



ACCURA® SI 40 MATERIAL

for the SLA® Viper™, 3500, 5000 & 7000 systems



Accura SI 40 material is the first SL material to combine high temperature resistance with toughness.

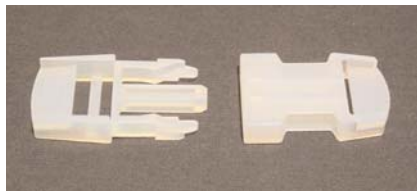
High temperature applications without the brittleness.

Accura® SI 40 material is the first stereolithography (SL) material to mimic *Nylon 6:6*, allowing parts to be used in true under-the-hood applications, and those requiring elevated temperatures without the limitation of brittleness and breakage.



Excellent mechanical properties.

Offering an attractive mix of thermal resistance, stiffness, and elongation at break, Accura SI 40 material is an excellent choice for a large number of applications.



Outstanding part quality.

With optical clarity, smooth side walls, a near-mirror top surface, tack-free downface, parts built with the SI 40 material require minimal finishing. A thin cured line-width produces excellent feature resolution.



Long vat life.

The Accura SI 40 material maintains good recoating characteristics and low viscosity without the need to make adjustments in the field by adding additional viscosity stabilizers, resulting in consistent, trouble-free part building.

High part yield.

The Accura SI 40 material builds green strength quickly with good layer-to-layer adhesion for excellent "first time" part building success. The Accura SI 40 material is also build chamber environment independent.

Accurate, mechanically stable parts.

The Accura SI 40 material is an accurate material with relatively low linear or differential shrinkage. Parts maintain their rigidity even when subjected to elevated humidity.

Build process you can depend on.

3D Systems' team of highly trained process engineers invests significant time to develop and optimize the build parameters with an emphasis on reliability, accuracy, part quality and throughput for each Accura SL material. This results in improved customer yields, reduced labor time and a better finished product.

Applications:

- High temperature applications
 - Under hood bolt-on testing
 - Wind tunnel testing
 - HVAC testing
- Prototyping and testing of rigid cases and enclosures
- Flow visualization
- Drilling and self-tapping
- Pressure tappings
- Snap fit assemblies
- RTV mold patterns

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Typical Properties

Liquid Material

MEASUREMENT	CONDITION	SOLID STATE Nd:YVO ₄
Appearance		Clear amber
Density	@ 25°C (77°F)	1.1 g/cm ³
Viscosity	@ 30°C (86°F)	485 cps
Penetration depth (Dp) ¹		6.6 mils *, 6.8 mils **
Critical exposure (Ec) ¹		21.7 mJ/cm ² *, 20.1 mJ/cm ² **
Tested build styles		EXACT™ EXACT HR* FAST™ ThinLayer™

¹ Dp and Ec values are not reliable indicators on throughput as throughput is affected by overhead time, layer thickness and part geometry.

* for the Viper SLA system

** for the SLA 7000 system

Post-Cured Material²

MEASUREMENT	CONDITION	90-MINUTE UV	90-MINUTE UV + THERMAL	90-MINUTE UV	90-MINUTE UV + THERMAL
		VIPER SLA SYSTEM		SLA 7000 SYSTEM	
Tensile Strength	ASTM D 638	57.2 - 58.7 MPa (8270 - 8490 PSI)	73.9 - 74.2 MPa (10690 - 10720 PSI)	61.5 - 61.7 MPa (8890 - 8920 PSI)	69.6 - 73.8 MPa (10050 - 10660 PSI)
Elongation at Break	ASTM D 638	4.8 - 5.1 %	4.8 - 5.1 %	4.9 - 5.1 %	4.7 - 6.4 %
Tensile Modulus	ASTM D 638	2628 - 3321 MPa (380 - 480 KSI)	2906 - 3321 MPa (420 - 480 KSI)	2840 - 3048 MPa (410 - 440 KSI)	2909 - 3186 MPa (420 - 460 KSI)
Flexural Strength	ASTM D 790	93.4 - 96.1 MPa (13500 - 13900 PSI)	116.2 - 118.3 MPa (16800 - 17100 PSI)	92.8 - 97 MPa (13400 - 14000 PSI)	106.7 - 110.1 MPa (15400 - 15900 PSI)
Flexural Modulus	ASTM D 790	2836 - 3044 MPa (410 - 440 KSI)	3113 - 3182 MPa (450 - 460 KSI)	2618 - 2756 MPa (380 - 400 KSI)	2840 - 2909 MPa (410 - 420 KSI)
Impact Strength Notched Izod	ASTM D 256	22.5 - 27.2 J/m (0.43 - 0.52 ft - lbs/in)	22.5 - 30.9 J/m (0.43 - 0.59 ft - lbs/in)	22.3 - 29.9 J/m (0.42 - 0.56 ft - lbs/in)	22.3 - 29.9 J/m (0.42 - 0.56 ft - lbs/in)
Heat Deflection Temperature	ASTM D 648 @ 66 PSI @ 264 PSI	51°C (123.8°F) 43°C (109.4°F)	101°C (213.8°F) 82°C (179.6°F)	54°C (129.2°F) 49°C (120.2°F)	114°C (237.2°F) 89°C (192.2°F)
Glass Transition, Tg	DMA, E''	65.6°C (150.1°F)	74.9°C (166.8°F)	62°C (143.6°F)	72°C (161.6°F)
Coefficient of Thermal Expansion	ASTM E 831-93 TMA (T<Tg) TMA (T>Tg)	99.6 x 10 ⁻⁶ m/m °C 185 x 10 ⁻⁶ m/m °C	60.8 x 10 ⁻⁶ m/m °C 167 x 10 ⁻⁶ m/m °C	73.5 x 10 ⁻⁶ m/m °C 188 x 10 ⁻⁶ m/m °C	67.1 x 10 ⁻⁶ m/m °C 189 x 10 ⁻⁶ m/m °C
Hardness, Shore D	ASTM D 2240	82	84	86	86

² Mechanical properties reported are determined after conditioning of the parts at 50%RH and 23°C for a period greater than 72 hours as specified by ASTM standards. Mechanical properties of parts without this conditioning may be different from values reported.



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