HLH | PROTOTYPES PROTOTOOL PRODUCTION

3D PRINTING MATERIAL SPECIFICATION SHEETS

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Material Reference

SLA Materials

CV-UV 9400

PRODUCT DESCRIPTION

C-UV 9400 is an ABS like SL resin which has accurate and durable features. It is designed for solid state SLA platforms, C-UV 9400 can be applied in master patterns, concept models, general parts and functional prototypes in the field of automotive, medical and consumer electronics industries. The parts duability building with C-UV9400 Is over 6.5 months.

TYPICAL FEATURES

- Liquid resin's medium viscosity, so easy recoating, easy clean parts and machines
- Improved strength retained, improved dimensions retention of parts in humid condition
- need minimal part finishing
- Long shelf life in machine

TYPICAL BENEFITS

- Need less part finishing time,easier post-curing
- Buliding accurate and high tough parts with an improved dimensional stability
- High quality controls for vacuum casting parts
- Low shrink and good resistance to yellowing
- Magnificent white color
- Outstanding machinable SLA material

Physical Properties - Liquid Material

Appearance	White
Density	1.13g / cm³ @ 25℃
Viscosity	355cps @ 28℃
Dp	0.145mm
Ec	9.3mJ/cm³
Building layer thickness	0.1mm

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SLA Materials

CV-UV 9400

Mechanical Properties of Post-Cured Material

MEASUREMENT	TEST METHOD	VALUE
		90-minute UV post-cure
Hardness	ASTMD 2240	83
Flexural modulus	ASTMD 790	2692-2775
Flexural strength	ASTMD 790	69-74
Tensile modulus	ASTMD 638	2189-2395
Tensile strength	ASTMD 638	27-31
Elongation at break	ASTMD 638	12-20%
Impact strength,notched Izod, J/m	ASTMD 256	58-70
Heat deflection temperature, ℃	ASTMD 648@66PSI	52
Glass transition,Tg	DMA，E”peak	62
Coefficient of thermal expension	TMA(T<Tg)	97*E-6
Density	0.1mm	1.16

注：C-UV9400 使用温度和保存温度不宜过高，请在25 摄氏度以下使用；推荐使用和保存温度为18-25 摄氏度。

SLA Materials

TOP31B

PRODUCT DESCRIPTION

TOP31B is an ABS like SL resin which has accurate and durable features. It is designed for solid state SLA platforms. TOP31B can be applied in master patterns, concept models, general parts and functional prototypes in the field of automotive, medical and consumer electronics industries.The parts duability building with TOP31B is over 6.5months.

TYPICAL FEATURES

- Liquid resin's medium viscosity, so easy recoating, easy clean parts and machines
- Improved strength retained, improved dimensions retention of parts in humid condition
- need minimal part finishing
- Long shelf life in machine

TYPICAL BENEFITS

- Need less part finishing time,easier post-curing
- Buliding accurate and high tough parts with an improved dimensional stability
- High quality controls for vacuum casting parts
- Low shrink and good resistance to yellowing
- Magnificent Grey color
- Outstanding machinable SLA material

Physical Properties - Liquid Material

Appearance	Grey
Density	1.11-~1.15g/cm³ @ 25 ℃
Viscosity	510~590 cps @ 25 ℃
Dp	0.135 ~ 0.158 mm
Ec	8.3 ~ 9.2 mJ/cm²
Building layer thickness	0.05 ~ 0.11mm

SLA Materials

TOP31B

Mechanical Properties of Post-Cured Material

MEASUREMENT	TEST METHOD	VALUE
		90-minute UV post-cure
Hardness	ASTMD 2240	78~88
Flexural modulus	ASTMD 790	2722-2792
Flexural strength	ASTMD 790	69-76
Tensile modulus	ASTMD 638	2649-2731
Tensile strength	ASTMD 638	41-58
Elongation at break	ASTMD 638	7-11%
Poisson`s Ratio	ASTMD 638	0.4-0.44
Impact strength,notched Izod, J/m	ASTMD 256	29-34
Heat deflection temperature, ℃	ASTMD 648@66PSI	58~69
Glass transition,Tg	DMA，E” peak	62~75
Coefficient of thermal expension	TMA(T<Tg)	90~103*E-6
Density		1.12~1.18
Dielectric Constant 60 Hz	ASTMD 150-98	4.2~5.0
Dielectric Constant 1 kHz	ASTMD 150-98	3.3~4.2
Dielectric Constant 1 MHz	ASTMD 150-98	3.2~4.0
Dielectric Strength	ASTMD 1549-9a	12.8~16.1

注：TOP31B使用及保存温度不宜过高，请在25摄氏度以下使用；使用及保存的相对湿度必须在38RH%以下。

SLA Materials

Godart®8228

PRODUCT DESCRIPTION

Godart®8228 is a ABS like material which have super toughness, high hardness, and high strength.It can produce the thin-walled parts with a thickness of 2.5mm and is resistant to temperature 70°C.It has excellent detail, small molding shrinkage, good dimensional stability, durability, and can meet the requirements of painting. As a kind of 3D printing material, it is suitable for parts with high impact and shock absorption.

KEY BENEFITS

- Rigid, precision plastic like injection molding ABS
- Resistant to temperature 65-70°C
- Suitable for Functional prototype, tools, Electrical components, chassis, phone cover
- Post-process including painting, bonding or metallization
- Suitable for SLA light curing 3D printing system with light source of 355nm

Physical Properties - Liquid Material

HEAT DEFLECTION TEMPERATURE (0.46 MPA)	56 °C
HARDNESS (SHORE D)	86
TENSILE STRENGTH	51.21 MPa
TENSILE MODULUS	2136 MPa
FLEXURAL STRENGTH	93.5 MPa
FLEXURAL MODULUS	2155 MPa
IMPACT STRENGTH	27 J/M

SLA Materials

Lasty-702

PRODUCT DESCRIPTION

Lasty-702 is an ABS like SL resin which has accurate and durable features. It is designed for solid state SLA platforms. Lasty-702 can be applied in master patterns, concept models, general parts and functional prototypes in the field of automotive, medical and consumer electronics industries.The parts duability building with Lasty-702 is over 6.5months.

TYPICAL FEATURES

- Liquid resin`s medium viscosity, so easy recoating, easy clean parts and machines
- Improved strength retained, improved dimensions retention of parts in humid condition
- need minimal part finishing
- Long shelf life in machine

TYPICAL BENEFITS

- Need less part finishing time,easier post-curing
- Buliding accurate and high tough parts with an improved dimensional stability
- High quality controls for vacuum casting parts
- Low shrink and good resistance to yellowing
- Magnificent yellow color
- Outstanding machinable SLA material

Physical Properties - Liquid Material

Appearance	White
Density	1.11 ~ 1.15g/cm³ @ 25 ℃
Viscosity	510~590 cps @ 25 ℃
Dp	0.135 ~ 0.158 mm
Ec	8.1 ~ 8.9 mJ/cm²
Building layer thickness	0.05 ~ 0.12mm

SLA Materials

Lasty-702

Mechanical Properties of Post-Cured Material

MEASUREMENT	TEST METHOD	VALUE
		90-minute UV post-cure
Hardness	ASTMD 2240	78~88
Flexural modulus	ASTMD 790	2722-2792
Flexural strength	ASTMD 790	69-76
Tensile modulus	ASTMD 638	2649-2731
Tensile strength	ASTMD 638	41-58
Elongation at break	ASTMD 638	7-11%
Poisson`s Ratio	ASTMD 638	0.4-0.44
Impact strength,notched Izod, J/m	ASTMD 256	29-34
Heat deflection temperature, ℃	ASTMD 648@66PSI	58~69
Glass transition,Tg	DMA，E” peak	62~75
Coefficient of thermal expension	TMA(T<Tg)	90~103*E-6
Density		1.12~1.18
Dielectric Constant 60 Hz	ASTMD 150-98	4.2~5.0
Dielectric Constant 1 kHz	ASTMD 150-98	3.3~4.2
Dielectric Constant 1 MHz	ASTMD 150-98	3.2~4.0
Dielectric Strength	ASTMD 1549-9a	12.8~16.1

注： Lasty-702使用及保存温度不宜过高，请在25摄氏度以下使用；使用及保存的相对湿度必须在38RH%以下。

SLA Materials

Crysta-8QEF1

An optically clear stereolithography material tailored for colorless, functional parts with excellent temperature resistance

PRODUCT DESCRIPTION

Crysta-8QEF1 is a clear SL resin which has accurate and durable features. It is designed for solid state SLA platforms. Crysta-8QEF1 can be applied in master patterns, concept models, general parts and functional prototypes in the field of automotive, medical and consumer electronics industries.

TYPICAL FEATURES

- Liquid resin`s medium viscosity, so easy recoating, easy clean parts and machines
- Improved strength retentin, improved dimensions retention of parts in humid condition
- Good green strength, so need minimal part finishing
- Easy burning completely

TYPICAL BENEFITS

- Superior clear,building patrs with outstanding clarity and excellent accuracy
- Need less part finishing time,easier post-curing
- Suitable for casting

Physical Properties - Liquid Material

Appearance	Clear
Density	1.12g/cm³ @ 25 ℃
Viscosity	312~420cps @ 25 ℃
Dp	0.18 mm
Ec	9.8-12mJ/cm²
Building layer thickness	0.1mm

SLA Materials

Crysta-8QEF1

Mechanical Properties of Post-Cured Material

MEASUREMENT	TEST METHOD	VALUE
		90-minute UV post-cure
Hardness	ASTMD 2240	76~82
Flexural modulus	ASTMD 790	2570 – 2860
Flexural strength	ASTMD 790	75 – 81
Tensile modulus	ASTMD 638	2490 – 2660
Tensile strength	ASTMD 638	44 – 62
Elongation at break	ASTMD 638	7-11%
Impact strength,notched Izod, J/m	ASTMD 256	27– 35
Heat deflection temperature, ℃	ASTMD 648@66PSI	40 ~ 51
Glass transition,Tg	DMA，E” peak	42 ~ 58

注： Crysta-8QEF1使用及保存温度不宜过高，请在25摄氏度以下使用；使用及保存的相对湿度必须在38RH%以下。

SLS Materials

FS3300PA

Mechanical Properties of Post-Cured Material

General Properties	
Bulk Density	0.48 g/cm³
Density of Parts	0.95 g/cm³
Color	white

Thermal Properties	
Melting Point	183 °C
Heat Deflection Temp (HDT) 1 . 8 Mpa GB/T 1040.2-2006	83.5 °C
Heat Deflection Temp (HDT) 0 . 45 Mpa GB/T 1040.2-2006	146.2 °C

Mechanical Properties	
Tensile Strength GB/T1040.2-2006	46 MPa
Tensile Modulus GB/T1040.2-2006	1602 MPa
Elongation at Break GB/T1040.2-2006	36 %
Flexural Strength GB/T1040.2-2006	46.3 MPa
Flexural Modulus GB/T1040.2-2006	1300 MPa
Impact Strength (notched Izod) GB/T 1843-2008	4.9 KJ/m²
Impact Strength (unnotched Izod) GB/T 1843-2008	13.2 KJ/m²

SLS Materials

FS3400GF

Mechanical Properties of Post-Cured Material

General Properties	
Bulk Density	0.67 g/cm³
Density of Parts	1.26 g/cm³
Color	Gray

Thermal Properties	
Melting Point	184 °C
Heat Deflection Temp (HDT) 1 . 8 Mpa GB/T 1040.2-2006	88 °C
Heat Deflection Temp (HDT) 0 . 45 Mpa GB/T 1040.2-2006	162 °C

Mechanical Properties	
Tensile Strength GB/T1040.2-2006	44 MPa
Tensile Modulus GB/T1040.2-2006	3500 ~ 7800 MPa
Elongation at Break GB/T1040.2-2006	5 %
Flexural Strength GB/T1040.2-2006	68 MPa
Flexural Modulus GB/T1040.2-2006	2415 MPa
Impact Strength (notched Izod) GB/T 1843-2008	4.13 KJ/m²
Impact Strength (unnotched Izod) GB/T 1843-2008	19.28 KJ/m²

SLS Materials

TPU

Ester based thermoplastic polyurethane TPU Powder, white color

Powder Properties

Powder for laser sintering (additive manufacturing). Elastic parts with high strength and high abrasive resistance for shoe and sports industry, pipes, sealings, prosthetics and many more applications.

Mechanical Properties of Post-Cured Material

Physical Properties		Test Method	Specimen	Units	Typical Value
Specific Gravity		ISO 1183	Sintered part	g/cm³	1.2
Water Absorption	23 °C, 24 h			%	< 0.5
Melt Volume Rate	MVR190°C/2.16 kg	ISO 1133	Power	cm³/10 min	18.0
Glass Transition Temp		ISO 6721-1	Sintered part	°C	-13.6
Shrinkage		Measured on test prints		%	3.0

Mechanical Properties at 23 °C/ 50 % rh (according to build orientation)		Test Method	Specimen	Units	Typical Value
Shore Hardness A		ISO 868	Sintered part	-	88
Flexural Modulus 20°C	1 Hz, 2 °C/min	ISO 6721-1	Sintered part	MPa	27
Flexural Modulus 60°C	1 Hz, 2 °C/min	ISO 6721-1	Sintered part	MPa	72
Tensile Strength (x-direction)		ISO 53504	Sintered S1-bar	MPa	20
Tensile Strength (z-direction)		ISO 53504	Sintered S1-bar	MPa	15
Elongation (x-direction)		ISO 53504	Sintered S1-bar	%	520
Elongation (z-direction)		ISO 53504	Sintered S1-bar	%	500
Abrasion Resistance (x-direction)		ISO 4649	Sintered part	mm³	31
Abrasion Resistance (z-direction)		ISO 4649	Sintered part	mm³	28
Compression Strength (x-direction)		ISO 604	Type A	MPa	33
Compression Strength (z-direction)		ISO 604	Type A	MPa	40
Compression Modulus (x-direction)		ISO 604	Type B	MPa	15
Compression Modulus (x-direction)		ISO 604	Type B	MPa	20
Poisson ratio (Hencky)	0.2 mm/s				0.45

SLS Materials

TPU

Ester based thermoplastic polyurethane TPU Powder, white color

Mechanical Properties of Post-Cured Material

Thermal Properties					
Vicat-softening Temperature	VST A	ISO 306	MPTS ISO 3167 A	°C	90
Melting Temperature	ISO 11357			°C	160

Powder Properties			
x10	Laser diff.	µm	20
X50	Laser diff.	µm	50
X90	Laser diff.	µm	105
Bulk Density		g/cm³	0.457
Part bed powder density		g/cm³	0.600

MJP Materials

VisiJet Armor M2G-CL

Mechanical Properties of Post-Cured Material

Properties	ASTM	
Color		Clear
Tensile Strength (MPa)	D638	30-35
Tensile Modulus (MPa)	D638	1500-2000
Elongation at Break	D638	55-65
Flexural Strength (MPa)	D790	40-45
Flexural Modulus (MPa)	D790	1000-1200
Impact Strength(Notched Izod) (J/m)	D256	40-50
Shore A Hardness	2240	N/A
Shore D Hardness	2240	70
Water Absorption (24 hr)	D570	
Heat Distortion Temp@ 0.45 MPa	D648	47 °C
Heat Distortion Temp@ 1.82 MPa	D648	43 °C
Melting Point		N/A
Softening Point		N/A
Description		Transparent clear

DLP Materials

TPU

PHYSICAL PROPERTIES			
Test	Company	Test standard	Test results
Hardness (a)	/	ASTM:D2240-05	60-75
Viscosity(25℃)	mpa.s	ASMT:D4212-10	980.0
Tear strength	KN/m	ASMT:D624-98	47.2
Tensile strength	Mpa	ASMT:D412-06	7.9
Elastic modulus	Mpa	ASMT:D412-06	2.0
Elongation at break	%	ASMT:D412-06	255.1%

3D printing of metal materials

Stainless Steel 316L

Properties		
Physical properties	Particle size	15 ~ 53μm
	Form	Spherical
	Liquidity	40 S
	Apparent density	3.9 g/cm³
Molded part performance	Density	≥99%
	Tensile strength	≥560Mpa
	The yield strength	≥480Mpa

3D printing of metal materials

Titanium Alloy

Properties		
Physical properties	Particle size	15 ~ 53μm
	Form	Spherical
	Liquidity	40 S
	Apparent density	2.5 g/cm³
Molded part performance	Density	≥99%
	Tensile strength	≥600 Mpa
	The yield strength	≥540 Mpa

3D printing of metal materials

Aluminum Alloy

Properties		
Physical properties	Particle size	15 ~ 53μm
	Form	Spherical
	Liquidity	150 S
	Apparent density	1.45 g/cm³
Molded part performance	Density	≥95%
	Tensile strength	≥330 Mpa
	The yield strength	≥245 Mpa

3D printing of metal materials

Die Steel

Properties		
Physical properties	Particle size	15 ~ 53μm
	Form	Spherical
	Liquidity	40 S
	Apparent density	4.3 g/cm³
Molded part performance	Density	≥99%
	Tensile strength	≥1090 Mpa
	The yield strength	≥1000 Mpa

3D printing of metal materials

Nickel base superalloy (GH4169)

Properties		
Physical properties	Particle size	15 ~ 53μm
	Form	Spherical
	Liquidity	50 S
	Apparent density	4.8 g/cm³
Molded part performance	Density	≥98%
	Tensile strength	≥400 Mpa
	The yield strength	≥260 Mpa

FDM Materials

PLA

Properties	
Density	1.24 g/cm³
Tensile strength	65 Mpa
Elongation at break	8 %
Flexural strength	97 Mpa
Flexural modulus	3600 Mpa
Impact strength,notched Izod, J/m	4 KJ/m²
Heat deflection temperature, ℃	56（℃,0.45Mpa）

FDM Materials

ABS

Properties	
Appearance	Filiform
Smell	Tasteless, with a small amount of special smell when melting
Spontaneous combustion point	>466°C
Flash point	>400°C
Melting temperature	170°C
Density	1.02 kg/L
Solubility	Insoluble in water
Tensile strength	41.6 Mpa
Flexural strength	56.6 Mpa
Impact strength	2
Elongation at break	30 %
Tensile strength	30 Mpa
Heat deflection temperature, ℃	86 - 100 ℃
Decomposition temperature	> 260 ℃
Processing temperature	180 – 230 ℃
Print temperature	230 – 260 ℃

FDM Materials

TPU95

PolyFlex™ TPU95 is a thermoplastic polyurethane (TPU) based filament specifically engineered to work on most desktop 3D printers. It has a shore hardness of 95A and can stretch more than 3 times its original length.

PHYSICAL PROPERTIES

Property	Testing Method	Typical Value
Density	ISO1183, GB/T1033	1.20-1.24 g/cm³ at 23 °C
Melt index	210°C, 1.2 kg	3-6 g/10min
Light transmission	N/A	N/A
Flame retardancy	N/A	N/A

CHEMICAL RESISTANCE DATA	
Property	Testing Method
Effect of weak acids	Not resistant
Effect of strong acids	Not resistant
Effect of weak alkalis	Not resistant
Effect of strong alkalis	Not resistant
Effect of organic solvent	No data available
Effect of oils and grease	No data available

FDM Materials

PC

PHYSICAL PROPERTIES		
Tension coefficient	D638	68 MPa
Tensile strength	D638	2，280 MPa
Tensile elongation	D638	4.80%
Flexibility coefficient	D710	52 MPa
Flexible strength	D790	2，234 MPa
Flexible elongation	D790	> 80%
AI impact, notched	D256	53 J/m
AI impact, no notch	D256	320 J/m
Thermal deflection (HDT) @ 66 psi, not annealed	ASTM D648	138℃
Thermal deflection (HDT) @ 66 psi, not annealed	ASTM D648	127℃
Vicat softening temperature (B / 50)	ASTM D1525	139℃
Thermal expansion rate (flow - 40F to 100F)	ASTM E831	3.8E-05 in/in/F
Thermal expansion rate (XFlow - 40F to 100F)	ASTM E831	
Glass transition	DSC (SSYS)	161℃
Proportion	ASTM D792	1.2
Vertical combustion test (flame)	UL 94	V2, 1.1 mm
Rocking hardness	ASTM D785	R115
Conductivity s (kV / mm)	IEC 60112	15
Conductivity C (60Hz)	IEC 60250	3.17
Conductivity C (1MHz)	IEC 60250	2.96
Layer thickness	>400°C	0.33mm,0.254mm,0.178mm,0.127mm
Supporting material		Solid support
Colour		white

FDM Materials

ASA

PHYSICAL PROPERTIES	
Print Temp，℃	220-260
Bed Temp，℃	90-110
Density, g/cm³	1.00
Heat Distortion Temp, ℃,0.45MPa	54
Melt Flow Index, g/10min	10 – 15(220℃/10KG)
Tensile Strength, MPa	50
Elongation at Break, %	30
Flexural Strength, MPa	35
Flexural Modulus, MPa	4300
IZOD Impact Strength, KJ/㎡	19

MJF Materials

PA12

Category	MEASUREMENT	VALUE	TEST METHOD
General properties	Powder melting point (DSC)	186℃/367℉	ASTM D3418
	Particle size	58μm	ASTM D3451
	Powder density	0.48 g/ cm³ (0.017 lb / inch3)	ASTM D1895
	Component density	1.3 g / cm³ (0.047 lb / inch3)	ASTM D792
Mechanical properties	Tensile strength, maximum load 17, XY	30 MPa/4350 psi	ASTM D638
	Tensile strength, maximum load 11, Z	30 MPa/4350 psi	ASTM D638
	Tensile modulus, MPa	2800 MPa/406 ksi	ASTM D638
	Tensile strength, Mpa	2900 MPa/421 ksi	ASTM D638
	Elongation at break	6.5%	ASTM D638
	Impact strength,notched Izod, J/m	2.7 KJ/m²	ASTM D256
Thermal properties	Heat deflection temperature, ℃ (0.45 MPa, 66 psi), Z	173℉/344℉ A	ASTM D648
	Heat deflection temperature, ℃ (1.82 MPa, 264 psi), Z	121℉/250℉	ASTM D648