

## Cubic Ink® High Temperature 303 VP-ESD Black

Highly temperature resistant ESD material for final part production

Liquid Properties	Value <sup>1</sup>	Unit
Viscosity @25 °C (DIN EN ISO 3219)	1040	mPa·s
Critical Energy (E <sub>c</sub> ) @405 / 385 nm	4.2 / 5.9	mJ/cm <sup>2</sup>
Depth of Penetration (D <sub>p</sub> ) @405 / 385 nm	0.14 / 0.20	mm
<b>Tensile Properties<sup>2</sup> (DIN EN ISO 527-5A)</b>		
Ultimate Tensile Strength	48	MPa
Tensile Modulus	3700	MPa
Elongation at Break	1.7	%
<b>Flexural Properties<sup>2</sup> (DIN EN ISO 178)</b>		
Flexural Strength	72	MPa
Flexural Modulus	3600	MPa
Deflection at Fracture	2.0	%
<b>Impact Properties</b>		
Izod notched (DIN EN ISO 180)	14	J/m
Charpy notched (DIN EN ISO 179-1)	0.7	kJ/m <sup>2</sup>
<b>Hardness (DIN EN ISO 7619)</b>		
Shore Hardness	90	D
<b>Thermal Properties</b>		
T <sub>g</sub> (TMA) <sup>3</sup>	257	°C
HDT A (DIN EN ISO 75)	216	°C

HDT B (DIN EN ISO 75)	221	°C
CTE (0 °C, 250 °C) (DIN EN ISO 11359-2)	98	$\times 10^{-6} \text{ K}^{-1}$
Specific Heat Capacity, 20 °C (DIN EN ISO 11357-4)	1.3	J/(g·K)

### Electrical Properties

Dielectric strength (IEC60243-1)	2	kV/mm
Relative Permittivity (Dielectric Constant, 25 °C, 10000 Hz, IEC60250)	118	-
Dissipation Factor (25 °C, 10000 Hz, IEC60250)	0.22	-
Volume Resistivity (IEC60093)	$6.6 \times 10^7$	$\Omega \cdot \text{cm}$
Volume Resistivity after 7 d/21 °C H <sub>2</sub> O (IEC60093)	$5.0 \times 10^7$	$\Omega \cdot \text{cm}$
Comparative Tracking Index (IEC60112)	>600	V

### Flame (UL94)

Flammability, horizontal (at 3.2 mm)	HB (FH-3)	-
--------------------------------------	-----------	---

### Chemical Resistance

Water Uptake, 168 h, 23 °C	1.2	%
Performance after Water Uptake, 168 h, 23 °C <sup>4</sup>	<1	%

### Thermal Ageing<sup>5</sup>

250 °C for 168 hours	<1	%
150 °C for 1000 hours	<1	%

### Print Appearance/ Color

Available in black.

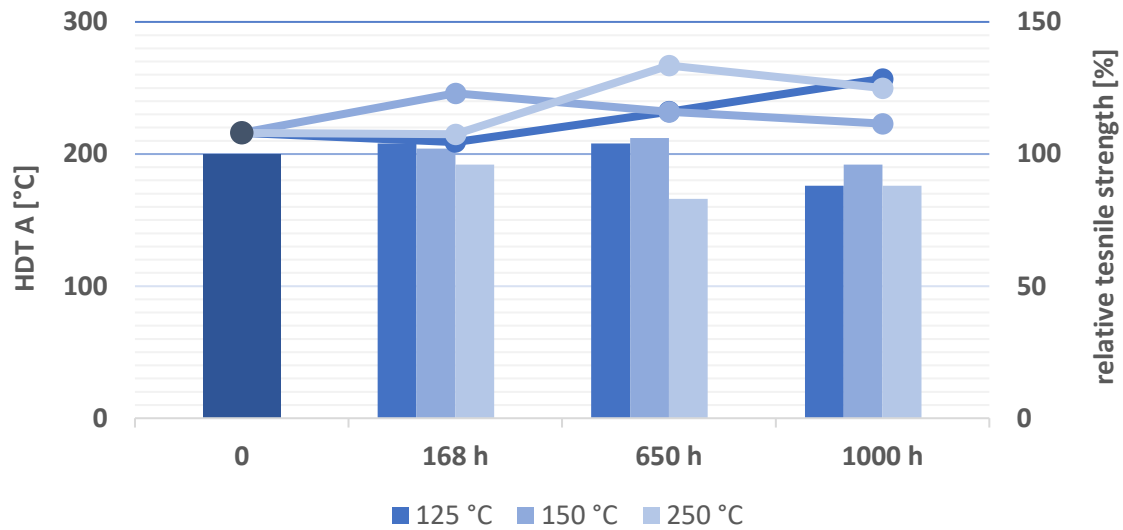
### Availability and Storage

Batch size starting from 1 kg.

Store at room temperature and protect from light. Stir thoroughly prior to use and after each building job.

<sup>1</sup>Properties may vary with post-processing – 30 min UV-post-cure followed by 3 h at 190 °C heating. 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>25 – 300 °C, 5 K/min, TMA alternating load with 3 mm ball; <sup>4</sup>Relative loss of tensile strength and elongation at break compared to reference, DIN EN ISO 527-5A, 5 mm/min; <sup>5</sup>Relative loss of tensile strength and HDT A compared to reference, DIN EN IS 527-5A, DIN EN ISO 75.

**Ageing of High Temperature 303 VP-ESD Black**  
(points - HDT A & bars - rel. tensile strength)



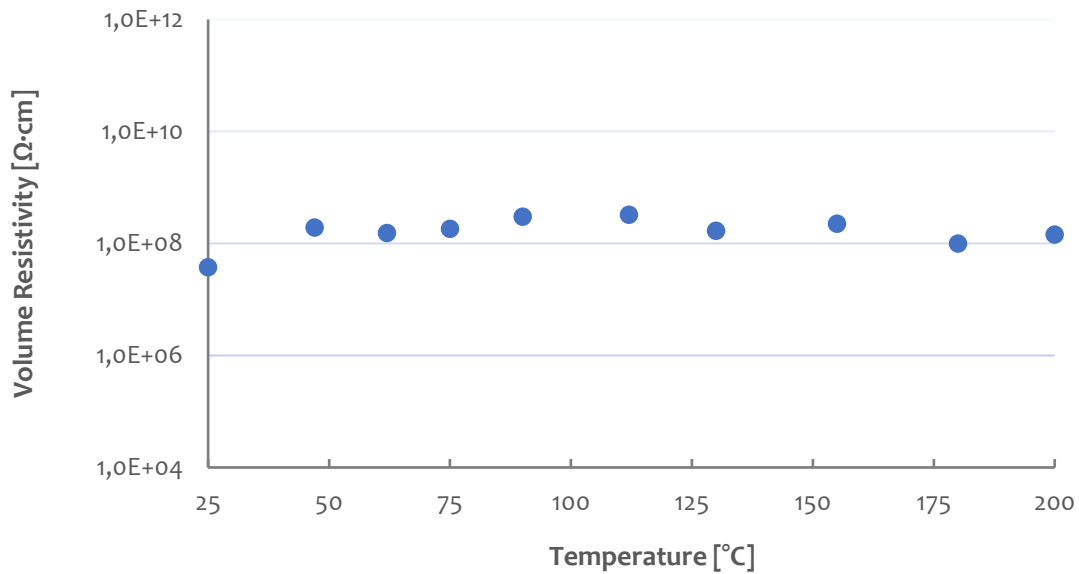
### Chemical Resistance

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

Water	0.5
Acetic Acid (5%)	0.6
Hydrochloric Acid (1%)	0.5
Nitric Acid (5%)	0.4
Sodium Hypochlorite (10%)	0.7
Hydrogen Peroxide (3%)	0.6
Sodium Hydroxide (1%)	0.4
Isopropyl Alcohol	0.2
Ethanol	0.2
Methanol	0.5
Butyl Glycol Acetate	0.2
Super Gasoline	0.2
Acetone	0.3
Methyl Ethyl Ketone	0.1

<sup>1</sup>Percental weight gained after 24 h submersion of printed and post-cured (30 min UV-post-cure followed by 3 h at 190 °C heating) 1 x 1 x 1 cm<sup>3</sup> cubes.

### ESD-Character of High Temperature 303 VP-ESD Black



**Cubic Ink®**  
**ALTANA New Technologies GmbH**

located at

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)

#### Disclaimer

The information contained herein is based on our current knowledge and experience. No warranties, guarantees and/or assurances of any kind, either express or implied, including warranties of merchantability or fitness for a particular purpose, are made regarding any products mentioned herein and data or information set forth, or that such products, data or information may be used without infringing intellectual property rights of third parties. Any information about suitability, use or application of the products is non-binding and does not constitute a commitment regarding the products' properties, use or application. Contractual terms and conditions, in particular agreed product specifications, always take precedence. We recommend that you test our products in preliminary trials to determine their suitability for your intended purpose prior to use. We reserve the right to make any changes and to update the information herein without notice.

**Follow us – ALTANA New Technologies GmbH – Cubic Ink®**

