

## Safety Data Sheet

### DuraForm® PA

Revision Date: December 22, 2020

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

##### 1.1 Identification of the substance or preparation: DuraForm PA

**1.2 Use of the substance / 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

3D Systems Europe Ltd.  
200 Maylands Avenue  
Hemel Hempstead  
Herts, HP2 7TG United Kingdom  
Phone: +44 144-2282600  
e-mail: moreinfo@3dsystems.com

3D Systems Asia-Pacific  
30-32 Ceylon St  
Nunawading VIC 3131  
Australia  
+61 3 9819 4422  
e-mail: moreinfo@3dsystems.com

##### 1.4. Emergency telephone number:

U.S.A.:  
Chemical Emergency:  
800.424.9300 – Chemtrec

Europe:  
Chemical Emergency:  
+1 703.527.3887 - Chemtrec

Australia:  
Chemical Emergency:  
+(61) 29037.2994 – Aus Chemtrec

#### 2. HAZARDS IDENTIFICATION

##### 2.1 Classification:

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

**Not a hazardous substance or mixture.**

##### 2.2 Label Elements

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

**Not a hazardous substance or mixture.**

##### Supplemental information:

###### Other hazards:

Dusts might form explosive mixtures with air.

Risk of skin burns caused by hot melt.

A PBT/vPvB evaluation is not available, since a chemical safety evaluation is not required / has not been carried out.

###### Safety information:

Do not handle until all safety precautions have been read and understood, see section 5 for details.

If exposed: Get medical advice/attention.

#### 3. COMPOSITION/INFORMATION ON INGREDIENTS

##### 3.1 Chemical characterization:

**Description:** Polymer Powder

##### 3.2 Mixtures:

Chemical name	CAS-No	EC-No	%	Classification
				Regulation (EC) 1272/2008
Polyamide Powder	25038-74-8	607-508-7	80-100	Not Classified

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#### 4. FIRST AID MEASURES

**4.1 In case of inhalation:** In case of symptoms of irritation caused by vapors in thermal processing: provide fresh air, seek medical advice if necessary.

Following inhalation of product dust: provide fresh air.

**4.2 In case of skin contact:** Flush skin with plenty of soap and water. Cool melted product on skin with plenty of water. Do not remove solidified product. In case of burns by molten product, medical treatment is necessary

**4.3 In case of eye contact:** Flush eyes with plenty of water.

#### 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 hazards arising from the substance or mixture**

Refer to 1995 edition of NFPA 33 Appendix A. Dust control and good housekeeping are required. Dust may also carry a static charge. Make sure equipment and personnel are grounded to avoid static discharge.

Hazardous decomposition products in a fire: carbon monoxide, carbon dioxide, nitric oxides, organic products of decomposition. Under certain fire conditions, traces of other toxic products may occur.

**5.4 Special protective equipment for fire-fighters:**

Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire will produce dense black smoke containing hazardous combustion products (see heading 10). Wear self-contained breathing apparatus for firefighting if necessary. Cool containers / tanks with water spray.

**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.

#### DuraForm PA- Power testing results

Explosion Severity	
Maximum Explosion Pressure P <sub>m</sub> (bar)	<b>7.1</b>
Maximum rate of explosion pressure rise dP/dt (bar/s)	<b>251</b>
Dust deflagration index K <sub>st</sub> (bar.m/s)	<b>68</b>
Minimum Ignition Energy M.I.E. (Cloud) (mJ)	<b>500-1,000</b>
Limiting Oxygen Concentration (%)	<b>10-11</b>
Minimum Explosive Concentration M.E.C. (g/m <sup>3</sup> )	<b>60-70</b>
Moisture content	<b>0.43%</b>
Particle Size distribution	<b>Average 75µm – 80% (Range 7.6 - 111 µm)</b>

Dust Hazard	
<b>Minimum Ignition Temperature</b>	
Dust Cloud (°C):	<b>410-420</b>
Dust Layer - 12.7mm or 5mm (°C):	<b>&gt;450</b>

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<b>Electrostatics Testing</b>	
<b>Volume Resistivity (<math>\Omega \cdot m</math>)</b>	
Ambient Relative Humidity (R.H.60% at 23 °C):	<b><math>8.7 \times 10^{12}</math></b>
Low Relative Humidity( R.H.20% at 24 °C):	<b><math>7.5 \times 10^{13}</math></b>
<b>Charge Decay/Relaxation Time (min:sec)</b>	
Ambient Relative Humidity (R.H.60% at 23 °C):	<b>07:14</b>
Low Relative Humidity( R.H.20% at 24 °C)::	<b>11.40</b>
<b>Chargeability - Ambient Relative Humidity (C/kg) ( R.H.60% at 23 °C):</b>	
Stainless Steel Tube:	<b><math>+2.5 \times 10^{-4}</math></b>
Plastic Tube:	<b><math>+3.1 \times 10^{-4}</math></b>
Glass Tube:	<b><math>+2.4 \times 10^{-4}</math></b>
<b>Chargeability - Low Relative Humidity (C/kg) ( R.H.20% at 25 °C)::</b>	
Stainless Steel Tube:	<b><math>+6.5 \times 10^{-5}</math></b>
Plastic Tube:	<b><math>+6.8 \times 10^{-5}</math></b>
Glass Tube:	<b><math>+6.6 \times 10^{-5}</math></b>

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

Exclude non-essential personnel. Remove all sources of ignition. Ensure adequate ventilation. Do not breathe dust.

### 6.2 Environmental precautions

Local authorities should be advised if significant spillages cannot be contained.

### 6.3 Methods and materials for containment and cleaning up

Use wet wipes to clean up smaller spills. For larger spills, use approved industrial vacuum cleaner is recommended. Do not create a powder cloud by using a brush or compressed air. (Example: Use of an X-839 Series ULPA Critical Filter Dry Canister Vacuum is recommended).

### 6.4 Reference to other sections

See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Provide adequate ventilation. Keep container tightly closed. Keep away from open flames, hot surfaces and sources of ignition. Avoid contact with skin and eyes. When using, do not eat, drink or smoke. Store in original container. Avoid dust formation. Dust may form explosive mixture in air. Do not breathe dust

### 7.2 Conditions for safe storage

Keep in a dry, cool and well-ventilated place. Keep away from direct sunlight. See section 5 for details.

**Storage temperature (°C):** 10 - 30

Minimum ignition temperature : 410-420°C.

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#### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

##### 8.1 Exposure limit values:

Occupational exposure limits: There are no PEL stabled for this product. Limit for nuisance dust is 10 mg/m<sup>3</sup> (total dust), 4 mg/m<sup>3</sup> (respirable dust). Check local regulations in case different limits apply. During normal use, these concentrations are not expected to be reached.

##### 8.2 Exposure controls

**Technical measures to prevent exposure:** Provide adequate ventilation. When ventilation is not adequate, use of a NIOSH approved N95 rated dusk mask is recommended (Example: 3M 8200, 3M8210,3M8110s).

**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:

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

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

**Body protection:** Wear appropriate protective clothing and shoes (e.g., lab coat, sleeve protectors, smock, etc.).

##### Environmental exposure controls

The product should not be allowed to enter drains, watercourses or the soil.

#### 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	-
<b>Physical state</b>	Solid
<b>Form</b>	Powder
<b>Color</b>	White
<b>Odor</b>	No distinct odor
<b>Odor threshold</b>	Not available
<b>pH</b>	Not available
<b>Melting point/freezing point (°C)</b>	>80
<b>Initial boiling point and boiling range (°C)</b>	Not available
<b>Flash point (°C)</b>	200°C (closed cup)
<b>Evaporation rate</b>	Not available
<b>Flammability (solid, gas)</b>	Not available
<b>Relative density (g/cm<sup>3</sup>)</b>	1.09
<b>Upper/lower flammability or explosive limits</b>	-
<b>Flammability limit - lower (%)</b>	Not available
<b>Flammability limit - upper (%)</b>	Not available
<b>Explosive limit - lower (%)</b>	Not available
<b>Explosive limit - upper (%)</b>	Not available
<b>Vapor pressure</b>	Not available
<b>Vapor density</b>	Not available
<b>Solubility(ies)</b>	-
<b>Solubility (water)</b>	insoluble
<b>Partition coefficient (n-octanol/water)</b>	Not available
<b>Auto-ignition temperature</b>	>350
<b>Decomposition temperature (°C)</b>	>300
<b>Viscosity (cPs)</b>	Not available
<b>Other information</b>	-
<b>Oxidizing properties</b>	Not available
<b>Dust deflagration index Kst (bar.m/s)</b>	68
<b>VOC (g/L)</b>	0.8±0.2 (CARB Method 310)

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#### 10. STABILITY AND REACTIVITY

**10.1 Conditions to avoid:** Avoid wet/humid environment. Avoid dust formation.

**10.2 Materials to avoid:** Oxidizing materials, acids, strong bases, water, high humidity.

**10.3 Hazardous decomposition products:** Carbon dioxide, carbon monoxide, NO<sub>x</sub> can be released at high temperatures or upon burning.

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#### 11. TOXICOLOGICAL INFORMATION

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

**11.2 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. No data are available for the components of this product.

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

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

**12.4 Results of PBT assessment:** PBT/vPvB evaluation is not available, since a chemical safety evaluation is not required / has not been carried out.

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

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#### 13. DISPOSAL CONSIDERATIONS

Do not let product enter drains. Do not contaminate ponds, waterways or ditches with chemical or used container. Where possible recycling is preferred to disposal or incineration. Dispose of as special waste in compliance with local and national regulations.

**European Waste Catalogue:** 08 02 01

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#### 14. TRANSPORT INFORMATION

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

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

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

**14.4 US DOT:** Not Regulated

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#### 15. REGULATORY INFORMATION

**15.1. European Union Regulation:**  
**Safety, health and environmental regulations/legislation specific for the substance or mixture**

**Persistent Organic Pollutants**

Not applicable

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#### Ozone-depleting substances (ODS) regulation (EC) 1005/2009

Not applicable

#### Authorisations and/or restrictions on use:

This product does not contain substances subject to authorization (Regulation (EC) No. 1907/2006 (REACH), Annex XIV) This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII)

#### Other EU regulations

##### Directive 2012/18/EU on major accident hazards involving dangerous substances, as amended.

Not listed

#### National regulations:

**German Water Hazard Class (WGK):** WGK2 (hazard to waters)

#### 15.2. Chemical safety assessment

**Chemical Safety Report** - No information available

#### 15.3 US FEDERAL

**TSCA:** All components listed on ACTIVE TSCA Inventory or exempt from listing.

**TSCA - 5(a) Significant New Use Rule List of Chemicals:** None

**US. Toxic Substances Control Act (TSCA) Section 12(b):** None

**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

**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

**California Prop. 65 Components:** Does not contain listed ingredients

**15.4 International regulations:** All components of this product are registered or exempt from registration according to chemical regulations in Australia, Canada, China, European Union, Japan, New Zealand, Philippines, South Korea, Switzerland, Taiwan and United States.

#### 15.5 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 (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):

None

##### 16.2 Further information:

SDS Creation Date: ..... November 25, 2013

SDS Revision #: ..... -06-A

SDS Revision Date: ..... December 22, 2020

Reason for Revision: ..... Update section 1 – 7, 9, 12 – 16.

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