

## Safety Data Sheet

according to Regulation (EC) No 1907/2006 and 1272/2008,  
Hazard Communication Standard 29 CFR 1910 (USA),  
WHS Regulations Australia,  
JIS Z 7253 (2012) Japan

### StrengthMax / Z-Max™ 90 Hardener

Revision Date: May 1, 2018

#### 1. IDENTIFICATION OF THE PREPARATION AND OF THE COMPANY/UNDERTAKING

##### 1.1 Identification of the mixture: StrengthMax / Z-Max™ 90 Hardener

**1.2 Use of the preparation:** An infiltration hardener used to strengthen parts made with ZPrinter® 3D printers and ProJet® x60 3D printers.

##### 1.3 Company/undertaking identification:

3D Systems, Inc.  
333 Three D Systems Circle  
Rock Hill, South Carolina U.S.A.  
Phone: 803.326.3900 or  
Toll-free Phone: 800.793.3669  
e-mail: [moreinfo@3dsystems.com](mailto:moreinfo@3dsystems.com)  
Chemical Emergency:  
800.424.9300 – Chemtrec

3D Systems Europe Ltd.  
Mark House, Mark Road  
Hemel Hempstead  
Herts HP2 7 United Kingdom  
Phone: +44 144-2282600  
e-mail: [moreinfo@3dsystems.com](mailto:moreinfo@3dsystems.com)  
Chemical Emergency:  
+1 703.527.3887 - Chemtrec

3D Systems / Australia  
5 Lynch Street  
Hawthorn, VIC 3122  
+1 03 9819-4422  
e-mail: [moreinfo@3dsystems.com](mailto:moreinfo@3dsystems.com)  
Chemical Emergency:  
+(61) 29037.2994 – Aus Chemtrec

#### 2. HAZARDS IDENTIFICATION

##### 2.1 Classification

**GHS : Regulation (EC) No. 1272/2008, HazCom 29 CFR 1910, Australian Dangerous Goods Code:**

Skin corrosion/irritation	Category 2	H312
Acute Toxicity	Category 4	H302
Skin corrosion	Category 1	H314
Skin sensitization	Category 1	H317
Aquatic Chronic	Category 4	H412

##### Regulation (EC) 67/548/EEC and 1999/45/EC:

C, Xn

R 20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

R 34 Causes burns.

R 43 may cause sensitization by skin contact.

R 52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

##### 2.2 Label Elements

**Regulation (EC) No, 1272/2008:**

**Hazard pictograms and signal word:**



**GHS07**

**GHS 05**

**Signal word: Warning**

##### Hazard statements:

H312: Harmful in contact with skin

H302: Harmful if swallowed

H314: Causes severe skin burns and eye damage

H317: May cause an allergic skin reaction

H412: Harmful to aquatic life with long lasting effects

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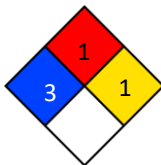
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**Hazard determining components of labelling:** 3-aminomethyl-3,5,5-trimethylcyclohexylamine

**Precautionary statements:**

P401: Store in a well-ventilated place  
P280: Wear protective gloves/protective clothing/eye protection/face protection  
P302+352: IF ON SKIN: Wash with plenty of soap and water.  
P305+351+338: 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.  
P333+313: If skin irritation or rash occurs: Get medical advice/attention.  
P337+313: If eye irritation persists: Get medical advice/attention.



NFPA Ratings  
0 = Minimal  
1 = Slight  
2 = Moderate  
3 = Serious  
4 = Severe

**Hazardous Materials Identification System (HMIS):**

(Degree of hazard: 0 = low, 4 = extreme);

Health **3**  
Flammability **1**  
Physical Hazards **1**

**Personal Protective Equipment B**

Skin, eye protection

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**3.1 Chemical characterization:** Organic mixture

**3.2 Dangerous components:**

Chemical name	CAS-No	EC-No	%	Classification Regulation (EC) 1272/2008
3-aminomethyl-3,5,5-trimethylcyclohexylamine	2855-13-2	220-666-8	50-100	Acute Tox.4, H312 Acute Tox.4, H301 Skin Corr.1B, H314 Skin Sens.1, H317 Aquat. Chron.3, H412
Benzyl alcohol	100-51-6	202-859-9	10-25	Acute Tox.4, H 332 Acute Tox.4, H302

### 4. FIRST AID MEASURES

**4.1 General Information:** Ensure that eyewash stations and safety showers are close to the workstation location.

**4.2 In case of inhalation:** May cause respiratory irritation. Move affected person to fresh air. If respiratory irritation occurs, if breathing becomes difficult seek medical attention immediately.

**4.3 In case of skin contact:** Immediately wash skin with soap and rinse with large amounts of water. Remove and wash contaminated clothing promptly. If symptoms persist, seek medical attention.

**4.4 In case of eye contact:** Immediately flush eyes with copious amounts of water for at least 15 minutes. Call physician if irritation continues.

**4.5 In case of ingestion:** Do not induce vomiting. Wash out mouth with water provided the person is conscious and seek medical attention.

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#### 5. FIRE-FIGHTING MEASURES

**5.1 Suitable extinguishing media:** Water mist, dry chemical, carbon dioxide, or appropriate foam.

**5.2 Extinguishing media which must not be used for safety reasons:** High volume water jet.

**5.3 Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases:** Thermal decomposition products can include CO<sub>2</sub>, CO, NO<sub>x</sub> and smoke.

**5.4 Special protective equipment for fire-fighters:** Wear full protective clothing, including helmet, self-contained positive-pressure or pressure demand breathing apparatus, protective clothing and facemask.

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#### 6. ACCIDENTAL RELEASE MEASURES

**6.1. Personal precautions:** Keep unnecessary personnel away. Wear appropriate protective equipment and clothing. Consult expert immediately.

**6.2 Environmental precautions:** Do not allow product to enter sewage systems, surface water or ground water.

**6.3 Methods for cleaning up:** Absorb product with liquid-binding material such as diatomite, sand, acid binders, universal binders, sawdust. Do not flush down drains. Place in closed containers. Ventilate area and wash spill site after material pickup is complete.

**6.4. Waste Disposal Method:** Follow safe solid waste disposal guidelines in accordance with federal, state and local regulations. National or regional provisions may also be in force. It is the responsibility of the generator to determine whether the material meets the criteria of a hazardous waste.

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#### 7. HANDLING AND STORAGE

**7.1 Handling:** Provide adequate ventilation. Use suitable protective equipment. Avoid contact with skin and eyes. Do not breathe vapors or mist. Avoid ignition sources. Do not allow to enter drains or watercourses.

**7.2 Storage:** Store sealed in the original container at room temperature. Keep this material indoors in a cool, dry, well ventilated place.

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#### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

##### 8.1 Exposure limit values:

Component	Component Manufacturer IEL (Internal Exposure Limit)
3-aminomethyl-3,5,5-trimethylcyclohexylamine	NA
Benzyl alcohol	NA

##### 8.2 Exposure controls

**Technical measures to prevent exposure:** Use local exhaust ventilation.

**Instructual measures to prevent exposure:** When using, do not eat, drink or smoke. Wash hands after handling and before eating, smoking and using the lavatory and at the end of the day.

##### Personal protection equipment:

**Respiratory protection:** If ventilation cannot effectively keep vapor concentrations below established limits, appropriate certified respiratory protection must be provided (respirator FFP3).

**Hand protection:** Use impervious Neoprene gloves.

**Eye protection:** Wear safety glasses or chemical goggles.

**Body protection:** Use apron and closed shoes.

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#### 9. PHYSICAL AND CHEMICAL PROPERTIES

##### 9.1 Appearance:

**Physical state:** Liquid

**Colour:** clear

**Odour:** Amine-like

##### 9.2 Important health, safety and environmental information

<b>pH (20 °C):</b>	> 10
<b>Melting point/range (°C):</b>	NA
<b>Boiling point/range (°C):</b>	200°C
<b>Flash point (°C):</b>	121°C
<b>Ignition temperature (°C):</b>	>300°C
<b>Vapour pressure (°C):</b>	NA
<b>Density (g/cm<sup>3</sup>):</b>	0.94 g/cm <sup>3</sup>
<b>Bulk density (kg/m<sup>3</sup>):</b>	NA
<b>Water solubility (20°C in g/l):</b>	Insoluble
<b>Viscosity, dynamic (mPa s):</b>	NA
<b>Dust explosion hazard:</b>	NA
<b>Explosion limits:</b>	NA

#### 10. STABILITY AND REACTIVITY

**10.1 Conditions to avoid:** Stable under recommended storage conditions.

**10.2 Materials to avoid:** Do not mix with acids.

**10.3 Hazardous decomposition products:** Corrosive gases/vapors, ammonia

**10.4 Hazardous Polymerization:** Strong exothermic reaction with acids.

#### 11. TOXICOLOGICAL INFORMATION

**11.1 Toxicokinetics, metabolism and distribution:** NA

##### 11.2 Acute effects (toxicity tests)

Component	LD50 Oral	LD50 Dermal
3-aminomethyl-3,5,5-trimethylcyclohexylamine	1030 mg/kg (rat)	1840 mg/kg (rabbit)
Benzyl alcohol	1230 mg/kg (rat)	2000 mg/kg (rabbit)

**Primary irritant effect:** Corrosive to skin, eyes and mucous membranes

**Sensitization:** May cause sensitization by skin contact.

**Additional toxicological information:** Swallowing is corrosive to mouth and throat and can cause perforation of esophagus and stomach.

**Potential Human Health Effects:** Irritating to the skin, eyes and mucous membranes. May cause sensitization by skin contact.

**Target Organs or Systems:** Skin, mucous membranes and eyes.

**Route of Exposure:** Skin Contact: Irritating and corrosive to the skin. May cause sensitization.

Eye Contact: Irritating and corrosive to the eyes.

Inhalation: Irritating and corrosive to mucous membranes.

Ingestion: Swallowing is corrosive to mouth and throat and can cause perforation of esophagus and stomach.

**Acute:** Irritation and corrosive to the skin, mucous membranes, and eyes.

**Chronic:** Skin: May cause sensitization from skin contact.

**Carcinogens Under OSHA, ACGIH, NTP, IARC, OTHER:**

All ingredients in this product contain no carcinogens in concentrations of 0.1 percent or greater based on U.S. and European chemical data base information.

**Potential Environmental Effects:** Harmful to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

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#### 12. Ecological information

**12.1 Ecotoxicity:** The aquatic toxicity of the product is unknown; the following information is available for components:

Component	Data
3-aminomethyl-3,5,5-trimethylcyclohexylamine	EC50/96h-110 mg/l (fish) EC 50/24h-44mg/l (Daphnia) EC 50/72h-37mg/l(Algae)

**12.2 Mobility:** No information available for product.

**12.3 Persistence and degradability:** No information available for product.

**12.4 Results of PBT assessment:** No information available for product

**12.5 Other adverse effects:** No information available for product

#### 13. DISPOSAL CONSIDERATIONS

**13.1 Appropriate disposal / Product:** As with all foreign substances do not allow to enter the storm or sewer drainage systems. Dispose of the product by burning in a suitable incinerator or bury in an approved land field following safe solid waste disposal guidelines in accordance with governmental regulations (community, national or regional). Contact a licensed professional waste disposal service to dispose of this product.

**13.2 Waste codes / waste designations according to EWC / AVV**

20 01 27 paint, inks, adhesives and resins containing dangerous substances

**13.3 Additional information: Uncleaned Packaging:** Recommend that empty containers not be disposed of unless any remaining material adhering to the internal walls has been removed.

#### 14. TRANSPORT INFORMATION



**Land transport ADR/RID (cross-border)**

ADR/RID class: 8 Corrosive substances

Danger code (Kemler): 80

UN-Number: 2289

Packaging group: III

Hazard label: 8

Description of goods: 2289 ISOPHORONEDIAMINE

**Maritime transport IMDG:**

IMDG Class: 8

UN Number: 2289

Label: 8

Packaging group: III

EMS Number: F-A, S-B

Marine pollutant: No

Proper shipping name: ISOPHORONEDIAMINE

**Air transport ICAO-TI and IATA-DGR:**

ICAO/IATA Class: 8

UN/ID Number: 2289

Label: 8

Packaging group: III

Proper shipping name: ISOPHORONEDIAMINE

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#### 15. REGULATORY INFORMATION

##### 15.1 EU regulations

EINEC/ELINCS/NLP: All materials are listed  
REACH Annex XVII: None listed

##### 15.2. US FEDERAL

TSCA: All materials are listed on the TSCA Inventory or are not subject to TSCA requirements:  
California Proposition 65: This product does not contain chemicals which are known to the state of California to cause cancer, birth, or any other reproductive defects.

##### 15.3. Australian regulations

SUSDP, Industrial Chemicals Act 1989:  
Australian Inventory of Chemical Substances, AICS: Listed

##### 15.4 Japanese regulations

Chemical Risk Information platform (CHRIP)	Listed
Industrial Health and Safety Law	not applicable
Hazardous material	not applicable
Organic solvent poison prevention rule	not applicable
Ordinance on prevention of hazard due to specified chemical substances	not applicable
Lead Poisoning Prevention Rule	not applicable
Poison and Deleterious Substance Control law	not applicable
PRTR and Promotion of Chemical Management law	no listed components
Fire Services Act	Category 4, Class 3, oil
Explosives Law	not applicable
High pressure gas safety law	not applicable
Export Trade Control Order	not applicable
Waste Disposal and Public Cleaning Law	applicable, industrial waste

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#### 16. OTHER INFORMATION

##### 16.1 Relevant Hazard Statements (number and full text) referred to in sections 2 and 3 (according to (EC) No. 1272/2008):

Acute Tox.4, H312: Acute Toxicity, category 4, H 312: Harmful in contact with skin  
Acute Tox.4, H301: Acute Toxicity, category 4, H 301: Toxic if swallowed  
Acute Tox.4, H302: Acute Toxicity, category 4, H 302: Harmful if swallowed  
Acute Tox.4, H 332: Acute Toxicity, category 4, H 332: Harmful if inhaled  
Skin Corr.1B, H314: Skin Corrosion, category 1B, H 314: Causes severe skin burns and eye damage  
Skin Sens.1, H317; Skin Sensitization, category 1, H 317: May cause an allergic skin reaction  
Aquat. Chron.3, H412: Aquatic Chronic, category 3, H412: Harmful to aquatic life with long lasting effects

##### Relevant R-Phrases (number and full text) referred to in sections 2 and 3:

C: Corrosive  
Xn; Harmful  
R20/22: Harmful by inhalation and if swallowed  
R 21/22: Harmful in contact with skin and if swallowed  
R34: Causes burns  
R43: May cause sensitisation by skin contact  
52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

##### 16.2 Further information:

SDS Creation Date: .....March 20, 2013  
SDS Revision #: .....-04-A  
SDS Revision Date: .....May 1, 2018  
Reason for Revision: .....Update header, section 3.

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[www.3dsystems.com](http://www.3dsystems.com)

800.793.3669 (Toll-free in the US GMT-07:00; N. America, Mon – Fri, 6:00 a.m. to 6 p.m.)

803.326.3900 (Outside the U.S. GMT-07:00; N. America, Mon – Fri, 6:00 a.m. to 6 p.m.)

+44 144-2282600 (Europe GMT+01:00; Mon – Fri, 08:00 a.m. - 17:00 p.m. MEZ)

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