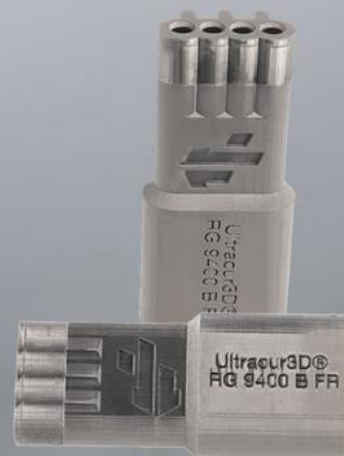


# Ultracur3D<sup>®</sup> RG 9400 B FR

Rigid | Flame-Retardant | Black

## Extended TDS

Complete Technical Documentation  
and Testing Summary



Version: 1.0

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# Technical Data Sheet

## Flame-retardant resin with UL 94 V-0 rating and superior HDT.

General Properties	Norm	Typical Values
Appearance	-	Black
Viscosity, 25°C	Cone/Plate Rheometer <sup>1)</sup>	550 mPas
Viscosity, 30°C	Cone/Plate Rheometer <sup>1)</sup>	350 mPas
Density (Printed Part)	ASTM D792	1.32 g/cm <sup>3</sup>
Density (Liquid Resin)	ASTM D4052-18a	1.21 g/cm <sup>3</sup>

Tensile Properties <sup>2)</sup>	Norm	Typical Values	
		(UV)	(UV + Thermal <sup>3)</sup> )
E Modulus	ASTM D638	3900 MPa	4200 MPa
Ultimate Tensile Strength	ASTM D638	78 MPa	74 MPa
Elongation at Break	ASTM D638	3%	2%

Flexural Properties	Norm	Typical Values
Flexural Modulus	ASTM D790	3400 MPa
Flexural Strength	ASTM D790	115 MPa

Impact Properties	Norm	Typical Values
Notched Izod (Machined), 23°C	ASTM D256	20 J/m
Unnotched Izod, 23°C	ASTM D256	176 J/m
Notched Charpy (Machined), 23°C	ISO 179-1	0.9 kJ/m <sup>2</sup>

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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Thermal Properties	Norm	Typical Values	
		(UV)	(UV + Thermal <sup>3)</sup> )
HDT at 0.45 MPa	ASTM D648	255°C	280°C
HDT at 1.82 MPa	ASTM D648	86°C	152°C
Flammability	UL 94 (3 mm)	V-0	V-0
Glass transition temperature (DMA, tan(d))	ASTM D4065	175°C	-

Other	Norm	Typical Values
Hardness Shore D	ASTM D2240	88
Water Absorption, Short-Term (24 hours)	ASTM D570	0.65%

*Mechanical properties overview*

- <sup>1)</sup> Determined with TA-Instrument DHR rheometer, cone/plate, diameter 60 mm, shear rate 100 s<sup>-1</sup>
- <sup>2)</sup> Tensile type ASTM D638 type IV, Pulling speed 5 mm/min
- <sup>3)</sup> Regular UV post-curing and additional thermal post-cure of 3h at 150°C, see [User Guideline](#) for more details.
- <sup>4)</sup> 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 12,7 x 12 mm, ASTM D648 127 x 3.2 x 13 mm, ISO 179-1 80 x 4 x 10 mm, UL 94 125 x 3 x 13 mm

## Printing Performance

The combination of 3D printer and material has a huge impact on the quality of the parts produced. The measured design characteristics as well as the printing speed can be found in the [Printing Evaluation Guideline of Ultracur3D® Resins](#).

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# Flammability Data

\*\*\* Flame testing \*\*\*

Flammability V acc. to UL 94 : 2023

Information about test procedure and test specimens

M 0 0324			Measurements & observations									Classification	
Dimensions of test specimens 127 * 12,7 * d mm³			1st flame application, 10 s				2nd flame application, 10 s				Total Afterflame time t1 + t2 [s]		
			After- flame time t1 [s]	Cotton indicator ignited?	Burning up to holding clamp?	Obser- vations	After- flame time t2 [s]	Cotton indicator ignited?	Burning up to holding clamp?	Obser- vations			Afterflame & Afterglow time t2 + t3 [s]
Requirements			≤ 10	no	no	---	≤ 10	no	no	---	≤ 30	≤ 50	= V-0
			≤ 30	no	no	---	≤ 30	no	no	---	≤ 60	≤ 250	= V-1
			≤ 30	yes	no	---	≤ 30	yes	no	---	≤ 60	≤ 250	= V-2
Pre-conditioning	Spec no.	Thickn [mm]	Abbrev.: A=dripping parts, K=edge-burning, T=dripping parts, R=rolls up										
Conditioning chamber (2d / 23°C / 50%)	1	3.04	1	No	No		1	No	No		1		V-0
	2	3.08	1	No	No		1	No	No		1		
	3	3.02	1	No	No		1	No	No		1		
	4	3.03	1	No	No		1	No	No		1		
	5	3.04	1	No	No		1	No	No		1	10	
			First test 2023-08-03 14:23 - 2023-08-03 14:26										
Drying oven (7d / 70°C)	1	3.03	2	No	No		3	No	No		3		V-0
	2	3.04	1	No	No		2	No	No		2		
	3	3.02	1	No	No		3	No	No		3		
	4	3.03	1	No	No		1	No	No		1		
	5	3.04	1	No	No		2	No	No		2	17	
			First test 2023-08-08 10:09 - 2023-08-08 10:15										
Conditioning chamber (2d / 23°C / 50%)	1												
	2												
	3												
	4												
	5												
			Repeated test -										
Drying oven (7d / 70°C)	1												
	2												
	3												
	4												
	5												
			Repeated test -										
													V-0 @3.0mm

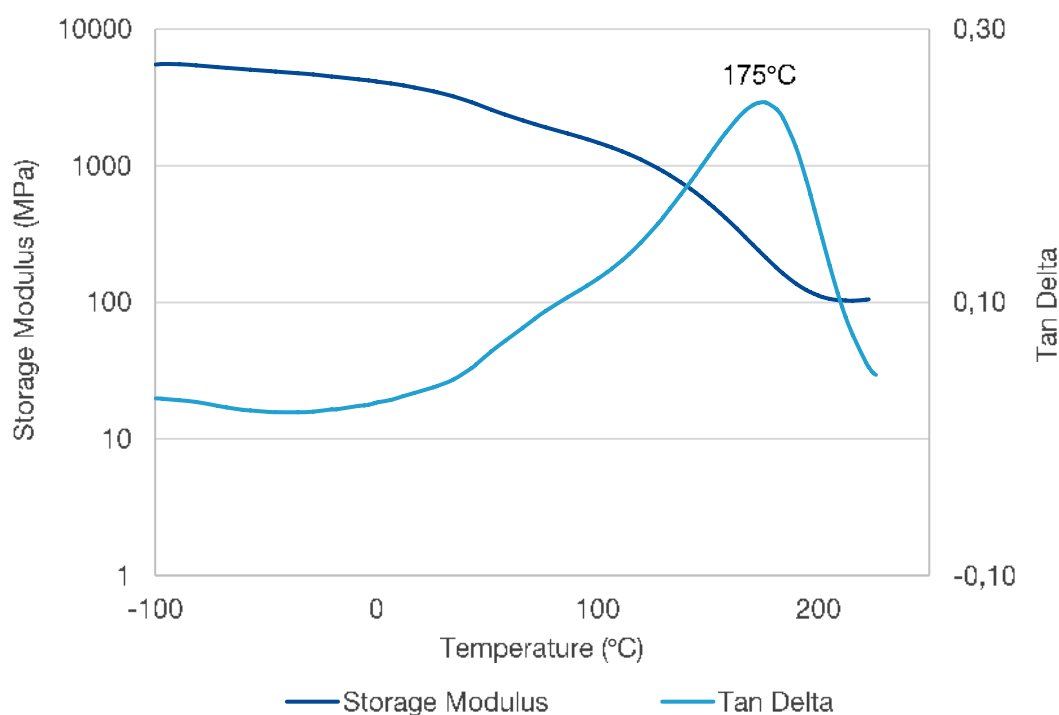
Flammability UL 94 raw data

# Dynamic Mechanical Analysis (DMA)

In this DMA measurement, a cyclic strain is applied to the sample, and the response of the sample is recorded as a function of temperature. This can give a good impression of the changes in material behavior, both at low and high temperatures. The measured Storage modulus is a good indication of the stiffness of the material. The maximum in Tan Delta gives the glass transition temperature.

	Setting
Measurement	Strain-controlled
Temperature sweep	1°C / min
Strain	0.023% (linear viscoelastic regime)
Type of loading	Dual cantilever
Frequency	1 Hz

Testing conditions DMA



DMA curve