

TECNOLOGIE



Questa tecnologia impiega **resine epossidiche** che permettono la produzione di **modelli estremamente dettagliati** anche con resine perfettamente trasparenti. Un materiale di particolare interesse è l'**Accura® Xtreme**. Adatto per la prototipazione ad alto modulo di elasticità è il materiale adatto per prototipi funzionali e prove meccaniche.

La tecnologia SLA è particolarmente adatta alla produzione di modelli dall'**elevato dettaglio superficiale, utili per test di accoppiamento**, controlli dimensionali e test ergonomici.

Stereolitografia SLA

MATERIALI

MATERIALE	DESCRIZIONE
Accura® 25	L' Accura® 25 è un materiale accurato e flessibile che simula le proprietà e l'aspetto del polipropilene. I pezzi prodotti con questo materiale sono molto simili a quelli stampati ad iniezione e possiedono un ottimo bilanciamento tra durata e flessibilità.
Somos® GP Plus 14122	Somos® GP Plus 14122 è una resina epossidica a bassa viscosità dall'aspetto bianco opaco. Il materiale riproduce le caratteristiche dell'ABS e del PBT e può essere facilmente integrato nei cicli di produzione. Materiale molto versatile.
Accura® ClearVue™	L' Accura® ClearVue™ è una resina trasparente con proprietà simili all'ABS ed una buona resistenza alle alte temperature. Produce componenti incolori, funzionali e precisi che simulano l'aspetto dell'acrilico.
Accura® Xtreme	L' Accura® Xtreme è un materiale adatto ad un prototipo ad alto modulo di elasticità, unisce structuralità e flessibilità. Il materiale è adatto per prototipi funzionali e per prove meccaniche.
Somos® PerFORM	Somos® PerFORM permette di realizzare modelli estremamente rigidi e resistenti alle alte temperature. Somos® PerFORM è il materiale ideale per la costruzione di utensili e per applicazioni utili a svolgere test in galleria del vento.

TECNOLOGIE



Dopo aver realizzato un master mediante Stereolitografia SLA o con la tecnologia Polyjet, da esso **si ricava uno stampo in silicone** utilizzabile per replicare più volte la parte specifica, con la possibilità di utilizzare vari materiali definitivi, come **elastomeri e resine trasparenti**.

Questo metodo di produzione è **adatto per piccoli lotti** o per realizzare **pre-serie nel materiale definitivo** (Rapid Manufacturing). La grande varietà di materiali disponibili consente di poter scegliere la soluzione migliore per ogni ambito applicativo.

REPLICHE SILICONICHE

ACCURA® 25

Accura® 25 is an accurate and flexible material that simulates the properties and appearance of polypropylene. The pieces produced with this material are very similar to those injection molded and have an **excellent balance between duration and flexibility**. **High production speed. Reliable and robust functional prototypes. Suitable as master in silicone mold-making processes.**

Both functional components and mock-ups can be made. Ideal for style elements for cars, electronic components, snap components.

Mechanical Properties

	Test Method	English	Metric
Tensile Strength	ASTM D638	5,540-5,570 psi	55-58 MPa
Tensile Modulus	ASTM D638	230-240 ksi	1,590-1,660 MPa
Elongation at Break	ASTM D638	13-20 %	13-20 %
Flexural Strength	ASTM D790	7,960-8,410 psi	55-58 MPa
Flexural Modulus	ASTM D790	200-240 ksi	1,380-1,660 MPa
Impact Strength	ASTM D256	0.4 lb/in	19-24 J/m

Thermal Properties

	Test Method	English	Metric
Heat Deflection (HDT) @ 66 psi	ASTM D648	136-145°F	51-55°C
Heat Deflection (HDT) @ 264 psi	ASTM D648	124-131°F	58-63°C
Coefficient Thermal Expansion TMA (T < Tg, 0-20 °C)	ASTM E831-93	59.4 µin/in°F	107 x 10 ⁻⁶ µm/m°C
Coefficient Thermal Expansion TMA (T < Tg, 75-140 °C)	ASTM E831-93	83.9 µin/in°F	151 x 10 ⁻⁶ µm/m°C
Glass Transition (Tg)	DMA, E"	162-165°F	72-74°C

Other

	Test Method	Value	Available Colors
Shore Hardness (D)	D2240	80	<input type="checkbox"/> White

SOMOS® GP Plus 14122

Somos® GP Plus 14122 is a low-viscosity stereolithography resin with an opaque white appearance. This material mirrors production plastics like ABS and PBT, making it an **ideal choice for virtually any applications**. Parts produced with Somos® GP Plus 14122 are **durable, accurate** and **water and moisture resistant**.

This material is ideal for functional prototypes, concept models and low volume production parts. Among the greatest advantages guaranteed by this material, we find: **extremely accurate; excellent humidity resistance; very durable**.

Mechanical Properties

	Test Method	UV Postcure Metric	UV Postcure Imperial
Tensile Strength	ASTM D638M	37 MPa	5.4 ksi
Tensile Modulus	ASTM D638M	2,510 MPa	364 ksi
Elongation at Break	ASTM D638M	7.5 %	7.5 %
Flexural Strength	ASTM D790M	67.3 MPa	9.8 ksi
Flexural Modulus	ASTM D2240	10,000 MPa	319 ksi
Izod Impact (Notched)	ASTM D256A	26 J/m	0.49 ft-lb/in

Thermal / Electrical Properties

	Test Method	UV Postcure Metric	UV Postcure Imperial
C.T.E. - 40 – 0° C (- 40 – 32° F)	ASTM E831-05	63 µm/m° C	35 µm/m° F
C.T.E. 0 – 50° C (32 – 122° F)	ASTM E831-05	89 µm/m° C	49 µm/m° F
C.T.E. 50 – 100° (122 – 212° F)	ASTM E831-05	170 µm/m° C	96 µm/m° F
C.T.E. 100 – 150° C (212 – 302° F)	ASTM E831-05	172 µm/m° C	96 µm/m° F
Dielectric Constant 60 Hz	ASTM D150-98	3.8	3.8
Dielectric Constant 1 KHz	ASTM D150-98	3.7	3.7
Dielectric Constant 1 MHz	ASTM D150-98	3.4	3.4
Dielectric Strength	ASTM D149-97A	17.9 kV/mm	454 V/mil
HDT @ 0.46 MPa (66 psi)	ASTM D648	46°C	115°F
HDT @ 1.81 MPa (264 psi)	ASTM D648	41°C	106°F

ACCURA® ClearVue™

Accura® ClearVue™ is a **transparent resin** with properties similar to PMMA and **excellent transparency**. It produces colorless, functional and precise components that simulate the appearance of acrylic.

Accura® ClearVue™ is ideal for **applications** that **require transparencies** such as **automotive lenses, bottles, fluid flow analysis parts, packaging prototypes, light tubes**.

Mechanical Properties

	Test Method	English	Metric
Tensile Strength	ASTM D638	5,950-6,670 psi	41-46 MPa
Tensile Modulus	ASTM D638	294-322 ksi	2,030-2,220 MPa
Elongation at Break	ASTM D638	4-7 %	4-7 %
Flexural Strength	ASTM D790	7,690-9,720 psi	53-67 MPa
Flexural Modulus	ASTM D790	226-296 ksi	1,560-2,040 MPa
Impact Strength	ASTM D256	0.81-1.26 lb/in	43-67 J/m

Thermal Properties

	Test Method	English	Metric
Heat Deflection (HDT) @ 66 psi	ISO 75-1/-2	115°F	46°C
Heat Deflection (HDT) @ 264 psi	ISO 75-1/-2	106°F	41°C
Coefficient Thermal Expansion < 35°C	ISO 306	70 µin/in°F	70 µm/m°C
Coefficient Thermal Expansion > 60°C	ISO 11357-1/-3	160 µin/in°F	160 µm/m°C
Glass Transition (Tg)	DMA, E"	113°F	56°C

Other

	Test Method	Value	Available Colors
Shore Hardness (D)	D2240	84	<input type="checkbox"/> Transparent
Solid Density @25°C /77°F	-----	1.17 g/cm ³	

ACCURA® Xtreme

The Accura® Xtreme is a material that is suitable for a very elastic prototype; it mixes a structural essence with flexibility. This material is suitable for **functional prototypes** and mechanical tests. **Great longevity and impact resistance. Equivalent in aspect and finish to the definitive piece. Perfect for electronic devices.**

The Accura® Xtreme withstands deformations and high temperatures. It has printed polypropylene's (PP) and ABS' aesthetic.

Mechanical Properties

	Test Method	English	Metric
Tensile Strength	ASTM D638	5,510-6,380 psi	38-44 MPa
Tensile Modulus	ASTM D638	260-287 ksi	1,790-1,980 MPa
Elongation at Break	ASTM D638	14-22 %	14-22 %
Flexural Strength	ASTM D790	7,540-10,300 psi	57-71 MPa
Flexural Modulus	ASTM D790	220-300 ksi	1,520-2,070 MPa
Impact Strength	ASTM D256	0.66-0.98 lb/in	35-52 J/m

Thermal Properties

	Test Method	English	Metric
Heat Deflection (HDT) @ 66 psi	ASTM D648	144°F	62°C
Heat Deflection (HDT) @ 264 psi	ASTM D648	129°F	54°C
Glass Transition (Tg)	DMA, E"	158-165°F	70-74°C

Other

	Test Method	Value	Available Colors
Solid Density @25°C /77°F	-----	1.19 g/cm ³	<input type="checkbox"/> Light Gray

SOMOS® PerFORM

Somos® PerFORM makes it possible to create models that are extremely rigid and resistant to high temperatures. Somos® PerFORM is the ideal material for tool making and for applications useful for wind tunnel testing. The material is ideal for many high performance engineering applications such as aerospace or automotive. Excellent surface yield. Excellent yield of finishing processes. Resistance to high temperature. With the lowest viscosity among stereolithography materials Somos® PerFORM allows rapid production times, ease of post-processing and superior surface quality in order to guarantee a very high definition of details.

Mechanical Properties

	Test Method	English UV/Thermal Postcure	Metric UV/Thermal Postcure
Tensile Strength	ASTM D638	9.9 ksi / 11.6 ksi	68 MPa / 80 MPa
Tensile Modulus	ASTM D638	1,520 ksi / 1,420 ksi	10,500 MPa / 9,800 MPa
Elongation at Break	ASTM D638	1.1% / 1.2%	1.1% / 1.2%
Flexural Strength	ASTM D790	17.4 ksi / 21.2 ksi	120 MPa / 146 MPa
Flexural Modulus	ASTM D790	1,450 ksi / 1,310 ksi	10,000 MPa / 9,030 MPa
IZOD Impact, notched A	ASTM D256	0.32 -lb/in / 0.37 -lb/in	17 J/m / 20 J/m

Thermal / Electrical Properties

	Test Method	English UV/Thermal Postcure	Metric UV/Thermal Postcure
Heat Deflection (HDT) @ 66 psi	ASTM D648	270°F / 514°F	132°C / 268°C
Heat Deflection (HDT) @ 264 psi	ASTM D648	180°F / 246°F	82°C / 119°C
Coefficient Thermal Expansion -40-0 °C/-40-32°F	ASTM E831-05	16.6 µin/in°F / 14.7 µin/in°F	29.9 µm/m°C / 26.4 µm/m°C
Coefficient Thermal Expansion 0-50 °C/32-122°F	ASTM E831-05	27.4 µin/in°F / 19.1 µin/in°F	49.4 µm/m°C / 34.3 µm/m°C
Coefficient Thermal Expansion 50-100 °C/122-212°F	ASTM E831-05	43.9 µin/in°F / 33.3 µin/in°F	79.1 µm/m°C / 59.9 µm/m°C
Coefficient Thermal Expansion 100-150 °C/212-302°F	ASTM E831-05	45.0 µin/in°F / 52.6 µin/in°F	80.9 µm/m°C / 94.7 µm/m°C
Tg	E1545-11	162°F / 178°F	72°C / 81°C
Dielectric Strength	D149-97a	668 V/mil / 644 V/mil	26.3 kV/mm / 25.4 kV/mm
Dielectric Constant @ 60 Hz	D150-98	4.0	4.0
Dielectric Constant @ 1 Khz	D150-98	3.8 / 3.9	3.8 / 3.9

Other

	Test Method	Value	Available Colors
Shore Hardness (D)	D2240	94-93	<input type="checkbox"/> Off-White
Water absorption, %	D570-98	0.2% / 0.1%	
Density @ 25°C	-----	~1.61 g/cm ³	



LA FABBRICA DEDICATA ALLA PRODUZIONE ADDITIVA

GUIDE Material Selection

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	MATERIAL	DESCRIPTION	PROTOTYPES			Color
			Functional	Aesthetic	Stiffness	
DMLS / SLM	Scalmalloy®	This material is corrosion-resistant and combines the low weight of aluminium with almost the specific strength of titanium.				
	Aluminium HTA	Aluminium HTA - High Temperature Aluminium – is a material developed with the objective of ensuring high performance even at 190—200°C.				
	Alloy 263	Alloy 263 is a nickel-cobalt-chromium-molybdenum alloy designed specifically to combine very good strength properties with excellent fabrication characteristics in the annealed condition. The alloy is also age hardenable.				
	Aluminium AlSi7Mg 0.6 (A357)	Definitive aluminum, very workable and extremely resistant.				
	Aluminium AlSi10Mg	Very low specific weight (light). AlSi7Mg is an alloy for aerospace applications.				
	Titanio Ti6Al4V (Grade 23 ELI)	Titanium grade 23, ideal for use in automotive, medical and jewellery applications according to ASTM F136-02a.				
	Inconel 718	Nickel based alloy for the production of components for high temperatures applications.				
	Inconel 625					
	Stainless Steel AISI 316L	It's an austenitic stainless steel for the production of functional parts or components for pre-production moulds.				
	Stainless Steel 17-4ph	It's a precipitation hardening stainless steel for the production of functional parts or medical instruments.				
	Stainless Steel 15-5PH	15-5 PH Stainless Steel is a martensitic precipitation-hardening stainless steel that provides an outstanding combination of high strength, good corrosion resistance, good mechanical properties at temperatures up to 600 °F (316 °C).				
	Cobalt-Chrome F75	Material with high mechanical and thermal resistance, ideal for models with thin walls and subjected to high temperatures.				
	Remanium® Star CL	Cobalt Chrome for dental applications.				
	Bronze	It's a material whose melting properties make it outstandingly suited to generative processing.				
	Copper Alloy CuNi2SiCr	Material with favorable combination of electrical and thermal conductivity accompanied by high stiffness.				
	Maraging Steel 1.2709	Material for the production of components for tool inserts with conformal cooling and production of functional components.				
	NickelAlloy HX	NickelAlloy HX is a nickel-chromium-iron-molybdenum alloy in fine powder form. This type of alloy is characterized by having high strength and oxidation resistance also at elevated temperatures and is often used up to 1200°. Therefore, its applications can be found in aerospace technology, Oil & Gas and gas turbine parts.				
	Alloy 282	Alloy 282 is a superalloy suitable for the aerospace and Oil & Gas industries developed for use in critical applications at temperatures close to 1000 °C as turbine parts and exhausts.				
AISI 420	The AISI 420 is a self-hardening martensitic steel which has complementary characteristics to ferritic and austenitic steels. The hardening process to which it is subjected makes it very useful for cutlery, structural parts, surgical and dental instruments, parts of valves.					
Tungsten	Tungsten is a material with high wear resistance used for the production of tools for the metalworking, mining, petroleum and construction industries. Tungsten is radiation-resistant and is widely used for aerospace applications.					
SLS	PA 603-CF	PA 603-CF is a carbon fiber filled nylon 12 easy to process, strong, light weight filled material. Its peculiarities are: low specific weight, good dimensional stability, excellent mechanical properties and excellent resistance to warping.	✓	✓	Rigid	Black
	PA 620-MF	PA 620-MF is a mineral fiber filled nylon 12 easy to process, performing and heavier weight filled material. Fibers have been optimized to produce a smooth surface finish without sacrificing feature detail for mechanical properties. The material boasts isotropic mechanical properties, excellent combination of strength and resistance to high temperatures.	✓	✓	Rigid	White, Black
	PA 6	The PA6 material is a polyamide widely used in all those applications where the components are subject to wear or friction. Compared to PA12, it has superior mechanical properties.	✓		Semi-Rigid	White
	WhiteSinter	Standard white nylon (PA12) with good characteristics of flexibility and elasticity.		✓	Semi-Rigid	White
	DuraForm EX Black	DuraForm EX is an impact resistant rigid plastic that is ideal for applications where impact resistance is required and functional hinges. DuraForm EX combines the characteristics of ABS with extraordinary flexural strength and it is perfect for creating functional snaps and hinges.	✓	✓	Rigid	Black
	Polypropylene (PP)	Polypropylene (PP) for Selective Laser Sintering. With this material pre-series parts can thus be produced in the same basic material as large series parts. Decisive advantages of this material are the outstanding toughness and media resistance.	✓	✓	Semi-Rigid	White
	TPU	Thermoplastic elastomer material with rubber-like flexibility and functionality for use with sPro 60 HD-HS.	✓	✓	Elastic	Ivory, Yellow, Black, Red, Blue
	Castform™ PS	Castform™ PS is a Styrene-based, expendable pattern casting material, compatible with most standard foundry processes. For prototype metal castings and low to medium production runs without tooling.	✓			Red
	FlexSinter-Infiltrated	Very tough elastomer, available in various colors; aesthetic quality lower than that of polyjet rubber.	✓		Elastic	Ivory, Yellow, Black, Red, Blue
Allusinter	Nylon reinforced with aluminum. Structural material, rigid and with high mechanical strength. Excellent reproduction of details.	✓	✓	Rigid	Light Gray	

Suitable materials for definitive parts.
All functional tests can be performed on prototype parts as they were the final product.
Suitable for finishes and surface treatments.
Ideal for rapid manufacturing products.

	MATERIAL	DESCRIPTION	PROTOTYPES		Stiffness	Color
			Functional	Aesthetic		
FDM	ASA	It's similar to ABS M30, but is UV resistant. It's ideal for end use parts.	✓		Rigid	Ivory, Black, Light Gray, Dark Gray, White, Dark Blue, Green, Yellow, Orange, Red
	ABS M30	Standard ABS created with FDM systems. Properties are identical to ABS injection molded.	✓		Rigid	Ivory, Dark Gray, White, Black, Red, Blue
	ABS-ESD7	ABS thermoplastic with static dissipative properties: prevents static charges from damaging products, or impair their performance.	✓		Rigid	Black
	ABSi	Components made from translucent Absi are penetrable by light. Monitoring of inside fluid movement is allowed.	✓		Rigid	Translucent Natural-Amber-Red
	PC	Polycarbonate. Material with high mechanical resistance, it is suitable for the creation of very strong and definitive models.	✓		Rigid	White
	PC-ISO	Polycarbonate ISO is an ideal material for the food, packaging and medical (certified for medical use) industry.	✓		Rigid	Translucent Natural, White
	PC-ABS	ABS and polycarbonate. Material that combines mechanical and thermal properties of the PC and the flexibility of ABS.	✓		Rigid	Black
	NYLON 12	Nylon 12 has an elongation at break greater than 100-300%. It has high impact resistance and excellent chemical resistance.	✓		Rigid	Black
	NYLON 6	Nylon 6 combines strength and toughness superior to other FDM Thermoplastics, for applications that require strong, customized parts and tooling that lasts longer and withstands rigorous functional testing.	✓		Rigid	Black
	NYLON 12CF	FDM Nylon 12CF™ is a carbon-filled thermoplastic with excellent structural characteristics. The material is comprised of a blend of Nylon 12 resin and chopped carbon fiber, at a loading of 35% by weight.	✓		Rigid	Black
	PPSF	Polyphenylsulfone. Material highly resistant to heat, it can be used in autoclave and it can be sterilized with various methods.	✓		Rigid	Tan
	ULTEM® 9085	Thermoplastic resin with high mechanical and thermal properties. Ideal for parts subject to high stress. Flame retardant.	✓		Rigid	Tan, Black
	ULTEM® 1010	Offering excellent strength and thermal stability with food contact and bio-compatibility certifications; it's ideal for food production tools, custom medical devices, aerospace and automotive applications.	✓		Rigid	Tan
Antero 800NA	Antero™ 800NA is a PEKK-based FDM® thermoplastic. It combines FDM's design freedom and ease of use with the excellent mechanical properties and low outgassing characteristics of the PEKK material.	✓		Rigid	Tan	
HP	HP 3D PA 12	The HP 3D PA 12 material is a highly optimized 3D thermoplastic for high reusability. It allows you to get high-precision models with dimensional tolerances.	✓	✓	Rigid	Black
	PA12 FDA (Food Grade)	The characteristics of PA12 FDA are: high resistance to fats, oils, water, saline solutions and solvents. It is a material suitable for the production of objects that need to come into contact with food (after certification of the process).	✓	✓	Rigid	Black
	HP 3D PA11	PA11 is a thermoplastic material which offers optimal mechanical properties and provides excellent corrosion resistance. Its ductility makes it suitable for the production of components with snap insertions.	✓	✓	Rigid	Gray
	HP 3D PA12 Glass Beads	PA12 Glass Beads material is 40% glass filled and is ideal for applications requiring high stiffness like enclosures, housing and tooling.	✓	✓	Rigid	Black
POLYJET	Vero Blue	Rigid pigmented photopolymer ideal for fine details and dental models.		✓	Rigid	Light Blue
	Vero Black Plus	Black pigmented photopolymer good for unpainted parts; can be finished with soft-touch effect.		✓	Rigid	Black
	Vero Gray	Rigid pigmented photopolymer ideal for highly detailed model seven with thin walls, excellent surface finish.		✓	Rigid	Light Gray
	Vero White Plus	Rigid pigmented photopolymer, slightly flexible and suitable for creating expendable masters for lost-wax casting.		✓	Semi-Rigid	White
	Vero Clear	Transparent photopolymer, ideal for simulating PMMA, PC models or transparent methacrylate.		✓	Rigid	Transparent, Opal
	ABS-Like 2	Pigmented photopolymer particularly suitable for functional models (excellent stability), not suitable for walls <0.8 mm.	✓		Rigid	Light Green
	Helios RGD 525 HT	Very rigid pigmented photopolymer, suitable for applications where thermal stability and extreme detail are required.	✓	✓	Rigid	Ivory
	Full Cure 720	Translucent photopolymer with high accuracy and excellent surface smoothness (certified for medical use).		✓	Rigid	Translucent Amber
	Tango Plus	Elastic photopolymers having 27 Shore A hardness (other hardnesses available).		✓	Elastic	Translucent Amber
	Tango Black Plus	Elastic photopolymers with 27 Shore A hardness (other hardnesses available).		✓	Elastic	Black
	Tango Black	Elastic photopolymer with 60 Shore A hardness (other hardnesses available).		✓	Elastic	Black
Tango Gray	Elastic photopolymer having 70 Shore A hardness (other hardnesses available).		✓	Elastic	Light Gray	
Endur RGD 450	Endur RGD 450 is a tough and flexible photopolymer. It enables you to 3D print precision prototypes that look and behave like injection-molded polypropylene.		✓	Rigid	Ivory	
SLA	Accura® 25	Flexible plastic to simulate and replace CNC machined white polypropylene articles.	✓		Semi-Rigid	White
	Somos® GP Plus 14122	Somos® GP Plus 14122 is a low-viscosity stereolithography resin with an opaque white appearance. This material mirrors production plastics like ABS and PBT and it is easily integrated in production cycles. Somos® GP Plus 14122 is a very versatile material.		✓	Rigid	White
	Accura® ClearVue™	High clarity plastic (transparent) for a multitude of applications.		✓	Rigid	Transparent
	Accura® Xtreme™	Ultra tough grey plastic to replace CNC-machined polypropylene and ABS articles.		✓	Rigid	Gray
	Somos® PerFORM	Somos® PerFORM produces strong, stiff, high temperature resistant composite parts that are ideal for tooling and wind tunnel testing applications.	✓		Rigid	White