



Nickel-Plated Stereolithography

SLA | SLS | FDM | Cast Urethanes | Injection Molding | Sheet Metal | CNC Machined Parts

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The Process:

Standard Finish SLA parts are first painted with a conductive paint. Then, a coating of copper is applied via an electroplating process. Finally, a coating of Nickel is applied via electroplating.

Stiffer:

Testing shows that Nickel-coating a part to 3.5 mil thickness increases its strength by 200% at 3% strain. Also, testing shows that part stiffness is increased by more than 500%.

Waterproof:

Testing shows that Nickel-coating makes the part virtually waterproof. When compared to non-coated parts, the coated part remains dimensionally stable over a 2 week period of immersion, whereas the uncoated part gradually increases in size (due to absorption) approaching a 2% size increase at the 2 week mark. Results of weight gain tests are similar.

Electrically Conductive:

Nickel-coated parts are electrically conductive, especially since the coating contains copper, a highly conductive material. This means that you can now use SLA parts as prototypes for components that must be grounded or must provide some EMF shielding.



Nickel-Plated SLA

Stereolithography Material Properties

Mechanical Properties	Test Method	Units	ABS-Like Std & High Res Somos 14120	ABS-Like Std & High Res Accura 50	Rigid Std & High Res Somos 11120	Rigid Std & High Res Accura 60
Tensile Strength	ASTM D638	psi	6,630	7,030 - 7,240	6,831 - 7,774	8,410 - 9,860
Tensile Modulus	ASTM D638	psi	357,000	360,000 - 390,000	N/A	390,000 - 450,000
Tensile Elongation at Break	ASTM D638	psi	7.9%	5.3 - 15%	11 - 20%	5 - 13%
Flexural Strength	ASTM D790	psi	9,240	10,400 - 11,200	9,152 - 10,756	12,620 - 14,650
Flexural Modulus	ASTM D790	psi	310,000	320,000 - 340,000	296,000 - 344,000	392,000 - 435,000
Hardness	DIJ 53505/2240	Shore D	81	86	N/A	86
Izod Impact-Notched	ASTM D256	(ft-lb)/in	0.44	0.31 - 0.51	0.4 - 0.6	0.3 - 0.5
Heat Deflection Temp	ASTM D648	°F	118 - 127 (66psi)	120 - 127 (66psi)	115 - 130	127 - 131 (66psi)

Mechanical Properties	Test Method	Units	Durable Std & High Res Somos 9420	Semi Flexible Somos 9110
Tensile Strength	ASTM D638	psi	2,450 - 2,900	2,600
Tensile Modulus	ASTM D638	psi	80,000 - 123,000	46,000
Tensile Elongation at Break	ASTM D790	psi	25 - 30%	27%
Flexural Strength	ASTM D790	psi	3,480 - 4,350	1,600
Flexural Modulus	DIJ 53505/2240	psi	111,000 - 130,500	45,000
Hardness	ASTM D256	Shore D	70 - 74	77
Izod Impact-Notched	ASTM D648	(ft-lb)/in	0.82 - 0.9	1.6
Heat Deflection Temp	ASTM D648	°F	117 - 122	129

The Benefits:

– SLA parts coated with nickel are stronger and stiffer, virtually waterproof, and electrically conductive.

The Features:

– The resulting coating is typically approximately 3 mils in thickness. The coating is uniform as a general rule, but may differ in thickness in areas of geometric change-of-direction.

The Project Impact:

– Nickel-plating is a 2-3 day post-production process and only adds slightly to the cost of the SLA parts.

Contact Information

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