

# DuraForm® Flex plastic

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



**A thermoplastic elastomer with excellent durability, resistance to heat and chemicals, and long-term stability.**



*Above:* Radiator hose prototype withstands bending without permanent damage or deformation (shown without infiltrant).

*Left:* Primary infiltrant colors of red, yellow and blue can be mixed to create custom colors (black and neutral infiltrants also available).

## APPLICATIONS

- Functional prototypes and end-use parts that require rubber-like flexibility, resistance to heat and chemicals, and long-term stability:
  - Gaskets and seals
  - Hoses
  - Athletic footwear
  - Ear molds

## FEATURES

- Rubber-like flexibility and functionality
- Durable and tear-resistant
- Resists harsh environments
- Good long-term stability
- Seals fluid-tight, even under pressure
- Excellent surface finish and feature detail
- Create colored parts using standard infiltrants
- Wide processing latitude
- Fully recyclable

## BENEFITS

- Rapidly produce parts with the look and feel of rubber and thermoplastic elastomers
- Eliminate the time and cost of casting, machining or other secondary processes
- Address broad applications requiring rubber-like flexibility and durability
- Address end-use applications requiring long-term stability
- Minimal finishing required
- Reduced cost per part

# DuraForm Flex plastic

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

"DuraForm Flex is a significant leap forward in material development," said Fabio Ciciani, CEM's partner. "With DuraForm Flex, producing flexible parts is simple -- there are no special requirements. The possibility to infiltrate and color parts easily, make this material very interesting for our automotive, appliance and shoe-sole markets."

— Fabio Ciciani, CEM

## TECHNICAL DATA

### Powder Properties

MEASUREMENT	CONDITION	VALUE:
Appearance	visual	opaque white
Density (tap)	ASTM D4164	0.44 g/cm <sup>3</sup>
Particle Size Ave. d <sub>50</sub>	Laser Diffraction	85 µm
Particle Size Range 90%	Laser Diffraction	21 - 138 µm
Melting Point: T <sub>m</sub>	DSC	192 °C (378 °F)

### Sintered Properties

MEASUREMENT	METHOD/CONDITION	VALUE (AS PRODUCED)	VALUE (INFILTRATED)**
Tensile Strength	ASTM D638	1.8 MPa (262 PSI)	2.3 MPa (335 PSI)
Tensile Modulus	ASTM D638	7.4 MPa (1080 PSI)	9.2 MPa (1340 PSI)
Elongation at Break (%)	ASTM D638	110%	151%
Flexural Modulus at 23 °C (73 °F)	ASTM D790	5.9 MPa (860 PSI)	7.8 MPa (1130 PSI)
Initial Tear Resistance Die C at 23 °C (73 °F)	ASTM D624	15.1 kN/m (86 lb/lin)	15.4 kN/m (88 lb/lin)
Abrasion Resistance Taber, CS-17 wheel, 1 kg (2.2 lb) load	ASTM D4060	83.5 mg (per 1000 cycles)	see note <sup>1</sup>
Bursting Strength (Straight) @ 23 °C (25 mm ID x 2 mm thick x 300 mm long hose)		0 PSI	11 PSI (with FlexSeal infiltration) >30 PSI (with two-part polyurethane infiltration)
Shore A Hardness at 23 °C	ASTM D2240	60	67

Chemical Resistance - Material doesn't dissolve in hydrocarbons, ketones, ethers or alcohols. May swell in some solvents or solvent mixtures.

Detailed test conditions are available upon request. Performance characteristics may vary according to product application and/or operating conditions. Test samples were produced on a HIQ+HS SLS system, using new material.

\* Owners of Sinterstation 2000, 2500 and 2500ci SLS systems are limited to 0.005 in (0.125 mm) build layer thickness rather than the 0.004 in (0.10 mm) layer thickness used by Sinterstation 2500plus or later SLS systems.

\*\* 8-dip processing method.

<sup>1</sup> Abrasion resistance is significantly reduced with infiltrated parts. For best abrasion resistance, infiltration is not recommended.



#### 3D Systems Europe Ltd.

Mark House, Mark Road  
Hemel Hempstead  
Herts HP2 7UA  
www.3dsystems.com

Tel: (+44) 1442 282 600  
Fax: (+44) 1442 282 601  
marketing.uk@3dsystems.com  
Nasdaq: TDSC

#### 3D Systems GmbH

Postfach 12 02 07  
D-64239 Darmstadt  
Germany

Tel: (+49) 6151 357 0  
Fax: (+49) 6151 357 333  
info@3dsystems-europe.com

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.

© 2005 by 3D Systems, Inc. All rights reserved. Specifications subject to change without notice. The 3D logo is a trademark, and DuraForm, SLS and Sinterstation are registered trademarks of 3D Systems, Inc.

PN 70618 Issue Date - 1 Jun 05