Cubic Ink® High Temperature 303 VP-ESD Black

Highly temperature resistant ESD material for final part production

Liquid Properties	Method	Value[1]	Unit
Viscosity (25 °C)	DIN EN ISO 3219	1040	mPa·s
Critical Energy (E_c)	405 nm / 385 nm	4.2 / 5.9	mJ/cm^2
Depth of Penetration (D_p)	405 nm / 385 nm	0.14 / 0.20	mm
Tensile Properties			
Ultimate Tensile Strength	DIN EN ISO 527-5A[2]	48	MPa
Tensile Modulus	DIN EN ISO 527-5A[2]	3700	MPa
Elongation at Break	DIN EN ISO 527-5A[2]	1.7	%
Flexural Properties			
Flexural Strength	DIN EN ISO 178[2]	72	MPa
Flexural Modulus	DIN EN ISO 178[2]	3600	MPa
Deflection at Fracture	DIN EN ISO 178[2]	2.0	%
Impact Properties			
Izod notched	DIN EN ISO 180	14	J/m
Charpy notched	DIN EN ISO 179-1	0.7	kJ/m^2
Hardness			
Shore Hardness	DIN EN ISO 7619	90	D
Thermomechanical Properties			
T_g	TMA[5]	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	x 10^{-6} K^{-1}
Specific Heat Capacity, 20 °C	DIN EN ISO 11357-4	1.3	J/(g·K)
Flammability, horizontal	UL 94, at 3.2 mm	HB (FH-3)	-
Electrical Properties			
Dielectric strength	IEC60243-1	2	kV/mm
Relative Permittivity (Dielectric Constant, 25 °C, 10 000 Hz)	IEC60250	118	-
Dissipation Factor (25 °C, 10 000 Hz)	IEC60250	0.220	-

Volume Resistivity	IEC60093	6.6 x 10^7	Ω·cm
Volume Resistivity after 7 d/21 °C H_2O	IEC60093	5.0 x 10^7	Ω·cm
Comparative Tracking Index	IEC60112	>600	V

Other Properties

Water Uptake, 168 h, 23 °C	Internal	1.2	%
Performance after Water Uptake, 168 h, 23 °C[4]	Internal	<1	%
Thermal Ageing 150 °C for 1000 h[5]	Internal	<1	%
Thermal Ageing 250 °C for 168 h[5]	Internal	<1	%

Availability and Storage

Available in black.

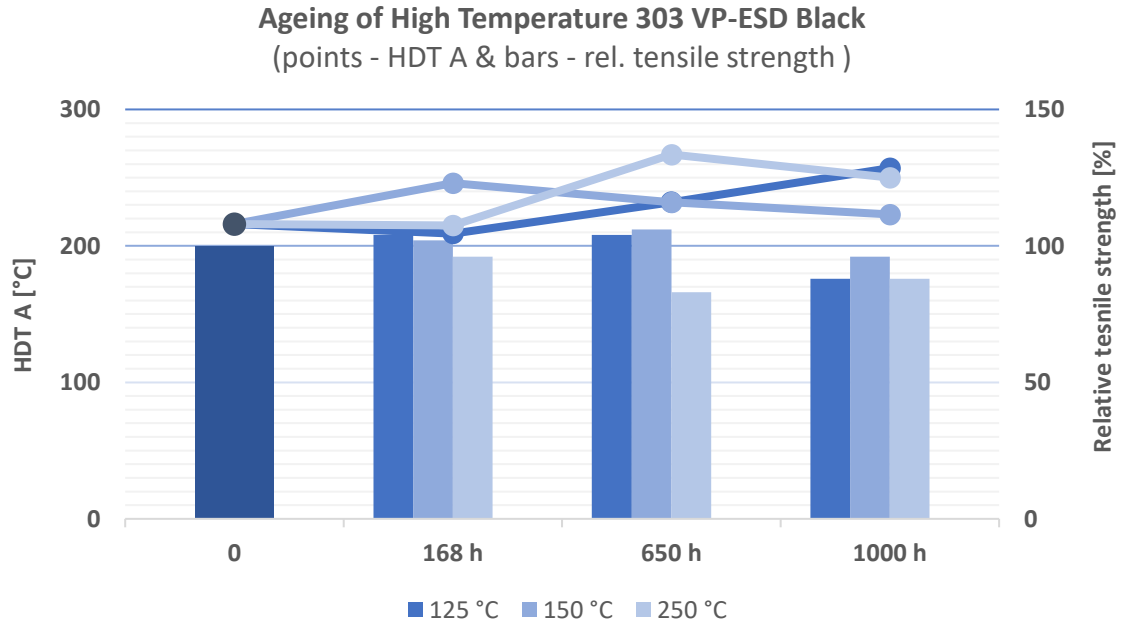
Batch size starting from 1 kg.

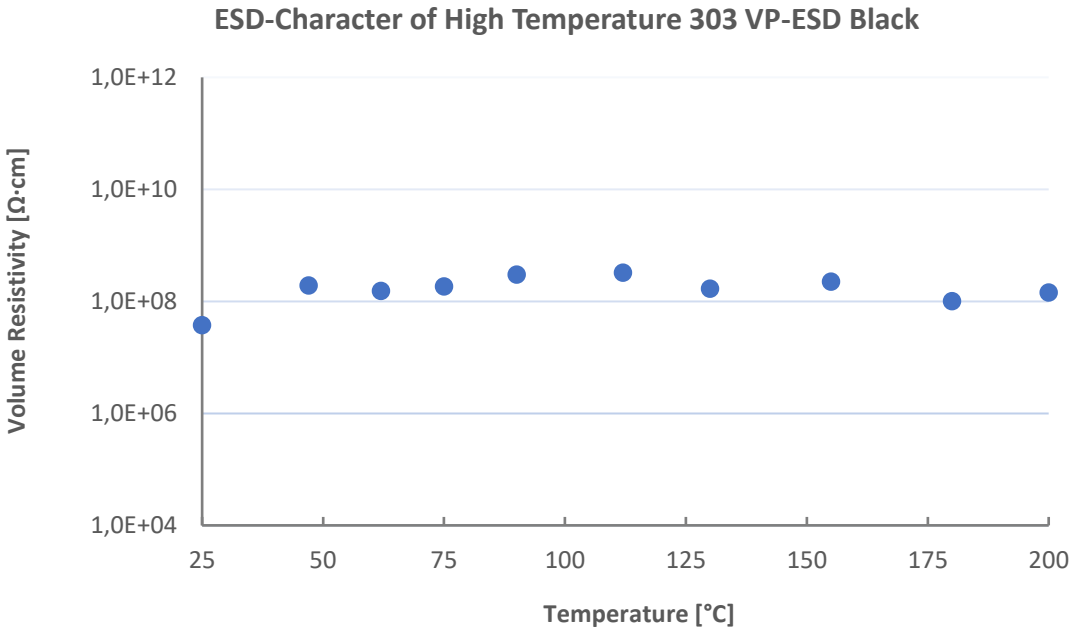
Shelf life 12 months, when stored at room temperature and protected from light. Stir thoroughly prior to use.

[1]Properties may vary with post-processing – 30 min UV post-cure via *Prusa CW1s* (LED 405 nm) 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. [2]5 mm/min; [3]25 - 300 °C, 5 K/min, TMA alternating load with 3 mm ball; [4]Relative loss of tensile strength and elongation at break compared to reference, DIN EN ISO 527-5A, 5 mm/min; [5]Relative loss of tensile strength and HDT A compared to reference, DIN EN ISO 527-5A, 5 mm/min and DIN EN ISO 75.

Chemical Resistance	Mass Gain [%][1]
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

[1]Percental weight gained after 24 h submersion of printed and post-cured (30 min UV post-cure via *Prusa CW1s* (LED 405 nm) followed by 3 h at 190 °C heating) 1 x 1 x 1 cm^3 cubes.





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