

Cubic Ink® High Performance 4-300 VP

Material with a good balance between temperature form-stability and toughness for final part production

Liquid Properties	Value ¹ UV + thermal ²	Value ¹ UV ³	Unit
Viscosity @ 25 °C (DIN EN ISO 3219)	50		mPa·s
Density (DIN EN ISO 15212-1)	1.08		g/mL
Critical Energy (E _c) @355 nm	7.9 / 8.2		mJ/cm ²
Depth of Penetration (D _p) @355 nm	0.78 / 0.24		mm
Tensile Properties⁴ (DIN EN ISO 527-5A)			
Ultimate Tensile Strength	72	63	MPa
Tensile Modulus	2700	2900	MPa
Elongation at Break	4.6	7.8	%
Flexural Properties⁵ (DIN EN ISO 178)			
Flexural Strength	107	110	MPa
Flexural Modulus	2500	2500	MPa
Deflection at Fracture	>6.5	>10	%
Impact Properties			
Izod notched (DIN EN ISO 180)	-	24	J/m
Charpy notched (DIN EN ISO 179-1)	-	8.2	kJ/m ²
Izod unnotched (DIN EN ISO 180)	240	420	J/m
Charpy unnotched (DIN EN ISO 179-1)	25	71	kJ/m ²

Hardness (DIN EN ISO 7619)

Shore Hardness (green)	75 – 78		D
Shore Hardness	80	79	D

Thermal Properties

T _g (TMA) ⁶	96	69	°C
HDT A (DIN EN ISO 75)	78	51	°C
HDT B (DIN EN ISO 75)	104	77	°C
CTE (-50 °C, 30 °C) (DIN EN ISO 11359-2)	71	85	x 10 ⁻⁶ K ⁻¹
CTE (65 °C, 200 °C) (DIN EN ISO 11359-2)	126	131	x 10 ⁻⁶ K ⁻¹
Specific Heat Capacity, 20 °C (DIN EN ISO 11357-4)	1.71	1.80	J/(g·K)

Electrical Properties

Dielectric strength (IEC60243-1)	22	-	kV/mm
Dielectric strength after 24 h/RT H ₂ O (IEC60243-1)	22	-	kV/mm
Relative Permittivity (Dielectric Constant, 24 °C, 1 MHz, IEC60250)	6.5	-	-
Dissipation Factor (24 °C, 1 MHz, IEC60250)	0.027	-	-
Volume Resistivity (IEC60093)	5.6 x 10 ¹⁴	-	Ω·cm
Volume Resistivity after 7 d/RT H ₂ O (IEC60093)	2.1 x 10 ¹⁴	-	Ω·cm
Comparative Tracking Index (IEC60112)	>600	-	V

Flame (UL94)

Flammability, horizontal (at 3.2 mm)	HB	HB ⁷	-
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Chemical Resistance

Water Uptake, 24 h, 23 °C	0.5	0.5 ⁸	%
Performance after Water Uptake, 24 h, 23 °C ⁹	6	32	%

Thermal Ageing⁹

80 °C for 500 hours	<1	<1	%
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Print Appearance/ Color

Natural color is translucent light yellow. Also available in cyan, magenta, yellow, black, and grey. More colors on request.

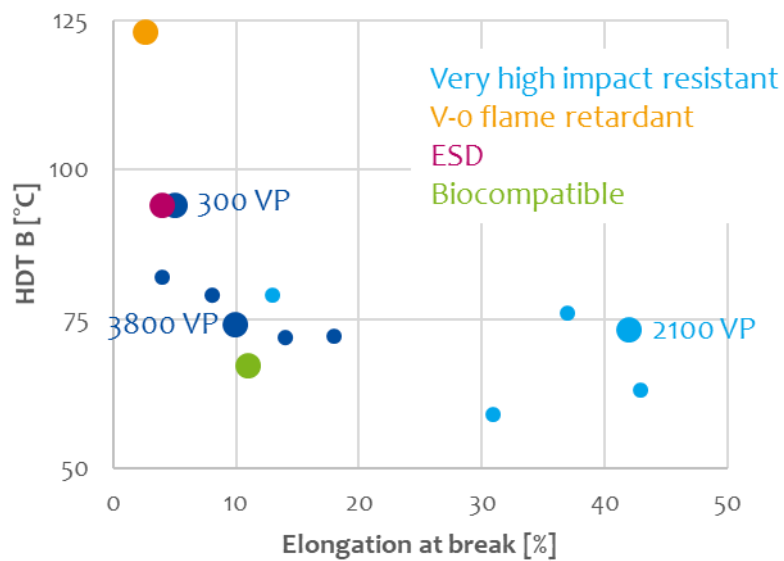
Availability and Storage

Batch sizes starting from 1 kg.

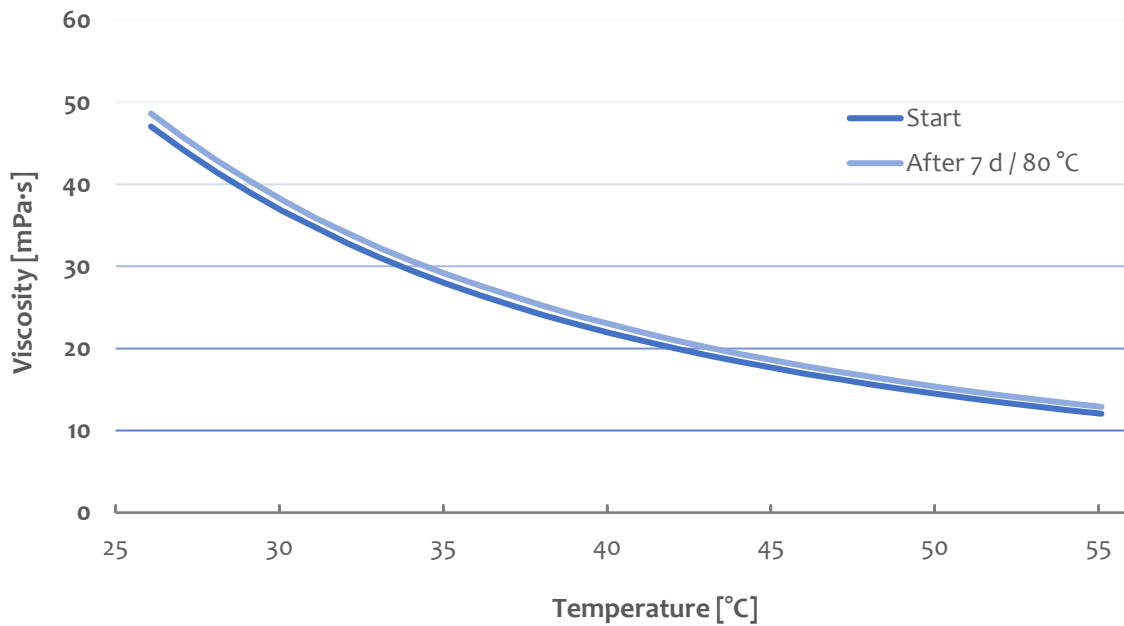
Store between 21 and 28 °C and protect from light. Stir prior to use.

¹Properties with post-processing. All material properties can vary with printer, print settings, object orientation, part geometry, post-processing and age of sample. ²Washed with water, UV and thermal post-cure (10 min Hg-lamp and 10 h 190 °C); ³Washed with water, UV post-cure (30 min 350-550 nm); ⁴5 mm/min; ⁵10 mm/min; ⁶-50 - 200 °C, 5 K/min; ⁷Properties characterized after thermal post-cure (1 h at 130 °C); ⁸Weight change 5A-specimen; ⁹Relative loss of tensile strength compared to reference, DIN EN ISO 527-5A, 5 mm/min.

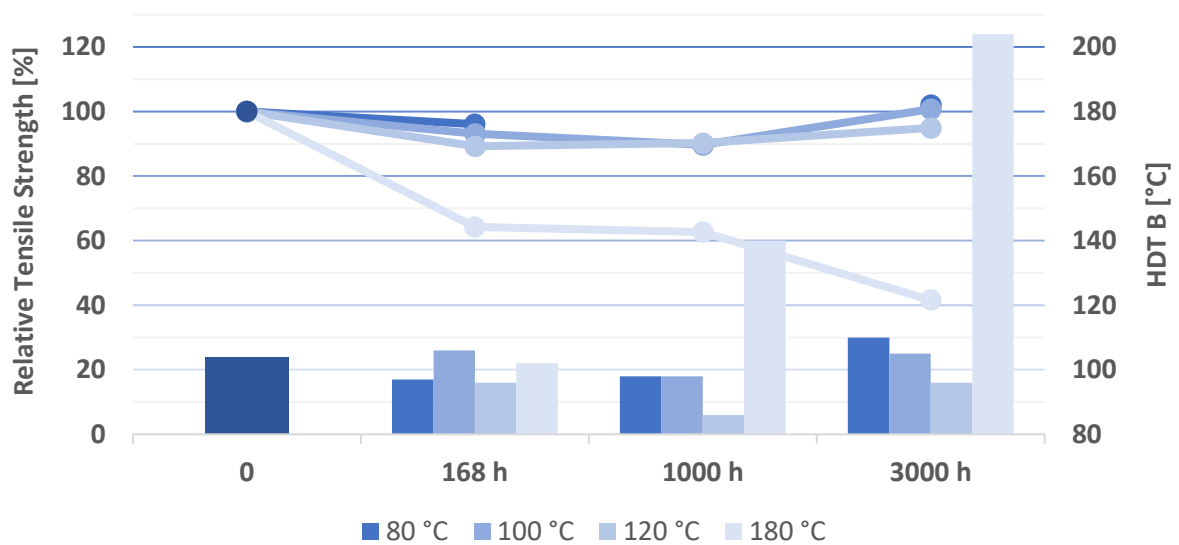
Versatility and Customization of High Performance 4-Series



Viscosity Profile (600 s⁻¹) of High Performance 4-300 VP



Ageing of High Performance 4-300 VP (UV + thermal cure) (points - rel. tensile strength & bars - HDT B)



Chemical Resistance ¹	Mass Gain [%] ²	Mass Gain [%] ³
Water	0.5	0.2
Acetic Acid (5%)	0.5	0.2
Hydrochloric Acid (1%)	0.5	0.2
Nitric Acid (5%)	0.5	0.2
Sodium Hypochlorite (10%)	0.4	0.1
Hydrogen Peroxide (3%)	0.5	0.3
Sodium Hydroxide (1%)	0.4	0.1
Isopropyl Alcohol	0.1	0.2
Methanol	4.5	4.1
Butyl Glycol Acetate	0.1	<0.1
Super Gasoline	0.2	1.7
Acetone	6.0	6.1
Methyl Ethyl Ketone	1.4	3.9

¹Percental weight gained after 24 h submersion of printed and post-cured (washed with water, UV and thermal post-cure) 1 x 1 x 1 cm cubes. ²Properties characterized with UV and thermal post-cure; ³Properties characterized after thermal post-cure (1 h at 130 °C).

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