



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

MATERIAL SAFETY DATA SHEET

Section I: Product Identification

Name used on Label: **LaserForm ST-100**
 Chemical Name: Stainless Steel Powder
 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> mg/m ³	<u>TLV</u> mg/m ³
Iron	7439-88-6	balance	10	5
#*Chromium	7440-47-3	12-14	1	0.5
*Manganese	7439-96-5	1	5	5
Silicon	7440-21-3	1	10	10
Organic Binder	Proprietary	2-3	N/E	N/E
Includes:				
Formaldehyde	50-00-0	<0.1	0.75	0.3
Phenol	108-95-2	<0.1	5	5

* - See Sections VII & VIII

- Chromium, its compounds and formaldehyde are listed in the current annual report on carcinogens (prepared by the National Toxicology Program). Their presence in this alloy is not believed to present a carcinogenic or any other health hazard due to their relatively low concentration and chemical form.

Section III: Hazards identification

General Toxicological Information: Effects associated with overexposure to metal dust may include respiratory irritation, skin and eye irritation, and pneumoconiosis. Inhalation of metal oxide fumes may cause metal-fume fever characterized by influenza-like symptoms lasting 24-48 hours.

Section IV: First Aid Measures	
Inhalation	Remove to fresh air and consult a physician.
Skin contact	Wash affected skin areas thoroughly with soap and water.
Eyes	Immediately flush eyes with flowing water for at least 15 minutes. Consult a physician.
Ingestion	Consult a physician at once.

Section V: Fire and Explosion Data	
Unusual fire and explosion hazards	NONE: The LaserForm ST-100 steel metal powder is not a flammable solid as tested by the U.S. Department of Transportation standard flammability screening procedures. (49 CFR 173, Appendix E) The LaserForm ST-100 steel powder is nonflammable and nonexplosive when tested for dust explosion severity using the U.S. Bureau of Mines standard testing procedures. (Hartman Appartus, dust cloud concentration up to 2.1g/l and a 12k volt AC arc at 2.4 miliamperes.) Fire or explosion may result by exposing any concentrated dust suspension to a spark or flame.
Flash point	C: N/A
Autoignition temperature	C: N/A
Flammable limit	LEL = N/A UEL = N/A
Extinguishing media	Dry sand or NFPA approved Class D extinguisher.
Special fire-fighting procedures	DO NOT USE CO2 EXTINGUISHERS OR WATER ON METAL POWDER FIRE. Fire fighters should wear self contained breathing apparatus (SCBA) and protective clothing. With out disturbing the burning mass, gently smother the fire with Class D extinguisher or dry sand and allow the fire to burn itself out.

Section VI: Accidental Release	
Spill or leak procedures	Wear protective clothing to prevent skin contact. Use goggles and NIOSH approved respirators. Use non-sparking equipment to vacuum up the spilled powder. During clean up avoid dust clouds. A substantial slip hazard exists when these small spherical particles are spilled.

Section VII: Handling and Storage	
Storage and handling	Store away from any incompatible materials. Avoid spilling powders to prevent slip hazards. Clean spills immediately. Keeping the material tightly covered, away from moisture, and in a well ventilated area is advisable.

Section VIII: Special Precautions	
Ventilation	General and local exhaust ventilation, engineering controls and good housekeeping practices are recommended to keep dust concentrations below the permissible exposure limits.
Respiratory protection	Use NIOSH/MSHA approved masks/respirators
Protective clothing	Use impervious gloves and apron to avoid prolonged skin contact. Also use chemical goggles.

Additional protective measures	Wash after use and before eating, drinking, or smoking.
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Section IX: Physical Data

Boiling point, °C	N/A	Melting point, °C (liq. temp.)	N/A
Specific gravity, g/cm ³	N/A	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	Silver/gray, odorless powder		

Section X: Stability and Reactivity Data

Stability	Stable
Conditions to avoid	Contact with air and moisture. Generation of airborne dust.
Incompatibility (materials to avoid)	Moisture, acids, oxidizers and bases
Hazardous polymerization	Does not occur
Hazardous decomposition products	Thermal oxidative decomposition of the iron and organic binder can produce toxic materials. Formaldehyde, ammonia and phenol vapors are released from exothermic reactions.

Section XI: Toxicological Information

See section III	
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Section XII: Environmental Information

N/A	
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Section XIII: Disposal Consideration

Waste disposal method	Put into closed container. This material is considered hazardous in some states. Disposal must be in accordance with applicable Federal, State and local regulations.
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Clean Water Act Requirements: Phenol is listed under Section 307 as a toxic pollutant not eligible for waiver from best available technology economically achievable (BAT) effluent limitations. Phenol and formaldehyde are both listed under Section 311 as hazardous substances requiring the submission of a National Pollutant Discharge Elimination System (NPDES) permit application to EPA. Formaldehyde is listed in Table V of testing requirements as a hazardous substance required to be identified by existing dischargers, if expected to be present.

Resource Conservation and Recovery Act (RCRA) Requirements:
 Formaldehyde (U122) and phenol (U188) are considered hazardous chemical wastes if and when they are discarded by themselves. As constituents of this material, the requirements of the federal hazardous waste regulations do not apply unless the waste fails to pass any of EPA's four tests for determining hazardous wastes.

Section XIV: Transportation Information											
Transportation	<p>Transportation Data (49 CFR 173 Appendix E); flammability screening tests on the LaserForm ST-100 steel powder (dry) showed that the material IS NOT a DOT flammable solid. Direct flame heating of the powder to 2000 °F (using an Oxy-Acetylene torch) fused the powder, but no ignition or propagation occurred. Powders of larger particle size are therefore also not to be considered or labeled as flammable solids.</p> <p>DOT:</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-right: 20px;"><u>Proper Shipping Name:</u></td> <td><u>Non-regulated</u></td> </tr> <tr> <td><u>Hazard Class:</u></td> <td><u>N/A</u></td> </tr> <tr> <td><u>Identification No.:</u></td> <td><u>N/A</u></td> </tr> <tr> <td><u>Packing Group:</u></td> <td><u>N/A</u></td> </tr> <tr> <td><u>Label Required:</u></td> <td><u>N/A</u></td> </tr> </table>	<u>Proper Shipping Name:</u>	<u>Non-regulated</u>	<u>Hazard Class:</u>	<u>N/A</u>	<u>Identification No.:</u>	<u>N/A</u>	<u>Packing Group:</u>	<u>N/A</u>	<u>Label Required:</u>	<u>N/A</u>
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Section XV: Regulatory Information										
SARA Title III, Section 313	<p>The following elements contained in this product are reportable under Section 313 of SARA Title III:</p> <table style="width: 100%; border: none;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 30%; text-align: center;"><u>CAS No.</u></th> <th style="width: 30%; text-align: center;"><u>%</u></th> </tr> </thead> <tbody> <tr> <td>Chromium</td> <td style="text-align: center;">7440-47-3</td> <td style="text-align: center;">12-14</td> </tr> <tr> <td>Phenol</td> <td style="text-align: center;">108-95-2</td> <td style="text-align: center;"><0.2</td> </tr> </tbody> </table>		<u>CAS No.</u>	<u>%</u>	Chromium	7440-47-3	12-14	Phenol	108-95-2	<0.2
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Chromium	7440-47-3	12-14								
Phenol	108-95-2	<0.2								
TSCA Inventory Status	All ingredients of this product are listed on the Toxic Substances Control Act (TSCA) inventory.									

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PREPARED: DTM CORPORATION
 2000

DATE: 7 SEPTEMBER

FOR FURTHER INFORMATION, CONTACT:

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