NANODIMENSION

ATARU BLACK

A GROUNDBREAKING UV-CURABLE MATERIAL FOR DLP PRINTING

Part of the ATARU series, ATARU BLACK combines exceptional high-temperature resistance, durability, superior surface quality, and low dielectric loss, all **while delivering enhanced precision,** making it the perfect choice for demanding applications.

Market-leading thermal performance and durability

Suitable for injection molding & demanding environmental conditions.

Signal Integrity Assurance

Unique low dielectric loss property ensures suitability for high-frequency electrical applications.

Seamless integration

Low viscosity ensures compatibility with a wide range of DLP printers, enabling reliable printing and consistently high-quality results.

Enhanced Precision

Maintains excellent accuracy, even for fine features, down to the printer's pixel size. Easily scalable, even after post-processing.

KEY BENEFITS

- High thermal performance and durability
- High impact strength
- Ultra low loss
- Excellent surface quality
- Maintains excellent accuracy, even for fine features, down to the printer's pixel size.
- Fast processing
- Serial production

IDEAL APPLICATIONS

- Connectors for electronics
- Molds (injection molding)
- Tools & fixtures
- Radio frequency (antenna)

PRINT PROCESS

Suitable for systems with a wavelength in the range of 365-405nm. Recommended exposition time at 405nm under room temperature:

- 2.7 mW/cm^2: 12.5 secs
- 5.5-16 mW/cm^2: 2.3 secs
- Base layer: 10-15 secs

Elevated temperature ease the release of large cross-sections. In case of flashing, add a delay before the exposition start.

POST PRINT PROCESS

1. CLEANING

- Precautions: Avoid sonication and avoid the usage of IPA.Ensure to monitor the soaking (and heating – optional) time carefully to prevent damage on the surface.
- It is recommended to use the **ATARU™ Resin Cleaner** for 7-10 min, under agitation. Heat up to 45°C **max 5 min** is optional for special cases. (Alternatively, in some cases, a mixture *MMB:**water 70:30 (w:w) can be used maximum for 15 minutes soaking time. *MMB: 3-Methoxy-3-methyl-1-butanol CAS: 56539-66-3/**Deionized preferred).
- Then rinse the parts with water.

2. DRYING

Dry under pressurized air or in an oven at a temperature of 90°C.

Make sure the parts do not touch each other during steps 3 & 4 to avoid sticking.

3. UV POST-CURING

Any type of UV treatment is suitable (no risk of overcuring). Examples:

- 6x10s @50% (Hoenle UV Cube 100 IC)
- 2x30 min (CureBox Wicked Engineering)

4. THERMAL POST-TREATMENT

- Heat from room temperature to 200°C: For bulky parts, apply heat at a controlled rate of 2°C/min to promote even material heating before curing begins. For thin parts heat-up ramps can be 1-3°C/min.
- Dwell time at 200°C – 2 hours.
- Cool down to 45°C at a rate of 3°C/min. Parts can be removed from the oven at 45°C.

ATARU PROPERTIES:

Resin Properties

Viscosity	~885 mPas (@ 23°C and 100 1/s)
Color	Black

Mechanical Properties

	Condition	Standard	Unit	Value
Tensile Modulus	1 mm/min	ISO 527-1/-2	MPa	5790
Stress at break	5 mm/min	ISO 527-1/-2	MPa	69
Strain at break	5 mm/min	ISO 527-1/-2	%	1.8
Flexural Modulus	1 %/min	ISO 178	MPa	5190
Flexural Strength	1 %/min	ISO 178	MPa	121
Flexural Strain at break	1 %/min	ISO 178	%	2.9
Izod impact strength unnotched	+22°C / 1 J	ASTM D4812 : 2006	J/m	170

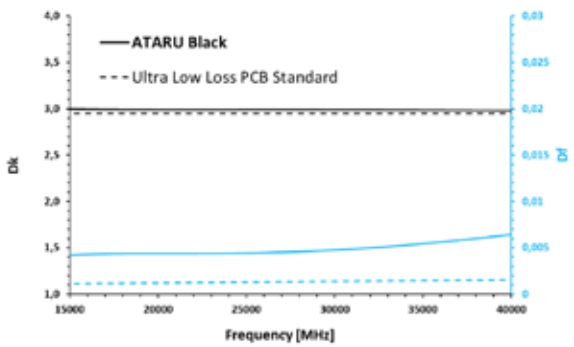
Thermo-Mechanical Properties

CTE (0°C to 110°C)	3 K/min	IPC-TM-650 2.4.24.5	µm/(m·K)	45.6
CTE (110°C to 200°C)	3 K/min	IPC-TM-650 2.4.24.5	µm/(m·K)	75.2
CTE (200°C to 300°C)	3 K/min	IPC-TM-650 2.4.24.5	µm/(m·K)	106.1
Td2	10 K/min	IPC-TM-650	°C	367
Td5	10 K/min	IPC-TM-650	°C	391
Tg	10 K/min	IPC-TM-650	°C	>300°C
HDT/B (0.45 MPa)	Flat	ISO 75-2:2013-08	°C	>300°C
HDT/A (1.8 MPa)	Flat	ISO 75-2:2013-08	°C	>300°C
HDT/C (8.0 MPa)	Flat	ISO 75-2:2013-08	°C	133

Thermal Properties

Thermal Conductivity	25°C		W/mK	0.28
Thermal Conductivity	50°C		W/mK	0.29
Thermal Conductivity	100°C		W/mK	0.31
Spec. Heat Capacity	23°C		J/gK	0.97
Spec. Heat Capacity	200°C		J/gK	1.5

Dielectric Properties



Electrical Properties

	Condition	Standard	Unit	Value
Dielectric Breakdown Voltage		IPC-TM-650 2.5.6	kV	42
Arc resistance		IPC-TM-650 2.5.1	s	187
Specific volume resistivity		DIN EN 62631-3-1:2016-10/IEC 62631	Ωcm	2.3×10^{14}
Specific Surface Resistance		DIN EN 62631-3-2:2016-10/ IEC 62631	Ω	2.8×10^{14}
CTI	50 drops at 600 V and 100 drops at 575 V	IEC 60112:2022-11	(V)	600

Outgassing

	Standard	Unit	Value
TML	ASTM E595-15	%	0.21
CVCM		%	<0.01
WVR		%	0.08

SYSTEM COMPATIBILITY REQUIREMENTS

- Wavelength 365-405nm
- Print at room temperature (no heat required)

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The data provided in this document represents typical tested values at a controlled environment. Printed parts properties may vary with part geometry, print orientation, print settings, environmental conditions, and additional variables. **5th March. 2025**