



Cast In Motion: CIM 500

Additive Manufacturing Casting Resin for Composite Tooling

CIM 500 is a modified epoxy system to be used by Massivit 3D's CIM (Cast In Motion) technology, developed for direct printing of tools and molds for the composite materials industry.

Key Advantages:

- Enables isotropic, 3D printed molds
- High heat deflection temperature
- Relatively low thermal expansion

Mechanical Properties

Character	Testing method	Tested value	
		Metric	Imperial
Izod Impact (un-notched)	ASTM D4812 / ISO 180	60.0 ± 4.0 [J/m]	1.12 ± 0.004 [ft.lbf/in]
Linear shrinkage	Internal test	0.1%	0.1%
Shore hardness	ASTM D2240	85D	85D
Tensile			
Stress at break	ISO 527	50.0 ± 3.1 [MPa]	7,250 ± 450 [psi]
Elongation at break	ISO 527	0.9 ± 0.1%	0.9 ± 0.1%
Elasticity modulus	ISO 527	6.1 ± 0.5 [GPa]	884,000 ± 72,000 [psi]
Flexural			
Stress at break	ASTM D790	50.7 ± 5.3 [MPa]	7,350 ± 770 [psi]
Elongation at break	ASTM D790	1.2 ± 0.3%	1.2 ± 0.3%
Elasticity modulus	ASTM D790	6.2 ± 0.8 [GPa]	900,000 ± 110,000 [psi]
Compression			
Compressive Strength	ASTM D695	119 [MPa]	17,260 [psi]
Compressive Modulus	ASTM D695	2.3 [GPa]	333,600 [psi]

Thermal Properties

Character	Testing method	Tested value	
		Metric	Imperial
Tg (DSC)	ASTM D3418	156 [°C]	312 [°F]
HDT	ASTM D648 / ISO 75-2	152 [°C]	305 [°F]
CTE @ 130°C	ASTM D696	29 [ppm/°C]	16 [ppm/°F]
Thermal conductivity, K	ASTM C177 / ISO 8302	0.5-0.6 [W/m·k]	0.30-0.35 [BTU/h·ft·F]

Physical properties

Character	Tested value
Mix ratio by weight	75 A: 25 B
Mixing viscosity @45°C	12,000 [cP]
Specific gravity - mixed	1.53 [g/cm ³]
Pot life @60°C	20 minutes
Pot life @RT	4 hours
Cure Time @RT	24 Hours & must be followed by post-curing
Mixture color	Gray

All measurements were done on lab specimens of cured material, followed by post - cure process. The specifications stated above refer to the Beta version and results were derived from internal lab tests. The material above is under R&D development.

Storage

The material base -A and hardener -B should be stored in a dry place in the sealed original container at temperatures between +2°C and +40°C. Under these storage conditions, the shelf life is 1 year. The product should not be exposed to direct sunlight.

Post-Curing Process

To meet the specified properties, CIM 500 should be heat - cured in a dedicated industrial oven. Consult Application Note for detailed instructions. Post - cured CIM 500 specimens can be milled, polished, or coated with a suitable coating or paint. Let coating fully dry before putting part into service.

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

Product name: CIM 500 Part B

Product description: Castable resin - Part B

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

Common uses: Cast in motion.

1.3 Details of the supplier of the safety data sheet

N/A

E-mail address of person responsible for this SDS: N/A

1.4 Emergency telephone number

Emergency telephone number (with hours of operation): N/A

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture**

Classification according to GHS:

Acute Tox. 4 H302

Skin Corr. 1B H314

Eye Dam. 1 H318

Skin Sens. 1B H317

STOT RE 2 H373

STOT SE 3 H335

Classification according to 29 CFR 1910.1200 (OSHA HCS):

Acute Tox. 4 H302

Skin Corr. 1B H314

Eye Dam. 1 H318

Skin Sens. 1B H317

STOT RE 2 H373

STOT SE 3 H335

Classification according to Regulation (EC) No. 1272/2008 (CLP):

Acute Tox. 4 H302

Skin Corr. 1B H314

Eye Dam. 1 H318

Skin Sens. 1B H317

STOT RE 2 H373

STOT SE 3 H335

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

2.2 Label elements

Labelling according to GHS:

Hazard pictogram(s):



Signal word: Danger



©ALSTOM. Custom front fairing
3D printed for Alstom light rail vehicle
by Stratiforme Industries

DIMENGEL 20-FR

Dimengel 20-FR (DIM 20-FR) is the world's first flame-retardant, photo polymeric gel for 3D printing. The polymer complies with the highest standard for flame-retardant materials, the UL94-V0 that contains a dedicated section (Blue Card) for additive manufacturing and is certified by Underwriters Laboratories (UL).

DIM 20-FR enables production of large parts for a range of industries that require flame retardancy such as Automotive, Marine, Rail, Scenic Fabrication, and Visual Communication. The material is suitable for producing a variety of applications from railway FRP spare parts through automotive aftermarket parts, military parts, to amusement park displays.

As with Massivit's range of advanced, proprietary materials, DIM 20-FR enables ultra-fast production of large custom parts that cure on-the-fly during printing, enabling ready-made solid objects straight off the printer with little-to-no need for internal support structures.

Character	Method	Metric Units		Imperial Units	
Tensile strength*	ISO 527	MPa	14.5 - 16.4	psi	2,030 - 2,320
Elongation at break*	ISO 527	%	4.0 - 7.0	%	4.0 - 7.0
Elasticity modulus	ISO 527	GPa	1.5-2.0	psi	218,000 - 282,830
Flexural strength*	ASTM D790	MPa	50 - 70	psi	7,250 - 10,150
Flexural modulus*	ASTM D790	MPa	3,200 - 4,200	psi	464,120 - 609,160
Izod Impact* (Notched)	ISO 180	J/m	16.0 - 17.6	ft-lbf/in	0.3 - 0.33
Glass transition, Tg	ASTM D3418	°C	75	°F	167
HDT* @ 0.45 MPa	ISO 75 ASTM D648	°C	54 - 56	°F	129 - 133
Density	-	g/ml	1.20	lb/ft³	75
Hardness (Shore D)	ASTM D2240	Shore D	80	Shore D	80 - 85
Flammability, UL-94	IEC 60695-11-10	VO			
Color	-	Off White			

* All measurements were done on lab specimens of cured material.

** Certified to UL94-VO, as tested within the official UL test labs.

Coating and Finishing

DIM 20-FR can be coated with a flame resistant resin and supports a wide array of finishes:

- SAV -self-adhesive vinyl
- Car / body filler
- Polyester
- Epoxy
- Polyurethane
- Fiberglass

Regulation Compliancy

- Compliant with 1907/2006/EEC regulation 2006 ("REACH")
- Compliant with Regulation (EC) No 1272/2008 ("CLP")
- Does not contain any chemicals listed on California Prop.65
- Compliant with the US Toxic Substances Control Act (TSCA) regulations

Fire Resistance

According to IEC 60695-11-10, Dim 20-FR prints are compliant with the following standard UL94-VO**

Precautionary Statement

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Stern extension 3D printed
by Velum Nautica

DIMENGEL 90

Dimengel 90 (DIM 90) is a cost-effective, photo polymer 3D printing gel that enables parts to cure while printing, delivering solid objects straight off the printer. This unique material facilitates production of complex geometries, including non-vertical parts and ceilings, with practically no need for support structures.

Character	Method	Metric Units		Imperial Units	
Tensile strength*	ISO 527	MPa	46	psi	6,670
Elongation at break*	ISO 527	%	20	%	20
Elasticity modulus	ISO 527	GPa	2.3	psi	336,340
Flexural strength*	ISO 178	MPa	150	psi	21,760
Flexural modulus*	ISO 178	MPa	4,720	psi	684,000
Izod Impact* (Notched)	ISO 180	J/m	17.6 - 18.4	ft-lbf/in	0.33 - 0.35
Glass transition, Tg	ASTM D3418	°C	64.3	°F	147.7
HDT* @ 0.45 MPa	ISO 75 ASTM D648	°C	51 - 55	°F	124 - 131
Density		g/ml	1.06	lb/ft³	66.2
Hardness (Shore D)	ASTM D2240	Shore D	80 - 85	Shore D	80 - 85
Color			Gray		

* All measurements were done on lab specimens of cured material.

** Internal lab testing.

Coating and Finishing

DIM 90 supports a wide array of finishes:

- SAV -self-adhesive vinyl
- Car / body filler
- Polyester
- Epoxy
- Polyurethane
- Fiberglass

Regulation Compliancy

- Compliant with 1907/2006/EEC regulation 2006 ("REACH")
- Compliant with Regulation (EC) No 1272/2008 ("CLP")
- Does not contain any chemicals listed on California Prop.65
- Compliant with the US Toxic Substances Control Act (TSCA) regulations

Fire Resistance

Dim 90 prints are compliant with the following standards:

- Din 4102 - class B2
- ASTM D635²
- UL94 - HB²

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.



SAFETY DATA SHEET

Dimengel 90 base

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Date of issue: 27/02/2019

Date of revision: 27/02/2019

Version no.: 1

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

1.1 Product identifier

Product name: Dimengel 90 base

Product description: Photo curable resin

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

Common uses: Printing/additive manufacturing.

1.3 Details of the supplier of the safety data sheet

N/A

E-mail address of person responsible for this SDS: N/A

1.4 Emergency telephone number

Emergency telephone number (with hours of operation): N/A

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to GHS:

Skin Irrit. 2 H315
Eye Irrit. 2A H319
Skin Sens. 1 H317
STOT SE 3 H335
Repr. 2 H361
Aquatic Acute 1 H400
Aquatic chronic 2 H411

Classification according to 29 CFR 1910.1200 (OSHA HCS):

Skin Irrit. 2 H315
Eye Irrit. 2A H319
Skin Sens. 1 H317
STOT SE 3 H335
Repr. 2 H361
Aquatic Acute 1 H400
Aquatic chronic 2 H411

Classification in accordance to Regulation (EC) No. 1272/2008 (CLP):

Skin irrit. 2 H315
Eye irrit. 2 H319
Skin Sens. 1 H317
STOT SE 3 H335
Aquatic Acute 1 H400
Aquatic chronic 2 H411

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

2.2 Label elements

Labelling according to GHS:

Hazard pictogram(s):



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Dimengel 90 base

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Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling according to 29 CFR 1910.1200 (OSHA HCS)

Hazard pictogram(s):



Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
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P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling in accordance with Regulation 1272/2008 (CLP)

Hazard pictogram(s):



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Dimengel 90 base

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Signal word: Warning

Hazard statement(s):

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 H400: Very toxic to aquatic life.
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Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapours/spray.
 P264: Wash hands thoroughly after handling.
 P273: Avoid release to the environment.
 P280: Wear protective gloves/protective clothing/eye protection/face protection.
 P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

2.3 Other hazard

Not available

SECTION 3: Composition / information on ingredients

3.2 Mixtures:

Ingredient name	Identifiers	%	CLP Classification	GHS Classification	OSHA HCS
Isobornyl acrylate	CAS number: EC number:	25-70	Skin Irrit. 2 H315 Eye Irrit. 2 H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411
Tricyclodecane	CAS number: EC number:	30-60	Skin Sens. 1 H317 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Acute 2 H401 Aquatic Chronic 2 H411	Aquatic Acute 2 H401 Aquatic Chronic 2 H411
Diphenyl(2,4,6-	CAS number: EC number: 278-355-8	0.5-1	Repr. 2 H361f Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411
Camphene	CAS number: 79-92-5 EC number: 201-234-8	<0.35	Flam. Sol. 2 H228 Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1
1,7,7- Trimethyltricyclo[2. 2.1.02,6]heptane	CAS number: 508-32-7 EC number: 208-083-7	<0.35	Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

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2-Propenoic acid	CAS number: 79-10-7 EC number: 201-177-9	≤0.12	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411
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See section 16 for the full text of the H-statements declared above.

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 and hence require reporting in this section.

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eyes contact: In case of contact with eyes, rinse immediately with plenty of soap and water for at least 15 minutes. Get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with plenty of water for at least 15 minutes. Get medical attention.

Inhalation: Remove the victim from site of exposure to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration. Get medical attention.

Ingestion: **Do not induce vomiting.** If victim is conscious, wash mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 (Label elements) and/or section 11 (Toxicological information) for the most important known symptoms and effects.

4.3 Indication of any immediate medical attention and special treatment needed

Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable: Foam, carbon dioxide, dry chemical.

Not suitable: Solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode. Cool containers exposed to flame with water spray until well after fire is out.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Ventilate area of spill.

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

6.4 Reference to other sections

See Section 1 for emergency contact information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapors, spray, mist or gas. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

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 measures. Avoid release to the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry, cool and well-ventilated place. Protect from heat, direct sunlight. Keep away from oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides. An air space is required above the liquid in all containers; avoid storage under an oxygen-free atmosphere.

7.3 Specific end use(s): N/A

SECTION 8: Exposure control/personal protection

8.1 Control parameters

Occupational exposure limits values: N/A

8.2 Exposure controlsEngineering measures

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fumé or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Person Protective measures

Respiratory protection: Suitable respirator. Be sure to use an approved/certified equipment or equivalent equipment. Wear appropriate respirator when ventilation is inadequate.

Hand protection: Wear protective gloves to prevent skin exposure.

Eye protection: Wear protective safety glasses.

Skin protection: Wear appropriate long-sleeved clothing to minimize skin contact.

Environmental exposure controls: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: transparent-white thick liquid-gel

Odour: characteristic

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

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Initial boiling point/boiling range: N/A
Flash point: N/A
Evaporation rate: N/A
Flammability: N/A
Upper/lower flammability or explosive limits: N/A
Vapor pressure: N/A
Vapor density: N/A
Relative density: N/A
Solubility(ies): N/A
Partition coefficient Octanol/Water: N/A
Auto-ignition temperature: N/A
Decomposition temperature: N/A
Viscosity: N/A
Explosive properties: N/A
Oxidizing properties: N/A

9.2 Other information:

N/A

SECTION 10: Stability and reactivity

10.1 Reactivity

Not available

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in Section 7.

10.3 Possibility of hazardous reactions

Hazardous reactions are not expected, under normal conditions of storage and use.
Polymerization is exothermic and can degenerate into an uncontrolled reaction.
Inhibitors have been added to stabilize isobornyl acrylate. Maintaining air in the storage containers is important to keep inhibitors active. Unless inhibited, hazardous polymerisation may occur.
may polymerize.

10.4 Conditions to avoid

Heat, direct sunlight, ultraviolet light.

10.5 Incompatible materials

Oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides.

10.6 Hazardous decomposition products

Other decomposition products: not available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:

Product/ingredient name	Test	Species	Dose
Isobornyl acrylate	LD50, Oral	Rat	4890 mg/kg
	LD50, Administration onto the skin	Rabbit	>5000 mg/kg
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	LD50, Oral	Rat	>5000 mg/kg

Skin corrosion/irritation: Not available

Serious eye damage/irritation: Not available

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Respiratory or skin sensitization: Not available

Germ cell mutagenicity: Not available

Carcinogenicity: Not available

Reproductive toxicity: Not available

Specific target organ toxicity (single exposure): Not available

Specific target organ toxicity (repeated exposure): Not available

Aspiration hazard: Not available

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	IC50/72h, 1-10 mg/l	LC50/96h, 1-10 mg/l	EC50/48h, 1-10 mg/l
Isobornyl acrylate	ErC50/72 h (Pseudokirchneriella subcapitata) 1.98 mg/l NOECr/72 h (Pseudokirchneriella subcapitata) 0.405 mg/l	LC50/96h (Danio rerio (zebra fish)) 0.7 mg/l	NOEC/21d (Daphnia magna (Water flea)) 0.092 mg/l

12.2 Persistence and Degradability

Isobornyl acrylate

Not readily biodegradable: 57% after 28 d.

12.3 Bioaccumulative potential

Isobornyl acrylate

Partition coefficient: n-octanol/water: log Kow: 4.52, Potentially bioaccumulable.

12.4 Mobility in soil

Not available

12.5 Results of PBT and vPvB assessment

Not available

12.6 Other adverse effects

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Packing

Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information

14.1 Un number

ADR/RID: 3082

IMDG: 3082

IATA: 3082

DOT (US): 3082

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14.2 UN proper shipping name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IATA: Environmentally hazardous substance, liquid, n.o.s. (Isobornyl acrylate)

DOT (US): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

14.3 Transport hazard class(es)

ADR/RID: 9 IMDG: 9 IATA: 9 DOT (US): 9

14.4 Packing group

ADR/RID: III IMDG: III IATA: III DOT (US): III

14.5 Environmental hazard

Marine pollutant: yes

14.6 Special precautions for user

N/A

14.7 Transport to bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available

SECTION 15: Regulatory information

This SDS complies with the following requirements of:
EU Regulation (EC) No.1907/2006 (REACH) including amendments
Regulation (EC) No.1272/2008 (CLP)
29 CFR 1910.1200 (OSHA HCS)
Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

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

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. (Benzene, methyl- 108-88-3 ≤ 0.6%)

TSCA inventory

The substances in this product are included on or exempted from the TSCA inventory.

15.2 Chemical safety assessment

Not available

SECTION 16: Other information

HMIS Rating

Health hazard: 2 Chronic Health Hazard:* Flammability: 0 Physical Hazard: 0

NFPA Rating

Health hazard: 2 Flammability: 0 Instability: 0

Full text of Hazards Statements referred to in sections 2 and 3:

Flam. Liq. - Flammable liquid
Flam. Sol. - Flammable solid
Acute Tox. - Acute toxicity
Skin Irrit. - Skin irritation
Skin Sens. - Skin sensitization

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Eye Irrit. - Eye irritation
Skin Corr. - Skin corrosion
Eye Dam. - Serious eye damage
STOT SE - Specific target organ toxicity — single exposure
Repr. - Reproductive toxicity
Aquatic Acute - Hazardous to the aquatic environment
Aquatic Chronic - Hazardous to the aquatic environment
H228: Flammable solid.
H226: Flammable liquid and vapour.
H302: Harmful if swallowed.
H332: Harmful if inhaled.
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 eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H361f: Suspected of damaging fertility.
H400: Very toxic to aquatic life.
H401 Toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects
H411: Toxic to aquatic life with long lasting effects.

Training advice: Before using/handling the product one must read carefully present SDS.

Key Legend Information:

CAS- Chemical Abstract Service
ACGIH- American Conference of Governmental Industrial Hygienists
OSHA- Occupational Safety and Health Administration
NTP- National Toxicology program
IARC- International Agency for Research on Cancer
N/A- Not available
H-statements- Hazard statements
TLV- Threshold Limit Value
TWA- Time-weighted average
STEL- Short-Term Exposure Limit
CSA- Chemical safety assessment

This SDS and the information presented within it are based on data held by Hazmat, Ltd. and the current legislation as at the date stated on it.

Hazmat, Ltd., 19 Ha'Melacha st. Rosh Ha'Ayin, Tel: +972-3-9037141, fax: +972-3-9032717, email: hazmat@hazmat.co.il.
The information detailed in this SDS was prepared by Hazmat, Ltd. for the orderer of the SDS and is for their use only. The contents of this SDS is

Version	Date	Prepared by	Quality Auditor
1	20/12/2017	K.B	M.H



"League of Giants" 3D printed
by Composite Images for
Rugby League World Cup, Australia

DIMENGEL 100

Dimengel 100 (DIM 100) is a photo polymer 3D printing gel that enables models to cure under UV light while printing, delivering solid, large parts straight off the printer. This unique material facilitates production of complex geometries, including non-vertical parts and ceilings, with practically no need for support structures. The objects are hollow, translucent, and can be illuminated.

Character	Method	Metric Units		Imperial Units	
Tensile strength*	ISO 527	MPa	47	psi	6,820
Elongation at break*	ISO 527	%	17	%	17
Elasticity modulus	ISO 527	GPa	2.4	psi	345,200
Flexural strength*	ISO 178	MPa	196	psi	28,430
Flexural modulus*	ISO 178	MPa	6,410	psi	930,000
Izod Impact* (Notched)	ISO 180	J/m	18.4 - 20.8	ft-lbf/in	0.35 - 0.39
Glass transition, Tg	ASTM D3418	°C	65.8	°F	150.4
HDT* @ 0.45 MPa	ISO 75 ASTM D648	°C	51 - 55	°F	124 - 131
Density		g/ml	1.06	lb/ft³	66.2
Hardness (Shore D)	ASTM D2240	Shore D	80 - 85	Shore D	80 - 85
Color			White		

** Internal lab testing.

Coating and Finishing

DIM 100 supports a wide array of finishes:

- SAV -self-adhesive vinyl
- Car / body filler
- Polyester
- Epoxy
- Polyurethane
- Fiberglass

Regulation Compliancy

- Compliant with 1907/2006/EEC regulation 2006 ("REACH")
- Compliant with Regulation (EC) No 1272/2008 ("CLP")
- Does not contain any chemicals listed on California Prop.65
- Compliant with the US Toxic Substances Control Act (TSCA) regulations

Fire Resistance

Dim 100 prints are compliant with the following standards:

- Din 4102 - class B2
- ASTM D635²
- UL94 - HB²

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.



SAFETY DATA SHEET

Dimengel 100 base

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Date of issue: 20/11/2014

Date of revision: 27/02/2019

Version no.: 3

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

1.1 Product identifier

Product name: Dimengel 100 base

Product description: Photo curable resin

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

Common uses: Printing/additive manufacturing.

1.3 Details of the supplier of the safety data sheet

N/A

E-mail address of person responsible for this SDS: N/A

1.4 Emergency telephone number

Emergency telephone number (with hours of operation): N/A

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to GHS:

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

STOT SE 3 H335

Repr. 2 H361

Aquatic Acute 1 H400

Aquatic chronic 2 H411

Classification according to 29 CFR 1910.1200 (OSHA HCS):

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

STOT SE 3 H335

Repr. 2 H361

Aquatic Acute 1 H400

Aquatic chronic 2 H411

Classification in accordance to Regulation (EC) No. 1272/2008 (CLP):

Skin irrit. 2 H315

Eye irrit. 2 H319

Skin Sens. 1 H317

STOT SE 3 H335

Aquatic Acute 1 H400

Aquatic chronic 2 H411

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

2.2 Label elements

Labelling according to GHS:

Hazard pictogram(s):



SAFETY DATA SHEET

Dimengel 100 base

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Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling according to 29 CFR 1910.1200 (OSHA HCS)

Hazard pictogram(s):



Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling in accordance with Regulation 1272/2008 (CLP)

Hazard pictogram(s):



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Dimengel 100 base

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Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
 H317: May cause an allergic skin reaction.
 H319: Causes serious eye irritation.
 H335: May cause respiratory irritation.
 H400: Very toxic to aquatic life.
 H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapours/spray.
 P264: Wash hands thoroughly after handling.
 P273: Avoid release to the environment.
 P280: Wear protective gloves/protective clothing/eye protection/face protection.
 P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

2.3 Other hazard

Not available

SECTION 3: Composition / information on ingredients

3.2 Mixtures:

Ingredient name	Identifiers	%	CLP Classification	GHS Classification	OSHA HCS
Isobornyl acrylate	CAS number: 5888-33-5 EC number: 227-561-6	25-70	Skin Irrit. 2 H315 Eye Irrit. 2 H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411
Tricyclodecane dimethanol diacrylate	CAS number: 42594-17-2 EC number: 255-901-3	30-60	Skin Sens. 1 H317 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Acute 2 H401 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Acute 2 H401 Aquatic Chronic 2 H411
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	CAS number: 75980-60-8 EC number: 278-355-8	0.5-1	Repr. 2 H361f Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411
Camphene	CAS number: 79-92-5 EC number: 201-234-8	<0.35	Flam. Sol. 2 H228 Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1
1,7,7-Trimethyltricyclo[2.2.1.0 ^{2,6}]heptane	CAS number: 508-32-7 EC number: 208-083-7	<0.35	Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

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Dimengel 100 base

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2-Propenoic acid	CAS number: 79-10-7 EC number: 201-177-9	≤0.12	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411
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See section 16 for the full text of the H-statements declared above.

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 and hence require reporting in this section.

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eyes contact: In case of contact with eyes, rinse immediately with plenty of soap and water for at least 15 minutes. Get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with plenty of water for at least 15 minutes. Get medical attention.

Inhalation: Remove the victim from site of exposure to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration. Get medical attention.

Ingestion: **Do not induce vomiting.** If victim is conscious, wash mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 (Label elements) and/or section 11 (Toxicological information) for the most important known symptoms and effects.

4.3 Indication of any immediate medical attention and special treatment needed

Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable: Foam, carbon dioxide, dry chemical.

Not suitable: Solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode. Cool containers exposed to flame with water spray until well after fire is out.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Ventilate area of spill.

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

6.4 Reference to other sections

See Section 1 for emergency contact information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapors, spray, mist or gas. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

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 measures. Avoid release to the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry, cool and well-ventilated place. Protect from heat, direct sunlight. Keep away from oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides. An air space is required above the liquid in all containers; avoid storage under an oxygen-free atmosphere.

7.3 Specific end use(s): N/A

SECTION 8: Exposure control/personal protection

8.1 Control parameters

Occupational exposure limits values: N/A

8.2 Exposure controls**Engineering measures**

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fumé or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Person Protective measures

Respiratory protection: Suitable respirator. Be sure to use an approved/certified equipment or equivalent equipment. Wear appropriate respirator when ventilation is inadequate.

Hand protection: Wear protective gloves to prevent skin exposure.

Eye protection: Wear protective safety glasses.

Skin protection: Wear appropriate long-sleeved clothing to minimize skin contact.

Environmental exposure controls: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: transparent-white thick liquid-gel

Odour: characteristic

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

Initial boiling point/boiling range: N/A
 Flash point: N/A
 Evaporation rate: N/A
 Flammability: N/A
 Upper/lower flammability or explosive limits: N/A
 Vapor pressure: N/A
 Vapor density: N/A
 Relative density: N/A
 Solubility(ies): N/A
 Partition coefficient Octanol/Water: N/A
 Auto-ignition temperature: N/A
 Decomposition temperature: N/A
 Viscosity: N/A
 Explosive properties: N/A
 Oxidizing properties: N/A

9.2 Other information:

N/A

SECTION 10: Stability and reactivity**10.1 Reactivity**

Not available

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in Section 7.

10.3 Possibility of hazardous reactions

Hazardous reactions are not expected, under normal conditions of storage and use.
 Polymerization is exothermic and can degenerate into an uncontrolled reaction.
 Inhibitors have been added to stabilize isobornyl acrylate. Maintaining air in the storage containers is important to keep inhibitors active. Unless inhibited, hazardous polymerisation may occur.
 Tricyclodecane dimethanol diacrylate may polymerize.

10.4 Conditions to avoid

Heat, direct sunlight, ultraviolet light.

10.5 Incompatible materials

Oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides.

10.6 Hazardous decomposition products

Other decomposition products: not available

In the event of fire: see section 5

SECTION 11: Toxicological information**11.1 Information on toxicological effects**

Acute toxicity:

Product/ingredient name	Test	Species	Dose
Isobornyl acrylate	LD50, Oral	Rat	4890 mg/kg
	LD50, Administration onto the skin	Rabbit	>5000 mg/kg
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	LD50, Oral	Rat	>5000 mg/kg

Skin corrosion/irritation: Not available

Serious eye damage/irritation: Not available

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Dimengel 100 base

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Respiratory or skin sensitization: Not available

Germ cell mutagenicity: Not available

Carcinogenicity: Not available

Reproductive toxicity: Not available

Specific target organ toxicity (single exposure): Not available

Specific target organ toxicity (repeated exposure): Not available

Aspiration hazard: Not available

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	IC50/72h, 1-10 mg/l	LC50/96h, 1-10 mg/l	EC50/48h, 1-10 mg/l
Isobornyl acrylate	ErC50/72 h (Pseudokirchneriella subcapitata) 1.98 mg/l NOECr/72 h (Pseudokirchneriella subcapitata) 0.405 mg/l	LC50/96h (Danio rerio (zebra fish)) 0.7 mg/l	NOEC/21d (Daphnia magna (Water flea)) 0.092 mg/l

12.2 Persistence and Degradability

Isobornyl acrylate

Not readily biodegradable: 57% after 28 d.

12.3 Bioaccumulative potential

Isobornyl acrylate

Partition coefficient: n-octanol/water: log Kow: 4.52, Potentially bioaccumulable.

12.4 Mobility in soil

Not available

12.5 Results of PBT and vPvB assessment

Not available

12.6 Other adverse effects

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Packing

Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information

14.1 Un number

ADR/RID: 3082

IMDG: 3082

IATA: 3082

DOT (US): 3082

SAFETY DATA SHEET

Dimengel 100 base

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14.2 UN proper shipping name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IATA: Environmentally hazardous substance, liquid, n.o.s. (Isobornyl acrylate)

DOT (US): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

14.3 Transport hazard class(es)

ADR/RID: 9 IMDG: 9 IATA: 9 DOT (US): 9

14.4 Packing group

ADR/RID: III IMDG: III IATA: III DOT (US): III

14.5 Environmental hazard

Marine pollutant: yes

14.6 Special precautions for user

N/A

14.7 Transport to bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available

SECTION 15: Regulatory information

This SDS complies with the following requirements of:
EU Regulation (EC) No.1907/2006 (REACH) including amendments
Regulation (EC) No.1272/2008 (CLP)
29 CFR 1910.1200 (OSHA HCS)
Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

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

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. (Benzene, methyl- 108-88-3 ≤ 0.6%)

TSCA inventory

The substances in this product are included on or exempted from the TSCA inventory.

15.2 Chemical safety assessment

Not available

SECTION 16: Other information

HMIS Rating

Health hazard: 2 Chronic Health Hazard:* Flammability: 0 Physical Hazard: 0

NFPA Rating

Health hazard: 2 Flammability: 0 Instability: 0

Full text of Hazards Statements referred to in sections 2 and 3:

Flam. Liq. - Flammable liquid
Flam. Sol. - Flammable solid
Acute Tox. - Acute toxicity
Skin Irrit. - Skin irritation
Skin Sens. - Skin sensitization

SAFETY DATA SHEET

Dimengel 100 base

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Eye Irrit. - Eye irritation
Skin Corr. - Skin corrosion
Eye Dam. - Serious eye damage
STOT SE - Specific target organ toxicity — single exposure
Repr. - Reproductive toxicity
Aquatic Acute - Hazardous to the aquatic environment
Aquatic Chronic - Hazardous to the aquatic environment
H228: Flammable solid.
H226: Flammable liquid and vapour.
H302: Harmful if swallowed.
H332: Harmful if inhaled.
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 eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H361f: Suspected of damaging fertility.
H400: Very toxic to aquatic life.
H401 Toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects
H411: Toxic to aquatic life with long lasting effects.

Training advice: Before using/handling the product one must read carefully present SDS.

Key Legend Information:

CAS- Chemical Abstract Service
ACGIH- American Conference of Governmental Industrial Hygienists
OSHA- Occupational Safety and Health Administration
NTP- National Toxicology program
IARC- International Agency for Research on Cancer
N/A- Not available
H-statements- Hazard statements
TLV- Threshold Limit Value
TWA- Time-weighted average
STEL- Short-Term Exposure Limit
CSA- Chemical safety assessment

This SDS and the information presented within it are based on data held by Hazmat, Ltd. and the current legislation as at the date stated on it. Anyone wishing to make use of the information presented within this document is obligated to update its instructions from time to time. The information presented in the SDS is based on the manufacturer's data and/ or the supplier of the substance/ product which is the subject of this SDS, as provided to Hazmat, Ltd. by the client and in the absence of such data the information was taken from a variety of literary professional sources. The information presented in this SDS is appropriate for the uses specified in paragraph 1 of the SDS only. It is emphasized, that the information specified in this SDS does not replace specific safety instructions for uses of the substance/ product which is the subject of this SDS, which were not explicitly specified in the SDS. Individual professional consultation should be received, and specific safety instructions should be read prior to any mixing of the substance which is the subject of this SDS with other substances and the stated in this SDS does not cover the entire safety instructions relating to mixing the substance which is the subject of this SDS with other substances and does not constitute a replacement to obtaining specific consultation as stated. Hazmat, Ltd. is not liable to any damage and/ or any loss, financial or otherwise, and will not accept responsibility, directly or indirectly, to damages of any kind, including as a result of failure to update and/ or misunderstanding and/ or misuse/ misinterpretation of the information within the document. Any question arising regarding the use of the SDS should be directed to Hazmat, Ltd., 19 Ha'Melacha st. Rosh Ha'Ayin, Tel: +972-3-9037141, fax: +972-3-9032717, email: hazmat@hazmat.co.il. The information detailed in this SDS was prepared by Hazmat, Ltd. for the orderer of the SDS and is for their use only. The contents of this SDS is the property of Hazmat, Ltd. only and it is strictly prohibited to copy, modify, edit, distribute, sell or take any other action which involves infringement of Hazmat's copyrights without the prior written consent of Hazmat, Ltd.

Version	Date	Prepared by	Quality Auditor
2	20/12/2017	D.A	K.B
3	27/02/2019	K.B	M.H



DIMENGEL 110

Dimengel 110 (DIM 110) is a photo polymer 3D printing gel that enables production of high-definition, large parts that cure under UV light while printing, delivering solid, parts straight off the printer.

This unique material facilitates complex geometries, including non-vertical parts and ceilings, with practically no need for support structures. The objects are hollow and translucent.

Character	Method	Metric Units		Imperial Units	
Tensile strength*	ISO 527	MPa	42	psi	6,100
Elongation at break*	ISO 527	%	10	%	10
Elasticity modulus	ISO 527	GPa	2.6	psi	376,400
Flexural strength*	ISO 178	MPa	150	psi	21,800
Flexural modulus*	ISO 178	MPa	4,715	psi	684,000
Izod Impact* (Notched)	ISO 180	J/m	18.4 - 19.2	ft.lbf/in	0.35 - 0.36
Glass transition, Tg	ASTM D3418	°C	66.3	°F	151.3
HDT* @ 0.45 MPa	ISO 75 ASTM D648	°C	51 - 55	°F	124 - 131
Density		g/ml	1.07	lb/ft³	66.8
Hardness (Shore D)	ASTM D2240	Shore D	80 - 85	Shore D	80 - 85
Color			White		

* All measurements were done on lab specimens of cured material.

** Internal lab testing.

Coating and Finishing

DIM 110 supports a wide array of finishes:

- SAV -self-adhesive vinyl
- Car / body filler
- Polyester
- Epoxy
- Polyurethane
- Fiberglass

Regulation Compliancy

- Compliant with 1907/2006/EEC regulation 2006 ("REACH")
- Compliant with Regulation (EC) No 1272/2008 ("CLP")
- Does not contain any chemicals listed on California Prop.65
- Compliant with the US Toxic Substances Control Act (TSCA) regulations

Fire Resistance

Dim 110 prints are compliant with the following standards:

- Din 4102 - class B2
- ASTM D635²
- UL94 - HB²

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.



SAFETY DATA SHEET

Dimengel 110 base

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Date of issue: 20/11/2014

Date of revision: 27/02/2019

Version no.: 3

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

1.1 Product identifier

Product name: Dimengel 110 base

Product description: Photo curable resin

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

Common uses: Printing/additive manufacturing.

1.3 Details of the supplier of the safety data sheet

N/A

E-mail address of person responsible for this SDS: N/A

1.4 Emergency telephone number

Emergency telephone number (with hours of operation): N/A

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to GHS:

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

STOT SE 3 H335

Repr. 2 H361

Aquatic Acute 1 H400

Aquatic chronic 2 H411

Classification according to 29 CFR 1910.1200 (OSHA HCS):

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

STOT SE 3 H335

Repr. 2 H361

Aquatic Acute 1 H400

Aquatic chronic 2 H411

Classification in accordance to Regulation (EC) No. 1272/2008 (CLP):

Skin irrit. 2 H315

Eye irrit. 2 H319

Skin Sens. 1 H317

STOT SE 3 H335

Aquatic Acute 1 H400

Aquatic chronic 2 H411

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

2.2 Label elements

Labelling according to GHS:

Hazard pictogram(s):



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Dimengel 110 base

Page 2 of 9

Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling according to 29 CFR 1910.1200 (OSHA HCS)

Hazard pictogram(s):



Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling in accordance with Regulation 1272/2008 (CLP)

Hazard pictogram(s):



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Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
 H317: May cause an allergic skin reaction.
 H319: Causes serious eye irritation.
 H335: May cause respiratory irritation.
 H400: Very toxic to aquatic life.
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Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapours/spray.
 P264: Wash hands thoroughly after handling.
 P273: Avoid release to the environment.
 P280: Wear protective gloves/protective clothing/eye protection/face protection.
 P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

2.3 Other hazard

Not available

SECTION 3: Composition / information on ingredients

3.2 Mixtures:

Ingredient name	Identifiers	%	CLP Classification	GHS Classification	OSHA HCS
Isobornyl acrylate	CAS number: 5888-33-5 EC number: 227-561-6	25-70	Skin Irrit. 2 H315 Eye Irrit. 2 H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411
Tricyclodecane dimethanol diacrylate	CAS number: 42594-17-2 EC number: 255-901-3	30-60	Skin Sens. 1 H317 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Acute 2 H401 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Acute 2 H401 Aquatic Chronic 2 H411
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	CAS number: 75980-60-8 EC number: 278-355-8	0.5-1	Repr. 2 H361f Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411
Camphene	CAS number: 79-92-5 EC number: 201-234-8	<0.35	Flam. Sol. 2 H228 Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1
1,7,7-Trimethyltricyclo[2.2.1.0 ^{2,6}]heptane	CAS number: 508-32-7 EC number: 208-083-7	<0.35	Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

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2-Propenoic acid	CAS number: 79-10-7 EC number: 201-177-9	≤0.12	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Acute Tox. 4 H302, H332 Skin Corr. 1A H314 Eye Dam. 1 H318 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic Chronic 2 H411
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See section 16 for the full text of the H-statements declared above.

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 and hence require reporting in this section.

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eyes contact: In case of contact with eyes, rinse immediately with plenty of soap and water for at least 15 minutes. Get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with plenty of water for at least 15 minutes. Get medical attention.

Inhalation: Remove the victim from site of exposure to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration. Get medical attention.

Ingestion: **Do not induce vomiting.** If victim is conscious, wash mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 (Label elements) and/or section 11 (Toxicological information) for the most important known symptoms and effects.

4.3 Indication of any immediate medical attention and special treatment needed

Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable: Foam, carbon dioxide, dry chemical.

Not suitable: Solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode. Cool containers exposed to flame with water spray until well after fire is out.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Ventilate area of spill.

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

6.4 Reference to other sections

See Section 1 for emergency contact information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapors, spray, mist or gas. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

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 measures. Avoid release to the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry, cool and well-ventilated place. Protect from heat, direct sunlight. Keep away from oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides. An air space is required above the liquid in all containers; avoid storage under an oxygen-free atmosphere.

7.3 Specific end use(s): N/A

SECTION 8: Exposure control/personal protection

8.1 Control parameters

Occupational exposure limits values: N/A

8.2 Exposure controls**Engineering measures**

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fumé or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Person Protective measures

Respiratory protection: Suitable respirator. Be sure to use an approved/certified equipment or equivalent equipment. Wear appropriate respirator when ventilation is inadequate.

Hand protection: Wear protective gloves to prevent skin exposure.

Eye protection: Wear protective safety glasses.

Skin protection: Wear appropriate long-sleeved clothing to minimize skin contact.

Environmental exposure controls: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: transparent-white thick liquid-gel

Odour: characteristic

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

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Initial boiling point/boiling range: N/A
Flash point: N/A
Evaporation rate: N/A
Flammability: N/A
Upper/lower flammability or explosive limits: N/A
Vapor pressure: N/A
Vapor density: N/A
Relative density: N/A
Solubility(ies): N/A
Partition coefficient Octanol/Water: N/A
Auto-ignition temperature: N/A
Decomposition temperature: N/A
Viscosity: N/A
Explosive properties: N/A
Oxidizing properties: N/A

9.2 Other information:

N/A

SECTION 10: Stability and reactivity

10.1 Reactivity

Not available

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in Section 7.

10.3 Possibility of hazardous reactions

Hazardous reactions are not expected, under normal conditions of storage and use.
Polymerization is exothermic and can degenerate into an uncontrolled reaction.
Inhibitors have been added to stabilize isobornyl acrylate. Maintaining air in the storage containers is important to keep inhibitors active. Unless inhibited, hazardous polymerisation may occur.
Tricyclodecane dimethanol diacrylate may polymerize.

10.4 Conditions to avoid

Heat, direct sunlight, ultraviolet light.

10.5 Incompatible materials

Oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides.

10.6 Hazardous decomposition products

Other decomposition products: not available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:

Product/ingredient name	Test	Species	Dose
Isobornyl acrylate	LD50, Oral	Rat	4890 mg/kg
	LD50, Administration onto the skin	Rabbit	>5000 mg/kg
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	LD50, Oral	Rat	>5000 mg/kg

Skin corrosion/irritation: Not available

Serious eye damage/irritation: Not available

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Respiratory or skin sensitization: Not available

Germ cell mutagenicity: Not available

Carcinogenicity: Not available

Reproductive toxicity: Not available

Specific target organ toxicity (single exposure): Not available

Specific target organ toxicity (repeated exposure): Not available

Aspiration hazard: Not available

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	IC50/72h, 1-10 mg/l	LC50/96h, 1-10 mg/l	EC50/48h, 1-10 mg/l
Isobornyl acrylate	ErC50/72 h (Pseudokirchneriella subcapitata) 1.98 mg/l NOECr/72 h (Pseudokirchneriella subcapitata) 0.405 mg/l	LC50/96h (Danio rerio (zebra fish)) 0.7 mg/l	NOEC/21d (Daphnia magna (Water flea)) 0.092 mg/l

12.2 Persistence and Degradability

Isobornyl acrylate

Not readily biodegradable: 57% after 28 d.

12.3 Bioaccumulative potential

Isobornyl acrylate

Partition coefficient: n-octanol/water: log Kow: 4.52, Potentially bioaccumulable.

12.4 Mobility in soil

Not available

12.5 Results of PBT and vPvB assessment

Not available

12.6 Other adverse effects

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Packing

Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information

14.1 Un number

ADR/RID: 3082

IMDG: 3082

IATA: 3082

DOT (US): 3082

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14.2 UN proper shipping name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IATA: Environmentally hazardous substance, liquid, n.o.s. (Isobornyl acrylate)

DOT (US): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

14.3 Transport hazard class(es)

ADR/RID: 9 IMDG: 9 IATA: 9 DOT (US): 9

14.4 Packing group

ADR/RID: III IMDG: III IATA: III DOT (US): III

14.5 Environmental hazard

Marine pollutant: yes

14.6 Special precautions for user

N/A

14.7 Transport to bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available

SECTION 15: Regulatory information

This SDS complies with the following requirements of:
EU Regulation (EC) No.1907/2006 (REACH) including amendments
Regulation (EC) No.1272/2008 (CLP)
29 CFR 1910.1200 (OSHA HCS)
Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

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

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. (Benzene, methyl- 108-88-3 ≤ 0.6%)

TSCA inventory

The substances in this product are included on or exempted from the TSCA inventory.

15.2 Chemical safety assessment

Not available

SECTION 16: Other information

HMIS Rating

Health hazard: 2 Chronic Health Hazard:* Flammability: 0 Physical Hazard: 0

NFPA Rating

Health hazard: 2 Flammability: 0 Instability: 0

Full text of Hazards Statements referred to in sections 2 and 3:

Flam. Liq. - Flammable liquid
Flam. Sol. - Flammable solid
Acute Tox. - Acute toxicity
Skin Irrit. - Skin irritation
Skin Sens. - Skin sensitization

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Eye Irrit. - Eye irritation
Skin Corr. - Skin corrosion
Eye Dam. - Serious eye damage
STOT SE - Specific target organ toxicity — single exposure
Repr. - Reproductive toxicity
Aquatic Acute - Hazardous to the aquatic environment
Aquatic Chronic - Hazardous to the aquatic environment
H228: Flammable solid.
H226: Flammable liquid and vapour.
H302: Harmful if swallowed.
H332: Harmful if inhaled.
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 eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H361f: Suspected of damaging fertility.
H400: Very toxic to aquatic life.
H401 Toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects
H411: Toxic to aquatic life with long lasting effects.

Training advice: Before using/handling the product one must read carefully present SDS.

Key Legend Information:

CAS- Chemical Abstract Service
ACGIH- American Conference of Governmental Industrial Hygienists
OSHA- Occupational Safety and Health Administration
NTP- National Toxicology program
IARC- International Agency for Research on Cancer
N/A- Not available
H-statements- Hazard statements
TLV- Threshold Limit Value
TWA- Time-weighted average
STEL- Short-Term Exposure Limit
CSA- Chemical safety assessment

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Version	Date	Prepared by	Quality Auditor
2	20/12/2017	D.A	K.B
3	27/02/2019	K.B	M.H



DIMENGEL 300

Dimengel 300 (DIM 300) is a thermoset photo polymer material ideal for production of large, transparent 3D printed parts. DIM 300 facilitates transparent prototype housings, concept models, interior design and architectural elements, scenic displays, design verification, and a range of advertising applications.

For optimal results, parts should be polished or lacquered according to Massivit 3D's recommended post processing methods.

As with Massivit's range of advanced, proprietary materials, DIM 300 enables ultra-fast production of large, complex parts that instantly cure during printing, providing ready-made solid parts straight off the printer with little-to-no need for internal support structures.

Character	Method	Metric Units		Imperial Units	
Tensile strength*	ISO 527	MPa	40	psi	5,800
Elongation at break*	ISO 527	%	4.5	%	4.5
Elasticity modulus	ISO 527	GPa	1.5	psi	217,556
Flexural strength*	ISO 178	MPa	53	psi	7,687
Flexural modulus*	ISO 178	MPa	1,760	psi	255,266
Izod Impact* (Notched)	ISO 180	J/m	19.2 - 20.8	ft-lbf/in	0.36 - 0.39
Glass transition, Tg	ASTM D3418	°C	65	°F	149
HDT* @ 0.45 MPa	ISO 75-2	°C	51 - 55	°F	124 - 131
Density	ASTM D792	g/cm ³	1.05	lb/ft ³	65.5
Hardness (Shore D)	ASTM D2240	Shore D	73	Shore D	73
Color		Transparent			

* All measurements were done on lab specimens of cured material.

Coating and Finishing

A variety of spray coatings are available for various applications.

In particular, Massivit 3D recommends Clear Spray coating as a post processing method.

Regulation Compliancy

- Compliant with 1907/2006/EEC regulation 2006 ("REACH")
- Compliant with Regulation (EC) No 1272/2008 ("CLP")
- Does not contain any chemicals listed on California Prop.65
- Compliant with the US Toxic Substances Control Act (TSCA) regulations

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.



SAFETY DATA SHEET

Dimengel 300

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Date of issue: 27/02/2019

Date of revision: 27/02/2019

Version no.: 1

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

1.1 Product identifier

Product name: Dimengel 300

Product description: Photo curable resin

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

Common uses: Printing/additive manufacturing.

1.3 Details of the supplier of the safety data sheet

N/A

E-mail address of person responsible for this SDS: N/A

1.4 Emergency telephone number

Emergency telephone number (with hours of operation): N/A

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to GHS:

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

STOT SE 3 H335

Repr. 2 H361

Aquatic Acute 1 H400

Aquatic chronic 2 H411

Classification according to 29 CFR 1910.1200 (OSHA HCS):

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

STOT SE 3 H335

Repr. 2 H361

Aquatic Acute 1 H400

Aquatic chronic 2 H411

Classification in accordance to Regulation (EC) No. 1272/2008 (CLP):

Skin irrit. 2 H315

Eye irrit. 2 H319

Skin Sens. 1 H317

STOT SE 3 H335

Aquatic Acute 1 H400

Aquatic chronic 2 H411

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

2.2 Label elements

Labelling according to GHS:

Hazard pictogram(s):



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Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H400: Very toxic to aquatic life.
H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.
P264: Wash hands thoroughly after handling.
P273: Avoid release to the environment.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling according to 29 CFR 1910.1200 (OSHA HCS)

Hazard pictogram(s):



Signal word: Warning

Hazard statement(s):

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P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+313: If exposed or concerned: Get medical advice/attention.

Labelling in accordance with Regulation 1272/2008 (CLP)

Hazard pictogram(s):



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 P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

2.3 Other hazard

Not available

SECTION 3: Composition / information on ingredients

3.2 Mixtures:

Ingredient name	Identifiers	%	CLP Classification	GHS Classification	OSHA HCS
Isobornyl acrylate	CAS number: 5888-33-5 EC number: 227-561-6	25-70	Skin Irrit. 2 H315 Eye Irrit. 2 H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411	Skin Irrit. 2 H315 Eye Irrit. 2A H319 Skin Sens. 1B H317 STOT SE 3 H335 Aquatic Acute 1 H400 Aquatic chronic 2 H411
Tricyclodecane dimethanol diacrylate	CAS number: 42594-17-2 EC number: 255-901-3	30-60	Skin Sens. 1 H317 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Acute 2 H401 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Acute 2 H401 Aquatic Chronic 2 H411
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	CAS number: 75980-60-8 EC number: 278-355-8	0.5-1	Repr. 2 H361f Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411	Repr. 2 H361 Aquatic Chronic 2 H411
Camphene	CAS number: 79-92-5 EC number: 201-234-8	<0.35	Flam. Sol. 2 H228 Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1	Flam. Sol. 2 H228 Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410 M-Factor Chronic = 1
1,7,7-Trimethyltricyclo[2.2.1.0 ^{2,6}]heptane	CAS number: 508-32-7 EC number: 208-083-7	<0.35	Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Eye Irrit. 2A H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

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

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 and hence require reporting in this section.

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eyes contact: In case of contact with eyes, rinse immediately with plenty of soap and water for at least 15 minutes. Get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with plenty of water for at least 15 minutes. Get medical attention.

Inhalation: Remove the victim from site of exposure to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration. Get medical attention.

Ingestion: **Do not induce vomiting.** If victim is conscious, wash mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 (Label elements) and/or section 11 (Toxicological information) for the most important known symptoms and effects.

4.3 Indication of any immediate medical attention and special treatment needed

Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable: Foam, carbon dioxide, dry chemical.

Not suitable: Solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode. Cool containers exposed to flame with water spray until well after fire is out.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Ventilate area of spill.

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6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

6.4 Reference to other sections

See Section 1 for emergency contact information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapors, spray, mist or gas. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

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 measures. Avoid release to the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry, cool and well-ventilated place. Protect from heat, direct sunlight. Keep away from oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides. An air space is required above the liquid in all containers; avoid storage under an oxygen-free atmosphere.

7.3 Specific end use(s): N/A

SECTION 8: Exposure control/personal protection

8.1 Control parameters

Occupational exposure limits values: N/A

8.2 Exposure controls

Engineering measures

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fumé or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Person Protective measures

Respiratory protection: Suitable respirator. Be sure to use an approved/certified equipment or equivalent equipment. Wear appropriate respirator when ventilation is inadequate.

Hand protection: Wear protective gloves to prevent skin exposure.

Eye protection: Wear protective safety glasses.

Skin protection: Wear appropriate long-sleeved clothing to minimize skin contact.

Environmental exposure controls: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: transparent-white thick liquid-gel

Odour: characteristic

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

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Initial boiling point/boiling range: N/A
Flash point: N/A
Evaporation rate: N/A
Flammability: N/A
Upper/lower flammability or explosive limits: N/A
Vapor pressure: N/A
Vapor density: N/A
Relative density: N/A
Solubility(ies): N/A
Partition coefficient Octanol/Water: N/A
Auto-ignition temperature: N/A
Decomposition temperature: N/A
Viscosity: N/A
Explosive properties: N/A
Oxidizing properties: N/A

9.2 Other information:

N/A

SECTION 10: Stability and reactivity

10.1 Reactivity

Not available

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in Section 7.

10.3 Possibility of hazardous reactions

Hazardous reactions are not expected, under normal conditions of storage and use.
Polymerization is exothermic and can degenerate into an uncontrolled reaction.
Inhibitors have been added to stabilize isobornyl acrylate. Maintaining air in the storage containers is important to keep inhibitors active. Unless inhibited, hazardous polymerisation may occur.
Tricyclodecane dimethanol diacrylate may polymerize.

10.4 Conditions to avoid

Heat, direct sunlight, ultraviolet light.

10.5 Incompatible materials

Oxidizing agents, reducing agents, acids, bases, free radical generators, inert gas, oxygen scavenger, peroxides.

10.6 Hazardous decomposition products

Other decomposition products: not available

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:

Product/ingredient name	Test	Species	Dose
Isobornyl acrylate	LD50, Oral	Rat	4890 mg/kg
	LD50, Administration onto the skin	Rabbit	>5000 mg/kg
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	LD50, Oral	Rat	>5000 mg/kg

Skin corrosion/irritation: Not available

Serious eye damage/irritation: Not available

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Respiratory or skin sensitization: Not available

Germ cell mutagenicity: Not available

Carcinogenicity: Not available

Reproductive toxicity: Not available

Specific target organ toxicity (single exposure): Not available

Specific target organ toxicity (repeated exposure): Not available

Aspiration hazard: Not available

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia
Diphenyl (2,4,6-trimethylbenzoyl) phosphine oxide	IC50/72h, 1-10 mg/l	LC50/96h, 1-10 mg/l	EC50/48h, 1-10 mg/l
Isobornyl acrylate	ErC50/72 h (Pseudokirchneriella subcapitata) 1.98 mg/l NOECr/72 h (Pseudokirchneriella subcapitata) 0.405 mg/l	LC50/96h (Danio rerio (zebra fish)) 0.7 mg/l	NOEC/21d (Daphnia magna (Water flea)) 0.092 mg/l

12.2 Persistence and Degradability

Isobornyl acrylate

Not readily biodegradable: 57% after 28 d.

12.3 Bioaccumulative potential

Isobornyl acrylate

Partition coefficient: n-octanol/water: log Kow: 4.52, Potentially bioaccumulable.

12.4 Mobility in soil

Not available

12.5 Results of PBT and vPvB assessment

Not available

12.6 Other adverse effects

Very toxic to aquatic life. Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Packing

Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information

Product shipped as non-hazardous under exception mentioned in IMDG code 2.10.2.7; ICAO/IATA A197 and ADR SP375

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14.1 Un number

ADR/RID: 3082

IMDG: 3082

IATA: 3082

DOT (US): 3082

14.2 UN proper shipping name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

IATA: Environmentally hazardous substance, liquid, n.o.s. (Isobornyl acrylate)

DOT (US): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ISOBORNYL ACRYLATE)

14.3 Transport hazard class(es)

ADR/RID: 9

IMDG: 9

IATA: 9

DOT (US): 9

14.4 Packing group

ADR/RID: III

IMDG: III

IATA: III

DOT (US): III

14.5 Environmental hazard

Marine pollutant: yes

14.6 Special precautions for user

N/A

14.7 Transport to bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available

SECTION 15: Regulatory information

This SDS complies with the following requirements of:
EU Regulation (EC) No.1907/2006 (REACH) including amendments
Regulation (EC) No.1272/2008 (CLP)
29 CFR 1910.1200 (OSHA HCS)
Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

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

California Prop. 65 Components

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. (Benzene, methyl- 108-88-3 ≤ 0.6%)

TSCA inventory

The substances in this product are included on or exempted from the TSCA inventory.

15.2 Chemical safety assessment

Not available

SECTION 16: Other information

HMIS Rating

Health hazard: 2

Chronic Health Hazard:*

Flammability: 0

Physical Hazard: 0

NFPA Rating

Health hazard: 2

Flammability: 0

Instability: 0

Full text of Hazards Statements referred to in sections 2 and 3:

Flam. Liq. - Flammable liquid

Flam. Sol. - Flammable solid

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Acute Tox. - Acute toxicity
Skin Irrit. - Skin irritation
Skin Sens. - Skin sensitization
Eye Irrit. - Eye irritation
Skin Corr. - Skin corrosion
Eye Dam. - Serious eye damage
STOT SE - Specific target organ toxicity — single exposure
Repr. - Reproductive toxicity
Aquatic Acute - Hazardous to the aquatic environment
Aquatic Chronic - Hazardous to the aquatic environment
H228: Flammable solid.
H226: Flammable liquid and vapour.
H302: Harmful if swallowed.
H332: Harmful if inhaled.
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 eye irritation.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.
H361f: Suspected of damaging fertility.
H400: Very toxic to aquatic life.
H401 Toxic to aquatic life.
H410: Very toxic to aquatic life with long lasting effects
H411: Toxic to aquatic life with long lasting effects.

Training advice: Before using/handling the product one must read carefully present SDS.

Key Legend Information:

CAS- Chemical Abstract Service
ACGIH- American Conference of Governmental Industrial Hygienists
OSHA- Occupational Safety and Health Administration
NTP- National Toxicology program
IARC- International Agency for Research on Cancer
N/A- Not available
H-statements- Hazard statements
TLV- Threshold Limit Value
TWA- Time-weighted average
STEL- Short-Term Exposure Limit
CSA- Chemical safety assessment

Date of issue: 27/02/2019

Version no.: 1

This SDS and the information presented within it are based on data held by Hazmat, Ltd. and the current legislation as at the date stated on it. Anyone wishing to make use of the information presented within this document is obligated to update its instructions from time to time. The information presented in the SDS is based on the manufacturer's data and/ or the supplier of the substance/ product which is the subject of this SDS, as provided to Hazmat, Ltd. by the client and in the absence of such data the information was taken from a variety of literary professional sources. The information presented in this SDS is appropriate for the uses specified in paragraph 1 of the SDS only. It is emphasized, that the information specified in this SDS does not replace specific safety instructions for uses of the substance/ product which is the subject of this SDS, which were not explicitly specified in the SDS. Individual professional consultation should be received, and specific safety instructions should be read prior to any mixing of the substance which is the subject of this SDS with other substances and the stated in this SDS does not cover the entire safety instructions relating to mixing the substance which is the subject of this SDS with other substances and does not constitute a replacement to obtaining specific consultation as stated. Hazmat, Ltd. is not liable to any damage and/ or any loss, financial or otherwise, and will not accept responsibility, directly or indirectly, to damages of any kind, including as a result of failure to update and/ or misunderstanding and/ or misuse/ misinterpretation of the information within the document. Any question arising regarding the use of the SDS should be directed to Hazmat, Ltd., 19 Ha'Melacha st. Rosh Ha'Ayin, Tel: +972-3-9037141, fax: +972-3-9032717, email: hazmat@hazmat.co.il. The information detailed in this SDS was prepared by Hazmat, Ltd. for the orderer of the SDS and is for their use only. The contents of this SDS is the property of Hazmat, Ltd. only and it is strictly prohibited to copy, modify, edit, distribute, sell or take any other action which involves infringement of Hazmat's copyrights without the prior written consent of Hazmat, Ltd.



DIMENGEL 400

Dimengel 400 (DIM 400) is the strongest and toughest of Massivit's family of high-performance Gels. Its impact resistance makes it ideal for the most demanding functional prototyping and end-use applications. It offers a high Heat Deflection Temperature (HDT) enabling production of large parts that can withstand elevated temperatures. As with other Dimengel materials, DIM 400 enables models to cure instantly under UV light while printing, delivering solid, large parts straight off the printer. It enables production of complex geometries, including non-vertical parts and ceilings, with practically no need for support structures.

Key Benefits

- High toughness
- Superior strength and thermal durability
- A wide range of applications

Applications

- Customized end-use parts
- Tough, functional prototypes
- Jigs and fixtures
- Internal cores for layups

Character	Method	Metric Units		Imperial Units	
Tensile strength*	IISO 527 ASTM D 638	MPa	45	psi	6,530
Elongation at break*	ISO 527 ASTM D 638	%	46	%	46
Elasticity modulus	ISO 527 ASTM D 638	GPa	1.7	psi	246,560
Flexural strength*	ISO 178 ASTM D 790	MPa	80	psi	11,600
Flexural modulus*	ISO 178 ASTM D 790	GPa	1.2	psi	174,045
IZOD Impact* (Notched)	ASTM D256	J/m	40-50	ft-lb/in	0.75-0.94
Heat Deflection Temperature @0.45 MPa	ASTM D 648	°C	67-70	°F	153-158
Glass transition, Tg	ASTM D 3418	°C	72	°F	162
Density		g/cm ³	1.17	lb/ft ³	73
Hardness (Shore D)	ASTM D 2240	Shore D	81-86	Shore D	81-86
Color		DARK GRAY			

* All measurements were done on lab specimens of cured material

** The specifications stated above refer to the Beta version and results were derived from internal lab tests. The material above is under R&D development"

Coating and Finishing

DIM 400 supports a wide array of finishes:

- SAV -self-adhesive vinyl
- Car / body filler
- Polyester
- Epoxy
- Polyurethane
- Fiberglass

Regulation Compliancy

- Compliant with 1907/2006/EEC regulation 2006 ("REACH")
- Compliant with Regulation (EC) No 1272/2008 ("CLP")
- Compliant with the US Toxic Substances Control Act (TSCA) regulations
- Does not contain any chemicals listed on California Prop.65

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.



SAFETY DATA SHEET

Dimengel 400

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Date of issue: 20/12/2022

Date of revision: 20/12/2022

Version no.: 1

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

1.1 Product identifier

Product name: Dimengel 400

Product description: Photo curable resin

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

Common uses: Printing/additive manufacturing.

1.3 Details of the supplier of the safety data sheet

N/A

E-mail address of person responsible for this SDS: N/A

1.4 Emergency telephone number

Emergency telephone number (with hours of operation): N/A

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to GHS:

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

Aquatic Chronic 2 H411

Classification according to 29 CFR 1910.1200 (OSHA HCS):

Skin Irrit. 2 H315

Eye Irrit. 2A H319

Skin Sens. 1 H317

Aquatic Chronic 2 H411

Classification according to Regulation (EC) No. 1272/2008 (CLP):

Skin irrit. 2 H315

Eye irrit. 2 H319

Skin Sens. 1 H317

Aquatic chronic 2 H411

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

2.2 Label elements

Labelling according to GHS:

Hazard pictogram(s):



Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

H319: Causes serious eye irritation.

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P264: Wash hands thoroughly after handling.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Labelling according to 29 CFR 1910.1200 (OSHA HCS)Hazard pictogram(s):

Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

H319: Causes serious eye irritation.

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P264: Wash hands thoroughly after handling.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Labelling in accordance with Regulation 1272/2008 (CLP)Hazard pictogram(s):

Signal word: Warning

Hazard statement(s):

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

H319: Causes serious eye irritation.

H411: Toxic to aquatic life with long lasting effects.

Precautionary Statement(s):

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P264: Wash hands thoroughly after handling.

P273: Avoid release to the environment.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.

2.3 Other hazard

Not available

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

Ingredient name	Identifiers	%	CLP Classification	GHS Classification	OSHA HCS
7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxo-5,12-diazahexadecane-1,16-diyl bismethacrylate	CAS number: 72869-86-4 EC number: 276-957-5	30-66.5	Skin Sens. 1 H317 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Chronic 2 H411	Skin Sens. 1 H317 Aquatic Chronic 2 H411
Methacrylic acid, monoester with propane-1,2-diol	CAS number: 27813-02-1 EC number: 248-666-3	6-19	Skin Sens. 1 H317 Eye Irrit. 2 H319	Skin Sens. 1 H317 Eye Irrit. 2 H319	Skin Sens. 1 H317 Eye Irrit. 2 H319
Exo-1,7,7-trimethylbicyclo [2.2.1]hept-2-yl methacrylate	CAS number: 7534-94-3 EC number: 231-403-1	6-19	Skin Irrit. 2 H315 STOT SE 3 H335 Aquatic Chronic 3 H412 Eye Irrit. 2 H319	Skin Irrit. 2 H315 STOT SE 3 H335 Aquatic Chronic 3 H412 Eye Irrit. 2 H319	Skin Irrit. 2 H315 STOT SE 3 H335 Aquatic Chronic 3 H412 Eye Irrit. 2 H319
Phenylbis (2,4,6-trimethylbenzoyl) phosphine oxide	CAS number: 162881-26-7 EC number: 423-340-5	0.1-2	Skin Sens. 1 H317 Aquatic Chronic 4 H413	Skin Sens. 1 H317 Aquatic Chronic 4 H413	Skin Sens. 1 H317 Aquatic Chronic 4 H413
Naphtha (petroleum)	CAS number: 64741-65-7 EC number: 265-067-2	<5	Flam. Liq. 3 H226 Asp. Tox. 1 H304 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Asp. Tox. 1 H304 Aquatic Chronic 2 H411	Flam. Liq. 3 H226 Asp. Tox. 1 H304 Aquatic Chronic 2 H411

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

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 and hence require reporting in this section.

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

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

- Eyes contact:** In case of contact with eyes, rinse immediately with plenty of soap and water for at least 15 minutes. Get medical attention.
- Skin contact:** Take off contaminated clothing and shoes immediately. Wash off with plenty of water for at least 15 minutes. Get medical attention.
- Inhalation:** Remove the victim from site of exposure to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration. Get medical attention.
- Ingestion:** **Do not induce vomiting.** If victim is conscious, wash mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 (Label elements) and/or section 11 (Toxicological information) for the most important known symptoms and effects.

4.3 Indication of any immediate medical attention and special treatment needed

Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable: Foam, carbon dioxide, dry chemical, water fog.

Not suitable: Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode. Use water spray/fog for cooling fire exposed containers.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Ventilate area of spill.

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

6.4 Reference to other sections

See Section 1 for emergency contact information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapors, spray, mist or gas. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

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 measures. Avoid release to the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry, cool and well-ventilated place. Protected from direct sunlight. Protect from freezing and physical damage. Store away from heat, open flames and other sources of ignition. Store away from incompatible materials (See Section 10).

7.3 Specific end use(s): N/A

SECTION 8: Exposure control/personal protection

8.1 Control parameters

Occupational exposure limits values: N/A

8.2 Exposure controlsEngineering measures

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal protective measures

Respiratory protection: Suitable respirator. Be sure to use an approved/certified equipment or equivalent equipment. Wear appropriate respirator when ventilation is inadequate.

Hand protection: Wear protective gloves to prevent skin exposure.

Eye protection: Wear protective safety glasses.

Skin protection: Wear appropriate long-sleeved clothing to minimize skin contact.

Environmental exposure controls: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: Gray thick liquid-gel

Odour: characteristic

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

Initial boiling point/boiling range: >100°C

Flash point: >93°C

Evaporation rate: N/A

Flammability: N/A

Upper/lower flammability or explosive limits: N/A

Vapor pressure: N/A

Vapor density: N/A

Relative density: N/A

Solubility(ies): N/A

Partition coefficient Octanol/Water: N/A

Auto-ignition temperature: N/A

Decomposition temperature: N/A

Viscosity: 80,000-180,000 cP

Explosive properties: N/A

Oxidizing properties: N/A

9.2 Other information

Density: 1.17 g/cm³

SECTION 10: Stability and reactivity

10.1 Reactivity

Not available

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in Section 7.

10.3 Possibility of hazardous reactions

Hazardous reactions are not expected, under normal conditions of storage and use.

10.4 Conditions to avoid

Extreme heat, open flames, hot surfaces, sparks, ignition sources.

10.5 Incompatible materials

Polymerization initiators, including peroxides, strong oxidizing agents, alcohols, copper, copper alloys, carbon steel, iron, rust, and strong bases.

10.6 Hazardous decomposition products

Other decomposition products: not available

In the event of fire: see section 5

SECTION 11: Toxicological information**11.1 Information on toxicological effects**

Acute toxicity:

Product/ingredient name	Test	Species	Dose
7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-diyl bismethacrylate	LD50, Oral	Rat	>5000 mg/kg
	LD50, Dermal	Rat	>2000 mg/kg
Methacrylic acid, monoester with propane-1,2-diol	LD50, Oral	Rat	>2000 mg/kg
	LD50, Dermal	Rabbit	>5000 mg/kg
Exo-1,7,7-trimethylbicyclo[2.2.1]hept-2-yl methacrylate	LD50, Oral	Rat	>2000 mg/kg
	LD50, Dermal	Rabbit	>3000 mg/kg
Phenylbis(2,4,6-trimethylbenzoyl) phosphine oxide	LD50, Oral	Rat	>2000 mg/kg
	LD50, Dermal	Rat	>2000 mg/kg
Naphtha (petroleum)	LD50, Oral	Rat	>5000 mg/kg
	LC50, Inhalation	Rat	> 4951 mg/l/4h
	LD50, Dermal	Rabbit	>5000 mg/kg

Skin corrosion/irritation: Causes skin irritation.

Serious eye damage/irritation: Causes serious eye irritation.

Respiratory or skin sensitization: May cause an allergic skin reaction.

Germ cell mutagenicity: Not available

Carcinogenicity: Not available

Reproductive toxicity: Not available

Specific target organ toxicity (single exposure): Not available

Specific target organ toxicity (repeated exposure): Not available

Aspiration hazard: Not available

SECTION 12: Ecological information**12.1 Toxicity**

Product/ingredient name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia
7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-diyl bismethacrylate	NOEC <i>Desmodesmus subspicatus</i> : 0.2 mg/l (72 h)	LC50/96h (<i>Danio rerio</i>) 10.1 mg/l	EC50/48h (<i>Daphnia magna</i>) 1.2 mg/l
Exo-1,7,7-trimethylbicyclo [2.2.1]hept-2-yl methacrylate	-	LC50/96h (<i>Danio rerio</i>) 1.79 mg/l	EC50/48h (<i>Daphnia magna</i>) 2.75 mg/l NOEC (<i>Daphnia magna</i>) 0.233 mg/l (21 days)
Phenylbis(2,4,6-trimethylbenzoyl) Phosphine oxide	ErC50/72h (<i>Desmodesmus subspicatus</i>) >0.26 mg/l	LC50/96h (<i>Danio rerio</i>) >0.09 mg/l	EC50/48h (<i>Daphnia magna</i>) >1.17 mg/l
Naphtha (petroleum)	EL50/72h (<i>Pseudokirchneriella subcapitata</i>) >1000 mg/l	LL50/96h (<i>Oncorhynchus mykiss</i> (rainbow trout)) >1000 mg/l	EL50/48 (<i>Daphnia magna</i>) >1000 mg/l

12.2 Persistence and Degradability

7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-diyl bismethacrylate: Not readily biodegradable: 22% in 28 days.

12.3 Bioaccumulative potential

Not available

12.4 Mobility in soil

Not available

12.5 Results of PBT and vPvB assessment

Not available

12.6 Endocrine disrupting properties

Not available

12.7 Other adverse effects

Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Packing

Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information**14.1 Un number**

ADR/RID: 3082

IMDG: 3082

IATA: 3082

DOT (US): 3082

14.2 UN proper shipping name

ADR/RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-diyl bismethacrylate)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-diyl bismethacrylate)

IATA: Environmentally hazardous substance, liquid, n.o.s. (7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-diyl bismethacrylate)

DOT (US): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (7,7,9(or 7,9,9)-trimethyl-4,13-dioxo-3,14-dioxa-5,12-diazahexadecane-1,16-diyl bismethacrylate)

14.3 Transport hazard class(es)

ADR/RID: 9

IMDG: 9

IATA: 9

DOT (US): 9

14.4 Packing group

ADR/RID: III

IMDG: III

IATA: III

DOT (US): III

14.5 Environmental hazard

Marine pollutant: yes

14.6 Special precautions for user

N/A

14.7 Transport to bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available

SECTION 15: Regulatory information

This SDS complies with the following requirements of:
EU Regulation (EC) No.1907/2006 (REACH) including amendments
Regulation (EC) No.1272/2008 (CLP)
29 CFR 1910.1200 (OSHA HCS)
Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixtureCalifornia Prop. 65 Components

To the best of our knowledge the product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

TSCA inventory

The substances in this product are included on or exempted from the TSCA inventory.

15.2 Chemical safety assessment

Not available

SECTION 16: Other information

Full text of Hazards Statements referred to in sections 2 and 3:

Flam. Liq. - Flammable liquid
Asp. Tox. - Aspiration hazard
Skin Irrit. - Skin irritation
Eye Irrit. - Eye irritation
Skin Sens. - Skin sensitization
STOT SE - Specific target organ toxicity — single exposure
Aquatic Chronic - Hazardous to the aquatic environment
H226: Flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H319: Causes eye irritation.
H317: May cause an allergic skin reaction.
H335: May cause respiratory irritation.
H411: Toxic to aquatic life with long lasting effects.
H412: Harmful to aquatic life with long lasting effects.
H413: May cause long lasting harmful effects to aquatic life.

Training advice: Before using/handling the product one must read carefully present SDS.

Key Legend Information:

CAS- Chemical Abstract Service
ACGIH- American Conference of Governmental Industrial Hygienists
OSHA- Occupational Safety and Health Administration
NTP- National Toxicology program
IARC- International Agency for Research on Cancer
N/A- Not available
H-statements- Hazard statements
TLV- Threshold Limit Value
TWA- Time-weighted average
STEL- Short-Term Exposure Limit
CSA- Chemical safety assessment

SAFETY DATA SHEET

Dimengel 400

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Date of issue: 20/12/2022

Version no.: 1

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DIMENGEL WB

Dimengel WB (Water Breakable) is a proprietary photopolymer material specially designed for the Massivit 10,000 printer equipped with LED curing process. This water breakable material enables the creations of parts with complex geometries, and printing without support.

It is a breakaway material that can be removed by immersing into water bath, or peeled after exposure to water fog system, or by any other mechanical means.

Character	Method	Metric Units		Imperial Units	
Tensile strength*	ISO 527	MPa	15	psi	2,175
Elongation at break*	ISO 527	%	1	%	1
Elasticity modulus	ISO 527	GPa	2.3	psi	333,587
Flexural strength*	ISO 178	MPa	43	psi	6,237
Flexural modulus*	ISO 178	GPa	5.7	psi	826,715
Izod Impact* (Notched)	ISO 180	J/m	19.2 – 21.6	ft-lbf/in	0.36 - 0.41
Glass transition, Tg	ASTM D3418	°C	101	°F	213.8
HDT* @ 0.45 MPa	ISO 75-2	°C	83 - 88	°F	181 - 190
Density	ASTM D792	g/cm ³	1.2	lb/ft ³	75
Hardness (Shore D)	ASTM D2240	Shore D	75	Shore D	75
Color	-	Off White			

* All measurements were done on lab specimens of cured material.

** Internal lab testing.

Storage

Material should be stored in a dry place in the sealed original container at temperatures between +2°C and +40°C. Under these storage conditions, the shelf life is 1 year. The product should not be exposed to direct sunlight.

Regulation Compliancy

- Compliant with 1907/2006/EEC regulation 2006 ("REACH")
- Compliant with Regulation (EC) No 1272/2008 ("CLP")
- Compliant with the US Toxic Substances Control Act (TSCA) regulations
- Does not contain any chemicals listed on California Prop.65

Precautionary Statement

Massivit 3D printing technologies maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.



Date of issue: 02/11/2021

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Version no.: 1

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**Product name: Dimengel WBProduct description: Photo curable resin**1.2 Relevant identified uses of the substance or mixture and uses advised against**Common uses: Printing/additive manufacturing.**1.3 Details of the supplier of the safety data sheet**

N/A

E-mail address of person responsible for this SDS: N/A**1.4 Emergency telephone number****Emergency telephone number (with hours of operation):** N/A**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**Classification according to GHS:

Acute Tox. 4 H302

Eye Dam. 1 H318

Skin Sens. 1 H317

Skin Irrit. 2 H315

STOT RE 2 H373

Classification according to 29 CFR 1910.1200 (OSHA HCS):

Acute Tox. 4 H302

Eye Dam. 1 H318

Skin Sens. 1 H317

Skin Irrit. 2 H315

STOT RE 2 H373

Classification according to Regulation (EC) No. 1272/2008 (CLP):

Acute Tox. 4 H302

Eye Dam. 1 H318

Skin Sens. 1 H317

Skin Irrit. 2 H315

STOT RE 2 H373

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

2.2 Label elementsLabelling according to GHS:Hazard pictogram(s):Signal word: DangerHazard statement(s):

H302: Harmful if swallowed.

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

H318: Causes serious eye damage.

H373: May cause damage to organs through prolonged or repeated exposure. Route of exposure: Oral.

Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P305+P351+P338 +P317: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical help.

P332 + P317: If skin irritation occurs: Get medical help.

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

Labelling according to 29 CFR 1910.1200 (OSHA HCS)

Hazard pictogram(s):



Signal word: Danger

Hazard statement(s):

H302: Harmful if swallowed.

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

H318: Causes serious eye damage.

H373: May cause damage to organs through prolonged or repeated exposure. Route of exposure: Oral.

Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapors/spray.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

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/doctor.

P332 + P313: If skin irritation occurs: Get medical advice/ attention.

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

Labelling in accordance with Regulation 1272/2008 (CLP)

Hazard pictogram(s):



Signal word: Danger

Hazard statement(s):

H302: Harmful if swallowed.

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

H318: Causes serious eye damage.

H373: May cause damage to organs through prolonged or repeated exposure. Route of exposure: Oral.

Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

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/physician.

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Dimengel WB

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P332 + P313: If skin irritation occurs: Get medical advice/ attention.

P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazard

Not available

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

Ingredient name	Identifiers	%	CLP Classification	GHS Classification	OSHA HCS
4-(1-oxo-2-propenyl)-morpholine	CAS number: 5117-12-4 EC number: 418-140-1	24-49	Acute Tox. 4 H302 Eye Dam. 1 H318 Skin Sens. 1 H317 STOT RE 2 H373	Acute Tox. 4 H302 Eye Dam. 1 H318 Skin Sens. 1 H317 STOT RE 2 H373	Acute Tox. 4 H302 Eye Dam. 1 H318 Skin Sens. 1 H317 STOT RE 2 H373
Tricyclodecane dimethanol dimethacrylate	CAS number: 43048-08-4 EC number: 256-062-6	7-25	Skin Irrit. 2 H315 Eye Irrit. 2 H319	Skin Irrit. 2 H315 Eye Irrit. 2A H319	Skin Irrit. 2 H315 Eye Irrit. 2As H319
Poly(oxy-1,2-ethanediyl), α -(2-methyl-1-oxo-2-propen-1-yl)- ω -methoxy-	CAS number: 26915-72-0 EC number: 608-019-1	5-30	Skin Irrit. 2 H315 Eye Irrit. 2 H319	Skin Irrit. 2 H315 Eye Irrit. 2A H319	Skin Irrit. 2 H315 Eye Irrit. 2As H319
Ethyl phenyl(2,4,6-trimethylbenzoyl)phosphinate	CAS number: 84434-11-7 EC number: 282-810-6	0.1-2	Skin Sens. 1B H317 Aquatic Chronic 2 H411	Skin Sens. 1B H317 Aquatic Chronic 2 H411	Skin Sens. 1B H317 Aquatic Chronic 2 H411

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

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 and hence require reporting in this section.

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

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

Eyes contact: In case of contact with eyes, rinse immediately with plenty of soap and water for at least 15 minutes. Get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with plenty of water for at least 15 minutes. Get medical attention.

Inhalation: Remove the victim from site of exposure to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration. Get medical attention.

Ingestion: **Do not induce vomiting.** If victim is conscious, wash mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 (Label elements) and/or section 11 (Toxicological information) for the most important known symptoms and effects.

4.3 Indication of any immediate medical attention and special treatment needed

Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable: Foam, carbon dioxide, dry chemical.

Not suitable: Solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode. Cool containers exposed to flame with water spray until well after fire is out.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Ventilate area of spill.

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

6.4 Reference to other sections

See Section 1 for emergency contact information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapors, spray, mist or gas. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

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 measures. Avoid release to the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry, cool and well-ventilated place. Protect from heat and direct sunlight. Keep away from oxidizing agents, reducing agents, acids, bases, inert gas, oxygen scavenger, peroxides, radical forming initiators, strong alkalies, reactive metals. An air space is required above the liquid in all containers; avoid storage under an oxygen-free atmosphere.

7.3 Specific end use(s): N/A

SECTION 8: Exposure control/personal protection

8.1 Control parameters

Occupational exposure limits values: N/A

8.2 Exposure controls

Engineering measures

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal protective measures

Respiratory protection: Suitable respirator. Be sure to use an approved/certified equipment or equivalent equipment. Wear appropriate respirator when ventilation is inadequate.

Hand protection: Wear protective gloves to prevent skin exposure.

Eye protection: Wear protective safety glasses.

Skin protection: Wear appropriate long-sleeved clothing to minimize skin contact.

Environmental exposure controls: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: transparent-white thick liquid-gel

Odour: characteristic

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

Initial boiling point/boiling range: N/A

Flash point: N/A

Evaporation rate: N/A

Flammability: N/A

Upper/lower flammability or explosive limits: N/A

Vapor pressure: N/A

Vapor density: N/A

Relative density: N/A

Solubility(ies): N/A

Partition coefficient Octanol/Water: N/A

Auto-ignition temperature: N/A

Decomposition temperature: N/A

Viscosity: N/A

Explosive properties: N/A

Oxidizing properties: N/A

9.2 Other information:

N/A

SECTION 10: Stability and reactivity

10.1 Reactivity

Not available

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in Section 7.

10.3 Possibility of hazardous reactions

Hazardous reactions are not expected, under normal conditions of storage and use. However, components of this product undergo hazardous polymerization. Polymerization occurs when exposed to white light, ultraviolet light, or heat. Polymerization is exothermic and can degenerate into an uncontrolled reaction.

10.4 Conditions to avoid

Heat, direct sunlight, ultraviolet light, oxygen free atmosphere.

10.5 Incompatible materials

oxidizing agents, reducing agents, acids, bases, inert gas, oxygen scavenger, peroxides, radical forming initiators, strong alkalies or reactive metals

10.6 Hazardous decomposition products

Other decomposition products: not available

In the event of fire: see section 5

SECTION 11: Toxicological information**11.1 Information on toxicological effects**

Acute toxicity:

Product/ingredient name	Test	Species	Dose
4-(1-oxo-2-propenyl)-morpholine	LD50, Oral	Rat	588 mg/kg
	LD50, Dermal	Rat	>2000 mg/kg
	LC50, Inhalation	Rat	5.28 mg/l/4h
Ethyl phenyl(2,4,6-trimethylbenzoyl)phosphinate	LD50, Oral	Rat	>5000 mg/kg
	LD50, Dermal	Rat	>2000 mg/kg

Skin corrosion/irritation: Causes skin irritation.

Serious eye damage/irritation: Causes serious eye damage.

Respiratory or skin sensitization: May cause an allergic skin reaction.

Germ cell mutagenicity: Not available

Carcinogenicity: Not available

Reproductive toxicity: Not available

Specific target organ toxicity (single exposure): Not available

Specific target organ toxicity (repeated exposure): May cause damage to organs through prolonged or repeated exposure. Route of exposure: Oral.

Aspiration hazard: Not available

SECTION 12: Ecological information**12.1 Toxicity**

Product/ingredient name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia
4-(1-oxo-2-propenyl)-morpholine	EC50/72h (algae) 120 mg/l	-	-
Ethyl phenyl(2,4,6-trimethylbenzoyl)phosphinate	EC50/72h (algae) 1.01 mg/l	LC50/96h (fish) 1.89 mg/l	EC50/48h (daphnia) 2.26 mg/l

12.2 Persistence and Degradability

Not available

12.3 Bioaccumulative potential

Not available

12.4 Mobility in soil

Not available

12.5 Results of PBT and vPvB assessment

Not available

12.6 Other adverse effects

Not available

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Packing

Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information**14.1 Un number**ADR/RID: -IMDG: -IATA: -DOT (US): -**14.2 UN proper shipping name**ADR/RID: Not regulatedIMDG: Not regulatedIATA: Not regulatedDOT (US): Not regulated**14.3 Transport hazard class(es)**ADR/RID: -IMDG: -IATA: -DOT (US): -**14.4 Packing group**ADR/RID: -IMDG: -IATA: -DOT (US): -**14.5 Environmental hazard**

Marine pollutant: N/A

14.6 Special precautions for user

N/A

14.7 Transport to bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available

SECTION 15: Regulatory information

This SDS complies with the following requirements of:

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

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

29 CFR 1910.1200 (OSHA HCS)

Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**California Prop. 65 Components**

WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. (Benzene, methyl- 108-88-3 ≤ 0.6%)

TSCA inventory

The substances in this product are included on or exempted from the TSCA inventory.

15.2 Chemical safety assessment

Not available

SECTION 16: Other information**Full text of Hazards Statements referred to in sections 2 and 3:**

Acute Tox. - Acute toxicity

Eye Dam. - Serious eye damage

Skin Sens. - Skin sensitization
Skin Irrit. - Skin irritation
Eye Irrit. - Eye irritation
STOT RE - STOT RE - Specific target organ toxicity — repeated exposure
Aquatic Chronic - Hazardous to the aquatic environment
H302: Harmful if swallowed.
H318: Causes serious eye damage.
H317: May cause an allergic skin reaction.
H315: Causes skin irritation.
H319: Causes eye irritation.
H373: May cause damage to organs through prolonged or repeated exposure.
H411: Toxic to aquatic life with long lasting effects.

Training advice: Before using/handling the product one must read carefully present SDS.

Key Legend Information:

CAS- Chemical Abstract Service
ACGIH- American Conference of Governmental Industrial Hygienists
OSHA- Occupational Safety and Health Administration
NTP- National Toxicology program
IARC- International Agency for Research on Cancer
N/A- Not available
H-statements- Hazard statements
TLV- Threshold Limit Value
TWA- Time-weighted average
STEL- Short-Term Exposure Limit
CSA- Chemical safety assessment

Date of issue: 02/11/2021

Version no.: 1

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Hazard statement(s):

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

H317: May cause an allergic skin reaction.

H373: May cause damage to organs through prolonged or repeated exposure.

H335: May cause respiratory irritation.

Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapours/spray.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P316: Get immediate emergency medical help.

P305+P354+P338: IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P303+P361+P354: IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.

Labelling according to 29 CFR 1910.1200 (OSHA HCS)Hazard pictogram(s):

Signal word: Danger

Hazard statement(s):

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

H317: May cause an allergic skin reaction.

H373: May cause damage to organs through prolonged or repeated exposure.

H335: May cause respiratory irritation.

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P305+P354+P338: IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P303+P361+P354: IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.

Labelling in accordance with Regulation 1272/2008 (CLP)Hazard pictogram(s):

Signal word: Danger

Hazard statement(s):

H302: Harmful if swallowed.

H314: Causes severe skin burns and eye damage.

H317: May cause an allergic skin reaction.

H373: May cause damage to organs through prolonged or repeated exposure.

H335: May cause respiratory irritation.

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Precautionary Statement(s):

P260: Do not breathe dust/fume/gas/mist/vapors/spray.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P310: Immediately call a POISON CENTER/doctor.

P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or 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.

P314: Get medical advice/attention if you feel unwell.

2.3 Other hazard

Not available

SECTION 3: Composition / information on ingredients

3.2 Mixtures:

Ingredient name	Identifiers	%	CLP Classification	GHS Classification	OSHA HCS
4,4'-Diaminodicyclohexylmethane	CAS number: 1761-71-3 EC number: 217-168-8	32-<99	Acute Tox. 4 H302 Skin Corr. 1B H314 Eye Dam. 1 H318 Skin Sens. 1B H317 STOT RE 2 H373	Acute Tox. 4 H302 Skin Corr. 1B H314 Eye Dam. 1 H318 Skin Sens. 1B H317 STOT RE 2 H373	Acute Tox. 4 H302 Skin Corr. 1B H314 Eye Dam. 1 H318 Skin Sens. 1B H317 STOT RE 2 H373
Copolymer of formaldehyde and aniline, hydrogenated	CAS number: 135108-88-2 EC number: 603-894-6	4-<20	Acute Tox. 3 H301 Skin Corr. 1C H314 Eye Dam. 1 H318 Skin Sens. 1 H317 STOT RE 2 H373 Aquatic Chronic 3 H412	Acute Tox. 3 H301 Skin Corr. 1C H314 Eye Dam. 1 H318 Skin Sens. 1 H317 STOT RE 2 H373 Aquatic Chronic 3 H412	Acute Tox. 3 H301 Skin Corr. 1C H314 Eye Dam. 1 H318 Skin Sens. 1 H317 STOT RE 2 H373 Aquatic Chronic 3 H412
Boron nitride	CAS number: 10043-11-5 EC number: 233-136-6	2-40	Skin Irrit. 2 H315 Eye Irrit. 2 H319 STOT SE 3 H335	Skin Irrit. 2 H315 Eye Irrit. 2A H319 STOT SE 3 H335	Skin Irrit. 2 H315 Eye Irrit. 2B H319 STOT SE 3 H335
Polyamine amide salt	CAS number: N/A EC number: N/A	<5	Skin Irrit. 2 H315	Skin Irrit. 2 H315	Skin Irrit. 2 H315

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

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 and hence require reporting in this section.

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eyes contact: In case of contact with eyes, rinse immediately with plenty of soap and water for at least 15 minutes. Get medical attention.

Skin contact: Take off contaminated clothing and shoes immediately. Wash off with plenty of water for at least 15 minutes. Get medical attention.

Inhalation: Remove the victim from site of exposure to fresh air. If breathing is difficult, give oxygen. If not breathing give artificial respiration. Get medical attention.

Ingestion: **Do not induce vomiting.** If victim is conscious, wash mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

See section 2.2 (Label elements) and/or section 11 (Toxicological information) for the most important known symptoms and effects.

4.3 Indication of any immediate medical attention and special treatment needed

Not available

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable: Foam, carbon dioxide, dry chemical, dry sand.

Not suitable: N/A

5.2 Special hazards arising from the substance or mixture

Thermal decomposition can lead to release of irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode. Cool containers exposed to flame with water spray until well after fire is out.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Ventilate area of spill.

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

6.4 Reference to other sections

See Section 1 for emergency contact information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid inhalation of vapors, spray, mist or gas. Wash thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice.

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 measures. Avoid release to the environment.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep container tightly closed in a dry, cool and well-ventilated place. Keep away from oxidizing agents and acids.

7.3 Specific end use(s): N/A

SECTION 8: Exposure control/personal protection

8.1 Control parameters

Occupational exposure limits values: N/A

8.2 Exposure controlsEngineering measures

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Person Protective measures

Respiratory protection: Suitable respirator. Be sure to use an approved/certified equipment or equivalent equipment. Wear appropriate respirator when ventilation is inadequate.

Hand protection: Wear protective gloves to prevent skin exposure. Butyl rubber, nitrile rubber, neoprene gloves, impervious gloves.

Eye protection: Wear protective safety glasses.

Skin protection: Wear appropriate long-sleeved clothing to minimize skin contact.

Environmental exposure controls: Not available

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: White thick liquid

Odour: characteristic

Odour threshold: N/A

pH: N/A

Melting point/Freezing point: N/A

Initial boiling point/boiling range: N/A

Flash point: N/A

Evaporation rate: N/A

Flammability: N/A

Upper/lower flammability or explosive limits: N/A

Vapor pressure: N/A

Vapor density: N/A

Relative density: N/A

Solubility(ies): N/A

Partition coefficient Octanol/Water: N/A

Auto-ignition temperature: N/A

Decomposition temperature: N/A

Viscosity: N/A

Explosive properties: N/A

Oxidizing properties: N/A

9.2 Other information:

N/A

SECTION 10: Stability and reactivity

10.1 Reactivity

Not available

10.2 Chemical stability

The product is stable under normal handling and storage conditions described in Section 7.

10.3 Possibility of hazardous reactions

Hazardous reactions are not expected, under normal conditions of storage and use.

10.4 Conditions to avoid

Not available

10.5 Incompatible materials

CAUTION! N-Nitrosamines, many of which are known to be potent carcinogens, may be formed when 4,4'-Diaminodicyclohexylmethane and Copolymer of formaldehyde and aniline, hydrogenated come in contact with nitrous acid, nitrites or atmospheres with high nitrous oxide concentrations. Nitrous acid and other nitrosating agents Organic acids (i.e. acetic acid, citric acid etc.). Mineral Acid Sodium hypochlorite. Its slowly corrodes copper, aluminum, zinc and galvanized surfaces. Reaction with peroxides may result in violent decomposition of peroxide possibly creating an explosion. Oxidizing agents.

10.6 Hazardous decomposition products

Other decomposition products: not available
In the event of fire: see section 5

SECTION 11: Toxicological information**11.1 Information on toxicological effects**

Acute toxicity:

Product/ingredient name	Test	Species	Dose
4,4'-Diaminodicyclohexylmethane	LD50, Oral	Rat	380 mg/kg
	LD50, Dermal	Rat	>2000 mg/kg
Copolymer of formaldehyde and aniline, hydrogenated	LD50, Oral	Rat	300 mg/kg

Skin corrosion/irritation: Causes severe skin burns.

Serious eye damage/irritation: Causes severe eye damage.

Respiratory or skin sensitization: May cause an allergic skin reaction.

Germ cell mutagenicity: Not available

Carcinogenicity: Not available

Reproductive toxicity: Not available

Specific target organ toxicity (single exposure): May cause respiratory irritation.

Specific target organ toxicity (repeated exposure): May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard: Not available

Other effects: Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause sore throat.

SECTION 12: Ecological information**12.1 Toxicity**

Product/ingredient name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia
4,4'-Diaminodicyclohexylmethane		LC50/96h (Leuciscus idus melanotus) > 100 mg/l	EC50/48h (Daphnia magna) 9.24 mg/l NOEC/21d (Daphnia magna) 4 mg/l
Polyamine amide salt		LC50/96h (Oncorhynchus mykiss (rainbow trout)) > 48 mg/l	EC50/48h (Daphnia magna (Water flea)) > 30 mg/l

12.2 Persistence and Degradability

Not available

12.3 Bioaccumulative potential

Not available

12.4 Mobility in soil

Not available

12.5 Results of PBT and vPvB assessment

Not available

12.6 Other adverse effects

Not available

SECTION 13: Disposal considerations**13.1 Waste treatment methods****Product**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Packing

Empty containers should be taken for local recycling, recovery or waste disposal.

SECTION 14: Transport information**14.1 Un number**ADR/RID: 2735IMDG: 2735IATA: 2735DOT (US): 2735**14.2 UN proper shipping name**ADR/RID: AMINES, LIQUID, CORROSIVE, N.O.S. (Cycloaliphatic amine, Mixed Cycloaliphatic amines)IMDG: AMINES, LIQUID, CORROSIVE, N.O.S. (Cycloaliphatic amine, Mixed Cycloaliphatic amines)IATA: Amines, liquid, corrosive, n.o.s. (Cycloaliphatic amine, Mixed Cycloaliphatic amines)DOT (US): Amines, liquid, corrosive, n.o.s. (Cycloaliphatic amine, Mixed Cycloaliphatic amines)**14.3 Transport hazard class(es)**ADR/RID: 8IMDG: 8IATA: 8DOT (US): 8**14.4 Packing group**ADR/RID: IIIMDG: IIIATA: IIDOT (US): II**14.5 Environmental hazard**

Marine pollutant: no

14.6 Special precautions for user

N/A

14.7 Transport to bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not available

SECTION 15: Regulatory information

This SDS complies with the following requirements of:
EU Regulation (EC) No.1907/2006 (REACH) including amendments
Regulation (EC) No.1272/2008 (CLP)
29 CFR 1910.1200 (OSHA HCS)
Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixtureCalifornia Prop. 65 Components

To the best of our knowledge the product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

TSCA inventory

The substances in this product are included on or exempted from the TSCA inventory.

15.2 Chemical safety assessment

Not available

SECTION 16: Other information

Full text of Hazards Statements referred to in sections 2 and 3:

Acute Tox.- Acute toxicity
Skin Corr.- Skin corrosion
Eye dam.- Serious eye damage
Skin Sens. - Skin sensitization
Skin Irrit. - Skin irritation
Eye Irrit. - Eye irritation
STOT SE - Specific target organ toxicity — single exposure
STOT RE - Specific target organ toxicity — repeated exposure
Aquatic Chronic - Hazardous to the aquatic environment
H301: Toxic if swallowed.
H302: Harmful if swallowed.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H317: May cause an allergic skin reaction.
H315: Causes skin irritation.
H319: Causes eye irritation.
H335: May cause respiratory irritation.
H373: May cause damage to organs through prolonged or repeated exposure.
H412: Harmful to aquatic life with long lasting effects.

Training advice: Before using/handling the product one must read carefully present SDS.

Key Legend Information:

CAS- Chemical Abstract Service
ACGIH- American Conference of Governmental Industrial Hygienists
OSHA- Occupational Safety and Health Administration
NTP- National Toxicology program
IARC- International Agency for Research on Cancer
N/A- Not available

H-statements- Hazard statements
TLV- Threshold Limit Value
TWA- Time-weighted average
STEL- Short-Term Exposure Limit
CSA- Chemical safety assessment

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