

## We give shape to ideas<sup>®</sup>

**ALTANA Cubic Ink<sup>®</sup>** 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 68 production sites and 71 service and research laboratory sites worldwide. Across the Group, around 8,000 employees work for the global success of ALTANA. In 2023, the company achieved sales of around 2,7 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.

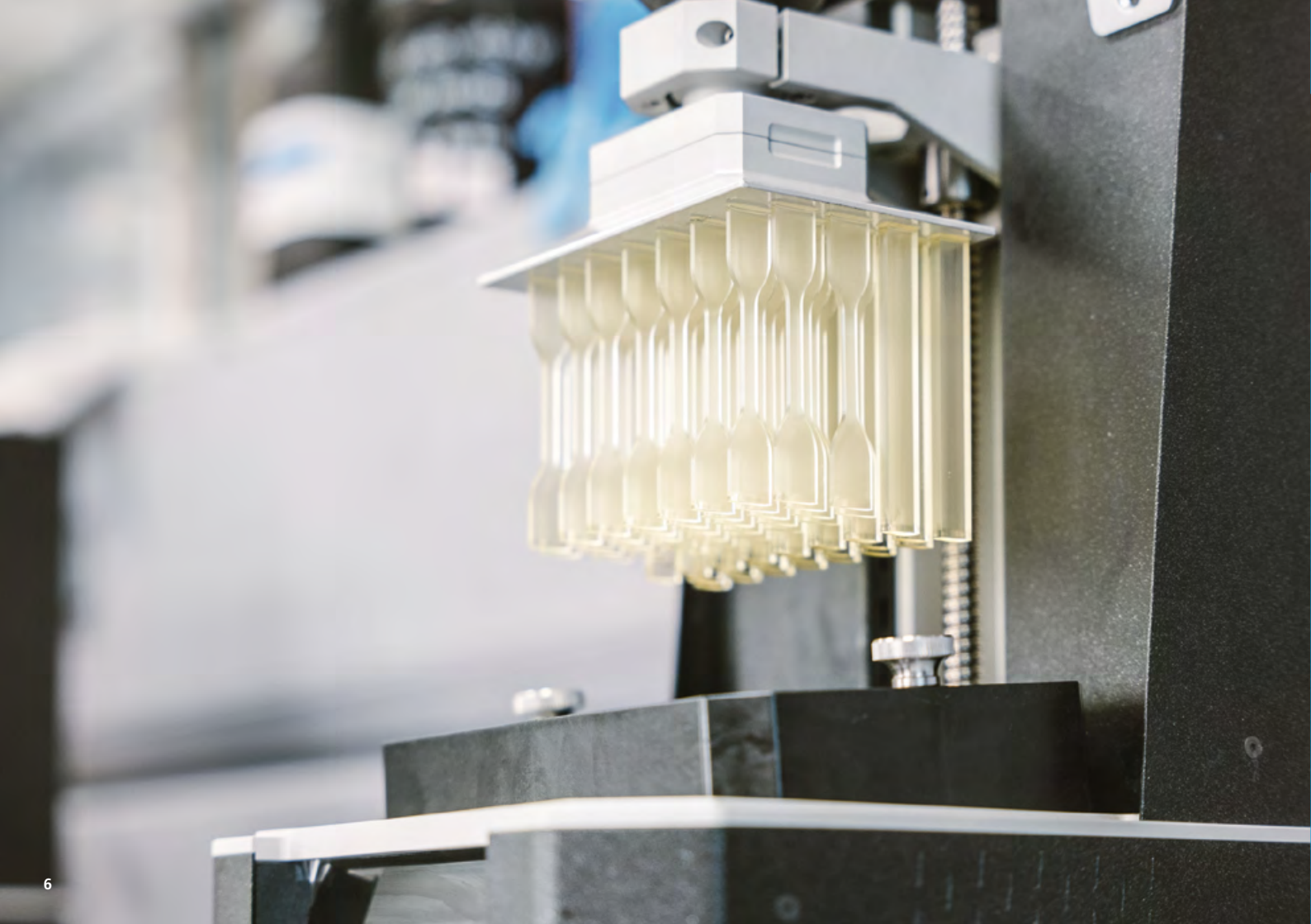
Fulfilling customer wishes, thinking ahead, or even exceeding customer requirements: with this aspiration, ALTANA offers innovative 3D printing materials for additive manufacturing in industry.

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 multi-material 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.





# Cubic Ink® Portfolio

## Resins for Functional Prototyping and Molding

Mold 2000 VP	Page 10
Mold 3000 VP	Page 12
Rigid 300 VP	Page 14
Rigid 300 VP High Resolution	Page 16
Rigid 404 VP Clear	Page 17
Tough 1900 VP	Page 18
Dental 3000 VP	Page 19
Flexible 1400 VP	Page 20

## High Temperature and High Performance Resins for Industrial Additive Manufacturing

High Temperature 200 VP	Page 24
High Temperature 303 VP-ESD Black	Page 25
High Performance 1-202 VP	Page 26
High Performance 2-900 VP	Page 28
High Performance 2-1400 VP	Page 30
High Performance 3-1700 VP	Page 32

## High Performance 4 Technical All-round Materials

HP 4-2800 VP-ESD Black	Page 34
HP 4-1000 VP-V0	Page 38
	Page 40

## Inks for Functional Prototyping, Supports and Special Applications

Support Materials	Page 44
Flexible and Rigid	
Multi-Material Capacity	Page 46
High Performance 4-1203	Page 48



# Resins for Functional Prototyping and Molding

Materials for DLP, LCD and SLA 3D Printing Technologies

Mold 2000 VP	Page 10
Mold 3000 VP	Page 12
Rigid 300 VP	Page 14
Rigid 300 VP High Resolution	Page 16
Rigid 404 VP Clear	Page 17
Tough 1900 VP	Page 18
Dental 3000 VP	Page 19
Flexible 1400 VP	Page 20

# Cubic Ink® Mold 2000 VP

Water-breakable cast material compatible with various (2K-)filling compounds

Cubic Ink® Mold 2000 VP is the material of choice for cast applications with molten and a variety of 2K filling compounds, e.g. 2K silicones, epoxides, polyurethanes, polyesters as well as low-melting metals and alloys. Highlight of this material is its water-breakable character allowing a complete breakup of the mold material when exposed to water. Thus, our material allows for the generation of complex and fine structures which are hardly achievable with conventional casting materials.

Moreover, since the manual removal is not necessary anymore, the mold materials are an enabler for an automatized fill and remove process.



shown low melting alloy

## Materials can be used in



Tooling



Machinery



Medical Applications

## Performance Indicators

Compatible Filling-Materials	Various 1 and 2K Materials
Solubility in Water or Aqueous Media	Very Good
Print Accuracy	Very Good
Minimum Wall Thickness (Mold)	200 µm

## Processing Guide

Printing Technology	DLP, LCD and SLA
Color	Transparent, Colors on Demand
Washing	IPA or Ethanol
Post-Processing	UV Post-Cure
Mold Removal	Water, or Diluted Alkalic Media



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

## Technical Details

### Material Compatibility



2K Silicones  
(RTV and LRS)



2K Epoxides  
(incl. GF and other fillers)



2K Polyurethanes



2K Polyesters



Metal(-Alloys)  
(m.p. <200 °C)

### Removal

Media, vs Object Complexity

	Simple	Medium	Complex
H <sub>2</sub> O, 23 °C	Green	Red	Red
H <sub>2</sub> O, 50 °C	Green	Orange	Red
NaOH (1 %), 23 °C	Green	Orange	Orange
NaOH (1 %), 50 °C	Green	Green	Green

Alkalic aqueous media significantly increases the water solubility and accelerates the de-molding process. Therefore, our **Mold Remover 100** is the ideal ready-to-use solution for the removal process for all our Mold prototypes.



## Cubic Ink® Mold 3000 VP

### Water-breakable cast material for injection molding applications

Cubic Ink® Mold 3000 VP is our newest product in the series of One-Shot-Molds (OSMs) for usage in injection molding applications tolerating high temperature and pressure conditions. Our material has proven excellent compatibility with typical filling materials, e.g. PE, PP, PA6(-GF) and PC providing very good accuracy in the final object.

The improved water-affinity allows for an easy mold removal in water or aqueous media. Moreover, undesired swelling behaviour is reduced to a minimum, which protects the final part from deformation or cracking.



### Materials can be used in



Industrial



Tooling



Machinery

### Performance Indicators

Max Temperature at Injection Nozzle	320 °C
Max Injection Pressure	800 bar
Min Thickness Filling Material	100 µm
Swelling in Water	Minimal

### Processing Guide

Printing Technology	DLP, LCD and SLA
Color	Transparent, Colors on Demand
Washing	IPA or Ethanol
Post-Processing	UV Post-Cure
Mold Removal	Water, or Diluted Alkaline Media



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

## Technical Details

### Material Compatibility



Polyethylene



2 Polypropylene  
(with up to 30 % GF)

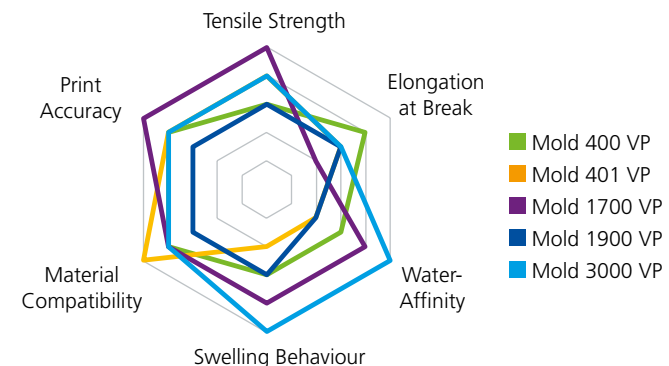


Polyamide-6  
(with up to 18 % GF)

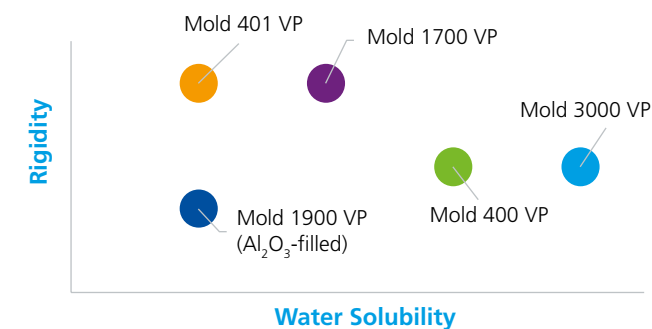


Polycarbonate

### Mold Performance Indicators



### Mold Water Solubility vs Rigidity



**Supplementary Document:** Mold User Manual – Detailed guide from the mold construction and printing settings to injection molding conditions and finally to the traceless removal to the finished part – our manual guides the whole process of using water-breakable one-shot molds for injection molding.

# Cubic Ink® Rigid 300 VP

## Rigid material 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

## 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	Black, more on Demand
Washing	IPA
Post-Processing	UV Post-Cure



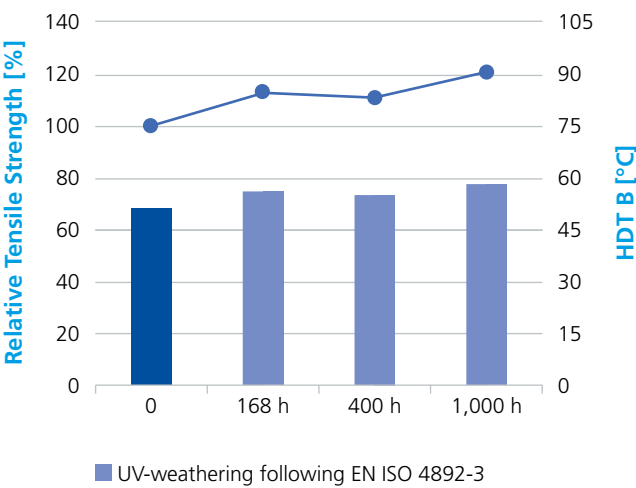
Scan the QR-Code for the technical datasheet and more information.

## Technical Details

Chemical Resistance	Mass Gain [%] <sup>1</sup>
Water	<0.1
Acetic Acid (5 %)	<0.1
Hydrochloric Acid (1 %)	<0.1
Nitric Acid (5 %)	<0.1
Sodium Hypochlorite (10 %)	<0.1
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

<sup>1</sup> 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)

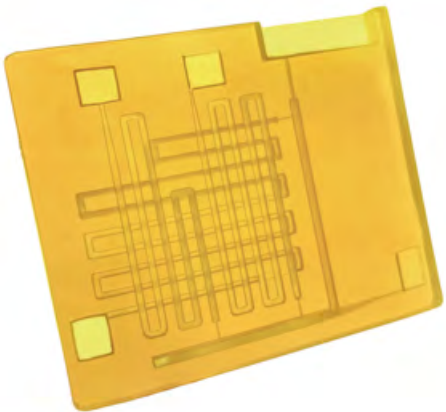




# Cubic Ink® Rigid 300 VP High Resolution

## Rigid material for high precision printing

Cubic Ink® Rigid 300 VP High Resolution allows for printing with ultra-thin layers and a crisp XY-resolution while offering high print speeds due to its reactivity. Its low water uptake ensures dimensional stability in permanent contact to fluids.



Copyright: printables.com/JunckerLab

## Materials can be used in



Micro-  
fluidics



Optical  
Applications

## Performance Indicators

Tensile Strength	37 MPa
Elongation at Break	8 %
Depth of Penetration	0.08/0.10
Water Uptake, 24h, 23 °C	0.3 %

## Processing Guide

Printing Technology	DLP, LCD and SLA
Color	Translucent Yellow
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® Rigid 404 VP Clear is 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 %
Optical Appearance	Exceptional Clarity
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.

# Cubic Ink® Tough 1900 VP

## All-round material with balanced properties

Cubic Ink® Tough 1900 VP is designed as a general purpose solution with excellent definition, a balanced set of mechanical properties and can be easily colored. It is of low viscosity and allows fast and reliable printing with maximum design freedom.



## Materials can be used in



Industrial



Tooling



Machinery

## Performance Indicators

Tensile Strength	30 MPa
Tensile Modulus	1,300 MPa
Elongation at Break	24 %
Izod notched	22 J/m

## Processing Guide

Printing Technology	DLP, LCD and SLA
Color	Grey, more on Demand
Washing	IPA
Post-Processing	UV Post-Cure



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

# Cubic Ink® Dental 3000 VP

## Material for dental models

Cubic Ink® Dental 3000 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. Printable with up to 150 microns.



## Materials can be used in



Dental

## Performance Indicators

Flexural Strength	83 MPa
Flexural Modulus	2,200 MPa
Deflection at Fracture	> 10 %
Shore Hardness	85 D

## Processing Guide

Printing Technology	DLP, LCD and SLA
Color	Ivory White, more 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.





# High Temperature and High Performance Resins for Industrial Additive Manufacturing

Materials for DLP, LCD and SLA 3D Printing Technologies

High Temperature 200 VP	Page 24
High Temperature 303 VP-ESD Black	Page 25
High Performance 1-202 VP	Page 26
High Performance 2-900 VP	Page 28
High Performance 2-1400 VP	Page 30
High Performance 3-1700 VP	Page 32
<b>High Performance 4</b>	
<b>Technical All-round Materials</b>	
HP 4-2800 VP-ESD Black	Page 34
HP 4-1000 VP-V0	Page 38
	Page 40



## Cubic Ink® High Temperature 200 VP

### Material with very high heat resistance

Cubic Ink® High Temperature materials with very easy and versatile processability show high printing accuracy. Due to superior thermal and chemical stabilities with heat deflection temperatures above 300 °C and no brittleness the materials are designed, and yet customizable, for demanding applications at elevated temperatures up to 250 °C.



### Materials can be used in



Tooling



Connectors



Machinery



Industrial

### Performance Indicators

HDT A	> 300 °C
Chemical Resistance	Superior
CTE (0–250 °C)	$70 \times 10^{-6} \text{ K}^{-1}$
E-Modul	4,500 MPa

### Processing Guide

Printing Technology	DLP, LCD and SLA
Color	on Demand
Washing	IPA
Post-Processing	UV and/or Thermal Post-Cure



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

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

### ESD material with very high heat resistance

Cubic Ink® High Temperature ESD materials meet customers ESD-requirements and target applications where high heat and chemical resistance is necessary. The materials are fairly low viscous and versatile processable in terms of printer and post-curing.



### Materials can be used in



Tooling



Transportation



Industrial



Machinery

### Performance Indicators

Volume Resistivity	$6.6 \times 10^7 \Omega \cdot \text{cm}$
HDT A	216 °C
Chemical resistance	Very Good
Thermal stability	Very Good

### Processing Guide

Printing Technology	DLP and LCD
Color	Black
Washing	IPA
Post-Processing	UV and/or Thermal Post-Cure



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

## Cubic Ink® High Performance 1-202 VP

### Thermal form stable material

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 and Thermal Post-Cure



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



# Cubic Ink®

## High Performance 2-900 VP

### Material for chemically challenging surroundings

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 and Thermal Post-Cure

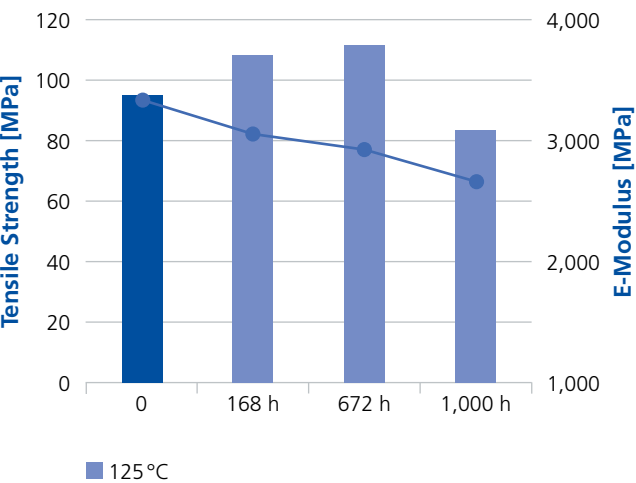


Scan the QR-Code for the technical datasheet and more information.

## Technical Details

Chemical Resistance	Mass Gain [%] <sup>1</sup>	Performance Loss [%] <sup>2</sup>
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)



<sup>1</sup> 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; <sup>2</sup> 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 all-round 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. Available in different colors and shades.



### Materials can be used in



Machinery



Optical Applications



Tooling



Household Goods

### Performance Indicators

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

### Processing Guide

Printing Technology	SLA
Color	Transparent, Black, on Demand
Washing	PC/IPA
Post-Processing	UV Post-Cure



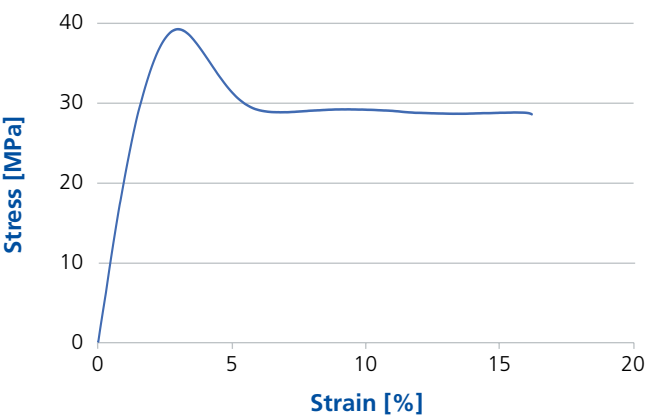
Scan the QR-Code for the technical datasheet and more information.

## Technical Details

Chemical Resistance	Mass Gain [%] <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.

### 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



Trans-  
portation

### Performance Indicators

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

### Processing Guide

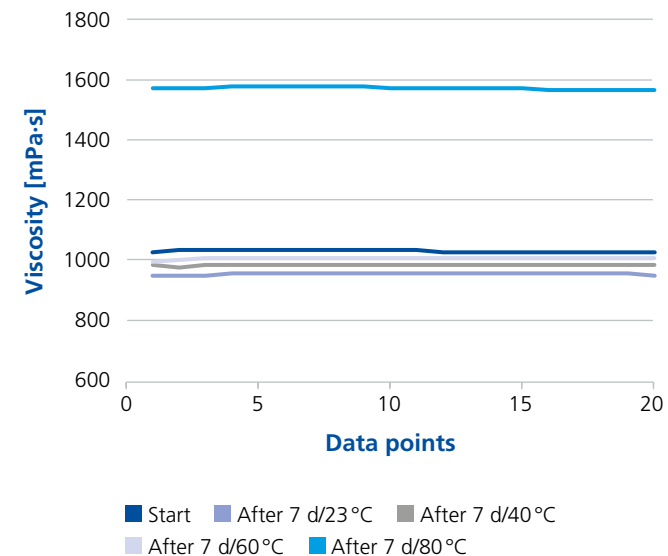
Printing Technology	DLP, LCD and SLA
Color	Black, Grey, Green, Intrinsic
Washing	DPM/IPA
Post-Processing	Thermal Post-Cure



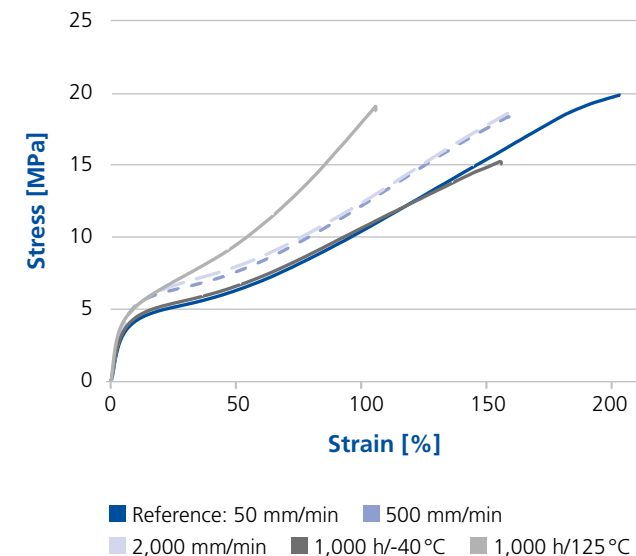
Scan the QR-Code for the technical  
datasheet and more information.

## Technical Details

Viscosity Profile (25 °C, 100 s<sup>-1</sup>)



Tensile Testing of High Performance 3-1700 VP



# Cubic Ink® High Performance 4 Technical All-round Materials

**Highly versatile technical all-round materials with good impact resistance, high thermal form stability and scratch resistance**

Cubic Ink® High Performance 4 materials were designed for applications where a combination of good impact strength and toughness with thermal form-stability and elasticity is needed. Additionally, an outstanding scratch resistant surface makes these technical all-round materials a customer's choice for final part production.

The resins' low viscosity allow fast and accurate printing while maintain a high degree of customization depending on customer's needs such as high impact resistance, flexibility, cytotoxicity, ESD-character or flame retardancy.



## Performance Indicators

Izod notched	25–70 J/m
HDT B	70–100 °C
Elongation at Break	5–70 %
Cytotoxicity	on Request

## Processing Guide

Printing Technology	DLP, LCD and SLA
Color	on Demand
Washing	Water
Post-Processing	UV and/or Thermal Post-Cure

HP 4-300 VP



HP 4-3800 VP



HP 4-6700 VP



HP 4-4800  
VP Black



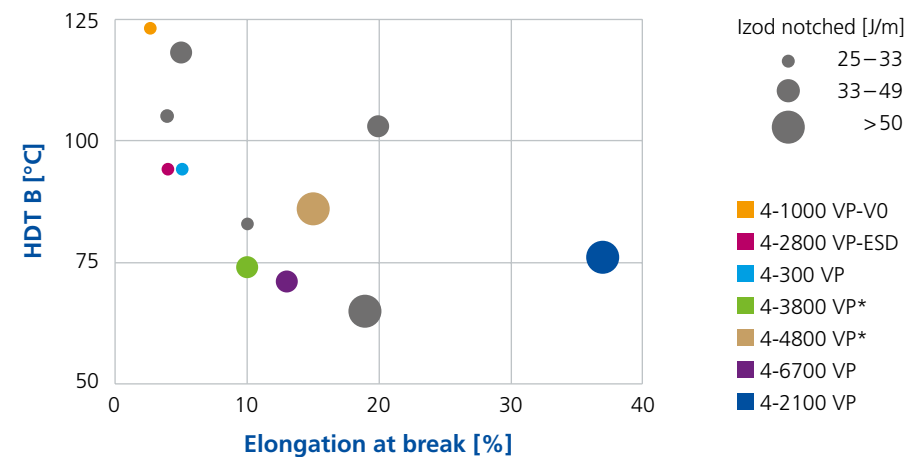
HP 4-2100 VP



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

## Technical Details

### Characteristics and Versatility of High Performance 4-series



Flame-retardant



ESD



Connectors



Industrial



Household Goods



Eyewear



Medical Applications

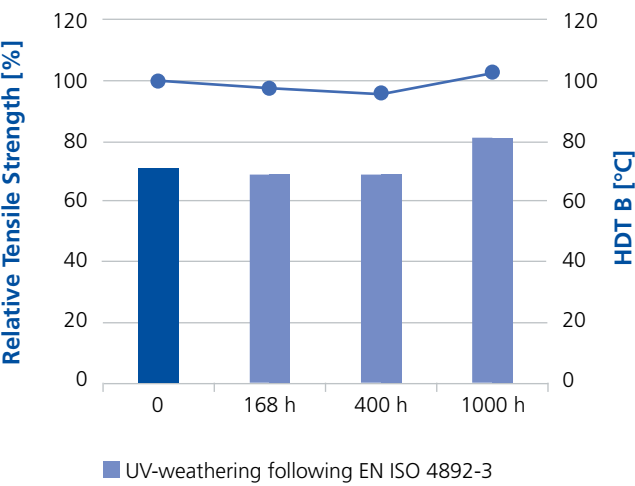
# Cubic Ink®

## High Performance 4 Technical All-round Materials

Chemical Resistance	Mass Gain [%] <sup>1</sup>
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

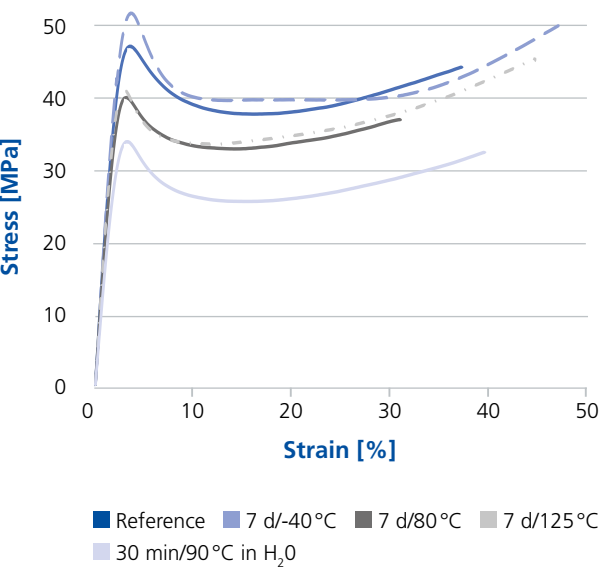
<sup>1</sup> Percental weight gained after 24 h submersion of printed and post-cured (High Performance 4-300 VP; washed with water, thermal post-cure 1h 130°C) 1 x 1 x 1 cm cubes.

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

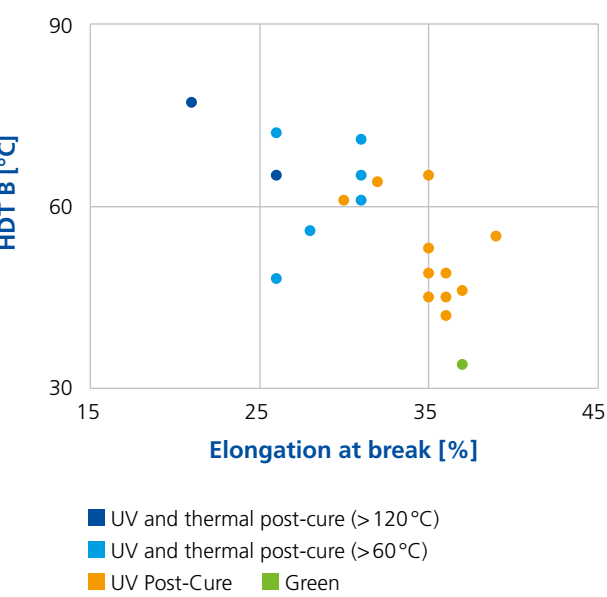


## Technical Details

Tensile Testing of High Performance 4-2100 VP



Examples of Post-Processing High Performance 4-Series



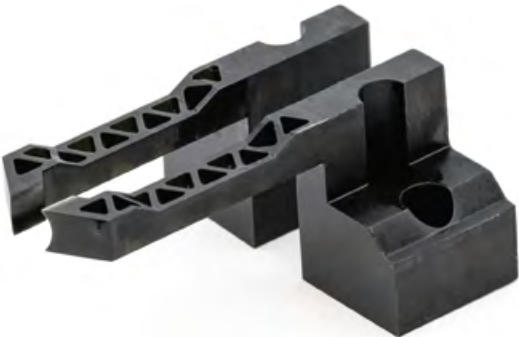
# Cubic Ink®

## High Performance

### 4-2800 VP-ESD Black

ESD material with excellent processability and low viscosity

Cubic Ink® 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



Transportation

### Performance Indicators

Volume Resistivity	1.8 x 10 <sup>7</sup> Ω·cm
HDT B	94 °C
Elongation at Break	4.0 %
Chemical Resistance	Very Good

### Processing Guide

Printing Technology	DLP, LCD and SLA
Color	Black
Washing	Water
Post-Processing	UV and/or Thermal Post-Cure



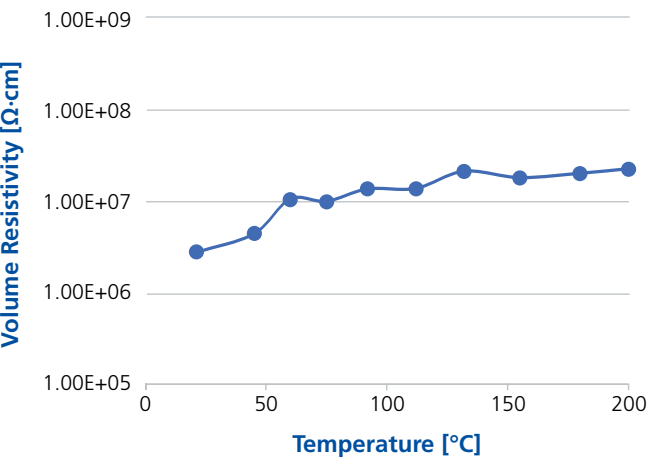
Scan the QR-Code for the technical datasheet and more information.

## Technical Details

Chemical Resistance	Mass Gain [%] <sup>1</sup>
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

<sup>1</sup> 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 4-1000 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 and Thermal Post-Cure



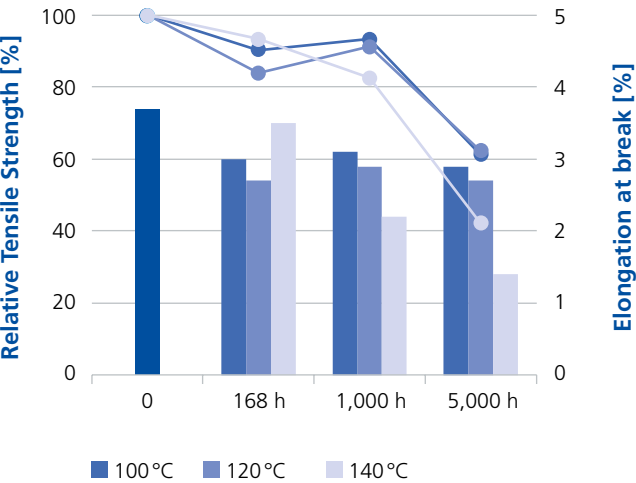
Scan the QR-Code for the technical  
datasheet and more information.

# Technical Details

Chemical Resistance	Mass Gain [%] <sup>1</sup>
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

<sup>1</sup> 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 Multi-Material 3D Printing

Support Materials  
Flexible and Rigid Multi-Material Capacity  
High Performance 4-1203

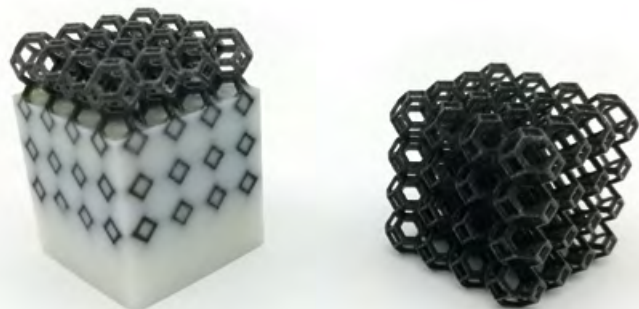
Page 44  
Page 46  
Page 48



## Support Materials

### Easily to remove 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 mPa·s
Shore Hardness	30 A–60 D

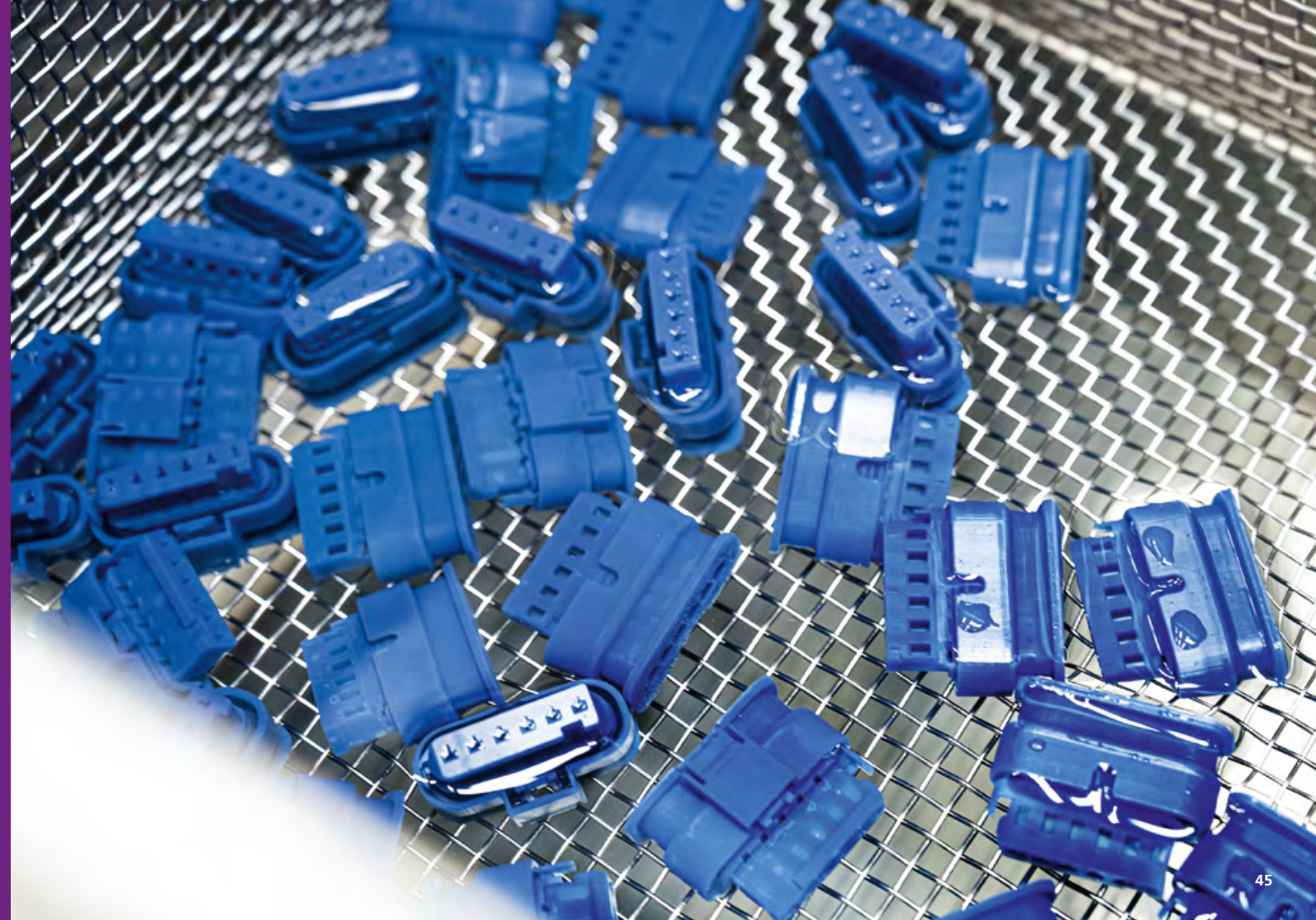
### Support removal<sup>1</sup>

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

<sup>1</sup>Time 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® Flexible and Rigid Multi-Material Capacity

### UV curable inks for material jetting

Benefit from the possibilities of Material Jetting with the Cubic Ink® versatile portfolio. Based upon our deep understanding and experience regarding low viscosity fluids, we can offer a broad range of inks for various end-uses. In addition to the standard CMYK and white colors, we can customize the color to your needs.

### Materials can be used in



Industrial



Machinery

Medical  
Applications

### Performance Indicators

Shore Gradient  
Elongation at Break

30A–85 D  
3–350 %

### Processing Guide

Printing Technology  
Color  
Washing  
Post-Processing

Material Jetting  
CMYK, White, Spot Color  
Water  
UV

For more information regarding Flexible and Rigid Materials for Material Jetting please contact us via [cubic.ink@altana.com](mailto:cubic.ink@altana.com)





# Cubic Ink®


## High Performance 4-1203


Technical all-round 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



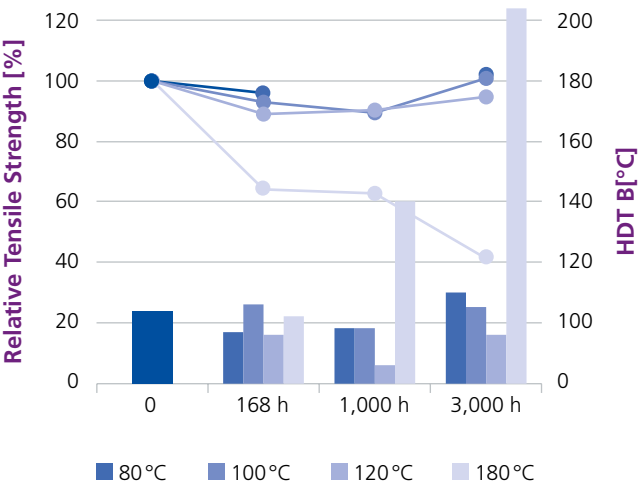
Scan the QR-Code for the technical datasheet and more information.

## Technical Details

Chemical Resistance	Mass Gain [%] <sup>1</sup>
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

<sup>1</sup> 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 High Performance 4-series  
(points – rel. tensile strength & bars – HDT B)



## Cubic Ink® – Functional Prototyping and Molding

Properties and Characterization Methods <sup>1</sup>		Mold 2000 VP	Mold 3000 VP	Rigid 300 VP	Rigid 300 VP High Res	Rigid 404 VP Clear	Tough 1900 VP	Dental 3000 VP	Flexible 1400 VP
Viscosity @25 °C [mPa·s]	DIN EN ISO 3219	70	40	185	171	160	103	710	120
Density [g/mL]	DIN EN ISO 15212-1	1.11	1.11	1.05	1.05	1.05	1.07	1.10	1.05
Tensile Strength [MPa]	DIN EN ISO 527-5A	38	46	57	37	55	32	51	2.6
Tensile Modulus [MPa]	DIN EN ISO 527-5A	1,800	2,100	2,600	1,900	2,700	1,200	2,500	160
Elongation at Break [%]	DIN EN ISO 527-5A	45	13	4.3	8	4.4	19	7	–
Flexural Strength [MPa]	DIN EN ISO 178	–	–	82	–	93	42	83	–
Flexural Modulus [MPa]	DIN EN ISO 178	–	–	2,300	–	2,500	1,200	2,200	–
Deflection at Fracture [%]	DIN EN ISO 178	–	–	>3.5	–	>3.5	>6	>10	–
Shore Hardness	DIN EN ISO 7619	82 D	82 D	82 D	80 D	85 D	76 D	85 D	30 A
Izod unnotched [J/m]	DIN EN ISO 180	–	–	–	–	–	–	–	–
Izod notched [J/m]	DIN EN ISO 180	–	–	15	17	–	24	–	–
Charpy unnotched [kJ/m²]	DIN EN ISO 179-1	–	–	–	–	–	–	–	–
Charpy notched [kJ/m²]	DIN EN ISO 179-1	–	–	–	–	–	–	–	–
HDT A [°C]	DIN EN ISO 75	–	–	–	–	–	–	–	–
HDT B [°C]	DIN EN ISO 75	–	–	59	52	–	–	70	–
Tg [°C]	DSC, TMA, DMA	–	–	–	–	–	–	–	–
Flammability	UL 94	–	–	–	–	–	–	–	–

## Cubic Ink® – Functional Prototyping and Molding

Properties and Characterization Methods <sup>1</sup>		Mold 2000 VP	Mold 3000 VP	Rigid 300 VP	Rigid 300 VP High Res	Rigid 404 VP Clear	Tough 1900 VP	Dental 3000 VP	Flexible 1400 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 [%]		–	–		0.3	0	–	–	–
Chemical Resistance		–	–		–	OK	–	–	–
Thermal Stability		–	–	Very Good	–	Very Good	–	–	–
Weathering	ISO 4892-3	–	–	–	–	–	–	–	–
CTE [10 <sup>-6</sup> K <sup>-1</sup> ]	DIN EN ISO 11359-2	–	–	–	–	–	–	–	–
Dielectric strength [kV/mm]	IEC60243-1	–	–	–	–		–	–	–
Relative Permittivity (10 000 Hz, 23 °C)	IEC60250	–	–	–	–	–	–	–	–
Volume Resistivity [Ω·cm]	IEC60093	–	–	–	–	–	–	–	–
Comparative Tracking Index [V]	IEC60112	–	–	–	–	–	–	–	–

<sup>1</sup> Properties with post-processing – washed with different fluids and different UV 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® – High Temperature and High Performance Resins

Properties and Characterization Methods <sup>1</sup>		HT 200 VP	HT 303 VP-ESD Black	HP 1-202 VP	HP 2-900 VP	HP 2-1400 VP	HP 3-1700 VP
Viscosity @25 °C [mPa·s]	DIN EN ISO 3219	810	1040	77	360	430	1030
Density [g/mL]	DIN EN ISO 15212-1	1.18	–	1.14	1.12	1.10	1.05
Tensile Strength [MPa]	DIN EN ISO 527-5A	67	48	83	94	39	19
Tensile Modulus [MPa]	DIN EN ISO 527-5A	4,500	3,700	3,000	3,400	2,100	35
Elongation at Break [%]	DIN EN ISO 527-5A	1.9	1.7	3.5	3.8	14	190
Flexural Strength [MPa]	DIN EN ISO 178	102	72	130	118	68	–
Flexural Modulus [MPa]	DIN EN ISO 178	4,200	3,600	3,300	3,300	1,800	–
Deflection at Fracture [%]	DIN EN ISO 178	2.5	2	4.2	3.9	>10	–
Shore Hardness	DIN EN ISO 7619	90 D	90 D	85 D	87 D	80 D	84 A
Izod unnotched [J/m]	DIN EN ISO 180	–	–	240	240	370	–
Izod notched [J/m]	DIN EN ISO 180	15	14	–	12	38	No break
Charpy unnotched [kJ/m²]	DIN EN ISO 179-1	–	–	24	21	42	–
Charpy notched [kJ/m²]	DIN EN ISO 179-1	0.6	0.7	–	1.2	3.8	No break
HDT A [°C]	DIN EN ISO 75	>300	216	177	115	47	–
HDT B [°C]	DIN EN ISO 75	>300	221	195	138	51	–
Tg [°C]	DSC, TMA, DMA	>250	257	150/230	124	42	-5/71
Flammability	UL 94	HB	HB	HB	HB	–	–

## Cubic Ink® – High Temperature and High Performance Resins

Properties and Characterization Methods <sup>1</sup>		HT 200 VP	HT 303 VP-ESD Black	HP 1-202 VP	HP 2-900 VP	HP 2-1400 VP	HP 3-1700 VP
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 [%]		1.7	1.2	1.2	0.1	<0.1	<0.1
Chemical Resistance		Superior	Very Good	Normal	Superior	Very Good	Very Good
Thermal Stability		Very Good	Very Good	Good	Good	Good	Very Good
Weathering	ISO 4892-3	–	–	–	–	–	Yes
CTE [10 <sup>-6</sup> K <sup>-1</sup> ]	DIN EN ISO 11359-2	70	98	78/231	70/167	68/176	124/149
Dielectric strength [kV/mm]	IEC60243-1	22	2	27	25	18	–
Relative Permittivity (10 000 Hz, 23 °C)	IEC60250	7.6	118	4.1	8.1	7.1	–
Volume Resistivity [Ω·cm]	IEC60093	5.4 x 10 <sup>14</sup>	6.6 x 10 <sup>7</sup>	6.4 x 10 <sup>14</sup>	9.7 x 10 <sup>14</sup>	4.2 x 10 <sup>12</sup>	–
Comparative Tracking Index [V]	IEC60112	>600	>600	125	>600	>600	–

<sup>1</sup> Properties with post-processing – washed with different fluids and different UV 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® – High Performance 4 and Technical All-round Materials

Properties and Characterization Methods <sup>1</sup>		HP 4-300 VP	HP 4-3800 VP	HP 4-6700 VP Grey	HP 4-4800 VP Black	HP 4-2100 VP	HP 4-2800 VP-ESD Black	HP 4-1000 VP-V0
Viscosity @25 °C [mPa·s]	DIN EN ISO 3219	50	47	73	220	25	130	460
Density [g/mL]	DIN EN ISO 15212-1	1.08	1.10	1.12	1.10	1.10	1.10	1.05
Tensile Strength [MPa]	DIN EN ISO 527-5A	72	49	49	34	48	67	97
Tensile Modulus [MPa]	DIN EN ISO 527-5A	2,700	2,400	2,200	1,500	2,200	3,100	4,500
Elongation at Break [%]	DIN EN ISO 527-5A	4.6	12	11	30	37	4	2.7
Flexural Strength [MPa]	DIN EN ISO 178	107	67	81	38	64	120	130
Flexural Modulus [MPa]	DIN EN ISO 178	2,500	1,700	2,000	1,200	1,600	2,800	4,100
Deflection at Fracture [%]	DIN EN ISO 178	>6.5	>10	>10	>10	>10	7.2	>3.5
Shore Hardness	DIN EN ISO 7619	80 D	81 D	83 D	73 D	77 D	86 D	88 D
Izod unnotched [J/m]	DIN EN ISO 180	240	260	380	380	670	110	220
Izod notched [J/m]	DIN EN ISO 180	–	34	43	51	67	16	14
Charpy unnotched [kJ/m²]	DIN EN ISO 179-1	25	–	36	48	110	11	19
Charpy notched [kJ/m²]	DIN EN ISO 179-1	–	3.4	4.9	6	9.9	1.5	1
HDT A [°C]	DIN EN ISO 75	78	48	54	54	49	78	98
HDT B [°C]	DIN EN ISO 75	104	74	70	75	76	94	123
Tg [°C]	DSC, TMA, DMA	96	97	73	81	90	111	80
Flammability	UL 94	HB	HB	–	–	HB	HB	V-0

## Cubic Ink® – High Performance 4 and Technical All-round Materials

Properties and Characterization Methods <sup>1</sup>		HP 4-300 VP	HP 4-3800 VP	HP 4-6700 VP Grey	HP 4-4800 VP Black	HP 4-2100 VP	HP 4-2800 VP-ESD Black	HP 4-1000 VP-V0
Tear Strength [kN/m]	DIN EN ISO 34-1 B	–	–	–	–	–	–	–
Compression Set-B [%]	DIN EN ISO 815-1	–	–	–	–	–	–	–
Rebound [%]	DIN 53512	–	–	–	–	–	–	–
Water Uptake, 24 h, 23 °C [%]		0.5	4.4	–	5.4	4.9	0.2	2.1
Chemical Resistance		Good	OK	OK	OK	OK	Very Good	OK
Thermal Stability		Good	Good	Good	Good	Good	Good	Good
Weathering	ISO 4892-3	–	Yes	Yes	Yes	Yes	–	–
CTE [10 <sup>-6</sup> K <sup>-1</sup> ]	DIN EN ISO 11359-2	71/126	91/113	92/154	113/122	94/113	79/159	53/141
Dielectric strength [kV/mm]	IEC60243-1	22	22	27	19	22	1	23
Relative Permittivity (10 000 Hz, 23 °C)	IEC60250	–	8.3	6.3	6.9	8.9	260	–
Volume Resistivity [Ω·cm]	IEC60093	5.6 x 10 <sup>14</sup>	5.6 x 10 <sup>14</sup>	3.4 x 10 <sup>14</sup>	3.1 x 10 <sup>14</sup>	1.5 x 10 <sup>14</sup>	1.8 x 10 <sup>7</sup>	3.3 x 10 <sup>11</sup>
Comparative Tracking Index [V]	IEC60112	>600	>600	>600	>600	>600	>600	200

<sup>1</sup> Properties with post-processing – washed with different fluids and different UV 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®**  
**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. This document replaces all previous versions.

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

