenic or reproductive toxicity properties

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures**4.1 Description of first aid measures****Eye contact**

: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

SECTION 4: First aid measures

- Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed**Potential acute health effects**

- Eye contact** : Causes serious eye damage.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Causes skin irritation. May cause an allergic skin reaction.
- Ingestion** : Harmful if swallowed.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
pain
watering
redness
- Inhalation** : Adverse symptoms may include the following:
reduced foetal weight
increase in foetal deaths
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
reduced foetal weight
increase in foetal deaths
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:
stomach pains
reduced foetal weight
increase in foetal deaths
skeletal malformations

SECTION 4: First aid measures

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media** : Use dry chemical, CO₂, water spray (fog) or foam. Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : Do not use water jet.

5.2 Special hazards arising from the substance or mixture

- Hazards from the substance or mixture** : In a fire or if heated, a pressure increase will occur and the container may burst. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous combustion products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

5.3 Advice for firefighters

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
- Additional information (Explosibility)** : Not considered to be a product presenting a risk of explosion.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

- : Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and material for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

SECTION 6: Accidental release measures

Large spill : Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

Protective measures : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store between the following temperatures: 0 to 40°C (32 to 104°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. Protect from moisture. Ensure adequate inhibitor and dissolved oxygen level.

Seveso Directive - Reporting thresholds (in tonnes)**Danger criteria**

Category	Notification and MAPP threshold	Safety report threshold
E1: Hazardous to the aquatic environment - Acute 1 or Chronic 1	100	200

Storage class (TRGS 510) : 6.1C

7.3 Specific end use(s)

Section 7. Handling and storage: The information in this section contains generic advice and guidance.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. Information is provided based on typical anticipated uses of the product. Additional measures might be required for bulk handling or other uses that could significantly increase worker exposure or environmental releases.

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
2-hydroxyethyl acrylate	DFG MAC-values list (Germany, 7/2025) Skin sensitiser.
cyclohexane	TRGS 900 OEL (Germany, 3/2025) TWA 8 hours: 700 mg/m³. PEAK 15 minutes: 2800 mg/m³. TWA 8 hours: 200 ppm. PEAK 15 minutes: 800 ppm. DFG MAC-values list (Germany, 7/2025) Develop D. TWA 8 hours: 200 ppm. PEAK 15 minutes: 800 ppm 4 times per shift [Interval: 1 hour]. TWA 8 hours: 700 mg/m³. PEAK 15 minutes: 2800 mg/m³ 4 times per shift [Interval: 1 hour]. EU OEL (Europe, 1/2022) TWA 8 hours: 700 mg/m³. TWA 8 hours: 200 ppm.

Biological exposure indices

Product/ingredient name	Exposure indices
cyclohexane	DFG BEI-values list (Germany, 7/2025) BEI: 150 mg/g creatinine, 1,2-cyclohexanediol (after hydrolysis) [in urine]. Sampling time: at the end of the shift, for long-term exposures after several previous shifts. TRGS 903 - BEI Values (Germany, 10/2024) BEI: 150 mg/g creatinine, 1,2-cyclohexanediol (after hydrolysis) [in urine]. Sampling time: at the end of the shift, for long-term exposure after several previous shifts.

Recommended monitoring procedures : Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

DNEL/DMEL Summary : Not applicable.

PNECs

PNEC Summary : Not applicable.

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

SECTION 8: Exposure controls/personal protection

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Wear tightly-sealed safety glasses. (EN 166, splash goggles) If inhalation hazards exist, a full-face respirator may be required instead.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
Recommended: Wear suitable gloves tested to EN374.
> 8 hours (breakthrough time): nitrile rubber (thickness ≥0.4 mm).
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.
Recommended: Combination filtering device (DIN EN 14387). Filter type: AP-2.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties**Appearance**

- Physical state** : Liquid.
- Colour** : Yellow. [Light]
- Odour** : Acrylic.
- Odour threshold** : Not available.
- pH** : Not applicable.
- Melting point/freezing point** : Not available.
- Boiling point or initial boiling point and boiling range** : Not available.
- Flash point** : >100°C (>212°F)
- Flammability** : Not available.
- Lower and upper explosion limit** : Not available.
- Vapour pressure** : Not available.

SECTION 9: Physical and chemical properties

Relative vapour density	: Not available.
Relative density	: Not available.
Density	: ca. 1.118 g/cm ³ [20°C] [ISO 2811-3]
Solubility	:

Media	Result
alcohols	Soluble
Ester	Soluble
Ketone	Soluble

Solubility in water	: Partially soluble [20°C].
Partition coefficient n-octanol/ water (log Pow)	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: 189.18°C, 363.61 kJ/kg
Viscosity	: Dynamic (room temperature): ca. 360 mPa.s Kinematic (room temperature): Not available. Kinematic (40°C): Not available.

Particle characteristics

Median particle size	: Not applicable.
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9.2 Other information**9.2.1 Information with regard to physical hazard classes**

Explosive properties	: Not considered to be a product presenting a risk of explosion.
Oxidising properties	: Not available.

9.2.2 Other safety characteristics

Hygroscopy	: Not hygroscopic.
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No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: The product is stable.
10.3 Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur. Hazardous polymerization may occur under certain conditions of storage or use. Polymerizes by heat, light or peroxides.
10.4 Conditions to avoid	: Keep away from heat, sparks and flame. Keep away from direct sunlight. Avoid UV-light and other radiation with high energy. Avoid prolonged storage. Avoid inhibitor loss.
10.5 Incompatible materials	: Reactive or incompatible with the following materials: peroxides, oxidising agents, free radical initiators, initiators.
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****Acute toxicity**

Product/ingredient name	Result and Species	Dose [Exposure]	Remarks
4-(1-oxo-2-propenyl)-morpholine (octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	Oral - Rat - LD50 [OECD 401]	588 mg/kg	-
	Dermal - Rat - LD50	>2000 mg/kg	-
	Oral - Rat - LD50	>2000 mg/kg	-
	Dermal - Rabbit - LD50	>2000 mg/kg	-

Conclusion/Summary : Harmful if swallowed.**Acute toxicity estimates**

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
Ultracur3D® ST 45 M	1110.0	N/A	N/A	N/A	N/A
4-(1-oxo-2-propenyl)-morpholine	588	N/A	N/A	N/A	N/A
2-hydroxyethyl acrylate	N/A	300	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result and Species	Exposure	Remarks
4-(1-oxo-2-propenyl)-morpholine	Skin - Rabbit - Not irritant	Duration of treatment/exposure: 24 hours	-
	Eyes - Unknown species - Corrosive	-	-
2-Oxepanone, polymer with 1,1'-methylenebis [4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol], 2-hydroxyethyl acrylate-blocked	Skin - Rabbit - Irritant - [OECD 404]	-	-
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	Skin - Rabbit - Not irritant	-	-
	Eyes - Rabbit - Not irritant	-	-

Conclusion/Summary**Skin** : Causes skin irritation.**Eyes** : Causes serious eye damage.**Respiratory** : Not available.**Respiratory or skin sensitization**

SECTION 11: Toxicological information

Product/ingredient name	Route of exposure and Species	Result	Remarks
4-(1-oxo-2-propenyl)-morpholine	skin - Unknown species	Sensitising	-
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	skin - Guinea pig [OECD 406]	Sensitising	-
4-(1,1-dimethylethyl)cyclohexyl acrylate	skin - Mouse [OECD 429]	Sensitising	-
diphenyl (2,4,6-trimethylbenzoyl)phosphine oxide	skin - Mouse [OECD 429]	Sensitising	-

Conclusion/Summary

Skin : May cause an allergic skin reaction.

Respiratory : Not available.

Mutagenicity

Product/ingredient name	Result	Experiment	Remarks
4-(1-oxo-2-propenyl)-morpholine	Negative [OECD 471]	In vitro - Bacteria	-
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	Negative	In vitro - Bacteria	-
	Negative	In vitro - CHO Cells	-

Conclusion/Summary : Based on available data, the classification criteria are not met.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Product/ingredient name	Result	Species and Route of exposure	Dose [Exposure]	Remarks
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	<u>Developmental</u> : Positive	Rat - Oral	-	-
	<u>Fertility effects</u> : Negative	Rat - Oral	-	-

Conclusion/Summary : May damage fertility. May damage the unborn child.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
4-(1,1-dimethylethyl)cyclohexyl acrylate	Category 3	-	Respiratory tract irritation
cyclohexane	Category 3	-	Narcotic effects

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
4-(1-oxo-2-propenyl)-morpholine	Category 2	oral	-

Aspiration hazard

SECTION 11: Toxicological information

Product/ingredient name	Result
cyclohexane	ASPIRATION HAZARD - Category 1

Information on likely routes of exposure : Not available.

Potential acute health effects

Eye contact	: Causes serious eye damage.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: Causes skin irritation. May cause an allergic skin reaction.
Ingestion	: Harmful if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	: Adverse symptoms may include the following: pain watering redness
Inhalation	: Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Skin contact	: Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced foetal weight increase in foetal deaths skeletal malformations
Ingestion	: Adverse symptoms may include the following: stomach pains reduced foetal weight increase in foetal deaths skeletal malformations

Delayed and immediate effects as well as chronic effects from short and long-term exposure**Short term exposure**

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Result and Species	Dose [Exposure]	Remarks
4-(1-oxo-2-propenyl)-morpholine	Oral - Sub-acute - Rat - NOAEL [OECD 407]	50 mg/kg [28 days]	-
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	Oral - Sub-chronic - Rat - NOAEL	>1000 mg/kg [90 days]	-
	Oral - Sub-acute - Rat - NOAEL	>1000 mg/kg [28 days]	-

Conclusion/Summary : May cause damage to organs through prolonged or repeated exposure.

SECTION 11: Toxicological information

General	: May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Reproductive toxicity	: May damage fertility. May damage the unborn child.

11.2 Information on other hazards**11.2.1 Endocrine disrupting properties**

Not available.

Conclusion/Summary [Human Health]	: The product does not meet the criteria to be considered as having endocrine disrupting properties according to the criteria set out in either Regulation (EC) No. 1907/2006 or Regulation (EC) No 1272/2008.
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11.2.2 Other information

Not available.

SECTION 12: Ecological information**12.1 Toxicity**

Product/ingredient name	Result [Exposure]	Species	Remarks
4-(1-oxo-2-propenyl)-morpholine	Acute - EC50 120 mg/l [72 hours]	Algae - <i>Raphidocelis subcapitata</i>	-
	Chronic - NOEC 120 mg/l [72 hours]	Algae - <i>Raphidocelis subcapitata</i>	-
	Acute - LC50 >220 mg/l [96 hours]	Fish - <i>Oncorhynchus mykiss</i>	-
	Chronic - NOEC 102 mg/l [96 hours]	Fish - <i>Oncorhynchus mykiss</i>	-
	Acute - EC50 120 mg/l [48 hours]	Daphnia - <i>Daphnia magna</i>	-
	Chronic - NOEC 46 mg/l [48 hours]	Daphnia - <i>Daphnia magna</i>	-
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	Acute - LC50 1.65 mg/l [96 hours] [OECD 203]	Fish - <i>Brachydanio rerio</i>	-
	Acute - EC50 2.36 mg/l [48 hours] [OECD 202]	Daphnia - <i>Daphnia magna</i>	Static
	Acute - ErC50 1.6 mg/l [72 hours] [OECD 201]	Algae - <i>Raphidocelis subcapitata</i>	-
	Chronic - NOEC 0.0046 mg/l [33 days] [OECD 210]	Fish - <i>Brachydanio rerio</i>	-
	Chronic - NOEC 0.01793 mg/l [21 days]	Daphnia - <i>Daphnia magna</i>	-
diphenyl (2,4,6-trimethylbenzoyl)	LC50 6.53 mg/l [48 hours]	Fish - <i>Oryzias latipes</i>	-

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phosphine oxide	EC50 3.53 mg/l [48 hours] [OECD 202]	Daphnia - <i>Daphnia magna</i>	-
	EC50 2.01 mg/l [72 days] [OECD 201]	Algae - <i>Raphidocelis subcapitata</i>	-
	EC10 1.56 mg/l [72 hours] [OECD 201]	Algae - <i>Raphidocelis subcapitata</i>	-
	EC20 1000 mg/l [3 hours] [OECD 209]	Micro-organism	-

Conclusion/Summary : Very toxic to aquatic life with long lasting effects.

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Remarks
4-(1-oxo-2-propenyl)-morpholine	OECD 301D	35% [28 days] - Not readily	-
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	OECD 301D	28% [28 days] - Not readily	-
diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	OECD 301F	0 to 10% [28 days]	-

Conclusion/Summary : There are no data available on the mixture itself.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
4-(1-oxo-2-propenyl)-morpholine	-	-	Not readily
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	-	-	Not readily
diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
4-(1-oxo-2-propenyl)-morpholine	-0.46	-	Low
(octahydro-4,7-methano-1H-indenediyl)bis(methylene)diacrylate	4.64	6.17	Low
diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	-	23 to 55	Low

12.4 Mobility in soil**Soil/water partition coefficient**

SECTION 12: Ecological information

Product/ingredient name	logKoc	Koc
(octahydro-4,7-methano-1H-indenediyl)bis(methylene) diacrylate	3.61	4073.8

Mobility : Not available.

Results of PMT and vPvM assessment

Product/ingredient name	PMT	P	M	T	vPvM	vP	vM
4-(1-oxo-2-propenyl)-morpholine	No	No	N/A	No	No	No	N/A
2-Oxepanone, polymer with 1,1'-methylenebis [4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol], 2-hydroxyethyl acrylate-blocked	No	N/A	N/A	No	N/A	N/A	N/A
(octahydro-4,7-methano-1H-indenediyl)bis(methylene) diacrylate	No	N/A	No	Yes	No	N/A	No
4-(1,1-dimethylethyl) cyclohexyl acrylate	No	N/A	N/A	No	N/A	N/A	N/A
diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	N/A	N/A	N/A	Yes	N/A	N/A	N/A
2-hydroxyethyl acrylate	No	N/A	N/A	No	N/A	N/A	N/A
cyclohexane	No	N/A	N/A	No	N/A	N/A	N/A

Conclusion/Summary : The product does not meet the criteria to be considered as a PMT or vPvM.

12.5 Results of PBT and vPvB assessment**Regulation (EC) No. 1907/2006 [REACH]**

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
4-(1-oxo-2-propenyl)-morpholine	N/A	N/A	N/A	Yes	N/A	N/A	N/A
2-Oxepanone, polymer with 1,1'-methylenebis [4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol], 2-hydroxyethyl acrylate-blocked	No	N/A	N/A	No	N/A	N/A	N/A
(octahydro-4,7-methano-1H-indenediyl)bis(methylene) diacrylate	No	N/A	No	Yes	No	N/A	No
4-(1,1-dimethylethyl) cyclohexyl acrylate	No	N/A	N/A	No	N/A	N/A	N/A
diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	No	N/A	No	Yes	No	N/A	No
2-hydroxyethyl acrylate	No	N/A	N/A	No	N/A	N/A	N/A
cyclohexane	No	N/A	N/A	No	N/A	N/A	N/A

Regulation (EC) No. 1272/2008 [CLP]

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Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
4-(1-oxo-2-propenyl)-morpholine	No	No	No	No	No	No	No
2-Oxepanone, polymer with 1,1'-methylenebis [4-isocyanatocyclohexane] and 2,2'-oxybis[ethanol], 2-hydroxyethyl acrylate-blocked	No	N/A	N/A	No	N/A	N/A	N/A
(octahydro-4,7-methano-1H-indenediyl)bis(methylene) diacrylate	No	N/A	No	Yes	No	N/A	No
4-(1,1-dimethylethyl)cyclohexyl acrylate	No	N/A	N/A	No	N/A	N/A	N/A
diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	No	N/A	No	Yes	No	N/A	No
2-hydroxyethyl acrylate	No	N/A	N/A	No	N/A	N/A	N/A
cyclohexane	No	N/A	N/A	No	N/A	N/A	N/A

Conclusion/Summary Regulation (EC) No. 1272/2008 [CLP] : The product does not meet the criteria to be considered as a PBT or vPvB.

12.6 Endocrine disrupting properties
Not available.

Conclusion/Summary [Environment] : The product does not meet the criteria to be considered as having endocrine disrupting properties according to the criteria set out in either Regulation (EC) No. 1907/2006 or Regulation (EC) No 1272/2008.

12.7 Other adverse effects
No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance.

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

The allocation of waste identity numbers/waste descriptions must be carried out according to the EWC, specific to the industry and process.

Hazardous waste : Yes.

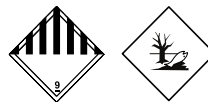
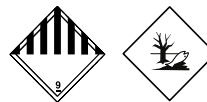
European waste catalogue (EWC)

Waste code	Waste designation
08 03 12*	waste ink containing hazardous substances

SECTION 13: Disposal considerations**Packaging**

- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible.
- Special precautions** : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number or ID number	UN3082	UN3082	UN3082	UN3082
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. ((octahydro-4,7-methano-1H-indenediyl)bis (methylene) diacrylate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. ((octahydro-4,7-methano-1H-indenediyl)bis (methylene) diacrylate)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. ((octahydro-4,7-methano-1H-indenediyl)bis (methylene) diacrylate)	Environmentally hazardous substance, liquid, n.o.s. ((octahydro-4,7-methano-1H-indenediyl)bis (methylene) diacrylate)
14.3 Transport hazard class(es)	9	9	9	9
Label				
14.4 Packing group	III	III	III	III
14.5 Environmental hazards	Yes.	Yes.	Marine Pollutant: Yes	Yes.

Additional information**ADR/RID**

- : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

Hazard identification number 90**Limited quantity** 5 L**Special provisions** 274, 335, 601, 375, 650**Tunnel code** (-)**ADN**

- : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

Special provisions 274, 335, 375, 601, 650**IMDG**

- : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8.

Emergency schedules F-A, S-F**Special provisions** 274, 335, 375, 969**IATA**

- : This product is not regulated as a dangerous good when transported in sizes of ≤5 L or ≤5 kg, provided the packagings meet the general provisions of 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8.

Quantity limitation Passenger and Cargo Aircraft: 450 L. Packaging instructions: 964. Cargo Aircraft Only: 450 L. Packaging instructions: 964. Limited Quantities - Passenger Aircraft: 30 kg. Packaging instructions: Y964.

Special provisions A97, A158, A197, A215

Ultracur3D® ST 45 M

SECTION 14: Transport information

14.6 Special precautions for user : Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

14.7 Maritime transport in bulk according to IMO instruments : Not intended.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV
None of the components are listed.
Substances of very high concern

Ingredient name	Intrinsic property	Status	Reference number	Date of revision
diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	Toxic to reproduction	Recommended	12th recommendation	2/8/2024

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Product/ingredient name	%	Designation [Usage]
Ultracur3D® ST 45 M	≥90	3 30 75
(octahydro-4,7-methano-1H-indenediyl)bis(methylene) diacrylate	≤5	30
diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	<1	30
cyclohexane	<0.1	57 [Neoprene-based contact adhesive]

Labelling : Restricted to professional users.

Other EU regulations

Explosive precursors : Not applicable.

Ozone depleting substances (EU 2024/590)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
E1

National regulations

Storage class (TRGS 510) : 6.1C

Hazardous incident ordinance

This product is controlled under the Germany Hazardous Incident Ordinance.

Danger criteria

SECTION 15: Regulatory information

Category	Reference number
E1	1.3.1

Hazard class for water : 2

Maternity Protection Act (MuSchG) : Applicable.

Law on the protection of young workers : Observe employment restrictions according to §22 JArbSchG for young people.

German Chemicals Prohibition Ordinance (ChemVerbotsV) : This product is subject to the Chemical Prohibition Ordinance (ChemVerbotsV).

Technical instruction on air quality control (TA Luft)

Number [Class]	Description	%
5.2.1	Total dust	31.3
5.2.5	Organic substances	58.2
5.2.5 [I]	Organic substances	0.13
5.2.7.1.3	Reproductive toxic substances	6

AOX : The product does not contain organically bound halogens which could lead to an AOX value in waste water.

There are no known additional national regulations relevant to the SDS.

International regulations**Chemical Weapon Convention List Schedules I, II & III Chemicals**

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

OECD Comprehensive Global PFAS Database

Not listed.

Inventory list

China : All components are listed or exempted.

Viet Nam : All components are listed or exempted.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

This Safety Data Sheet is prepared in accordance with Annex II to Regulation (EC) No 1907/2006, as amended by Commission Regulation (EU) 2020/878.

 Indicates information that has changed from previously issued version.

SECTION 16: Other information**Abbreviations and acronyms**

: ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
 ADR = Agreement concerning the International Carriage of Dangerous Goods by Road
 ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DMEL = Derived Minimal Effect Level
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 EWC = European Waste Catalogue
 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)
 N/A = Not available
 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
 SGG = Segregation Group
 vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Acute Tox. 4, H302	Calculation method
Skin Irrit. 2, H315	Calculation method
Eye Dam. 1, H318	Calculation method
Skin Sens. 1, H317	Calculation method
Repr. 1B, H360FD	Calculation method
STOT RE 2, H373	Calculation method
Aquatic Chronic 1, H410	Calculation method

Full text of abbreviated H statements

H225	Highly flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H360D	May damage the unborn child.
H360FD	May damage fertility. May damage the unborn child.
H360Fd	May damage fertility. Suspected of damaging the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

SECTION 16: Other information

Acute Tox. 3	ACUTE TOXICITY - Category 3
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Acute 1	SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1
Aquatic Chronic 1	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Asp. Tox. 1	ASPIRATION HAZARD - Category 1
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Flam. Liq. 2	FLAMMABLE LIQUIDS - Category 2
Repr. 1B	REPRODUCTIVE TOXICITY - Category 1B
Skin Corr. 1B	SKIN CORROSION/IRRITATION - Category 1B
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1	SKIN SENSITISATION - Category 1
Skin Sens. 1A	SKIN SENSITISATION - Category 1A
Skin Sens. 1B	SKIN SENSITISATION - Category 1B
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

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Date of previous issue : No previous validation

Version : 1

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.