

N3D-CAST363

Investment Casting Material

TECHNICAL DATA SHEET

SLA

N3D-CAST363 is a low viscosity, antimony-free investment casting resin tuned for top down 355 nm large format SLA printers. It exhibits excellent resolution, and green strength and also has minimal water absorption, and low ash content after burnout.



KEY PROPERTIES

N3D-CAST363	
Liquid	
Appearance	Clear, yellow liquid
Viscosity @ 25°C	110 mPa.s
Material	
Tensile Modulus	3,300 MPa
Tensile Strength	38 MPa
Tensile Elongation	4%
Flexural Modulus	3,500 MPa
Flexural Strength	91 MPa
HDT @ 0.455 MPa	72 °C
Water Absorption	0.19%

KEY FEATURES



- Low viscosity
- Fast cure speed
- Excellent green strength
- Minimal water absorption
- High quality burnout performance

APPLICATIONS



- Investment casting
- Specialty alloy casting

MAIN MARKETS



- Aerospace
- Automotive



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MATERIAL PROPERTIES

Property	Units	Method	Green ^[1]	UV post-curing ^[2]
Ultimate Tensile Strength	MPa	ASTM D638	29 ± 4	38 ± 5
Tensile Young's Modulus	MPa	ASTM D638	2800 ± 200	3300 ± 200
Tensile Strain at Break	%	ASTM D638	3 ± 1	4 ± 1
Flexural Strength	MPa	ASTM D790	75 ± 4	90 ± 10
Flexural Modulus	MPa	ASTM D790	3300 ± 40	3500 ± 170
Notched Izod Impact Resistance	J/m	ASTM D256 ^[3]	10.1 ± 0.6	11.4 ± 0.9
HDT @ 0.455 MPa	°C	ASTM D648	64	72
HDT @ 1.82 MPa	°C	ASTM D648	-	53
Hardness	Shore D	ASTM D2240	86	88
Glass Transition Temperature (T _g)	°C	ASTM D4065	Pending	Pending
Water Absorption (24 hour soak)	% mass	ASTM D570	-	0.19
CTE (T>T _g)	µm/m. °C	ASTM E831-93	-	186
CTE (T<T _g)	µm/m. °C	ASTM E831-93	-	55.7

1. Parts were printed in the XZ orientation with a 100 µm layer thickness on a 355 nm top-down SLA printer with a laser power of 750 mW. Green samples were conditioned for 40-80 hours following ASTM D618 Procedure A before testing.
2. Parts were printed in the XZ orientation with a 100 µm layer thickness on a 355 nm top-down SLA printer with a laser power of 750 mW. Parts were post-cured for 60 minutes per side with 10 mW/cm² of UVB irradiance & 10 mW/cm² of UVA irradiance. Samples were conditioned for 40-80 hours following ASTM D618 Procedure A before testing.
3. Parts were printed without a notch and a notch was generated with a manual notch cutting plane.

LIQUID PROPERTIES

Property	Units	Method	Value
Appearance	-	-	Clear/yellow
Viscosity @ 25°C	mPa.s	ASTM D2983	110

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PRINTING CONDITIONS

Reactivity values were generated on a 355 nm wavelength top-down SLA printer with a laser power of 650 mW.

Working-curves	Units	Value
Critical exposure (E_c)	mJ/cm ²	6.6
Penetration depth (D_p)	mils	4.7

POST-CURING CONDITIONS

Value	Units	UV Bulb PCA
Time per side	Minutes	60
UVA irradiance	mW/cm ²	10-15
UVB irradiance	mW/cm ²	10-15

CLEANING PROCESS

Submerge 3D printed parts in traditional 3D printing solvents and agitate and/or sonicate for approximately 10 minutes. Incorporate two-stage cleaning baths for optimal cleaning. Use compressed air to remove any residual liquid material. Repeat steps as necessary until parts are free of residual material, and then proceed to post-curing. Although not explicitly stated, other cleaning procedures may be realized that adequately clean 3D printed parts.

STORAGE & HANDLING

Store bottles in a cool, dry place. Do not freeze. The material is light sensitive. Keep open bottles away from ambient lighting or sunlight, and shield material from ambient light. Once opened, packaging should be resealed immediately after use. See Safety Data Sheet for additional storage & handling considerations.