



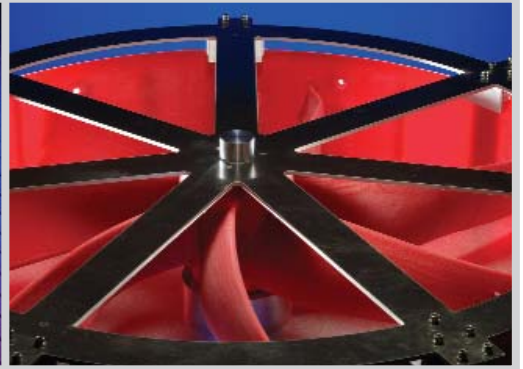
CastForm™ PS plastic

for use with all selective laser sintering (SLS®) systems

Directly produce complex investment casting patterns without tooling.



Cylinder head cover courtesy of Kegelmann



APPLICATIONS

- Create patterns directly rather than through indirect methods
- Complex investment casting patterns
 - Reactive metals like titanium
 - Low melt-temperature metals such as aluminum, magnesium and zinc
 - Ferrous and non-ferrous metals
- Economic, low-volume production castings without tooling
- Smaller parts can be joined to create very large patterns
- Sacrificial, expendable patterns

FEATURES

- Functions like foundry wax and is “foundry friendly”
- Low residual ash content (less than 0.02%)
- Short burnout cycle
- Easy-to-process plastic
- Good plastic powder recycle characteristics

BENEFITS

- Create complex patterns without welds or joints
- Reduce lead times resulting in faster time-to-market
- Compatible with autoclaves, low-temperature furnaces, and vacuum plaster casting methods
- Easy to assemble and repair patterns
- Rapidly test new designs in iterative process

CastForm™ PS plastic

For use with all selective laser sintering (SLS®) systems

Process Description

Build Castform PS (polystyrene-based) material into a foundry pattern in an SLS machine.



Infiltrate the pattern with foundry wax, which increases part strength and surface quality.



Polish the pattern to the desired surface finish.



Process the infiltrated pattern using standard foundry practices.

Castform™ PS patterns are comparable to conventional wax patterns in the following areas:

- Assembly methods and tools
- Stability and transportability
- Handling during assembly and repair
- Suitable for all cast metal alloys
- Low residual ash
- No ceramic shell cracking
- Usable for ceramic and plaster molds

TECHNICAL DATA

Powder Properties

MEASUREMENT	METHOD/CONDITION	METRIC	U.S.
Density - Tap	ASTM D4164	0.46 g/cm ³	0.46 g/cm ³
Specific Gravity @ 20 °C	ASTM D792	0.86 g/cm ³	0.86 g/cm ³
Moisture Absorption @ 20 °C, 65% R.H.	ASTM D570	0.06 %	0.06 %
Ash Content	ASTM D482	0.02 %	0.02 %

Mechanical Properties

MEASUREMENT	METHOD/CONDITION	METRIC	INFILTRATED*	U.S.
Tensile Strength, Ultimate	ASTM D638	2.84 MPa		412 psi
Tensile Modulus	ASTM D638	1604 MPa		232 ksi
Impact Strength (notched Izod)	ASTM D256	<11 J/m		<0.21 ft- lb/in
Impact Strength (unnotched Izod)	ASTM D256	14 J/m		0.26 ft- lb/in

Thermal Properties

MEASUREMENT	METHOD/CONDITION	METRIC	INFILTRATED*	U.S.
Glass Transition (Tg) - Polystyrene	ASTM D3418	89 °C		192 °F
Melting Point (Mp) - Wax		>63 °C		>145 °F
Flash Point (Cleveland Open Cup)	Polystyrene	350 °C		662 °F
	Wax	>200 °C		>392 °F
Autoignition Point	Polystyrene	410 °C		770 °F

Surface Finish

MEASUREMENT	METHOD/CONDITION	METRIC	INFILTRATED*	U.S.
Upward Surface				
As Processed (R _a)	Mitutoyo Surftest-402	13 µm		13 µm
After Polishing (R _a)	Mitutoyo Surftest-402	3 µm		3 µm

*Data was generated from the testing of parts produced by an SLS system from CastForm PS material under typical processing conditions. Secondary wax infiltration performed with Red Dip Wax #2-D504.



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