



# Ultracur3D<sup>®</sup> ST 80 W

Tough | Economic | White

## Extended TDS

Complete Technical Documentation  
and Testing Summary



Version: 1.0

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# Technical Data Sheet

## Multi-purpose resin targeting the lowest cost per part.

General Properties	Norm	Typical Values
Appearance	-	White
Viscosity, 25°C	Cone/Plate Rheometer <sup>1)</sup>	580 mPas
Viscosity, 30°C	Cone/Plate Rheometer <sup>1)</sup>	410 mPas
Density (Printed Part)	ASTM D792	1.2 g/cm <sup>3</sup>
Density (Liquid Resin)	ASTM D4052-18a	1.1 g/cm <sup>3</sup>

Tensile Properties <sup>2)</sup>	Norm	Typical Values
E Modulus	ASTM D638	1800 MPa
Ultimate Tensile Strength	ASTM D638	37 MPa
Elongation at Break	ASTM D638	20%

Flexural Properties	Norm	Typical Values
Flexural Modulus	ASTM D790	1270 MPa
Flexural Strength	ASTM D790	60 MPa

Impact Properties	Norm	Typical Values
Notched Izod (Machined), 23°C	ASTM D256	29 J/m
Unnotched Izod, 23°C	ASTM D256	860 J/m
Notched Charpy (Machined), 23°C	ISO 179-1	2 kJ/m <sup>2</sup>

Thermal Properties	Norm	Typical Values
HDT at 0.45 MPa	ASTM D648	49°C
HDT at 1.82 MPa	ASTM D648	44°C

The data contained in this publication is based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, this data does not relieve processors from carrying out their own investigations and tests; neither does this data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose.

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Biocompatibility	Norm	Typical Values
Cytotoxicity – Neutral Red	ISO 10993-5 (2009)	PASS <sup>3)</sup>

Other	Norm	Typical Values
Hardness Shore D	ASTM D2240	74

*Mechanical properties overview*

- 1) Determined with TA-Instrument DHR rheometer, cone/plate, diameter 60 mm, shear rate 100 s<sup>-1</sup>
- 2) Tensile type ASTM D638 type IV, Pulling speed 5 mm/min
- 3) For the statement on Biocompatibility data see Chapter: [Biocompatibility](#)
- 4) If not noted otherwise, all specimens are 3D printed. Samples were tested at room temperature, 23°C. ASTM sample size (L x W x H): ASTM D790 80 x 4 x 10 mm, ASTM D256 63 x 3.2 x 12 mm, ASTM D648 127 x 3.2 x 13 mm, ISO 179-1 80 x 4 x 10 mm

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# Long-Term UV

Durability is a key feature for the components utilized within many industries, as they expect the materials used to withstand years of exposure to the elements. Through the effects of UV radiation, photopolymers can degrade over time. The aging can be caused by the influence of UV light, heat and water. The degree of ageing depends on duration and intensity.

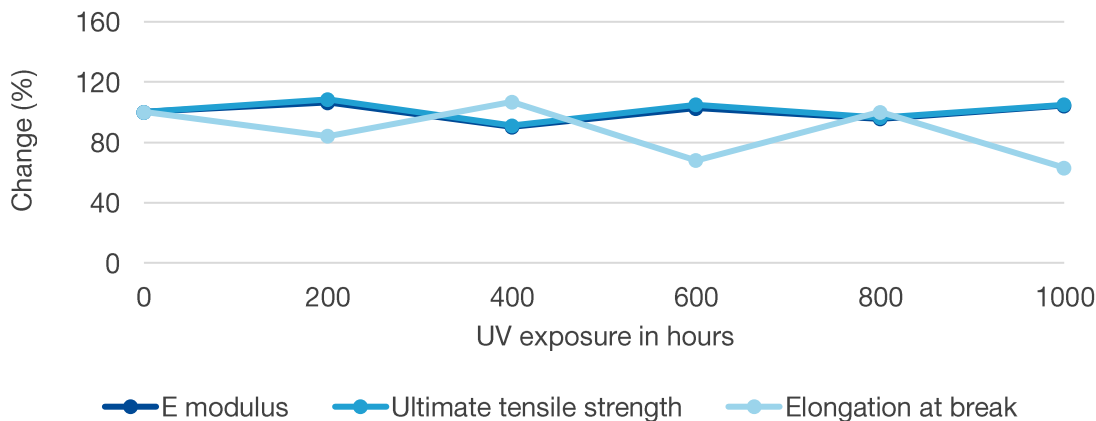
## Test Method and Specimens

The ageing tests were performed with ASTM D638 type IV tensile bars and color cones as per ISO 4892-2:2013 method A, cycle 1.

Cycle No.	Exposure period	Irradiance		Black standard temperature in °C	Chamber temperature in °C	Relative humidity in %
		Broadband (300 nm to 400 nm) in W/m <sup>2</sup>	Narrowband (340 nm) in W/(m <sup>2</sup> nm)			
1	102 min dry	60 ± 2	0.51 ± 0.02	65 ± 3	38 ± 3	50 ± 10
	18 min water spray	60 ± 2	0.51 ± 0.02	-	-	-

*Testing conditions for ISO 4892-2 method A, cycle 1*

## Mechanical Testing



*Change in mechanical properties after accelerated weathering*

The final values after 1000 hours of long-term UV exposure can be found below.

Property	Before long-term UV exposure	After 1000 hours of UV exposure
E modulus	1850 MPa	1930 MPa
Ultimate tensile strength	41 MPa	43 MPa
Elongation at break	19%	12%

*Mechanical properties before and after 1000 hours of UV exposure as per ISO 4892:2 method A*

## Coloration

After being exposed up to 3000 hours, some yellowing can be seen.



*Effect of UV exposure on color of the specimens*

# Biocompatibility

**Product: Ultracur3D® ST 80 W**

Revision: 08<sup>th</sup> of December 2021

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**3D printed test items of the above stated product have fulfilled the requirements of tests as stated below:**

**Cytotoxicity Testing- Neutral red:**

(ISO 10993-5 (2009))

The biocompatibility tests were recorded on test specimen of the above referenced product to show compatibility of the material in general. The biocompatibility tests listed are not part of any continuous production protocol. The test assessments reflect only the test specimen and have to be retested on the final product. It remains the responsibility of the device manufacturers and /or end-users to determine the suitability of all printed parts for their respective application.

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