



HMIS	
Health:	1 (slight)
Fire:	1 (slight)
Reactivity:	0 (least)
Protection:	E (safety glasses, gloves & dust respirator)

## MATERIAL SAFETY DATA SHEET

### Section I: Product Identification

Name used on Label: **CastForm™ PS**  
 Chemical Name: Proprietary Polymer Resin  
 (if single substance)  
 Chemical Family: Polystyrene  
 Product Use: Material for Selective Laser Sintering

Manufacturer: DTM Corporation  
 1611 Headway Circ., Build. 2  
 Austin, Texas 78654

For information Call: (512) 339-2922 (8:00 a.m. - 5:00 p.m.)  
 Emergency Call (CHEMTREC): (800) 424-9300

### Section II: Ingredients

<u>Identity</u>	<u>CAS No.</u>	<u>%</u>	<u>PEL</u>	<u>TLV</u>
polystyrene	9003-53-6	100	N/E	*6 mg/m <sup>3</sup>

PEL and TLV values are reported as TWA unless otherwise noted.

\* = Finest powder as nuisance dust

Identity (remarks)

The specific identity of the resin is withheld as a trade secret.

### Section III: Hazards identifications

The CastForm PS material is not included on the OSHA list of Toxic and Hazardous Contaminants (29CFR 1910.1000). This standard, however, provides Permissible Exposure Limits (PEL) for inert or nuisance dusts. Threshold Limit Values (TLV) for some nuisance particulates have also been established by the American Conference of Governmental Industrial Hygienists (ACGIH). The table below provides the established standards expressed as 8-hour time-weighted averages.

N/E = Not Established; N/A = Not Applicable; \* = See Miscellaneous (Section IX)

	Total Dust	Respirable Fraction ≤10 microns
OSHA (PEL)	15 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>
ACGIH (TLV)	10 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>

Dust from the CastForm PS material is expected to be the primary hazard in an occupational exposure. Follow good industrial hygiene practices and exercise care when dumping bags, sweeping, mixing or doing other tasks which can create dust.

Wear appropriate protective equipment for nuisance dust when handling the powder. Keep powder concentrations at working environment as low as possible and avoid concentrations exceeding MAK/TLV values. Avoid contact with eyes, skin and clothing. Use with adequate ventilation. Wash thoroughly after handling.

Primary routes of entry	Yes - EYE; Yes - SKIN; Yes - INGESTION; Yes – INHALATION
Eye contact	Dust or vapors that contact the eye may be irritating or cause mechanical injury.
Skin contact	May cause slight skin irritation. Molten material will produce thermal burns.
Ingestion	It is reasonable to anticipate ingestion of powder would be irritating to the GI tract.
Inhalation	Dust or vapors may be irritating to the respiratory tract and cause coughing or sneezing. Adverse health effects are caused by the inhalation of the finest powders, below 10 microns.
Chronic toxicity	CastForm PS powder is physiologically harmless.
Medical conditions prone to aggravation by exposure	As with any organic compound that is heated to vaporization, exposure may aggravate pre-existing conditions such as colds, allergies, asthma, emphysema and psoriasis.

#### **Section IV: First Aid Measures**

Eyes	Immediately flush eyes with flowing water for at least 15 minutes. See a physician if the irritation persists.
Skin	Remove contaminated clothing. Wash thoroughly with soap and water. See a physician if the irritation persists.
Ingestion	Do not induce vomiting! Keep patient at rest and obtain immediate medical attention.
Inhalation	Remove patient from danger area. If breathing is irregular or has stopped, administer artificial respiration. Seek medical advice.

### Section V: Fire and Explosion Data

Unusual fire and explosion hazards	Avoid dust clouds and accumulation to minimize the potential for explosions. Keep away from heat, sparks, flame and all other ignition sources. For additional information, refer to NFPA pamphlet #654, "PREVENTION OF FIRE AND DUST EXPLOSION IN THE CHEMICAL, DYE, PHARMACEUTICAL AND PLASTICS INDUSTRY."
Flash Point (Test Method) Autoignition Temperature Flammable Limit	350 °C 410 °C LEL= 100 g/m <sup>3</sup> UEL=N/A
Extinguishing media	Water spray, carbon dioxide, foam or dry chemical
Special fire fighting procedures	In the event of fire, wear full protective clothing and NIOSH approved self-contained breathing apparatus with full-face piece, operated in the positive pressure mode. Cool closed and over heated containers with water spray.
Hazardous combustion products	Danger of intoxication through smoke gas. At high temperatures, decomposition products such as CO <sub>2</sub> , CO and smoke may be formed. Thermal decomposition starts at 250°C.

### Section VI: Accidental Release

Spill or leak procedures	Do not inhale dust. Avoid ignition sources. Avoid contact with skin, eyes and clothing. 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. Wear appropriate respiratory protection and protective clothing as described in Section VIII. Transfer to closed containers for disposal.
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### Section VII: Handling and Storage

Storage and handling	Avoid dispersion of dust in to air to reduce potential explosions hazard. Eliminate ignition sources. Conveying and processing equipment should be spark proof, bonded, and grounded to prevent static charge build-up. Maintain good house keeping standards to prevent accumulation of dust. Refer to NFPA pamphlet #654, "PREVENTION OF FIRE AND DUST EXPLOSION IN THE CHEMICAL, DYE, PHARMACEUTICAL AND PLASTICS INDUSTRY." Keep powder dry and away from acids and strong oxidizing agents. Store in cool place in tightly sealed containers. Maximum storage temperature is 40°C.
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**Section VIII: Special Protection Information**

Ventilation	Keep powder concentrations at working environment as low as possible and avoid concentrations exceeding MAK/TLV values. Provide local exhaust ventilation where heat can cause polymer breakdown, e.g. extrusion, molding and where there is a need to draw dusts and fumes from worker breathing zones. The following publication offers ventilation guidelines and techniques: "Industrial Ventilation, A Manual of Recommended Practice" available from ACGIH.
Respiratory protection	For conditions where exposure to dust and fumes is apparent or MAK/TLV values are exceeded, a NIOSH approved respirator for dust, mist and fumes appropriate to the airborne concentration may be worn. Where vapors are generated, a NIOSH approved organic respirator suitable to the airborne concentration is recommended.
Eye and face protection	Safety glasses with side shields are recommended for any type of powder handling. Dust-tight goggles are recommended for dusty operations and areas where vapors accumulate.
Other clothing and equipment	Wear clean body covering and gloves impervious to dust or vapor to minimize skin contact.

**Section IX: Physical Data**

Boiling point, °C	N/A	Melting point, °C	80
Specific gravity, g/cm <sup>3</sup>	1.05	Vapor pressure @ 20°C	N/A
Vapor density (Air = 1)	N/A	Evaporation rate (Butyl acetate = 1)	N/A
% volatiles	N/A	Solubility in water:	Insoluble
Appearance and odor	White, odorless powder		

**Section X: Stability and Reactivity Data**

Stability	Compound is stable
Conditions to avoid	Heating above 350°C
Incompatibility (materials to avoid)	Acids, bases and strong oxidizing agents to avoid exothermic reactions
Hazardous polymerization	Does not occur

**Section XI: Toxicological Information**

	N.A.
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**Section XII: Environmental Information**

Ecological information	There is no direct influence on ground, air and water if disposed, yet it is biologically not decomposable.
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### Section XIII: Disposal Consideration

Waste disposal method	Dispose of waste in a licensed landfill or by incineration in accordance with federal, state and local regulations. Prevent contamination of soil, drains and surface waters.
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### Section XIV: Miscellaneous

Transportation	For domestic transportation purposes, the U.S. Department of Transportation under Title 49 of the Code of Federal Regulations does not classify powder compounds as hazardous. <ul style="list-style-type: none"><li>• DOT Proper Shipping Name: Not applicable</li><li>• DOT Hazard Class: Not applicable</li><li>• DOT Label: Not applicable</li><li>• UN/NA Hazard No.: Not applicable</li><li>• Reportable Quantity: Not applicable</li><li>• DOT ID#: 156200</li></ul>
SARA Hazard Classification	
SARA Title III, Section 302	
SARA Title III, Section 313	
TSCA Inventory Status	
WHMIS Classification:	

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PREPARED: DTM CORPORATION

DATE MARCH 12, 1999

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