ACCURA® LASERFORM™ ST-200 MATERIAL

for all laser sintering (LS) systems

Digital scale tooling insert data provided courtesy of HK Polytechnic University

A specialty stainless steel composite developed for use with 3D Systems' SLS® systems to produce durable, fully dense metal parts and tooling inserts for injection molding and die casting applications.

Quickly obtain complex functional metal parts or tooling inserts for injection molding and die casting applications — using Accura® LaserForm™ ST-200 material and 3D Systems' Vanguard™ SLS system.

Vanguard SLS system

Durable and functional.

Fully dense, durable and functional — parts made of LaserForm ST-200 material are ideal for both prototype and production applications.

Reduce or eliminate programming, tooling or pattern making.

Produce stainless steel parts directly from your CAD data with LaserForm ST-200 material and the SLS™ process. Greatly reduce the cost, time and effort required of secondary tool-path programming, machining or investment casting.

Meet and beat critical deadlines.

LaserForm ST-200 material provides durable sintered tooling inserts directly from your CAD data — in as little as three to four days! Using LaserForm ST-200 material, some customers report delivery of injection-molded parts in less than one week.

High quality inserts with complex feature detail.

The SLS process produces high quality, fully dense, sintered inserts without the thermal stresses associated with other technologies. Complex metal tooling inserts made from LaserForm ST-200 material are produced in a few days, compared to weeks or even months using traditional machining methods.

Capture new revenue and profit opportunities.

Produce up to 10,000 (or more) injection molded ABS or nylon parts and 50,000 or more injection molded glass-filled nylon parts, or a few hundred prototype die-cast parts.

Mold parts — faster.

The high thermal conductivity of metal tooling inserts produced with LaserForm ST-200 material can reduce cycle time by as much as 20-40% compared to traditional tooling.

Explore the world of instant manufacturing solutions to develop innovative new ways of manufacturing products.

Radically alter designs and manufacturing methods — existing designs can be manufactured without the cost and lead time associated with hard tooling, and more complex designs are easier and faster to manufacture. Add custom features and complexity to designs not currently feasible with today's manufacturing technologies.

With LaserForm ST-200 material and 3D Systems' SLS process — the capability is yours.

Benefits:

- Fast! Design to part in as little as 3-4 days
- Complements existing fabrication processes
- Characteristics similar to P20 steel
- Fully dense, annealed inserts and parts
- Heat resistant
- "Tool-less" manufacturing

Applications:

- Direct metal parts
- Tooling inserts for injection molding and die-casting
- Ideal for complex geometries and features

Accura LaserForm ST-200 Material

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Typical Properties

Powder Material

Properties	Condition	Units	Test Method	Value
Density	@23°C (73.4°F)	g/cm3	ASTM D792	6.73

Thermal Properties

Properties	Condition	Units	Test Method	Value
Thermal Conductivity	@215°C (419°F)	w/m°C	ASTM E457	39
Coefficient Thermal Expansion x10-6	51 - 150°C (124 - 302°F)	m/m/°C	ASTM E831	7.45

Mechanical Properties

Properties	Condition	Units	Test Method	Value
Tensile - Yield Strength (0.2%)		MPa	ASTM E8	250
Tensile Strength		MPa	ASTM E8	435
Elongation		%	ASTM E8	6
Young Modulus		GPa	ASTM E8	137
Compression - Yield Strength		MPa	ASTM E8	277
Hardness - Rockwell "B"	as infiltrated		ASTM E18	79
	as machined		ASTM E18	73

Data was generated from the testing of parts produced with LaserForm ST-200 material and the SLS process under the following typical processing conditions: new material processed at 36 watts laser power, 762 cm/sec. scan speed, 0.075 mm scan spacing, 0.075 mm layer thickness on a Sinterstation® 2500*plus* or Vanguard SLS system, and then debinded, sintered and bronze infiltrated at 85% weight in an oven. Final composition is approximately 46% bronze and 54% 420 stainless steel. Store material in dry conditions at ambient temperatures.

Warranty/Disclaimer: The performance characteristics of these products may vary according to product application, operating conditions, material combined with, or with end use. 3D Systems makes no warranties of any type, express or implied, including, but not limited to, the warranties of merchantability or fitness for a particular use.

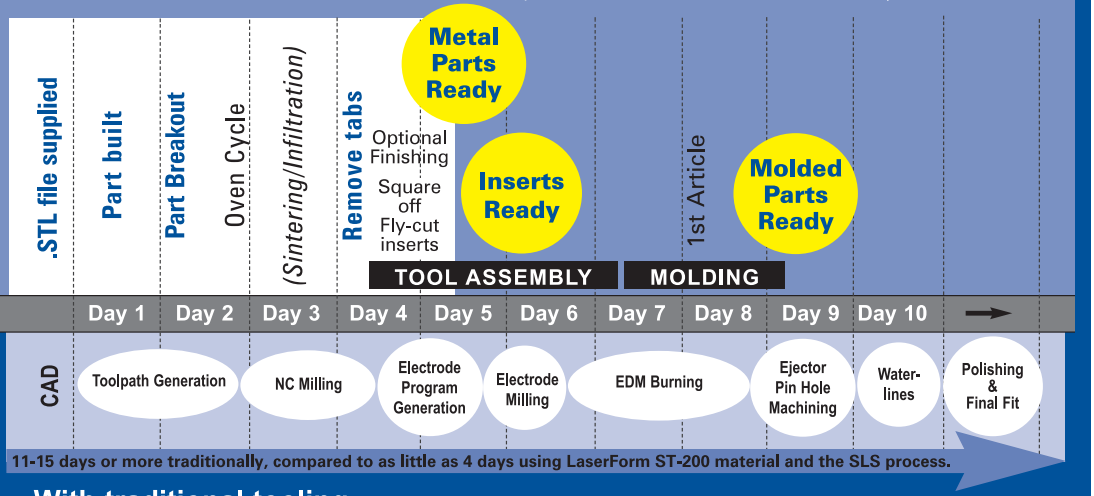
* "Fully dense" is defined as achieving 99.5% density after sintering and infiltration.

Comparison - Timeline for Producing Inserts and Parts

With an SLS system and LaserForm ST-200 material, you can produce usable, functional metal parts or tooling inserts in a few days - at a fraction of the time required of traditional processes.

With the SLS system and LaserForm ST-200 material

Based on internal benchmarks. Assumes in-house resources and prioritization (no wait time). Your results will vary.



11-15 days or more traditionally, compared to as little as 4 days using LaserForm ST-200 material and the SLS process.

With traditional tooling

Assumes "typical" process of tooling preparation of inserts with complex geometry. Exception will occur. Your results will vary.

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