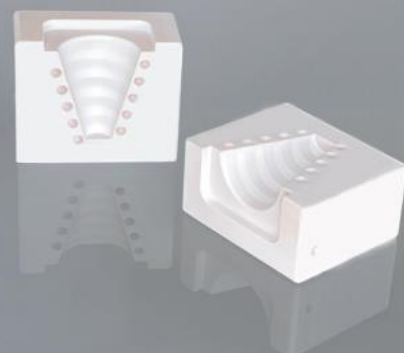


Ultracur3D[®] RG 3280

Rigid | HDT 280 | Ceramic-filled

Extended TDS

Complete Technical Documentation
and Testing Summary



Version: 1.0

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Technical Data Sheet

Ceramic-filled resin with exceptionally high stiffness and temperature resistance.

General Properties	Norm	Typical Values
Appearance	-	White
Ceramic content	-	≈ 65 wt% silica
Viscosity, 25°C	Cone/Plate Rheometer ¹⁾	300 mPas
Viscosity, 30°C	Cone/Plate Rheometer ¹⁾	230 mPas
Density (Printed Part)	ASTM D792	1.73 g/cm ³
Density (Liquid Resin)	ASTM D4052-18a	1.65 g/cm ³

Tensile Properties ²⁾	Norm	Typical Values	
		(UV)	(UV + Thermal ⁴⁾)
E Modulus	ASTM D638	10000 MPa	10300 MPa
Ultimate Tensile Strength	ASTM D638	76 MPa	70 MPa
Elongation at Break	ASTM D638	1 %	0.7 %
Poisson's Ratio	ISO 527-2	0.31	-

Flexural Properties	Norm	Typical Values (UV)
Flexural Modulus	ASTM D790	8780 MPa
Flexural Strength	ASTM D790	73 MPa

Impact Properties	Norm	Typical Values (UV)
Notched Izod (Machined), 23°C	ASTM D256	24 J/m
Notched Charpy (Machined), 23°C	ISO 179-1	0.98 kJ/m ²

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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The safety data given in this publication is for informational purposes only and does not constitute a legally binding MSDS. The relevant MSDS can be obtained upon request from your supplier or you may contact BASF 3D Printing Solutions GmbH directly at sales@basf-3dps.com.

Thermal Properties	Norm	Typical Values	
		(UV)	(UV + Thermal ⁴⁾)
HDT at 0.45 MPa	ASTM D648	>280°C	>280°C
HDT at 1.82 MPa	ASTM D648	132°C	162°C
Flammability	UL 94 (1.8 mm)	HB	-

Electrical Properties	Norm	Typical Values (UV)
Volume resistivity	DIN EN 62631-3-1	2.80E+16 Ωcm
Surface resistivity	DIN EN 62631-3-2	3.40E+16 Ω

Biocompatibility	Norm	Typical Values (UV)
Cytotoxicity – Neutral Red	ISO 10993-5 (2009)	PASS ³⁾

Other	Norm	Typical Values (UV)
Hardness Shore D	ASTM D2240	96
Water Absorption, Short-Term (24 hours)	ASTM D570	0.29%
Water Absorption, Long-Term (>3000 hours)	ASTM D570	2.60%

Mechanical properties overview

- ¹⁾ Determined with TA-Instrument DHR rheometer, cone/plate, diameter 60 mm, shear rate 100 s⁻¹
- ²⁾ Pulling speed 5 mm/min
- ³⁾ For the statement on Biocompatibility data see Chapter: [Biocompatibility](#).
- ⁴⁾ Regular UV post-curing and additional thermal post-cure of 3h at 150°C, see [User Guideline](#) for more details.
- ⁵⁾ 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

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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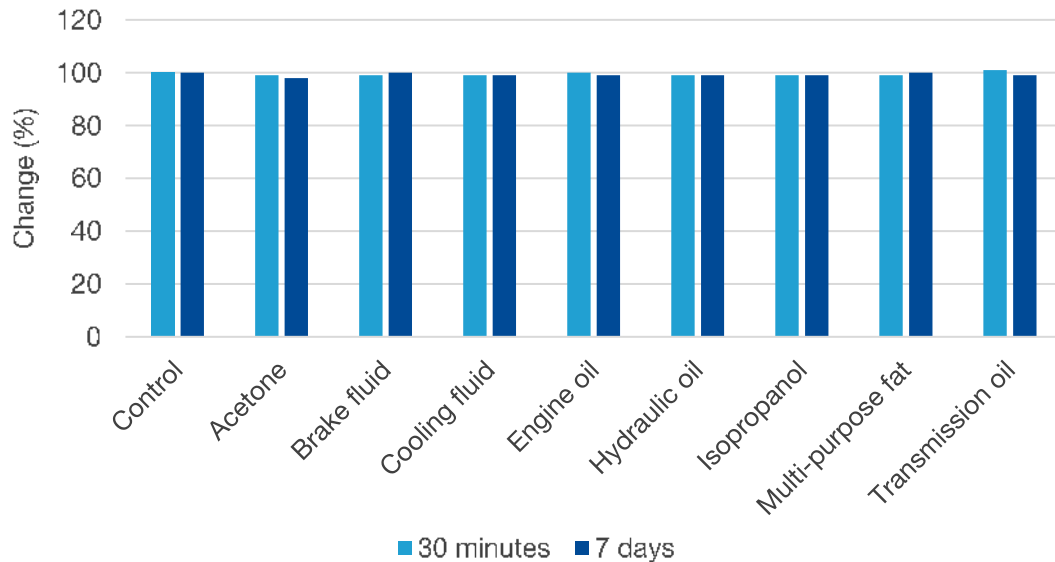
Industrial Chemical Resistance

The resistance of resin materials against chemicals, solvents and other contact substances is an important criterion of selection for many industrial applications. General chemical resistance depends on the period of exposure, the temperature, the quantity, the concentration and the type of the chemical substance. When exposed to industrial chemicals, the chemical bonds of photopolymers can break or degrade, causing a change in the mechanical properties.

Test Method and Specimens

ASTM D638 type IV tensile bars were soaked in each fluid at room temperature, one set for 30 minutes and one set for 7 days. Upon completion of the soaking time, the parts were removed from the test fluid and were dried to measure the weight and the mechanical properties.

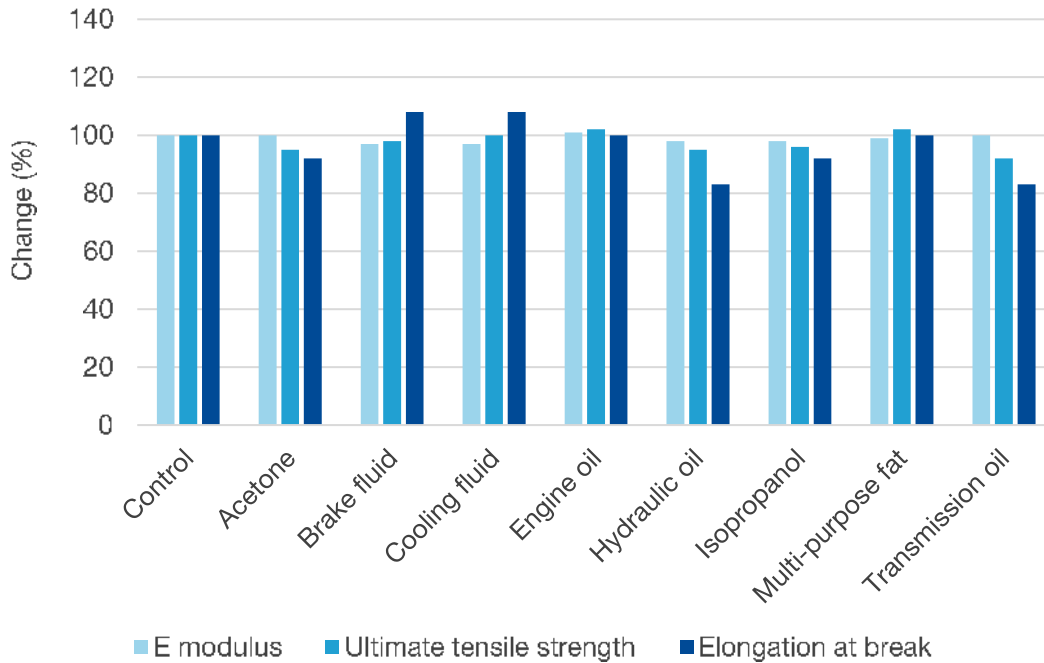
Weight Measurement



Change in weight after immersion time

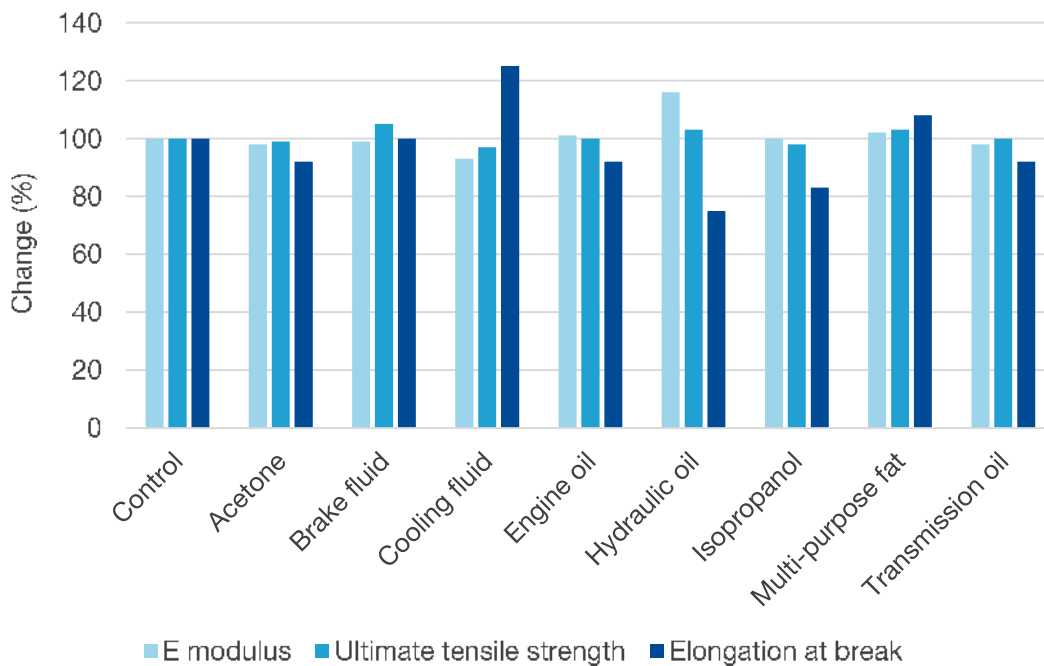
Mechanical Testing

30 minutes



Change in mechanical properties after 30 minutes immersion

7 days



Change in mechanical properties after 7 days immersion

Biocompatibility

Product: Ultracur3D® RG 3280

Revision: 27 February 2023

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.

For notice:

We give no warranties, expressed or implied, concerning the suitability of above-mentioned product for use in any medical device and pharmaceutical applications.

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Sterilization

Sterilization is an essential requirement in many applications especially when used in the medical field. Testing not only ensures the material quality but also determines how effectively the chosen sterilization process is eliminating potential microorganisms.

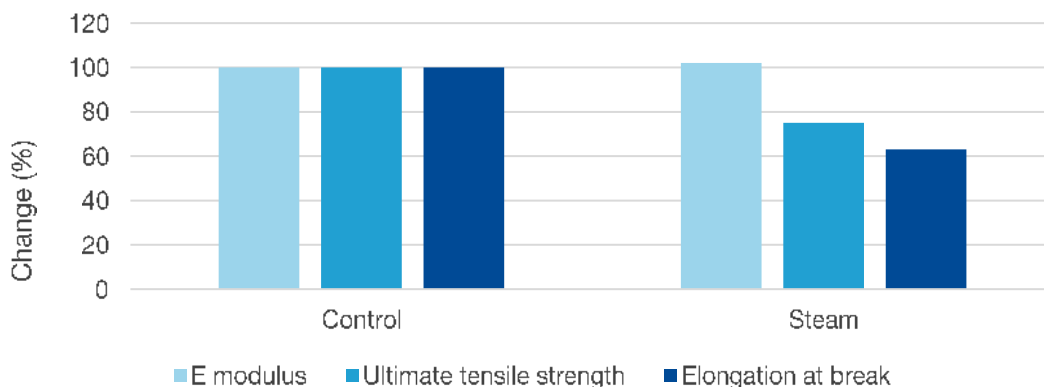
Test Method and Specimens

Steam Sterilization

Steam sterilization parameters	Settings
Vacuum pulses	4
Temperature	134°C
Pressure	210 kPa
Holding time	4 minutes
Drying time	20 minutes

Testing conditions steam sterilization

Mechanical Testing



Change in mechanical properties after sterilization

Coloration



Color samples before and after sterilization