

## Cubic Ink® High Performance 2-1400 VP

Versatile SLA-resin with good impact strength, chemical resistance and high clarity

<b>Liquid Properties</b>	<b>Value<sup>1</sup></b>	<b>Unit</b>
Viscosity @ 25 °C (DIN EN ISO 3219)	420	mPa·s
Density (DIN EN ISO 15212-1)	1.09	g/mL
Surface Tension (Dynamic Bubble Pressure)	45	mN/m
Critical Energy (E <sub>c</sub> ) @355 nm	11.9	mJ/cm <sup>2</sup>
Depth of Penetration (D <sub>p</sub> ) @355 nm	0.19	mm
<b>Tensile Properties<sup>2</sup> (DIN EN ISO 527-5A)</b>		
Ultimate Tensile Strength	39	MPa
Yield Strength	39	MPa
Tensile Modulus	2100	MPa
Elongation at Break	14	%
<b>Flexural Properties<sup>3</sup> (DIN EN ISO 178)</b>		
Flexural Strength	68	MPa
Flexural Modulus	1800	MPa
Deflection at Fracture	>10	%
<b>Impact Properties</b>		
Izod notched (DIN EN ISO 180)	38	J/m
Charpy notched (DIN EN ISO 179-1)	3.8	kJ/m <sup>2</sup>
Izod unnotched (DIN EN ISO 180)	370	J/m
Charpy unnotched (DIN EN ISO 179-1)	42	kJ/m <sup>2</sup>

### Hardness (DIN EN ISO 7619)

Shore Hardness (green)	58 - 62	D
Shore Hardness	63	D

### Thermal Properties

T <sub>g</sub> (TMA) <sup>4</sup>	42	°C
HDT A (DIN EN ISO 75)	44	°C
HDT B (DIN EN ISO 75)	47	°C
CTE (-50 °C, 30 °C) (DIN EN ISO 11359-2)	68	x 10 <sup>-6</sup> K <sup>-1</sup>
CTE (65 °C, 200 °C) (DIN EN ISO 11359-2)	176	x 10 <sup>-6</sup> K <sup>-1</sup>
Specific Heat Capacity, 20 °C (DIN EN ISO 11357-4)	1.8	J/(g·K)

### Electrical Properties

Dielectric strength (IEC60243-1)	18	kV/mm
Dielectric strength after 24 h/RT H <sub>2</sub> O (IEC60243-1)	17	kV/mm
Comparative Tracking Index (IEC60112)	>600	V

### Chemical Resistance

Water Uptake, 24 h, 23 °C	<0.1	%
Performance after Water Uptake, 24 h, 23 °C <sup>5</sup>	<1	%

### Thermal Ageing<sup>6</sup>

80 °C for 168 hours	<1	%
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### Print Appearance/ Color

Natural color is translucent blue. Also available in black. More colors on request.

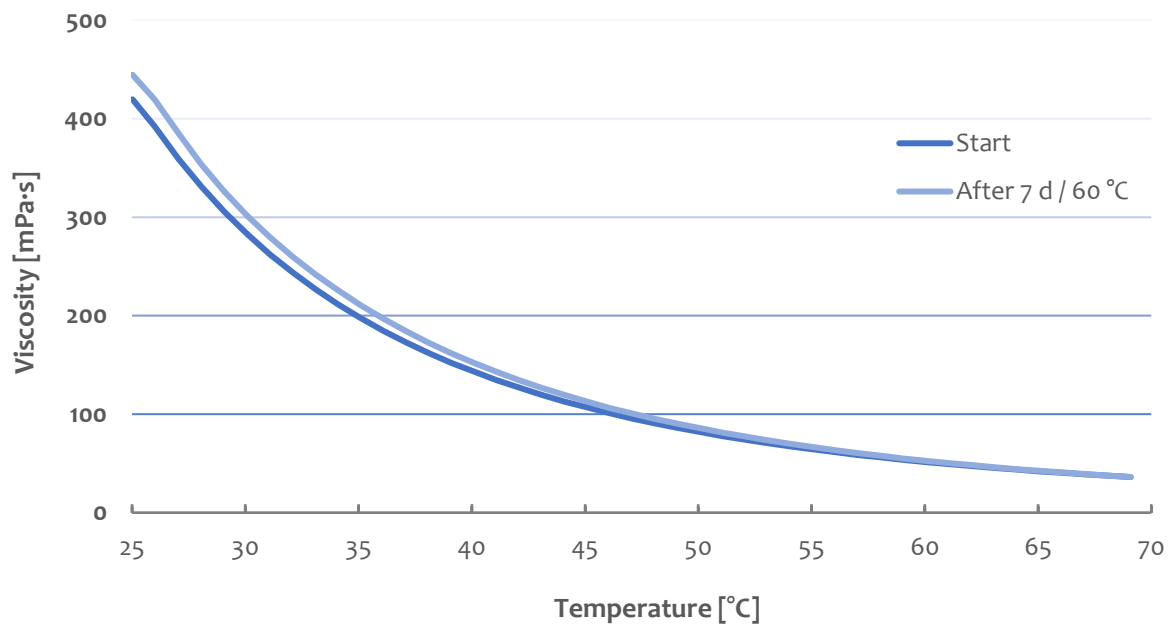
### Availability and Storage

Batch sizes starting from 1 kg.

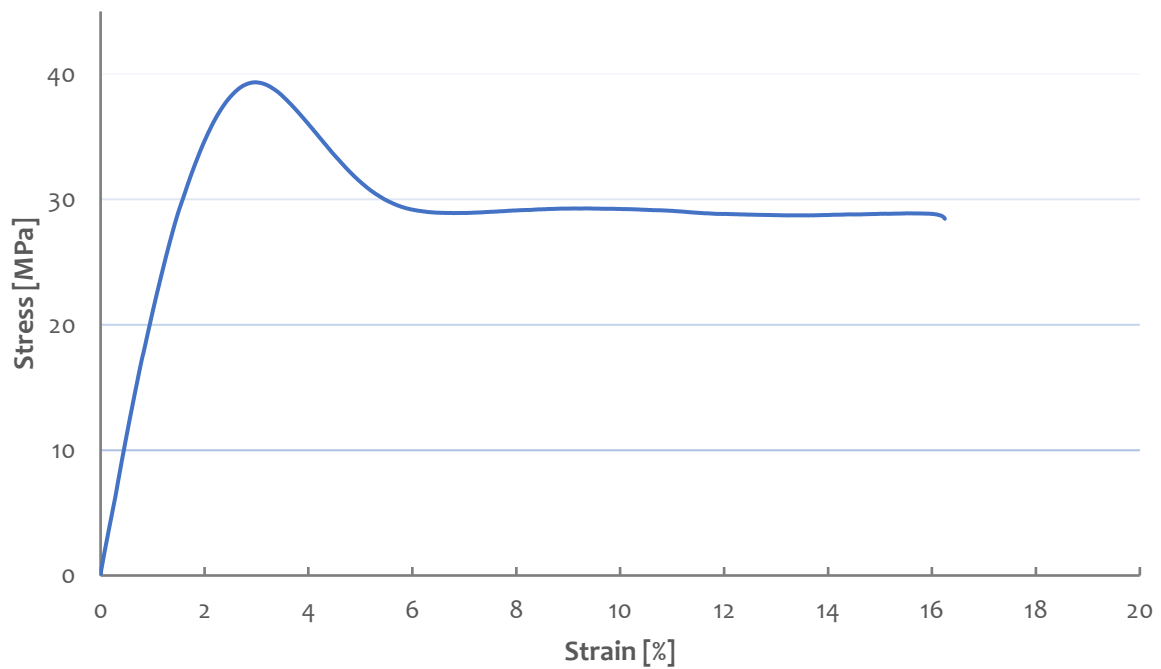
Store at room temperature or at 8 °C and protect from light.

<sup>1</sup>Properties with post-processing – washed with propylene carbonate, UV-post-cure. All material properties can vary with printer, print settings, object orientation, part geometry, post-processing and age of sample. <sup>2</sup>5 mm/min; <sup>3</sup>5 mm/min; <sup>4</sup>-50 - 200 °C, 5 K/min; <sup>5</sup>Relative loss of HDT B compared to reference; <sup>6</sup>Relative loss of tensile modulus, tensile strength, elongation at break and HDT B compared to reference, DIN EN ISO 527-5A, 5 mm/min.

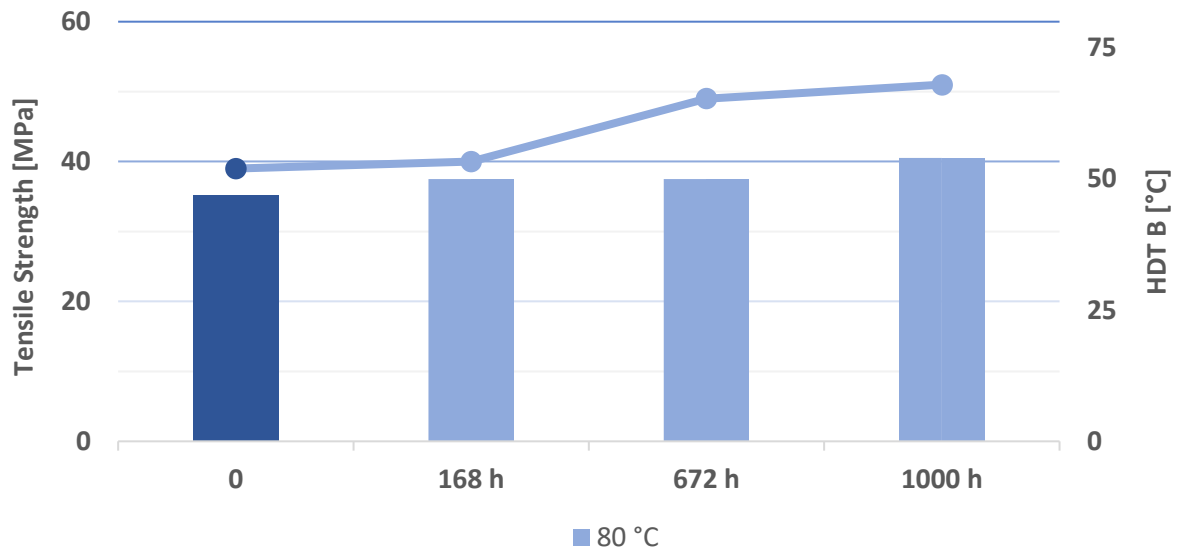
### Viscosity Profile (600 s<sup>-1</sup>) of High Performance 2-1400 VP



### Tensile Testing of High Performance 2-1400 VP



### Ageing of High Performance 2-1400 VP (points - tensile strength & bars - HDT B)



#### Chemical Resistance

#### Mass Gain [%]<sup>1</sup>

Water	<0.1
Acetic Acid (5%)	<0.1
Hydrochloric Acid (1%)	<0.1
Nitric Acid (5%)	<0.1
Sodium Hypochlorite (10%)	0.2
Hydrogen Peroxide (3%)	<0.1
Sodium Hydroxide (1%)	0.2
Isopropyl Alcohol	0.7
Ethanol	2.1
Methanol	3.4
Butyl Glycol Acetate	0.7
Super Gasoline	1.8
Acetone	4.3
Methyl Ethyl Ketone	4.3

<sup>1</sup>Percental weight gained after 24 h submersion of printed and post-cured (washed with propylene carbonate, UV-post-cure) 1 x 1 x 1 cm cubes.

**Cubic Ink®**  
**ACTEGA Terra GmbH**  
Mielestraße 13  
31275 Lehrte  
GERMANY

Tel +49 (0)5132 5009-600

[cubic.ink@altana.com](mailto:cubic.ink@altana.com)

[www.altana.com](http://www.altana.com)

**Learn more about Cubic Ink® materials** [www.altana.com/cubic-ink](http://www.altana.com/cubic-ink) [www.altana.de/cubic-ink](http://www.altana.de/cubic-ink)

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