

Cubic Ink® High Performance 4-3800 VP

Material with a good balance between toughness and impact resistance for final part production

Liquid Properties	Value ¹	Unit
Viscosity @ 25 °C (DIN EN ISO 3219)	47	mPa·s
Density (DIN EN ISO 15212-1)	1.10	g/mL
Critical Energy (E _c) @405 / 385 nm	3.6 / 4.4	mJ/cm ²
Depth of Penetration (D _p) @405 / 385 nm	0.53 / 0.35	mm
Tensile Properties² (DIN EN ISO 527-5A)		
Ultimate Tensile Strength	49	MPa
Yield Strength	49	MPa
Tensile Modulus	2400	MPa
Elongation at Break	12	%
Flexural Properties³ (DIN EN ISO 178)		
Flexural Strength	67	MPa
Flexural Modulus	1700	MPa
Deflection at Fracture	>10	%
Impact Properties		
Izod notched (DIN EN ISO 180)	34	J/m
Charpy notched (DIN EN ISO 179-1)	3.4	kJ/m ²
Izod unnotched (DIN EN ISO 180)	260	J/m
Hardness (DIN EN ISO 7619)		
Shore Hardness (green)	68 - 75	D
Shore Hardness	81	D

Thermal Properties

T _g (DSC) ⁴	97	°C
HDT A (DIN EN ISO 75)	48	°C
HDT B (DIN EN ISO 75)	74	°C
CTE (-50 °C, 60 °C) (DIN EN ISO 11359-2)	91	x 10 ⁻⁶ K ⁻¹
CTE (90 °C, 200 °C) (DIN EN ISO 11359-2)	113	x 10 ⁻⁶ K ⁻¹
Specific Heat Capacity, 20 °C (DIN EN ISO 11357-4)	1.65	J/(g·K)

Electrical Properties

Dielectric strength (IEC60243-1)	22	kV/mm
Relative Permittivity (Dielectric Constant, 21 °C, 10000 Hz, IEC60250)	8.3	-
Dissipation Factor (21 °C, 10000 Hz, IEC60250)	0.016	-
Volume Resistivity (IEC60093)	5.6 x 10 ¹⁴	Ω·cm
Volume Resistivity after 7 d/RT H ₂ O (IEC60093)	2.7 x 10 ¹¹	Ω·cm
Comparative Tracking Index (IEC60112)	>600	V

Flame (UL94)

Flammability, horizontal (at 3.2 mm)	HB	-
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Chemical Resistance

Water Uptake, 168 h, 23 °C ⁵	6.1	%
Performance after Water Uptake, 24 h, 23 °C ⁶	28	%

Thermal Ageing⁷

125 °C for 672 hours	<1	%
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Ageing at -40 °C⁶

for 168 hours	<1	%
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UV Ageing^{6,8}

for 1000 hours	<1	%
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Cytotoxicity⁹ (DIN EN ISO 10993-5)

In-vitro cytotoxicity	On request
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Print Appearance/ Color

Natural color is translucent light yellow. Also available in cyan, magenta, yellow, black and grey. More colors on request.

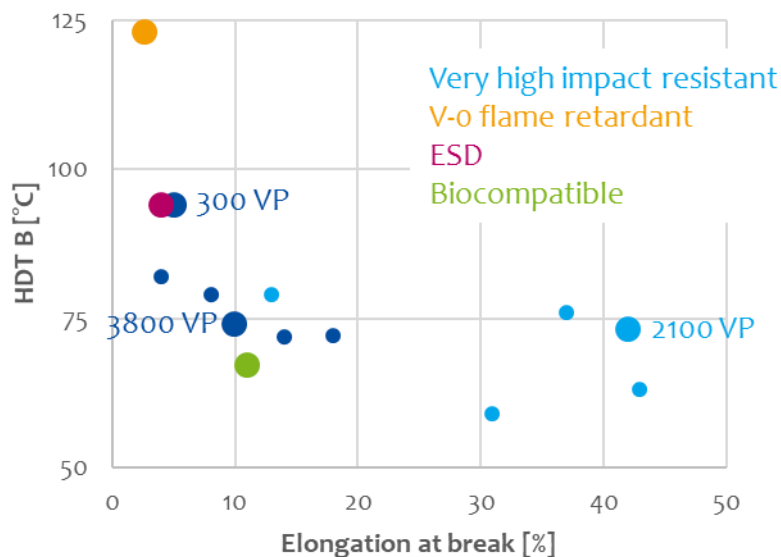
Availability and Storage

Batch sizes starting from 1 kg.

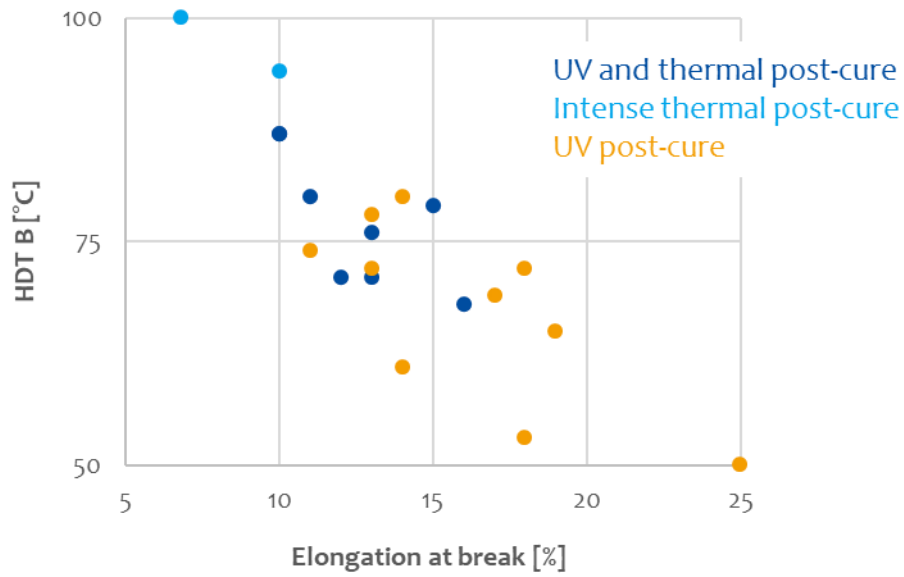
Store between 21 and 28 °C, stir before use and protect from light.

¹Properties with post-processing – washed with water, UV post-treatment. All material properties can vary with printer, print settings, object orientation, part geometry, post-processing and age of sample. ²5 mm/min; ³5 mm/min; ⁴-20 - 200 °C, 20 K/min; ⁵Weight loss of 5A-specimen DIN EN ISO 527; ⁶Relative loss of tensile modulus, tensile strength, elongation at break and HDT B compared to reference; ⁷Relative loss of elongation at break and HDT B compared to reference, DIN EN ISO 527-5A, 5 mm/min; ⁸QUV weathering tester following ISO 4892-3 with High Performance 4-3700 VP; ⁹Testing at 22 °C, 61% rel. humidity, duration of extraction 24h at 37 °C following DIN EN ISO 10993-5 and -12.

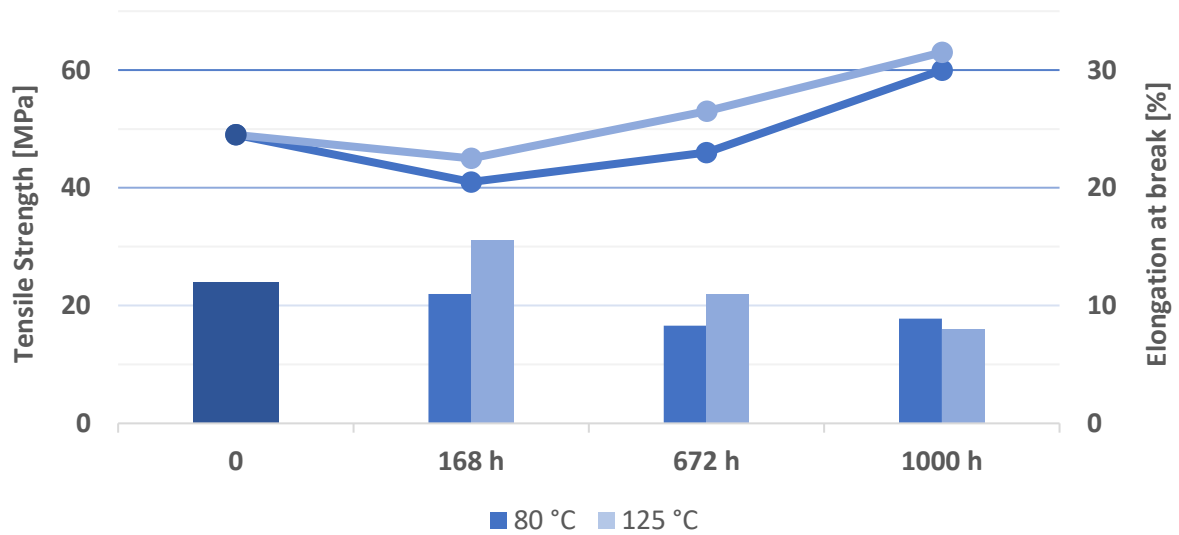
Versatility and Customization of High Performance 4-Series



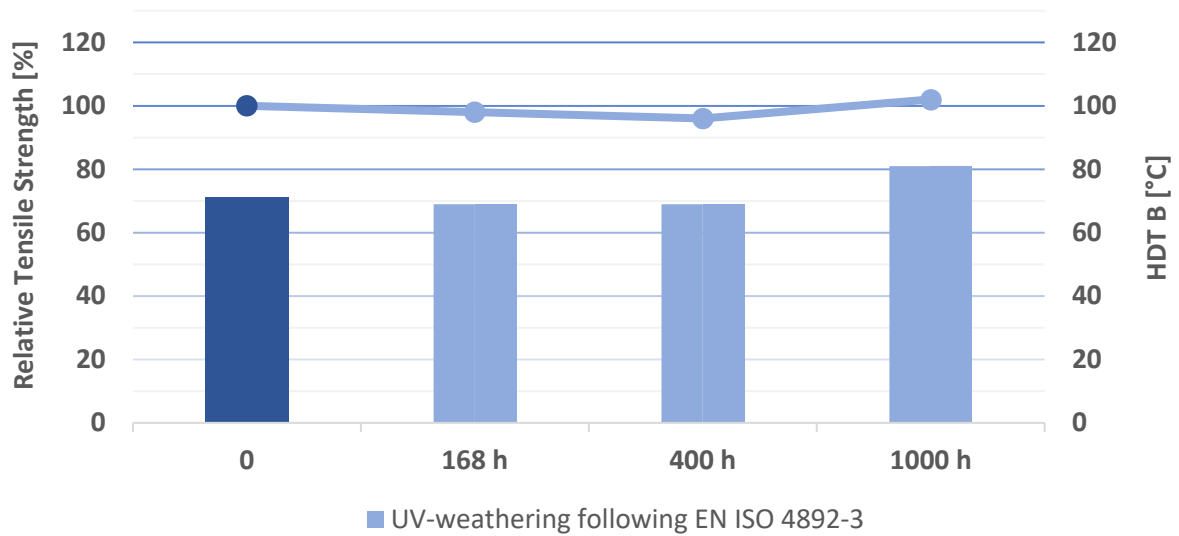
Examples of Post-Processing High Performance 4-Series



Ageing of High Performance 4-3800 VP (points - tensile strength & bars - elongation at break)



UV Ageing of High Performance 4-3700 VP (points - rel. tensile strength & bars - HDT B)



Chemical Resistance

Mass Gain [%]¹

Water	4.4 ²
Acetic Acid (5%)	1.5
Hydrochloric Acid (1%)	1.2
Nitric Acid (5%)	1.8
Sodium Hypochlorite (10%)	0.1
Hydrogen Peroxide (3%)	1.6
Sodium Hydroxide (1%)	1.1
Isopropyl Alcohol	<0.1
Methanol	5.6
Butyl Glycol Acetate	<0.1
Super Gasoline	0.8
Acetone	6.2
Methyl Ethyl Ketone	4.2

¹Percental weight gained after 24 h submersion of printed and post-cured (washed with water, UV post-cure) 1 x 1 x 1 cm cubes. ²Weight loss of 5A-specimen DIN EN ISO 527.

Cubic Ink®
ACTEGA Terra GmbH
Mielestraße 13
31275 Lehrte
GERMANY

Tel +49 (0)5132 5009-600

cubic.ink@altana.com

www.altana.com

Learn more about Cubic Ink® materials www.altana.com/cubic-ink www.altana.de/cubic-ink

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