

Material Name: DuraForm® PA

**I. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

Product/Trade Name: **DuraForm® PA**  
 Chemical Family: Polyamide (nylon) Composite  
 Product Use: Material for SLS® (selective laser sintering) systems

|  |          |
|--|----------|
| <b>Hazardous Materials Identification System (HMIS):</b> |          |
| <i>(Degree of hazard: 0 = low, 4 = extreme):</i>         |          |
| Health   | <b>0</b> |
| Flammability   | <b>1</b> |
| Physical Hazards   | <b>0</b> |
| <b>Personal Protection:</b>                              |          |
| Dust mask, skin, eye protection                          |          |

Manufacturer:



|                      |  |
|----------------------|--|
| Manufacturer Contact | 3D Systems, Inc.<br>26081 Avenue Hall<br>Valencia, CA 91355 U.S.A. |
| For Information      | Phone: 970.257.4700 or<br>Toll-free Phone: 800.793.3669            |
| Emergency            | 800.424.9300 - Chemtrec  |

**II. COMPOSITION INFORMATION**

| CAS #      | Component        | %    |
|------------|------------------|------|
| 25038-74-8 | Polyamide powder | >99% |

**Component Information**

This product is not considered to be hazardous according to 29CFR 1910.1200 (Hazard Communication Standard).

**III. HAZARDS IDENTIFICATION**

**Emergency Overview**

Product may form explosive dust/air mixtures if high concentration of product dust is suspended in air. This product is irritating to the eyes, respiratory system and skin. Avoid contact with eyes.

**Potential Health Effects:**

- Eyes: This product can cause eye irritation. Symptoms include discomfort, itching and redness after contact.
- Skin: This product can cause skin irritation. Symptoms include reversible redness, itching and/or pain.
- Ingestion: Ingestion of large amounts can cause gastrointestinal irritation, vomiting, diarrhea and/or nausea.
- Inhalation: This product can irritate the respiratory system. Symptoms include mild nasal and respiratory irritation, coughing, and difficulty breathing.

**Medical Conditions Aggravated by Exposure**

Could irritate an existing dermatitis or respiratory condition.

**IV. FIRST AID MEASURES**

- Eyes: Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists.
- Skin: Wash affected area with mild soap and water. Remove contaminated clothing. If irritation persists, get medical attention. Wash contaminated clothing before reuse.
- Ingestion: If large quantities of this material are ingested, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.
- Inhalation: If a problem develops, move affected person to fresh air, give artificial respiration if not breathing, and get medical attention immediately.



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## V. FIRE FIGHTING MEASURES

Flash Point: >360 °F (183 °C)

Method Used: NA

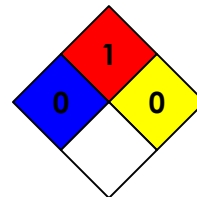
Upper Flammable Limit (UFL): NA

Lower Flammable Limit (LFL): NA

Auto Ignition: > 350 °C

Flammability Classification: NA

Rate of Burning: NA



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

General Fire Hazards: Dusts can form an explosive mixture with air.

Hazardous Combustion Products: Thermal decomposition products can include CO<sub>2</sub>, CO, NO<sub>x</sub>, and smoke.

Extinguishing Media: Use water mist, dry chemical, carbon dioxide, or chemical foam.

Fire Fighting Equipment/Instructions: Wear full protective clothing, including helmet, self-contained positive-pressure or pressure-demand breathing apparatus, protective clothing and facemask. Move container from area if it can be done without risk. Do not use high-volume water jet or high-pressure inert gas since pressure may cause dusting. Avoid inhalation of material or combustion by-products. Dust accumulation from this product can present an explosion hazard in the presence of an ignition source. For additional information, refer to National Fire Protection Association (NFPA) pamphlet #654, "Prevention of Fire and dust Explosion in the Chemical, Dye, Pharmaceutical and Plastics Industry".

## VI. ACCIDENTAL RELEASE MEASURES

Containment Procedures: Stop the flow of material, if this is without risk. Ventilate contaminated area. Eliminate sources of ignition. Avoid contact with water. Avoid the generation of dusts during clean up.

Clean-Up Procedures: Wear appropriate protective equipment and clothing, including a ground strap or conductive soled shoes, during clean up. Vacuum the dry powder into a closed container with internally and externally explosion-proof vacuum equipment with appropriate electrical classification per National Electrical Code, Article 502 or use non-sparking tools. Avoid the generation of dusts during clean up. Place material in an appropriate container for disposal.

Evacuation Procedures: Keep unnecessary personnel away.

Special Procedures: NA

## VII. HANDLING AND STORAGE

Handling Procedures: Avoid dust accumulation of this material to reduce potential explosion hazard. Use non-sparking tools when opening or closing containers. Use spark-proof, bonded, and grounded conveying and processing equipment to prevent static charge build-up. Keep this product from heat, sparks, or open flame.

Storage Procedures: Keep this material in a cool, dry, well-ventilated place. Avoid dust accumulation of this material. Eliminate all sources of ignition. Avoid contact with water or moisture. Keep separate from incompatible materials.

## VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Guidelines

A: General Product Information: Follow all applicable exposure limits.

B: Component Exposure Limits:

|                  | ACGIH TLV              | OSHA PEL               |
|------------------|------------------------|------------------------|
| Polyamide powder | 10 mg/m <sup>3</sup> * | 15 mg/m <sup>3</sup> * |

\*This substance is regulated by OSHA as a Particulate Not Otherwise Regulated (PNOR). The exposure limits listed for both OSHA and ACGIH refer to total dust; the OSHA PEL for the respirable fraction is 5 mg/m<sup>3</sup>.

### Engineering Controls

Use explosion-proof local exhaust ventilation. Ventilation should effectively remove and prevent buildup of any dust generated from the handling of this product.

### PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face: Wear chemical goggles.

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- Skin:** Use impervious gloves and apron. If dust accumulation is possible, wear conductive-soled shoes or ground strap.
- Respiratory:** If ventilation cannot effectively keep dust concentrations below established limits, appropriate NIOSH approved respiratory protection must be provided.
- General:** An eye wash fountain is recommended.

## IX. PHYSICAL AND CHEMICAL PROPERTIES

|                                    |                  |                             |              |
|------------------------------------|------------------|-----------------------------|--------------|
| Appearance.....                    | White powder     | Odor.....                   | Mild         |
| Physical State.....                | Powder           | PH.....                     | NA           |
| Vapor Pressure.....                | < 2 Pa @ 20°C    | Vapor Density.....          | NA           |
| Boiling Point.....                 | >200°C           | Melting/Freezing Point..... | 175 – 190 °C |
| Solubility (H <sub>2</sub> O)..... | insoluble @ 20°C | Specific Gravity.....       | 1.0 – 1.5    |
| Percent Volatile.....              | <1%              | Molecular Weight.....       | NA           |

## X. CHEMICAL STABILITY AND REACTIVITY

- Chemical Stability:** Stable under normal conditions of handling, use and transportation.
- Conditions to Avoid:** Avoid dispersion of dust in air. Avoid ignition sources where dust is produced. Avoid incompatible materials. Avoid heating above the thermal decomposition temperature (>340 °C).
- Incompatibility:** Oxidizing materials, strong acids and strong bases.
- Hazardous Decomposition:** Thermal decomposition products can include CO<sub>2</sub>, CO, NO<sub>x</sub>, and smoke.
- Hazardous Polymerization:** Will not occur.

## XI. TOXICOLOGICAL INFORMATION

### Acute and Chronic Toxicity

- A: General Product Information:** Single exposure (acute) studies indicate that this material is non-irritating to rabbit skin (4-hr exposure; 0/8) No genetic changes were observed in tests using bacteria.

### Carcinogenicity

- A: General Product Information:** This product is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

## XII. ECOLOGICAL INFORMATION

### Ecotoxicity

- A: General Product Information:** This product is not classified as dangerous to the environment.
- B: Component Analysis - Ecotoxicity - Aquatic Toxicity:** No ecotoxicity data are available for this product, however, it is not predicted to be toxic to aquatic organisms or to cause long-term adverse effects in the aquatic environment.
- Environmental Fate:** No information available for product.

## XIII. DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

- General Product Information:** No EPA Waste Numbers are applicable for this product. This product is not defined or designated as hazardous by current provisions of RCRA – 40CFR261.
- Disposal Instructions:** Avoid disposal. If possible, completely utilize product. Dispose of unused product in accordance with applicable Federal, State, Provincial, or Local regulations.

**XIV. TRANSPORT INFORMATION**

|                | US DOT        | RID/ADR | IMDG | IATA | IMO | Canada TDG |
|----------------|---------------|---------|------|------|-----|------------|
| Shipping Name  | Not Regulated |         |      |      |     |            |
| Hazard Class:  |               |         |      |      |     |            |
| UN Number:     |               |         |      |      |     |            |
| Packing Group: |               |         |      |      |     |            |

**XV. REGULATORY INFORMATION**

**US FEDERAL**

TSCA:.....All materials are listed on the TSCA Inventory  
 SARA 302 EHS List (40 CFR 355 Appendix A): .....Not listed  
 SARA 313 (40 CFR 372.65): .....Not listed  
 CERCLA (40 CFR 302.4): .....Not listed

**STATE RIGHT-TO-KNOW STATUS**

The following components appear on one or more of the following state hazardous substances lists:

| Component   | CA Prop. 65 | MA | MN | NJ | PA | RI |
|-------------|-------------|----|----|----|----|----|
| None listed | --          | -- | -- | -- | -- | -- |

**Component Analysis - WHMIS IDL**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List: None

**Component Analysis - Inventory**

| Component/CAS                 | EC # | EEC | CAN | TSCA | NLP |
|-------------------------------|------|-----|-----|------|-----|
| Polyamide powder / 25038-74-8 | -    | No  | DSL | Yes  | No  |

**XVI. ADDITIONAL INFORMATION**

MSDS Creation Date: .... August 24, 2001  
 MSDS Revision #: ..... 3  
 MSDS Revision Date:.... February 14, 2005  
 Reason for Revision: ..... update regulatory status  
 For more information: .... 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.)  
 970.257.4700 (Outside the U.S. GMT-07:00; N. America, Mon – Fri, 6:00 a.m. to 6 p.m.)  
 +49 (0) 6151 357-357 (Europe GMT+01:00; Mon – Fri, 08:00 a.m. - 17:00 p.m. MEZ)

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## Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists

CAS = Chemical Abstracts Service

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

CFR = Code of Federal Regulations

CPR = Controlled Products Regulations

DOT = Department of Transportation

DSL = Domestic Substances List

EINECS = European Inventory of Existing Commercial Chemical Substances

EPA = Environmental Protection Agency

IARC = International Agency for Research on Cancer

IATA = International Air Transport Association

IDL = Ingredients Disclosure List

mg/Kg = milligrams per Kilogram

mg/L = milligrams per Liter

mg/m<sup>3</sup> = milligrams per Cubic Meter

MSHA = Mine Safety and Health Administration

NA = Not Applicable or Not Available

NIOSH = National Institute for Occupational Safety and Health

NJTSP = New Jersey Trade Secret Registry

NTP = National Toxicology Program

OSHA = Occupational Safety and Health Administration

SARA = Superfund Amendments and Reauthorization Act

STEL = Short Term Exposure Limit

TDG = Transport Dangerous Goods

TSCA = Toxic Substances Control Act

WHMIS = Workplace Hazardous Materials Information System.