

# Cubic Ink® High Performance 3-1700 VP

Tear resistant and elastic material for final part production with Shore A 84

Liquid Properties	Value <sup>1</sup>	Unit
Viscosity @ 25 °C (DIN EN ISO 3219)	1030	mPa·s
Density (DIN EN ISO 15212-1)	1.05	g/mL
Critical Energy (E <sub>c</sub> ) @405 / 385 nm	7.7 / 7.1	mJ/cm <sup>2</sup>
Depth of Penetration (D <sub>p</sub> ) @405 / 385 nm	0.26 / 0.10	mm
<b>Tensile Properties<sup>2</sup> (DIN EN ISO 527-5A)</b>		
Ultimate Tensile Strength	19	MPa
Tensile Modulus	35	MPa
Elongation at Break	190	%
Tensile Strength at 50% elongation	6	MPa
Tensile Strength at 100% elongation	10	MPa
Tensile Strength at 150% elongation	15	MPa
Tear Strength (DIN EN ISO 34-1 B) <sup>3</sup>	120	kN/m
<b>Impact Properties</b>		
Izod notched (DIN EN ISO 180)	210 (No break)	J/m
Charpy notched (DIN EN ISO 179-1)	24 (No break)	kJ/m <sup>2</sup>
<b>Compression Properties (DIN EN ISO 815-1)<sup>4</sup></b>		
Compression Set-B after 22h @70 °C	24	%
<b>Rebound Properties<sup>4</sup> (DIN 53512)</b>		
Schob-Pendulum @23 °C	30	%

### Hardness (DIN EN ISO 7619)

Shore Hardness (green)	40 - 50	A
Shore Hardness	84	A

### Thermal Properties

T <sub>g</sub> (DSC) <sup>5</sup>	52	°C
T <sub>g</sub> (DMA) <sup>6</sup>	-5, 71	°C
CTE (-50 °C, 30 °C) (DIN EN ISO 11359-2)	124	x 10 <sup>-6</sup> K <sup>-1</sup>
CTE (70 °C, 160 °C) (DIN EN ISO 11359-2)	149	x 10 <sup>-6</sup> K <sup>-1</sup>
Specific Heat Capacity, 20 °C (DIN EN ISO 11357-4)	1.9	J/(g·K)

### Chemical Resistance

Water Uptake, 24 h, 23 °C <sup>7</sup>	<0.1	%
Performance after Water Uptake, 24 h, 23 °C <sup>8</sup>	<1	%

### Thermal Ageing<sup>8</sup>

80 °C for 168 hours	<1	%
125 °C for 1000 hours	<1	%

### Ageing at -40 °C<sup>8</sup>

for 1000 hours	<3	%
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### UV Ageing<sup>9,10</sup>

for 1000 hours	<5	%
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### Print Appearance/ Color

Natural color is brown-opaque. Also available in green, black and dark grey. More colors on request.

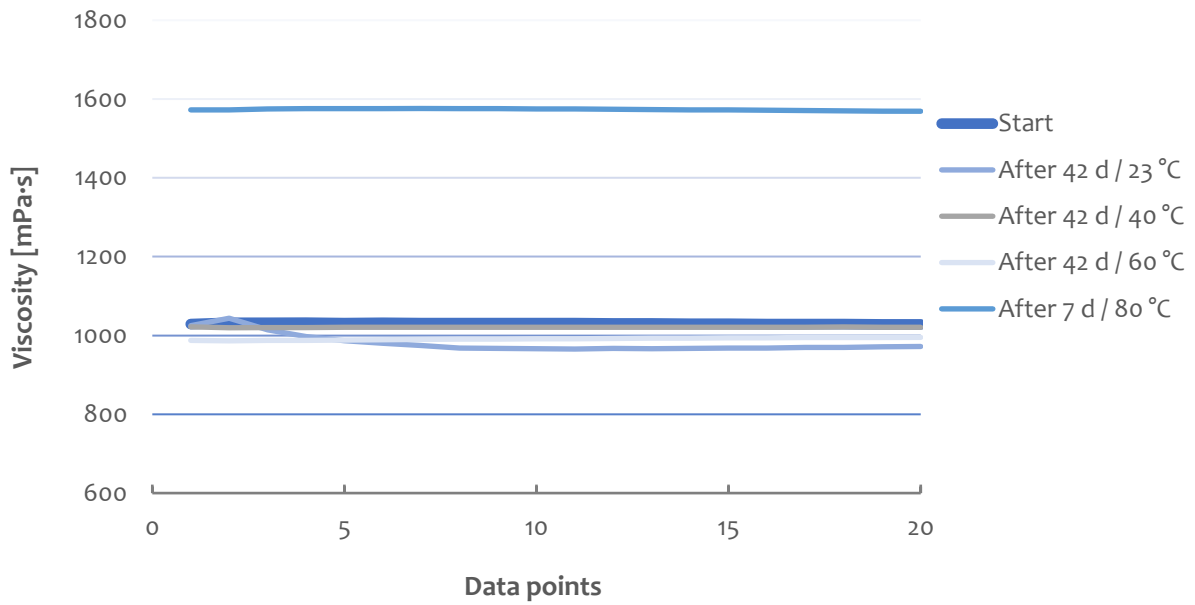
### Availability and Storage

Batch sizes starting from 1 kg.

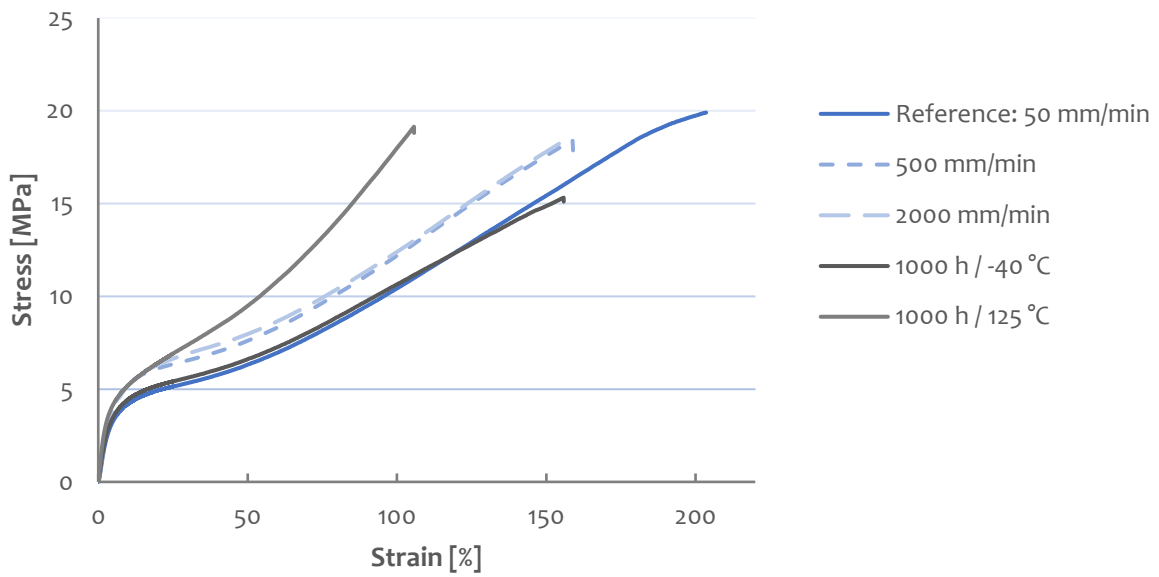
Store at room temperature between 21 and 28 °C and protect from light.

<sup>1</sup>Properties with post-processing – washed with DPM, thermal treatment up to 130 °C. All material properties can vary with printer, print settings, object orientation, part geometry, post-processing and age of sample. <sup>2</sup>50 mm/min; <sup>3</sup>500 mm/min, notched specimen method B; <sup>4</sup>Specimen with 12.5 mm height; <sup>5</sup>-20 - 200 °C, 20 K/min; <sup>6</sup>-80 - 180 °C, 3 K/min, 1 Hz, single; <sup>7</sup>Specimen DIN EN ISO 527-5A weight difference; <sup>8</sup>Relative loss of tensile strength compared to reference, DIN EN ISO 527-5A, 50 mm/min; <sup>9</sup>Relative loss of rebound compared to reference, DIN 53512; <sup>10</sup>QUV weathering tester following ISO 4892-3.

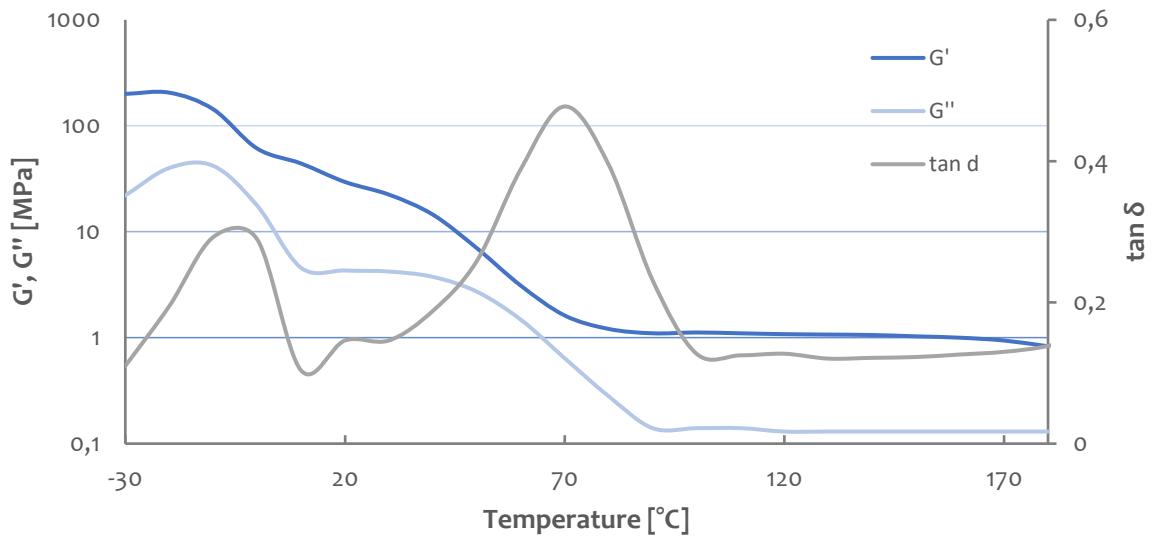
### Viscosity Profile (25 °C, 100 s<sup>-1</sup>) of High Performance 3-1700 VP



### Tensile Testing of High Performance 3-1700 VP

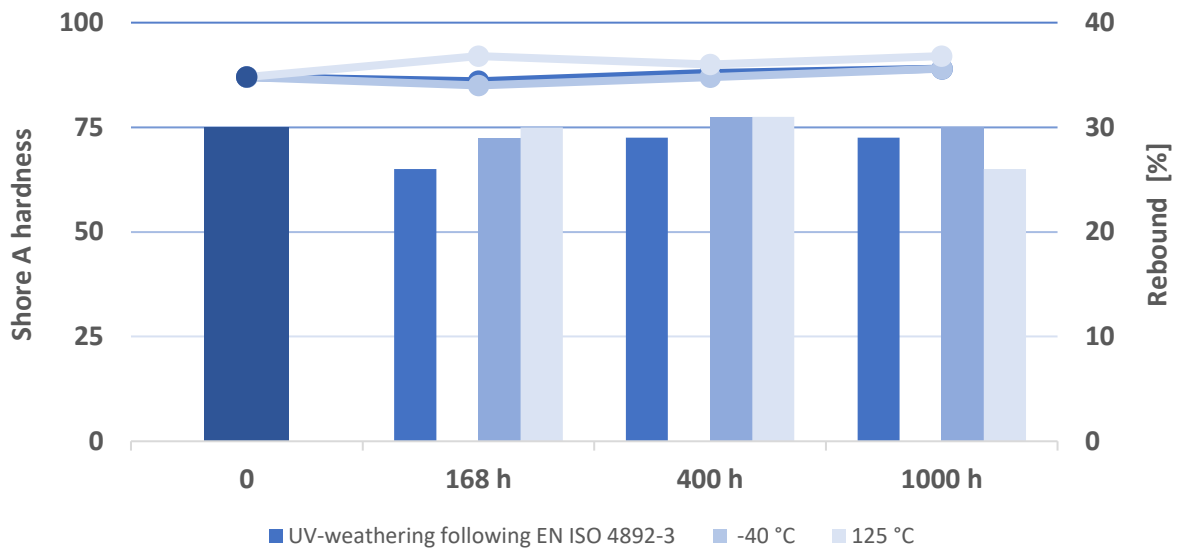


### DMA ( Shear, 1 Hz, 3 K/min) of High Performance 3-1700 VP



### Ageing of High Performance 3-1700 VP

(points - Shore A hardness & bars - Rebound)



Chemical Resistance	Mass Gain [%] <sup>1</sup>
Water	0.5
Acetic Acid (5%)	0.5
Hydrochloric Acid (1%)	0.4
Nitric Acid (5%)	0.8
Sodium Hypochlorite (10%)	0.8
Hydrogen Peroxide (3%)	0.5
Sodium Hydroxide (1%)	0.5
Isopropyl Alcohol	3.0
Methanol	5.6
Butyl Glycol Acetate	27.5
Super Gasoline	12.9
Acetone	6.5
Methyl Ethyl Ketone	-9.5

<sup>1</sup>Percental weight gained after 24 h submersion of printed and post-cured (washed with DPM, thermal treatment up to 130 °C) 1 x 1 x 1 cm cubes.

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