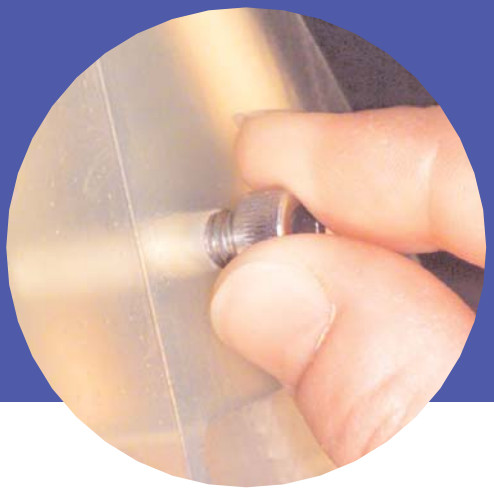
ACCURA® SI 40 MATERIAL

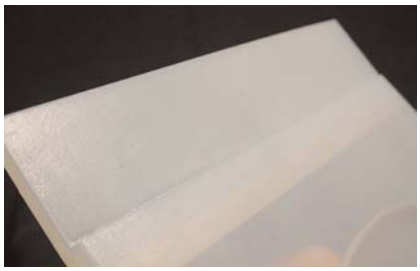
for the SLA® 250 and 500 systems



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

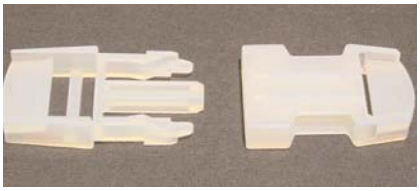
High temperature applications without the brittleness.

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.



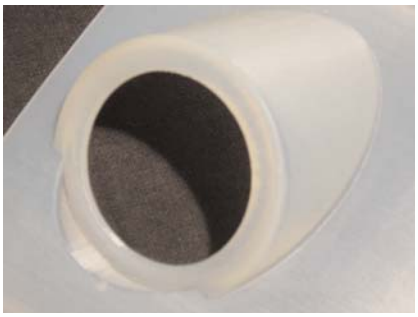
Excellent mechanical properties.

Offering an attractive mix of thermal resistance, stiffness, and elongation at break, Accura SI 40 material is suitable 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 adustments 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 first time 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

Accura SI 40 Material

for the SLA 250 and 500 systems

Typical Properties

Liquid Material

Measurement	Condition	HeCad (HC) and Argon Ion (Ar)
Appearance		Clear amber
Density	@ 25°C (77°F)	1.1 g/cm^3
Viscosity	@ 30°C (86°F)	485 cps
Penetration depth (Dp) [1]		4.7 mils *, 4.2 mils **
Critical exposure (Ec) [1]		13.9 mJ/cm^2 *, 11.3 mJ/cm^2 **
Tested build style		EXACT™

[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 SLA 250 system

** for the SLA 500 system

Post-Cured Material [2]

Measurement	Condition	90-minute UV	90-minute UV + Thermal	90-minute UV	90-minute UV + Thermal
		SLA 250 system		SLA 500 system	
Tensile Strength	ASTM D 638	64.9 - 65.7 MPa (9430 - 9550 PSI)	75.2 - 76.7 MPa (10920 - 11140 PSI)	61.5 - 62.2 MPa (8890 - 8990 PSI)	75 - 76.7 MPa (10820 - 11080 PSI)
Elongation at Break	ASTM D 638	4.4 - 5.5 %	5.3 - 8.2 %	4.1 - 4.3 %	5.9 - 7.5 %
Tensile Modulus	ASTM D 638	3169 - 3238 MPa (460 - 470 KSI)	3100 - 3309 MPa (450 - 480 KSI)	2840 - 3048 MPa (410 - 440 KSI)	3047 - 3532 MPa (440 - 510 KSI)
Flexural Strength	ASTM D 790	106.7 - 110.2 MPa (15500 - 16000 PSI)	110.9 - 112.3 MPa (16100 - 16300 PSI)	101.8 - 106.67 MPa (14700 - 15400 PSI)	117 - 119.1 MPa (16900 - 17200 PSI)
Flexural Modulus	ASTM D 790	3169 - 3238 MPa (460 - 470 KSI)	3100 - 3186 MPa (450 - 460 KSI)	3186 - 3255 MPa (460 - 470 KSI)	3186 - 3255 MPa (460 - 470 KSI)
Impact Strength Notched Izod	ASTM D 256	16.58 - 18.72 J/m (0.31 - 0.35 ft - lbs/in)	12.81 - 23 J/m (0.24 - 0.43 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	61°C (141.8°F) 55°C (131°F)	120°C (248°F) 105°C (221°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"	76°C (168.8°F)	99°C (210.2°F)	75.9°C (168.6°F)	90°C (194.0°F)
Coefficient of Thermal Expansion	ASTM E 831-93 TMA (T<Tg) TMA (T>Tg)	61 x 10^{-6} m/m °C 147 x 10^{-6} m/m °C	53.7 x 10^{-6} m/m °C 103 x 10^{-6} m/m °C	89.2 x 10^{-6} m/m °C 190 x 10^{-6} m/m °C	80.6 x 10^{-6} m/m °C 157 x 10^{-6} m/m °C
Hardness, Shore D	ASTM D 2240	90	90	87	87

[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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P/N 70487 02/04