



**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

**DuraForm® FlexSeal Black**

Revision Date: October 4, 2016

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

**1.1 Identification of the mixture: DuraForm FlexSeal Black**

**1.2 Use of the preparation:** For use with SLS (selective laser sintering) systems

**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  
Chemical Emergency:  
800.424.9300 – Chemtrec

3D Systems Europe Ltd.  
Mark House, Mark Road  
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e-mail: 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  
Chemical Emergency:  
+(61) 29037.2994 – Aus Chemtrec

**2. HAZARDS IDENTIFICATION**

**2.1 Classification**

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

Serious eye irritation	Category 2	H319
Skin irritation	Category 2	H315
Aquatic environment- acute hazard	Category 3	H402

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

Xi, R 36/38

**2.2 Label Elements**

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

**Hazard pictograms and signal word:**



**GHS07**

**Signal word: Warning**

**Hazard determining components of labelling:**

Diethylene glycol

**Hazard statements:**

H319: Causes serious eye irritation  
H315: Causes skin irritation  
H402: Harmful to aquatic life

**Precautionary statements:**

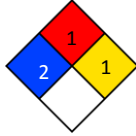
P264: Wash face, hands and any exposed skin thoroughly after handling.  
P273: Avoid release to the environment.  
P307+313: If exposed or concerned: Get medical advice/attention  
P303+361+353: If on skin: Take off contaminated clothing and wash before reuse  
Wash contaminated clothing before reuse.  
P302+352: If on skin, wash with 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  
P501: Dispose of contents/container in accordance with local/regional regulations



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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 **2**  
Flammability **1**  
Physical Hazards **1**

**Personal Protection:**

Skin, eye protection

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

**3.1 Chemical characterization:**

**Description:** Organic mixture

**3.2 Dangerous components:**

Chemical name	CAS-No	EC-No	%	Classification	
				Regulation (EC) 1272/2008	Regulation 67/548/EEC, 1999/45/EC
DIETHYLENE GLYCOL	111-46-6	203-872-2	1-1.5	Acute Tox. 4 , H302	Xn, R22
ETHOXYLATED OLEIC ALCOHOL	9004-98-2	500-016-2	1-1.5	Acute Tox. 4, H302 Eye Dam. 1, H318	Xn R22 ,41
POTASSIUM HYDROXIDE	1310-58-3	215-181-3	0.5-1	Acute Tox. 4 , H302 Skin Corr. 1A , H314	C;R35 Xn;R22
AMMONIA	1336-21-6	215-647-6	0.1-0.3	Skin Corr. 1B ,H314 Aquatic Acute 1, H400	C;R34 N;R50
AMINES, SOYA ALKYL	61790-18-9	263-112-0	0.1-0.2	Acute Tox. 4, H302 Skin Corr. 1A, H314 Aquatic Acute 1, H400	Xn;R22 C;R35 N;R50

**4. FIRST AID MEASURE**

**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:** May cause irritation or sensitization by skin contact, including redness and/or swelling. Immediately flush skin with plenty of soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse.

**4.4 In case of eye contact:** Irritating to eyes. Causes redness, swelling and pain. Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if symptoms persist.

**4.5 In case of ingestion:** Irritating to mouth, throat and stomach. If ingested, drink plenty of water and seek immediate medical attention. Do not induce vomiting.

**4.6 Self-protection of the first aider:** Put on appropriate protective equipment (see section 8). Move exposed person to fresh air. Remove contaminated clothing and shoes.

**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.



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**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 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.

**5.5 Additional information:** Move container from area if it can be done without risk. Cool containers with water spray. Avoid inhalation of material or combustion by-products.

## 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:** Stop the flow of material, if this is without risk. Ventilate contaminated area. Eliminate sources of ignition. In case of contamination of aquatic environment inform local authorities.

**6.3 Methods for 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. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Clean with detergents. Avoid solvents.

## 7. HANDLING AND STORAGE

**7.1 Handling** Operators should wear anti-static footwear and clothing. Use only non-sparking tools. Good housekeeping standards and regular safe removal of waste materials will minimize the risks of spontaneous combustion and other fire hazards. Vapors are heavier than air and may spread along floors. Prevent the creation of flammable or explosive concentrations of vapor in air and avoid vapor concentration higher than the occupational exposure limits. Provide adequate ventilation. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Electrical equipment should be protected to the appropriate standard. Preparation may charge electrostatically: always use earthing leads when transferring from one container to another. Keep container tightly closed. Keep away from open flames, hot surfaces and sources of ignition. Avoid contact with skin and eyes. Do not breathe vapors or spray mist. When using, do not eat, drink or smoke. Do not use pressure to empty drums. Store in original container.

**7.2 Storage:** Containers which are opened must be carefully resealed and kept upright to prevent leakage. Take notice of the directions of use on the label. Keep in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Keep away from direct sunlight. Store in a place accessible by authorized persons only. Do not smoke.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Exposure limit values:

General Product Information: No occupational exposure limits (PEL/TWA) have been established for this product.  
Component Analysis:

Component	Component Manufacturer OEL
DIETHYLENE GLYCOL	10 ppm 44 mg/m <sup>3</sup>
POTASSIUM HYDROXIDE	2 mg/m <sup>3</sup>
AMMONIA ...%	14 mg/m <sup>3</sup> 20 ppm

### 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.



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**Personal protection equipment:**

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

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

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

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

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**9.1 Appearance:**

**Physical state:** Liquid

**Colour:** Black

**Odor:** ammonia

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

<b>pH (20 °C):</b>	NA
<b>Melting point/range (°C):</b>	NA
<b>Boiling point/range (°C):</b>	100°C
<b>Flash point (°C):</b>	100°C (cc)
<b>Ignition temperature (°C):</b>	NA
<b>Vapour pressure (°C):</b>	24 mmHg/25°C
<b>Density (g/cm<sup>3</sup>):</b>	1.01 g/cm <sup>3</sup>
<b>Bulk density (kg/m<sup>3</sup>):</b>	NA
<b>Water solubility (20°C in g/l):</b>	slightly soluble
<b>Viscosity, dynamic (mPa s):</b>	35 cps (23°C)
<b>Explosion limits:</b>	NA

**10. STABILITY AND REACTIVITY**

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

**10.2 Materials to avoid:** Oxidizing materials, strong acids and strong bases

**10.3 Hazardous decomposition products:** Carbon dioxide, carbon monoxide and other toxic fumes can be released at high temperatures or upon burning.

**11. TOXICOLOGICAL INFORMATION**

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

**11.2 Acute effects (toxicity tests)**

**Component analysis:**

Ingredient Name CAS-No.	LD50 Oral	LD50 Dermal
DIETHYLENE GLYCOL 111-46-6	12565 mg/kg ( Rat )	11890 mg/kg ( Rabbit )
ETHOXYLATED OLEIC ALCOHOL 9004-98-2	2700 mg/kg ( Rat )	
POTASSIUM HYDROXIDE 1310-58-3	214 mg/kg ( Rat )	

**Irritant and corrosive effects:** Irritating

**Irritation to respiratory tract:** NA

**11.3 General remarks:**

Carcinogenicity: None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.



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**12. Ecological information**

**12.1 Ecotoxicity:** The aquatic toxicity of the product is unknown.

**Component analysis:**

Ingredient Name CAS-No.	Acute Fish toxicity:	Freshwater Daphnia 48 hour - Acute Toxicity Data	Freshwater Water Flea 48 hour - Acute Toxicity Data
DIETHYLENE GLYCOL 111-46-6	= 75200 mg/L Pimephales promelas	= 84000 mg/L Daphnia magna	
POTASSIUM HYDROXIDE 1310-58-3	= 80 mg/L Gambusia affinis		
AMMONIA ...% 1336-21-6	= 8.2 mg/L Pimephales promelas	= 0.66 mg/L Daphnia pulex	= 0.66 mg/L water flea

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

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

**12.4 Bioaccumulative potential**

**Component analysis:**

Ingredient Name CAS-No.	LogKow (Coefficient of Octanol/Water Distribution)	Bioconcentration Factors
DIETHYLENE GLYCOL 111-46-6	-1.98	100 - 180 static
POTASSIUM HYDROXIDE 1310-58-3	0.65 0.83	

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

**13. DISPOSAL CONSIDERATIONS**

**13.1 Appropriate disposal / Product:** Do not contaminate drains, soil or surface waters with this material or its container. Reduce waste by attempting to utilize product completely. Dispose of this container and its contents in accordance with all local, state, and federal regulations. Do not reuse or refill.

**13.2 Waste codes / waste designations according to EWC / AVV:** 08 01 11

**13.3 Appropriate packaging:** NA

**13.4 Additional information:** Prior to disposal 3D Systems recommends consulting an approved waste disposal firm to ensure regulatory compliance.

**14. TRANSPORT INFORMATION**

**14.1 Land transport (ADR/RID/GGVSE):** Not Regulated

Official transport designation:

Class:

Classification Code:

UN-No.:

Packing group:

Hazard label:

Tunnel restriction code:

Special provisions:



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### 14.2 Sea transport (IMDG-Code/GGVSee): Not Regulated

Proper Shipping Name:

Class:

UN-No.:

Packing group:

EmS:

Marine Pollutant:

Special provisions:

### 14.3 Air transport (ICAO-IATA/DGR): Not Regulated

Proper Shipping Name:

Class:

UN-No.:

Packing group:

Special provisions:

## 15. REGULATORY INFORMATION

### 15.1 EU regulations

EINEC/ELINCS/NLP: All materials are listed

REACH Annex XVII: None listed

### 15.2 National EU regulations

Wassergefährdungsklasse (water hazard class, Germany): WGK 2: Hazard to waters

### 15.3 US FEDERAL

TSCA: All materials are listed on the TSCA Inventory or are not subject to TSCA requirements

SARA 302 EHS List (40 CFR 355 Appendix A): None listed

SARA 313 (40 CFR 372.65): None listed

CERCLA (40 CFR 302.4): None listed

### 15.4 Australian regulations

SUSDP, Industrial Chemicals Act 1989:

Australian Inventory of Chemical Substances, AICS: Listed

### 15.5 Japanese regulations

Chemical Risk Information platform (CHRIP):	Listed
Industrial Health and Safety Law	Article 57-2
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 (PRTR Law)	no listed components
Fire Services Act	not applicable
Explosives Law	not applicable
High pressure gas safety law	not applicable
Export Trade Control Order	not applicable
Waste Disposal and Public Cleaning Law	applicable. Before disposal, consult an approved waste disposal operative to ensure regulatory compliance.



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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, H302- Acute toxicity, oral, category 4: Harmful if swallowed  
Skin Corr.1, H314- Skin corrosion, category 1: Causes severe skin burns and eye damage  
Eye Dam. 1, H318- Serious eye damage, category 1: Causes serious eye damage  
Aqu. Acute 1, H400- Aquatic environment- acute hazard, category 1: Very toxic to aquatic life

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

R22 - Harmful if swallowed.  
R41 - Risk of serious damage to eyes.  
R35 - Causes severe burns.  
R34 - Causes burns.  
R50 - Very toxic to aquatic organisms.

**16.2 Further information:**

SDS Creation Date: ..... November 27, 2013  
SDS Revision #: ..... 02-A  
SDS Revision Date: ..... October 4, 2016  
Reason for Revision: ..... Update Sections 2, 8, 15

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