

Cubic Ink® High Performance 4-1000 VP

Flame retardant material with a good balance between temperature form-stability and toughness for final part production

Liquid Properties	Value¹	Unit
Viscosity @ 25 °C (DIN EN ISO 3219)	460	mPa·s
Density (DIN EN ISO 15212-1)	1.05	g/mL
Critical Energy (E _c) @405 / 385 nm	8.7 / 10.0	mJ/cm ²
Depth of Penetration (D _p) @405 / 385 nm	0.60 / 0.30	mm
Tensile Properties² (DIN EN ISO 527-5A)		
Ultimate Tensile Strength	97	MPa
Tensile Modulus	4500	MPa
Elongation at Break	2.7	%
Flexural Properties³ (DIN EN ISO 178)		
Flexural Strength	130	MPa
Flexural Modulus	4100	MPa
Deflection at Fracture	>3.5	%
Impact Properties		
Izod notched (DIN EN ISO 180)	14	J/m
Charpy notched (DIN EN ISO 179-1)	1	kJ/m ²
Izod unnotched (DIN EN ISO 180)	220	J/m
Charpy unnotched (DIN EN ISO 179-1)	19	kJ/m ²
Hardness (DIN EN ISO 7619)		
Shore Hardness	88	D

Thermal Properties

T _g (TMA) ⁴	80	°C
HDT A (DIN EN ISO 75)	98	°C
HDT B (DIN EN ISO 75)	123	°C
CTE (-50 °C, 30 °C) (DIN EN ISO 11359-2)	53	x 10 ⁻⁶ K ⁻¹
CTE (70 °C, 200 °C) (DIN EN ISO 11359-2)	141	x 10 ⁻⁶ K ⁻¹

Electrical Properties

Dielectric strength (IEC60243-1)	23	kV/mm
Relative Permittivity (Dielectric Constant, 20 °C, 1 MHz, IEC60250)	7.3	-
Dissipation Factor (20 °C, 1 MHz, IEC60250)	0.058	-
Volume Resistivity (IEC60093)	3.3 x 10 ¹¹	Ω·cm
Comparative Tracking Index (IEC60112)	200	V

Flame (UL94)

Flammability, vertical (at 3.2 mm)	V-0	-
Flammability, horizontal (at 0.4 mm)	HB (FH-1)	-

Chemical Resistance

Water Uptake, 24 h, 23 °C	2.1	%
Performance after Water Uptake, 24 h, 23 °C ⁵	46	%

Print Appearance/ Color

Natural color is translucent light yellow. Available in black and grey. More colors on request.

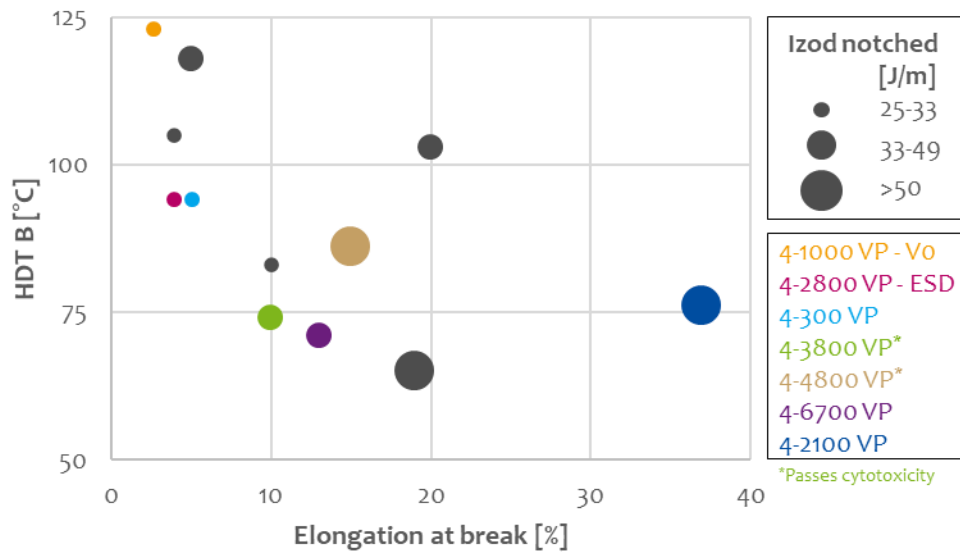
Availability and Storage

Batch sizes starting from 1 kg.

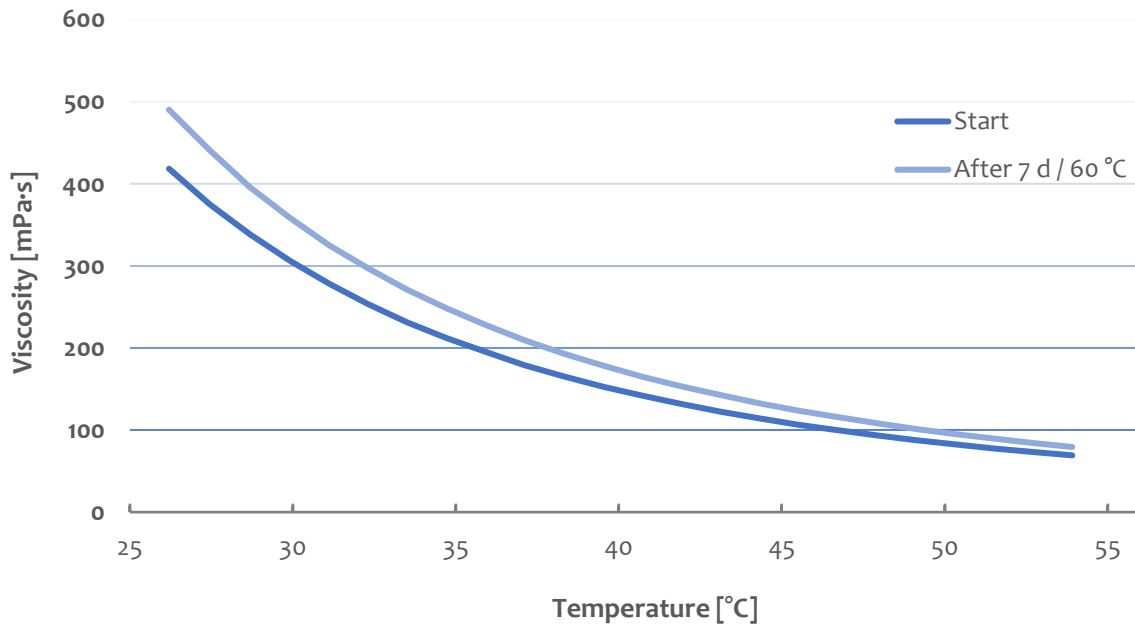
Store between 21 and 28 °C and protect from light. Stir prior to use.

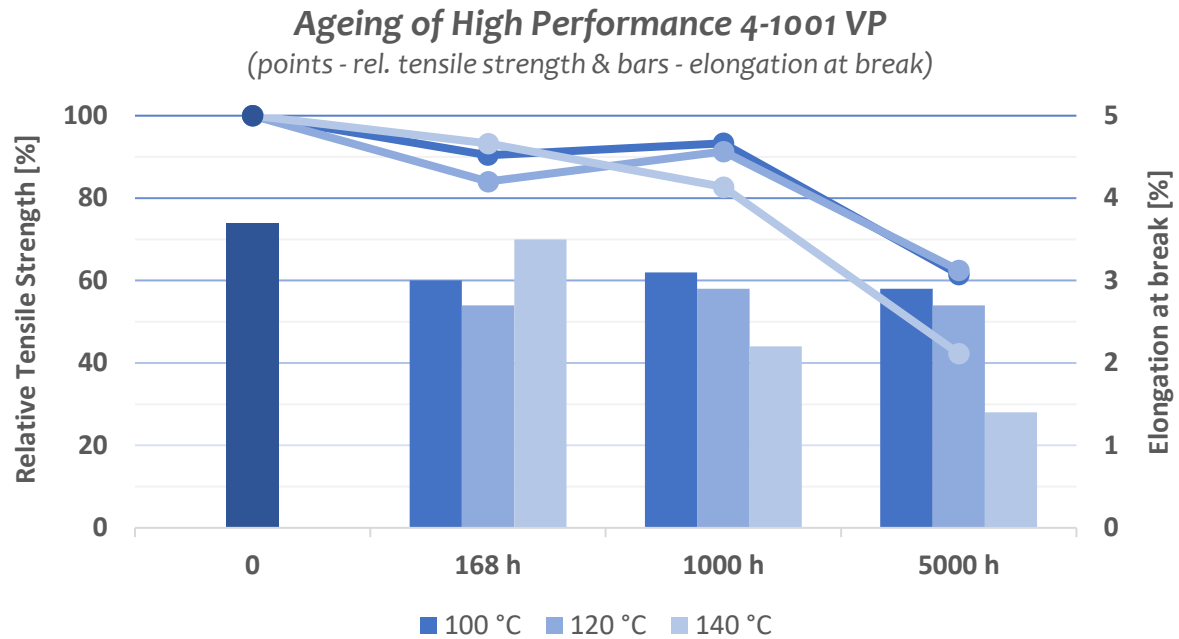
¹Properties with post-processing – washed with water, UV and thermal post-cure. All material properties can vary with printer, print settings, object orientation, part geometry, post-processing and age of sample. ²5 mm/min; ³10 mm/min; ⁴20 - 280 °C, 5 K/min; ⁵Relative loss of HDT B compared to reference.

Characteristics and Versatility of High Performance 4-series



Viscosity Profile (600 s⁻¹) of High Performance 4-1000 VP





Chemical Resistance

Mass Gain [%]¹

Water	2.1
Acetic Acid (5%)	2.0
Hydrochloric Acid (1%)	1.4
Nitric Acid (5%)	2.1
Sodium Hypochlorite (10%)	0.9
Hydrogen Peroxide (3%)	2.3
Sodium Hydroxide (1%)	1.0
Isopropyl Alcohol	0.2
Methanol	0.9
Butyl Glycol Acetate	0.2
Super Gasoline	0.2
Acetone	0.2
Methyl Ethyl Ketone	0.2

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.

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