

We give shape to ideas

ALTANA Cubic Ink® High Performance Materials
suitable for DLP, LCD, SLA and Material Jetting



ALTANA

Global Leader in Specialty Chemicals

The ALTANA Group develops and manufactures high-quality, innovative specialty chemical products. ALTANA's four divisions – BYK, ECKART, ELANTAS, and ACTEGA – have set worldwide standards in their markets.

The Group offers innovative, environmentally compatible special solutions for coatings manufacturers, coatings and plastics processors, the printing and packaging industry, the cosmetics sector, and the electrical industry. The product range includes additives, special coatings and adhesives, effect pigments, sealants and potting compounds, impregnating agents as well as testing and measuring instruments. The four divisions of ALTANA each hold leading positions in their target markets in terms of quality, product solution competence, innovation and service. Our innovative products enable companies to develop future technologies today, technologies that make life easier, safer, and more comfortable.

The ALTANA Group is headquartered in Wesel on the Lower Rhine and has 48 production sites and 63 service and research laboratory sites worldwide. Across the Group, around 7,000 employees work for the global success of ALTANA. In 2022, the company achieved sales of more than 3 billion euros. About 7 percent of this is invested in research and development each year. With a high profitability compared to the industry as a whole, ALTANA is one of the most innovative as well as fastest-growing and most profitable chemical companies in the world.





We give shape to ideas

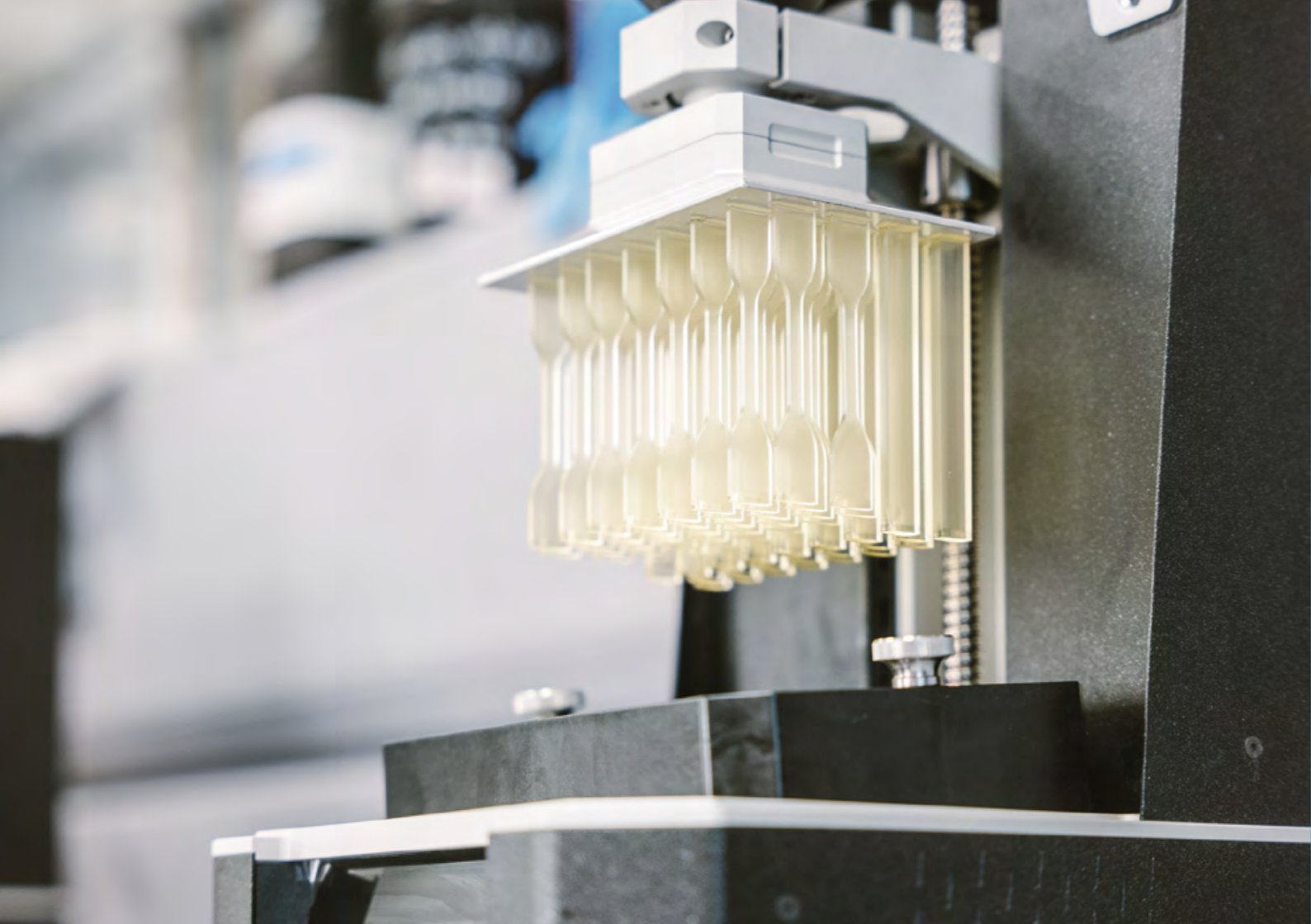
ALTANA Cubic Ink® – Materials for Additive Manufacturing. Suitable for DLP, LCD, SLA and Material Jetting.

Fulfilling customer wishes, thinking ahead, or even exceeding customer requirements: with this aspiration, ALTANA offers innovative 3D printing materials for additive manufacturing in industry.

We are setting new standards for industrial 3D printing. As one of the leading international specialty chemicals companies, ALTANA offers you highly innovative UV-curable resins and inks for DLP, LCD, SLA and material jetting 3D printing technologies. Our portfolio spans from rigid, tough and flexible to transparent and special molding materials.

With the High Performance material family, we address industrial relevant properties, such as reduced environmental ageing, flame-retardancy, heat resistance, impact strength, true elasticity and ESD capability. When it comes to material jetting, sets of compatible inks specially designed for multimaterial 3D printing are available including a broad range of properties, colors and the relevant water-soluble or water-breakable support materials.

Next to our innovative material portfolios we offer high levels of service and support in respect to the 3D printing and post-processing processes present in our partners and customers production environments. We at ALTANA are constantly further developing materials for industry-compliant additive manufacturing to match your printing technology and meet your needs.



Resins for Functional Prototyping and Molding

Materials for DLP, LCD and SLA 3D printing technologies

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Cubic Ink® Mold 2000 VP

Easy to remove mold materials

The Cubic Ink® mold family is the choice for printing casts and molds designed for a plethora of geometries and filling materials, e.g. low-melting metal and alloys as well as 2K components, such as epoxides and polyurethanes. Its water-soluble or water-breakable nature allows hands-free and automated de-molding. Depending on application requirements, important properties such as hardness, elasticity and processability can be customized including a broad compatibility with the respective molding materials and a preferred regulatory profile.



shown low melting alloy

Materials can be used in



Machinery



Tooling



Dental

Performance Indicators

Tensile Strength	12 MPa
Tensile Modulus	322 MPa
Elongation at Break	46%
Shore Hardness	53 D

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	transparent, on demand
Washing	IPA, Ethanol
Post-Processing	UV post-cure



Scan the QR-Code for the technical datasheet and more information.



Cubic Ink® Rigid 300 VP

Rigid materials for functional prototyping

This class of materials is not only customizable in rigidity and hardness, but also allows maximum design freedom and delivers sharp details thanks to its low viscosity. It is ideal for robust applications and has a good thermal long-term stability.



Materials can be used in



Industrial



Tooling

Optical
Applications

Performance Indicators

Tensile Strength	57 MPa
Tensile Modulus	2,600 MPa
Elongation at Break	4.3%
Shore Hardness	82 D

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	on demand
Washing	IPA
Post-Processing	UV post-cure



Scan the QR-Code for the technical datasheet and more information.

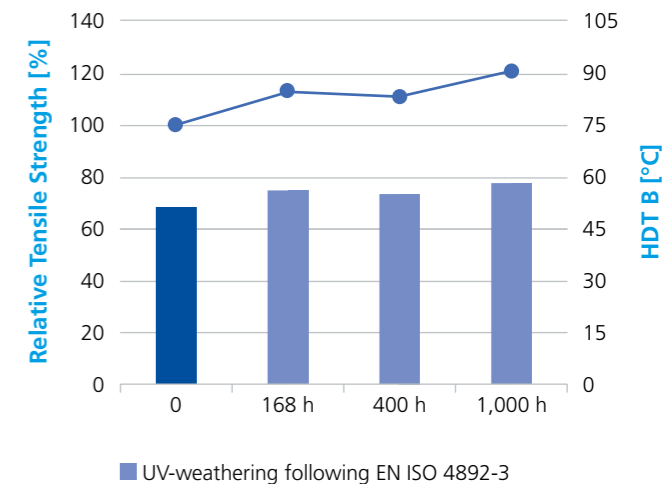
Technical Details

Chemical Resistance	Mass Gain [%] ¹
Water	<0.1
Acetic Acid (5%)	<0.1
Hydrochloric Acid (1%)	<0.1
Nitric Acid (5%)	<0.1
Sodium Hypochlorite (10%)	<0.1
Hydrogen Peroxide (3%)	<0.1
Sodium Hydroxide (1%)	<0.1
Isopropyl Alcohol	0.5
Methanol	2.6
Butyl Glycol Acetate	0.4
Super Gasoline	2.0
Acetone	7.1
Methyl Ethyl Ketone	7.2

¹ Percental weight gained after 24 h submersion of printed 1 x 1 x 1 cm cubes.

UV Ageing of the Rigid-series

(points - rel. tensile strength & bars - HDT B)



Cubic Ink® Tough 1400 VP

Allround material with balanced properties

The Tough material family was designed as a general purpose solution with excellent definition, a balanced set of mechanical properties and can be easily colored. It is low viscous and allows fast and reliable printing with maximum design freedom.



Materials can be used in



Industrial



Tooling



Machinery

Performance Indicators

Tensile Strength	39 MPa
Tensile Modulus	2,070 MPa
Elongation at Break	4.7%
Shore Hardness	82 D

Processing Guide

Printing Technology	DLP and LCD
Color	on demand
Washing	IPA
Post-Processing	UV post-cure



Scan the QR-Code for the technical datasheet and more information.

Cubic Ink® Dental 501 VP

Dental model materials

Cubic Ink® Dental 501 VP is designed for fast and high-resolution printing. Fine-tuned mechanical and thermo-mechanical properties, application-specific color and scalable pricing make this material an excellent model material for the dental industry.



Materials can be used in



Dental

Performance Indicators

Flexural Strength	77 MPa
Flexural Modulus	1,800 MPa
Deflection at Fracture	8%
Shore Hardness	81 D

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	on demand
Washing	IPA
Post-Processing	UV post-cure



Scan the QR-Code for the technical datasheet and more information.

Cubic Ink® Flexible 1400 VP

Very soft and flexible material

Cubic Ink® Flexible material family groups resins with adaptable hardness, elasticity and colors in the Shore A range. Flexible 1400 VP has a Shore A of 30 while being processable on both common open DLP and LCD printers.



Materials can be used in



Tooling



Machinery

Medical
Applications

Performance Indicators

Shore Hardness	30 A
Compression Set-B	<5%
Elongation at Break	160%
Tensile Strength	2.6 MPa

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	on demand
Washing	IPA
Post-Processing	UV post-cure



Scan the QR-Code for the technical datasheet and more information.

Cubic Ink® Rigid 404 VP-Clear

Transparent and colorless materials

Cubic Ink® clear materials are designed for applications where a high transparency and clarity is needed. Other optical properties such as the refractive index along with the mechanical properties can be customized.



Materials can be used in

Optical
Applications

Performance Indicators

Tensile Strength	55 MPa
Elongation at Break	4.4%
Transparency	Good
Refractive Index	on demand

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	colorless, on demand
Washing	IPA
Post-Processing	UV post-cure



Scan the QR-Code for the technical datasheet and more information.



High Performance Resins for industrial Additive Manufacturing

Materials for DLP, LCD and SLA 3D printing technologies

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High Performance 4-2100 VP	Page 30
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Cubic Ink® High Performance 1-202 VP

Thermal form stable materials

With thermal form stabilities over 190 °C these materials are designed for demanding applications at very high temperatures. Additionally, this material family maintains its strong character over a long period at elevated temperatures.



Materials can be used in



Industrial



Aerospace



Machinery

Performance Indicators

HDT B	195 °C
Flexural Strength	130 MPa
Elongation at Break	3.5%
Flammability	HB

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	black, intrinsic
Washing	IPA
Post-Processing	UV + thermal post-cure



Scan the QR-Code for the technical datasheet and more information.



Cubic Ink® High Performance 2-900 VP

Chemical resistant materials

Chemical very resistant materials in various industrial fluids including a broad range of customizable mechanical and thermo-mechanical properties for final part production. The inherent decent viscosity and good pot-life allows fast printing and easy handling in the printing process.



Materials can be used in



Industrial



Machinery



Tooling

Performance Indicators

Chemical Resistance	Superior
HDT B	138 °C
Flexural Strength	118 MPa
Dielectric Strength	25 kV/mm

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	black, red, intrinsic
Washing	IPA
Post-Processing	UV + thermal post-cure



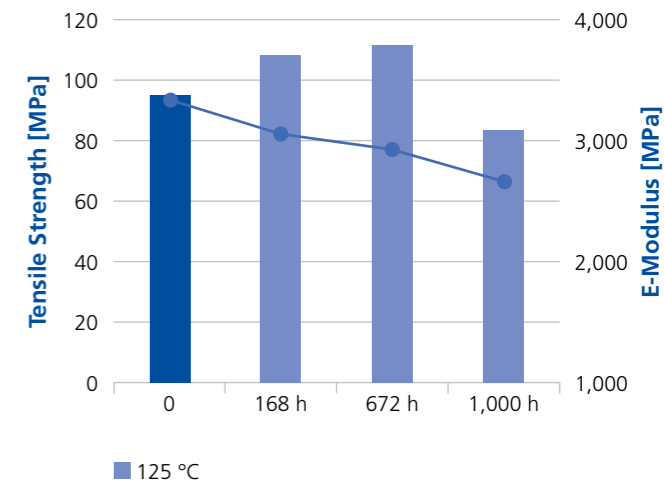
Scan the QR-Code for the technical datasheet and more information.

Technical Details

Chemical Resistance	Mass Gain [%] ¹	Performance Loss [%] ²
Water	0.1	4
Acetic Acid (5%)	0.2	3
Hydrochloric Acid (1%)	0.1	<1
Nitric Acid (5%)	0.1	<1
Sulfuric Acid (30%)	0.2	<1
Sodium Hypochlorite (10%)	0.1	<1
Hydrogen Peroxide (3%)	0.2	3
Hydrogen Peroxide (30%)	0.2	3
Sodium Hydroxide (1%)	0.2	6
Sodium Hydroxide (10%)	0.2	6
Isopropyl Alcohol	<0.1	3
Ethanol	0.1	<1
Methanol	1.3	12
Butyl Glycol Acetate	<0.1	<1
Super Gasoline	<0.1	<1
Acetone	0.5	<1
Methyl Ethyl Ketone	<0.1	<1

Ageing of High Performance 2-900 VP

(points - tensile strength & bars - E-modulus)



¹ Percental weight gained after 24 h submersion of printed and post-cured (IPA-washed, UV-post-cure followed by a thermal treatment up to 160 °C) 1 x 1 x 1 cm cubes; ² Relative loss of E-modulus, DIN EN ISO 527-5A, 5 mm/min after 24 h submersion.

Cubic Ink® High Performance 2-1400 VP

Transparent allround material for Stereolithography

Cubic Ink® High Performance 2-1400 VP is a transparent material with a balanced set of mechanical and thermo-mechanical properties. It has a very low water-uptake, a good surface finish and low shrinkage. This material is especially designed to be used on stereolithography printers. A black version is also available.



Materials can be used in



Machinery

Optical
Applications

Tooling

Performance Indicators

Water Uptake	<0.1
Chemical Resistance	Very Good
Izod notched	38 J/m
Shrinkage	Less

Processing Guide

Printing Technology	SLA
Color	transparent, on demand
Washing	PC/IPA
Post-Processing	UV post-cure



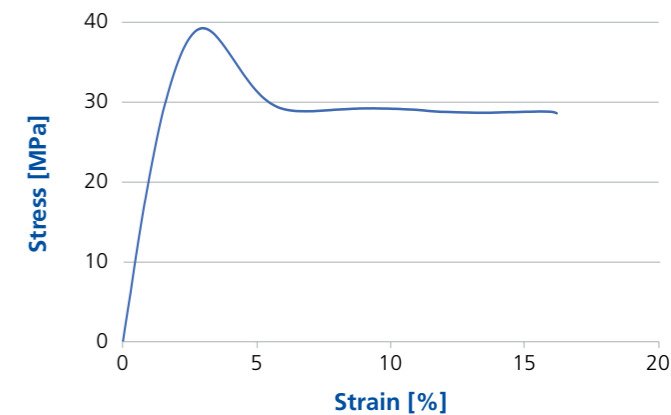
Scan the QR-Code for the technical datasheet and more information.

Technical Details

Chemical Resistance	Mass Gain [%] ¹
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

¹ 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.

Tensile Testing of High Performance 2-1400 VP (5 mm/min)



Cubic Ink® High Performance 3-1700 VP

Elastic and tear resistant material with a very low water uptake

Cubic Ink® High Performance 3-1700 VP is an elastic material with outstanding low water-uptake, a broad range of operating temperature, a competitive UV- and temperature ageing stability and a high tear strength. It comes in a moderate viscosity and has long-time pot-life even at elevated temperatures.



Materials can be used in



Footwear



Medical
Applications

Performance Indicators

Tear Strength	120 kN/m
Thermal Stability	Over broad temp. range
Chemical Resistance	Very Good
Rebound	30%

Processing Guide

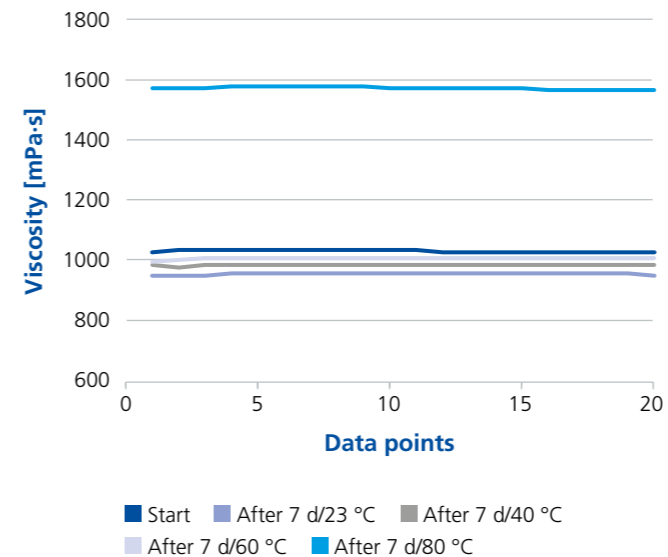
Printing Technology	DLP, LCD and SLA
Color	black, grey, green, intrinsic
Washing	DPM/IPA
Post-Processing	Thermal post-cure



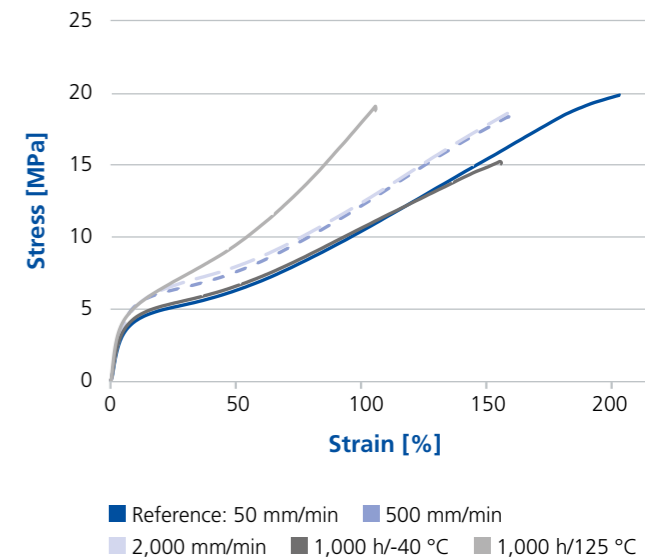
Scan the QR-Code for the technical datasheet and more information.

Technical Details

Viscosity Profile (25 °C, 100 s⁻¹)



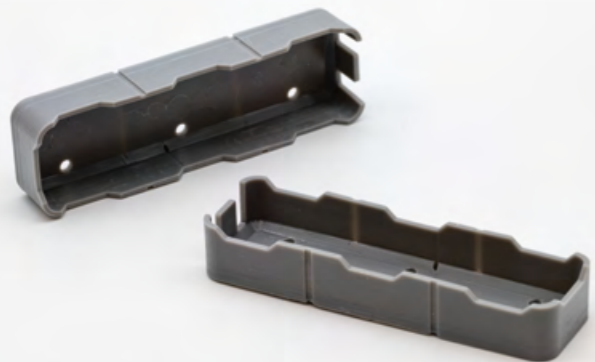
Tensile Testing of High Performance 3-1700 VP



Cubic Ink® High Performance 4-300 VP

Technical allround material with a HDT B up to 100 °C

Cubic Ink® High Performance 4-300 VP shows a good balance between temperature form-stability and toughness for final part production including passing horizontal-burning tests. Its low viscosity allows fast and accurate printing while maintain a high degree of customization depending on customer's needs.



Materials can be used in



Industrial



Machinery



Tooling



Connectors

Performance Indicators

HDT B	104 °C
Elongation at Break	4.6%
Flammability	HB
Viscosity	Very Low

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	black, grey, intrinsic, on demand
Washing	Water
Post-Processing	UV and/or thermal post-cure



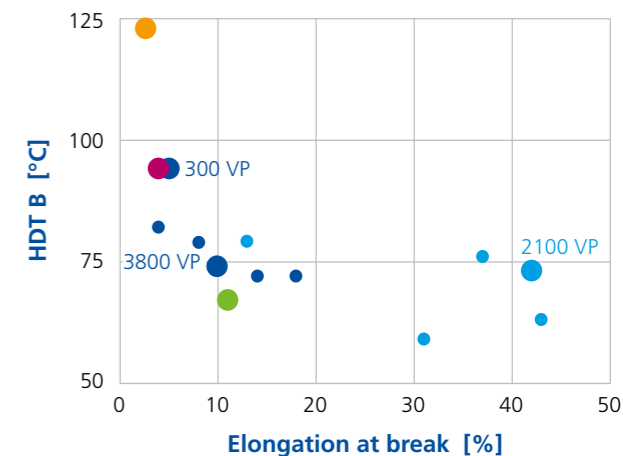
Scan the QR-Code for the technical datasheet and more information.

Technical Details

Chemical Resistance	Mass Gain [%] ¹
Water	0.2
Acetic Acid (5%)	0.2
Hydrochloric Acid (1%)	0.2
Nitric Acid (5%)	0.2
Sodium Hypochlorite (10%)	0.1
Hydrogen Peroxide (3%)	0.3
Sodium Hydroxide (1%)	0.1
Isopropyl Alcohol	0.2
Methanol	4.1
Butyl Glycol Acetate	<0.1
Super Gasoline	1.7
Acetone	6.1
Methyl Ethyl Ketone	3.9

¹ Percental weight gained after 24 h submersion of printed and post-cured (washed with water, thermal post-cure 1 h 130 °C) 1 x 1 x 1 cm cubes.

Versatility and Customization of High Performance 4-series



Very high impact resistant V-0 flame retardant
ESD Biocompatible

Cubic Ink® High Performance 4-2800 VP-ESD black

ESD material with excellent processability and low viscosity

Cubic Ink®'s ESD materials are designed to meet the customer's ESD requirements. Thanks to their low viscosity a very good processability is given. The tough yet customizable range of properties of these materials makes them a good choice for a broad range of applications.



Materials can be used in



Industrial



Machinery



Tooling

Performance Indicators

Volume Resistivity	1.8 x 10 ⁷ Ωcm
HDT B	94 °C
Elongation at Break	4%
Chemical Resistance	Very Good

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	black
Washing	Water
Post-Processing	UV and/or thermal post-cure



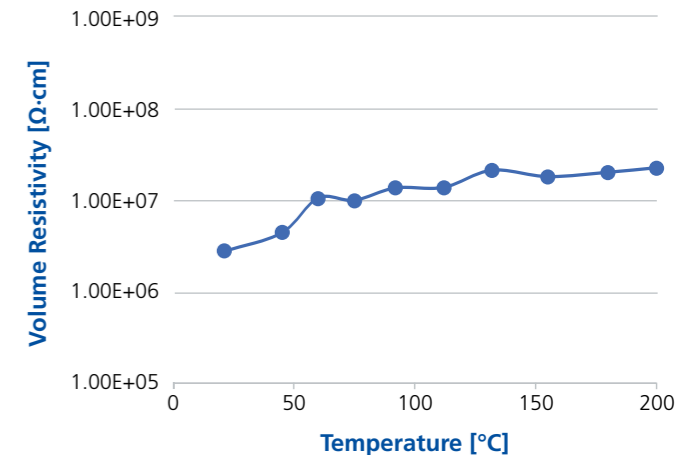
Scan the QR-Code for the technical datasheet and more information.

Technical Details

Chemical Resistance	Mass Gain [%] ¹
Water	0.2
Acetic Acid (5%)	0.2
Hydrochloric Acid (1%)	<0.1
Nitric Acid (5%)	0.3
Sodium Hypochlorite (10%)	0.1
Hydrogen Peroxide (3%)	0.3
Sodium Hydroxide (1%)	0.1
Isopropyl Alcohol	<0.1
Methanol	3.4
Butyl Glycol Acetate	0.1
Super Gasoline	0.6
Acetone	5.4
Methyl Ethyl Ketone	2.2

¹ Percental weight gained after 24 h submersion of printed and post-cured (washed with water, UV and thermal post-cure) 1 x 1 x 1 cm cubes.

ESD-Character of High Performance 4-2800 VP-ESD



Cubic Ink® High Performance 4-2100 VP

Technical allround material with excellent impact strength

Cubic Ink® High Performance 4-2100 VP was designed for applications where a high impact strength is crucial. Its low viscosity allows fast and accurate printing while maintain a high degree of customization depending on customer's needs.



Materials can be used in



Industrial



Machinery



Tooling

Performance Indicators

Izod notched	67 J/m
Elongation at Break	37%
HDT B	76 °C
Flammability	HB

Processing Guide

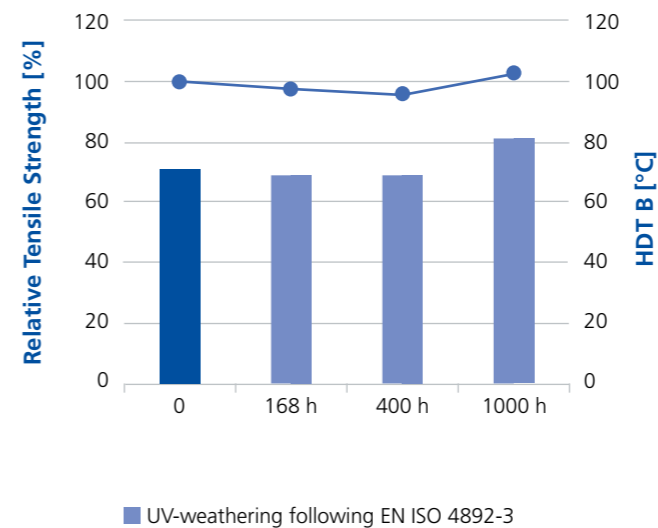
Printing Technology	DLP, LCD and SLA
Color	on demand
Washing	Water
Post-Processing	UV and/or thermal post-cure



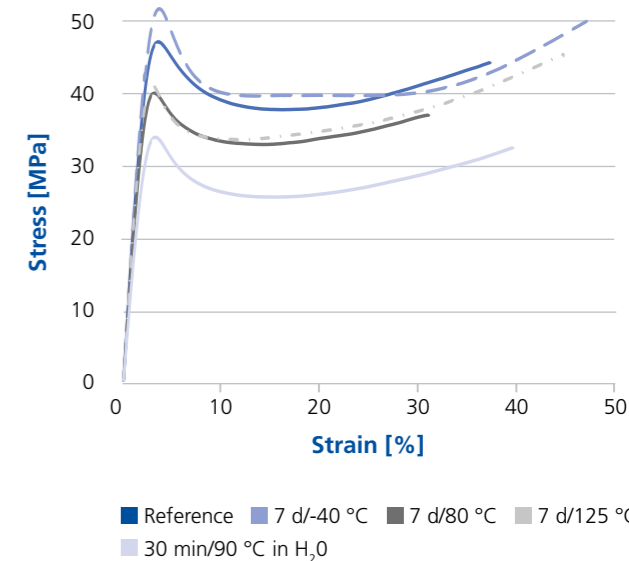
Scan the QR-Code for the technical datasheet and more information.

Technical Details

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



Tensile Testing of High Performance 4-2100 VP



Cubic Ink® High Performance 4-3800 VP

Technical allround material with a HDT B of 75 °C

Cubic Ink® High Performance 4-3800 VP was designed for applications where a combination of a good impact strength and thermal form-stability is needed. Its low viscosity allows fast and accurate printing while maintain a high degree of customization depending on customer's needs. Additionally, its chemistry shows a preferred regulatory profile in respect to cytotoxicity and other related tests.



Materials can be used in



Industrial



Medical
Applications



Eyewear



Connectors

Performance Indicators

Cytotoxicity	on request
Izod notched	34 J/m
UV- and thermal stability	Good
Flammability	HB

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	on demand
Washing	Water
Post-Processing	UV and/or thermal post-cure



Scan the QR-Code for the technical
datasheet and more information.

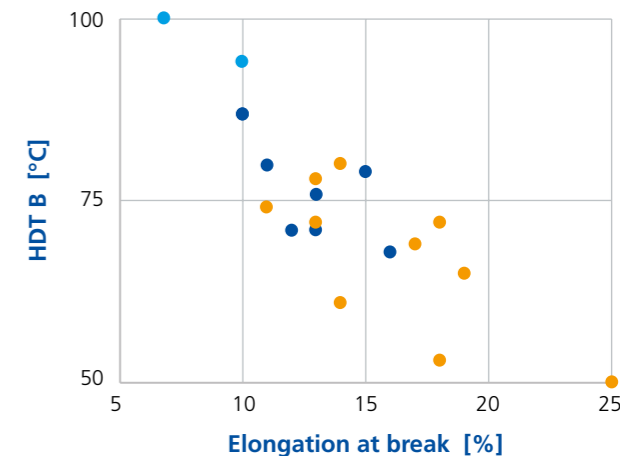
Technical Details

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

¹ Percental weight gained after 24 h submersion of printed and post-cured (washed with water, UV post-cure) 1 x 1 x 1 cm cubes.

² Weight loss of 5A-specimen DIN EN ISO 527.

Post-Processing Examples of High Performance 4-series



■ UV and thermal post-cure ■ Intense thermal post-cure
■ UV post-cure

Cubic Ink® High Performance 4-1000 VP-V0

UL 94 V0-certified material

Cubic Ink® HP 4-1000 VP-V0 is a flame retardant material with high rigidity. It is V-0 according to UL 94 and its low viscosity results in very good processability and maximal design freedom.



Materials can be used in



Connectors



Industrial



Automotive



Machinery

Performance Indicators

Flammability	V-0
Viscosity	Low
HDT B	123 °C
Tensile Strength	97 MPa

Processing Guide

Printing Technology	DLP, LCD and SLA
Color	black, grey, intrinsic
Washing	Water
Post-Processing	UV + thermal post-cure



Scan the QR-Code for the technical datasheet and more information.

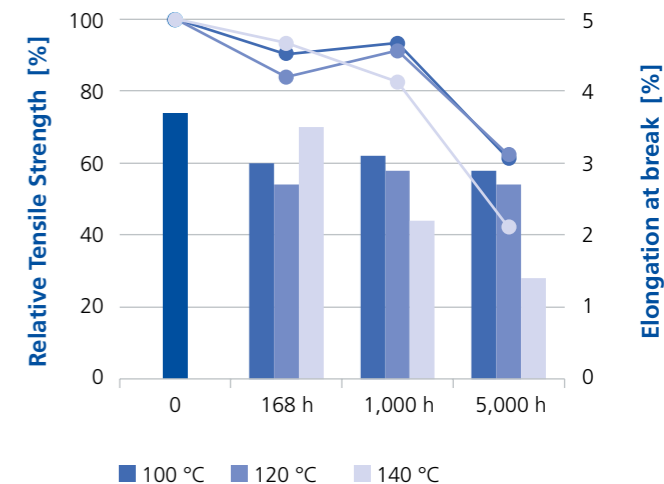
Technical Details

Chemical Resistance	Mass Gain [%] ¹
Water	2.1
Acetic Acid (5%)	2.0
Hydrochloric Acid (1%)	1.4
Nitric Acid (5%)	2.1
Sodium Hypochlorite (10%)	0.9
Hydrogen Peroxide (3%)	2.3
Sodium Hydroxide (1%)	1.0
Isopropyl Alcohol	0.2
Methanol	0.9
Butyl Glycol Acetate	0.2
Super Gasoline	0.2
Acetone	0.2
Methyl Ethyl Ketone	0.2

¹ Percental weight gained after 24 h submersion of printed and post-cured (washed with water, UV and thermal post-cure) 1 x 1 x 1 cm cubes.

Ageing of V0-material

(points - rel. tensile strength & bars - elongation at break)





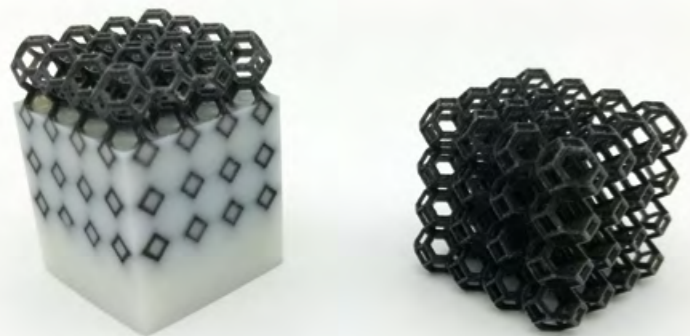
Inks for Functional Prototyping, Supports and Special Applications

Materials for multimaterial 3D printing

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Support materials

Cubic Ink® Support materials are water-soluble or water-breakable. They can be removed automatically in a water bath without chemical solvents or manually with low force. These materials are designed to give a high resolution and ease of process. The hardness and the dissolution times are adjustable.



Materials can be used in



Industrial



Tooling

Performance Indicators

Dissolution Time	variable
Viscosity	10 – 1,000 mPas
Shore Hardness	30 A – 60 D

Support removal¹

Dissolution time - Support 3800	2 hours
Dissolution time - Support 1201	5 hours
Dissolution time - Support 2700	15 hours
Dissolution time - Support 2701	50 hours

¹Time until total dissolution of support based on a model geometry in water at 40 °C and ultra-sound.



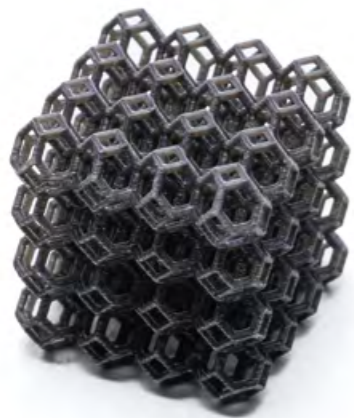
Scan the QR-Code for the technical datasheet and more information.



Cubic Ink® Rigid 700

Rigid materials for functional prototyping

This class of materials is not only customizable in rigidity and hardness, but also allows maximal design freedom and delivers sharp details. It is ideal for robust applications and has a good thermal long-term stability.



Materials can be used in



Industrial



Machinery

Performance Indicators

Tensile Strength	55 MPa
Elongation at Break	4.4%
Shore Hardness	85 D
Viscosity	38 mPas

Processing Guide

Printing Technology	Material Jetting
Color	on demand
Post-Processing	UV post-cure



Scan the QR-Code for the technical datasheet and more information.

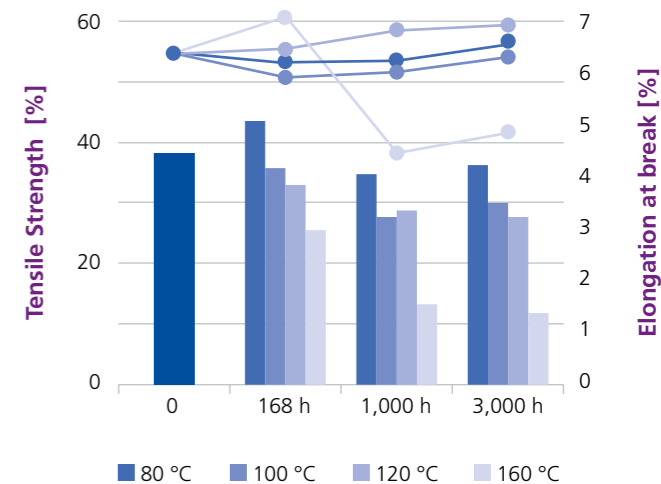
Technical Details

Chemical Resistance	Mass Gain [%] ¹
Water	<0.1
Acetic Acid (5%)	<0.1
Hydrochloric Acid (1%)	<0.1
Nitric Acid (5%)	<0.1
Sodium Hypochlorite (10%)	<0.1
Hydrogen Peroxide (3%)	<0.1
Sodium Hydroxide (1%)	<0.1
Isopropyl Alcohol	0.5
Methanol	2.6
Butyl Glycol Acetate	0.4
Super Gasoline	2.0
Acetone	7.1
Methyl Ethyl Ketone	7.2

¹ Percental weight gained after 24 h submersion of printed 1 x 1 x 1 cm cubes.

UV Ageing of Rigid 700

(points: tensile strength; bars: elongation at break)



Cubic Ink® Flexible 1201

Very soft and flexible materials

Multimaterial-printing materials with a variable flexibility for additive manufacturing. These materials are ideal for pliable and stretchable objects where various degrees of hardness are required.



Materials can be used in



Medical
Applications



Tooling

Performance Indicators

Shore Hardness	30 A
Elongation at Break	350%
Compression Set-B	<2%
Tear Strength	82 kN/m

Processing Guide

Printing Technology	Material Jetting
Color	on demand
Post-Processing	UV post-cure



Scan the QR-Code for the technical
datasheet and more information.

Cubic Ink® Clear 502

Transparent and colorless materials

Cubic Ink® clear materials are designed for applications where a high transparency and clearness is needed. Other optical properties such as the refractive index along with the mechanical properties can be highly customized.



Materials can be used in



Machinery



Optical
Applications

Performance Indicators

Tensile Modulus	1,200 MPa
Elongation at Break	10%
Shore Hardness	78 D
Transparency	Very Good

Processing Guide

Printing Technology	Material Jetting
Color	on demand
Post-Processing	UV post-cure



Scan the QR-Code for the technical
datasheet and more information.

Cubic Ink® High Performance 2-301

Chemical resistant materials with high HDT

This material family shows a broad chemical resistance in various industrial fluids including a broad range of customizable mechanical and thermo-mechanical properties for final part production. The inherent decent viscosity and good pot-life allows fast printing and easy handling in the printing process.



Materials can be used in



Industrial



Aerospace



Machinery

Performance Indicators

Chemical Resistance	Superior
HDT B	150 °C
Flexural Strength	110 MPa
Thermal Ageing	Good

Processing Guide

Printing Technology	Material Jetting
Color	intrinsic, on demand
Post-Processing	UV + thermal post-cure



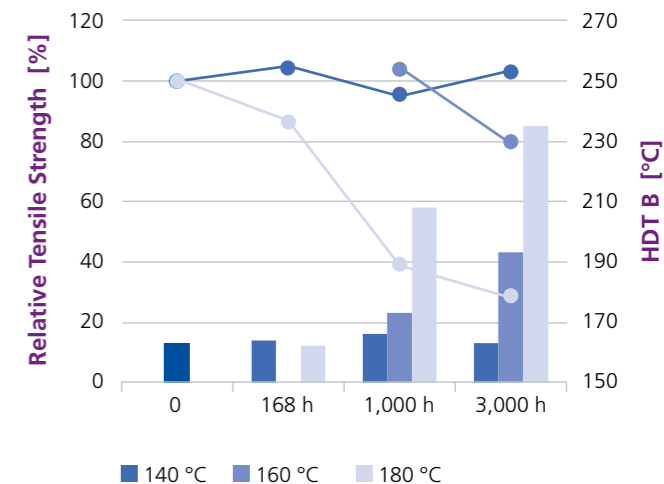
Scan the QR-Code for the technical datasheet and more information.

Technical Details

Chemical Resistance	Mass Gain [%] ¹
Water	0.2
Acetic Acid (5%)	0.2
Hydrochloric Acid (1%)	0.2
Nitric Acid (5%)	0.2
Sodium Hypochlorite (10%)	0.2
Hydrogen Peroxide (3%)	0.3
Sodium Hydroxide (1%)	0.2
Isopropyl Alcohol	0.1
Methanol	0.7
Butyl Glycol Acetate	0.1
Super Gasoline	0.1
Acetone	0.1
Methyl Ethyl Ketone	0.1

¹Percent weight gained after 24 h submersion of printed and post-cured (thermal treatment up to 160 °C) 1 x 1 x 1 cm cubes.

Ageing of High Performance 2-series (points - rel. tensile strength & bars - HDT B)



Cubic Ink® High Performance 4-1203

Technical allround material with a HDT B up to 100 °C

Cubic Ink® High Performance 4-1203 shows a good balance between temperature form-stability and toughness for final part production including passing horizontal-burning tests.



Materials can be used in



Industrial



Machinery



Connectors



Tooling

Performance Indicators

HDT B	100 °C
Elongation at Break	6%
Flammability	HB
Flexural Strength	118 MPa

Processing Guide

Printing Technology	Material Jetting
Color	black, intrinsic, on demand
Post-Processing	UV and/or thermal post-cure



Scan the QR-Code for the technical datasheet and more information.

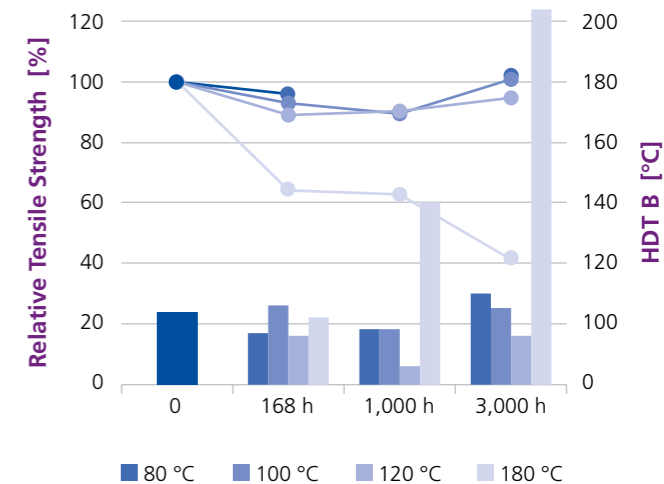
Technical Details

Chemical Resistance	Mass Gain [%] ¹
Water	0.5
Acetic Acid (5%)	0.5
Hydrochloric Acid (1%)	0.5
Nitric Acid (5%)	0.5
Sodium Hypochlorite (10%)	0.4
Hydrogen Peroxide (3%)	0.5
Sodium Hydroxide (1%)	0.4
Isopropyl Alcohol	0.1
Methanol	4.5
Butyl Glycol Acetate	0.1
Super Gasoline	0.2
Acetone	6.0
Methyl Ethyl Ketone	1.4

¹Percental weight gained after 24 h submersion of printed and post-cured (washed with water, UV and thermal post-cure) 1 x 1 x 1 cm cubes.

Ageing of High Performance 4-series

(points - rel. tensile strength & bars - HDT B)



Cubic Ink® - High Performance Materials

Properties and Characterization Methods ¹		1-202 VP	2-900 VP	2-1400 VP	3-1700 VP	4-300 VP	4-2800 VP-ESD	4-2100 VP	4-3800 VP	4-1000 VP-V0
Viscosity @25 °C [mPas]	DIN EN ISO 3219	77	360	420	1030	50	130	25	47	460
Ultimate Tensile Strength [MPa]	DIN EN ISO 527-5A	83	94	39	19	72	67	48	47	97
Tensile Modulus [MPa]	DIN EN ISO 527-5A	3,000	3,400	2,100	35	2,700	3,100	2,200	2,300	4,500
Elongation at Break [%]	DIN EN ISO 527-5A	3.5	3.8	14	190	4.6	4	37	10	2.7
Flexural Strength [MPa]	DIN EN ISO 178	130	118	68	–	107	120	64	67	130
Flexural Modulus [MPa]	DIN EN ISO 178	3,300	3,300	1,800	–	2,500	2,800	1,600	1,700	4,100
Deflection at Fracture [%]	DIN EN ISO 178	4.2	3.9	>10	–	>6.5	7.2	>10	>10	>3.5
Shore Hardness	DIN EN ISO 7619	85 D	87 D	63 D	84 A	80 D	86 D	77 D	81 D	88 D
Izod unnotched [J/m]	DIN EN ISO 180	240	240	370	–	240	110	670	260	220
Izod notched [J/m]	DIN EN ISO 180	–	12	38	No break	–	16	67	34	14
Charpy unnotched [kJ/m ²]	DIN EN ISO 179-1	24	21	42	–	25	11	110	19	–
Charpy notched [kJ/m ²]	DIN EN ISO 179-1	–	1.2	3.8	No break	–	1.5	9.9	3.4	1.0
HDT A [°C]	DIN EN ISO 75	177	115	44	–	78	78	49	48	98
HDT B [°C]	DIN EN ISO 75	195	138	47	–	104	94	76	74	123
Tg [°C]	DSC, TMA, DMA	150 / 230	124	42	-5 / 71	–	111	90	97	80
Flammability	UL 94	HB	HB	–	–	HB	HB	HB	HB	V-0

Cubic Ink® - High Performance Materials

Properties and Characterization Methods ¹		1-202 VP	2-900 VP	2-1400 VP	3-1700 VP	4-300 VP	4-2800 VP-ESD	4-2100 VP	4-3800 VP	4-1000 VP-V0
Tear Strength [kN/m]	DIN EN ISO 34-1 B	–	–	–	120	–	–	–	–	–
Compression Set-B [%]	DIN EN ISO 815-1	–	–	–	24 (@70 °C)	–	–	–	–	–
Rebound [%]	DIN 53512	–	–	–	30	–	–	–	–	–
Water Uptake, 24 h, 23 °C [%]		1.2	0.1	<0.1	0.5	0.5	0.2	4.9	4.4	2.1
Chemical Resistance		Normal	Superior	Very Good	Very Good	Good	Very Good	OK	OK	OK
Thermal Stability		Good	Good	Good	Very Good	Good	Good	Good	Good	Good
Weathering	ISO 4892-3	–	–	–	Good	–	–	–	Good	–
Dielectric strength [kV/mm]	IEC60243-1	27	25	18	–	22	1	22	22	23
Dielectric strength after 24 h/RT H ₂ O [kV/mm]	IEC60243-1	–	24	17	–	22	1	–	–	–
Volume Resistivity [Ωcm]	IEC60093	6.4 x 10 ¹⁴	9.7 x 10 ¹⁴	–	–	5.6 x 10 ¹⁴	1.8 x 10 ⁷	1.5 x 10 ¹⁴	5.6 x 10 ¹⁴	3.3 x 10 ¹¹
Volume Resistivity after 7 d/RT H ₂ O [Ωcm]	IEC60093	9.3 x 10 ¹⁴	3.4 x 10 ¹⁴	–	–	2.1 x 10 ¹⁴	4.9 x 10 ⁷	–	–	–
Comparative Tracking Index [V]	IEC60112	125	600	600	–	600	600	600	600	200

¹ Properties with post-processing – washed with different fluids and different UV and/or thermal post-treatment. All material properties can vary with printer, print settings, object orientation, part geometry, post-processing and age of sample. For more information and details please take a look into the proper TDS.

Cubic Ink® - Functional Prototyping and Molds

Properties and Characterization Methods ¹		Rigid 300 VP	Tough 1400 VP	Dental 501 VP	Flexible 1400 VP	Rigid 404 VP - Clear	Mold 2000 VP
Viscosity @25 °C [mPas]	DIN EN ISO 3219	185	46	47	120	160	83
Ultimate Tensile Strength [MPa]	DIN EN ISO 527-5A	57	39	48	2,6	55	12
Tensile Modulus [MPa]	DIN EN ISO 527-5A	2,600	2,070	2,500	160	2,700	322
Elongation at Break [%]	DIN EN ISO 527-5A	4.3	4.7	5	–	4.4	46
Flexural Strength [MPa]	DIN EN ISO 178	82	53	77	–	93	–
Flexural Modulus [MPa]	DIN EN ISO 178	2,300	2,000	1,800	–	2,500	–
Deflection at Fracture [%]	DIN EN ISO 178	–	3,5	8	–	–	–
Shore Hardness	DIN EN ISO 7619	82 D	82 D	81 D	30 A	85 D	53 D
Izod unnotched [J/m]	DIN EN ISO 180	–	–	–	–	360	–
Izod notched [J/m]	DIN EN ISO 180	15	15	–	–	–	–
Charpy unnotched [kJ/m ²]	DIN EN ISO 179-1	–	–	–	–	–	–
Charpy notched [kJ/m ²]	DIN EN ISO 179-1	2.5	1.1	–	–	–	–
HDT A [°C]	DIN EN ISO 75	–	–	–	–	–	–
HDT B [°C]	DIN EN ISO 75	59	52	67	–	–	–
Tg [°C]	DSC, TMA, DMA	–	–	–	–	–	–
Flammability	UL 94	–	–	–	–	–	–

Cubic Ink® - Functional Prototyping and Molds

Properties and Characterization Methods ¹		Rigid 300 VP	Tough 1400 VP	Dental 501 VP	Flexible 1400 VP	Rigid 404 VP - Clear	Mold 2000 VP
Tear Strength [kN/m]	DIN EN ISO 34-1 B	–	–	–	32	–	–
Compression Set-B [%]	DIN EN ISO 815-1	–	–	–	5 (@70 °C)	–	–
Rebound [%]	DIN 53512	–	–	–	4	–	–
Water Uptake, 24 h, 23 °C [%]		<0.1	–	–	–	<0.1	–
Chemical Resistance		Good	–	–	–	OK	–
Thermal Stability		Good	–	–	–	–	–
Weathering	ISO 4892-3	Good	–	–	–	–	–
Dielectric strength [kV/mm]	IEC60243-1	–	–	–	–	–	–
Dielectric strength after 24 h/RT H ₂ O [kV/mm]	IEC60243-1	–	–	–	–	–	–
Volume Resistivity [Ωcm]	IEC60093	–	–	–	–	–	–
Volume Resistivity after 7 d/RT H ₂ O [Ωcm]	IEC60093	–	–	–	–	–	–
Comparative Tracking Index [V]	IEC60112	–	–	–	–	–	–

¹ Properties with post-processing – washed with different fluids and different UV and/or thermal post-treatment. All material properties can vary with printer, print settings, object orientation, part geometry, post-processing and age of sample. For more information and details please take a look into the proper TDS.



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