

Method of Manufacturing Structural, Optically Transparent Glass Fiber-Reinforced Polymers (tGFRP) Using Infusion Techniques with Epoxy Resin Systems and E-Glass Fabrics

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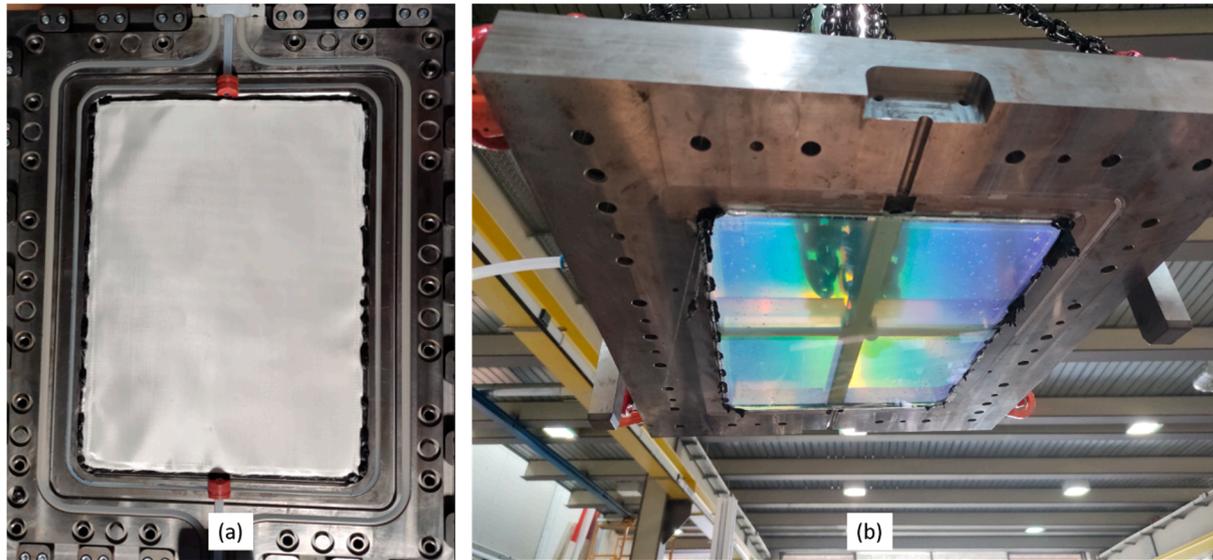


Figure S1. (a) Preform in the mold cavity and tacky tape (black) applied to prevent runners on the edges, (b) tGFRP plate sticking to the upper mold when opening after 24 h curing at room temperature.

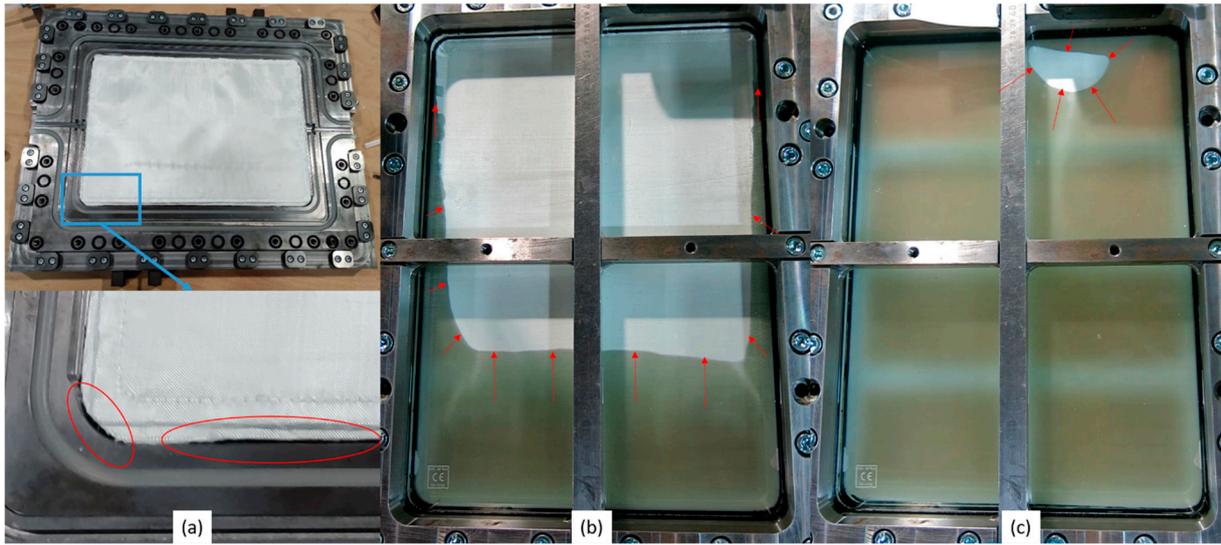


Figure S2. (a) Preform with cutting tolerances placed in a stiff mold with defined cavity dimensions leading to a fiber-free volume between preform and mold, (b) race-tracking (runners) on the preform edges, (c) uncontrolled flow-fronts colliding.

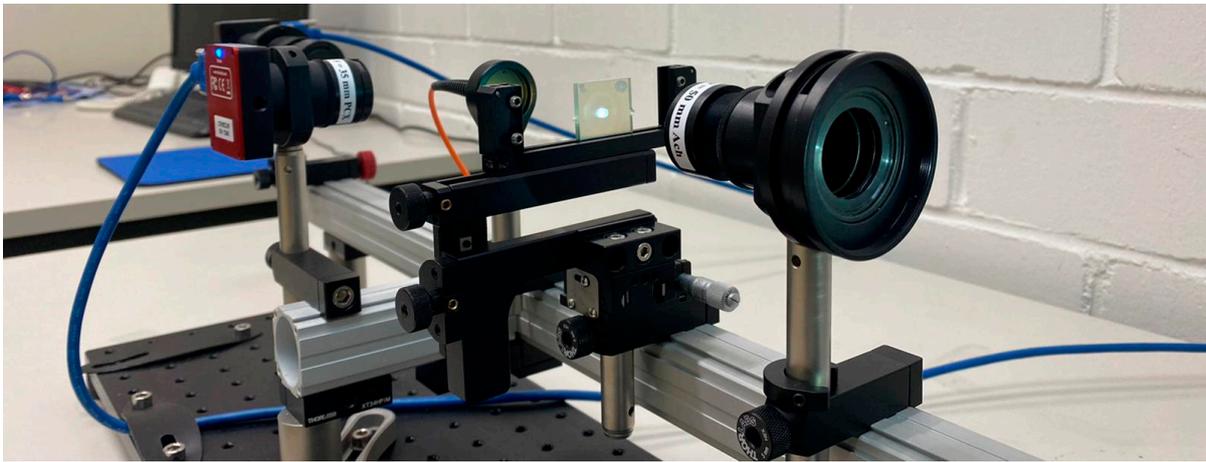


Figure S3. Spectrometer for transmittance measurements.

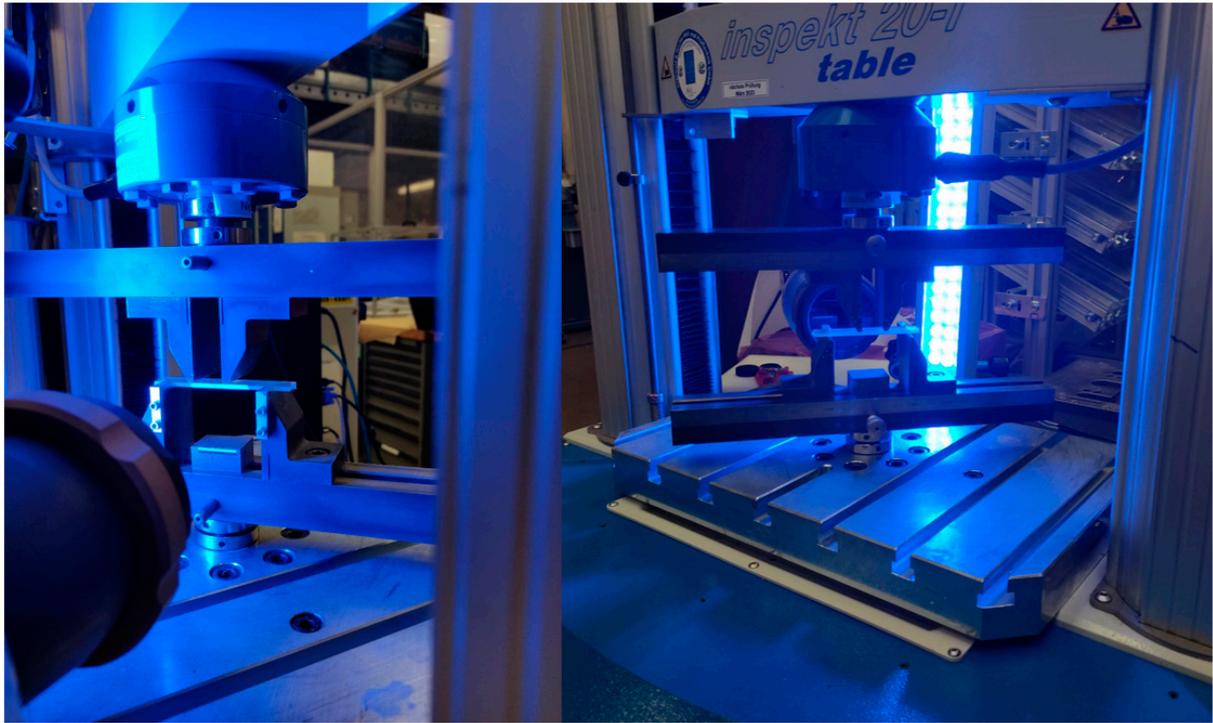


Figure S4. Four point bending apparatus (left: backside, right: front side).

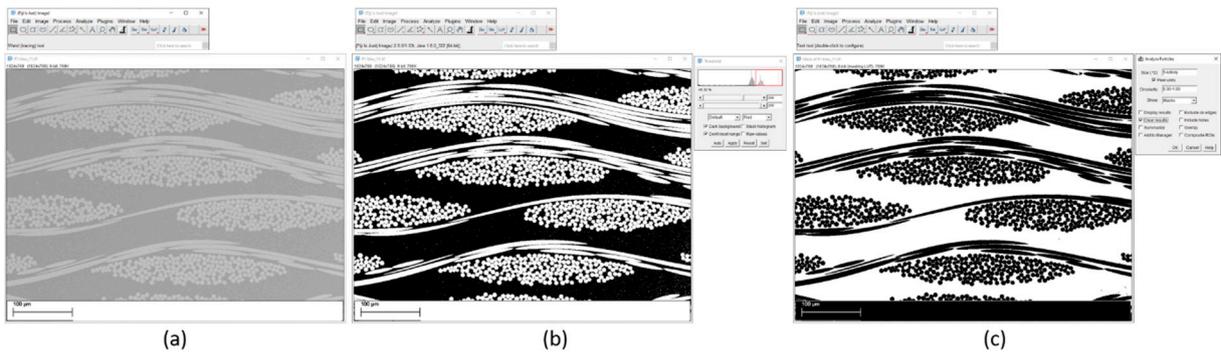


Figure S5. Image preprocessing using ImageJ: (a) 8-bit grayscale, (b) BW-image with threshold values, (c) mask of BW-image.

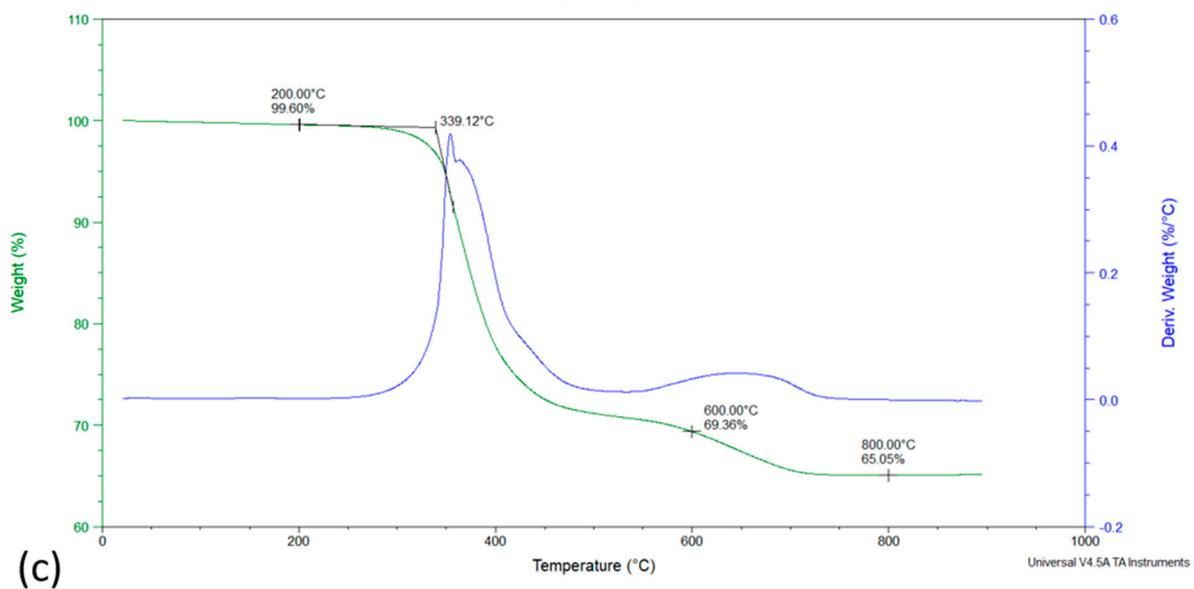
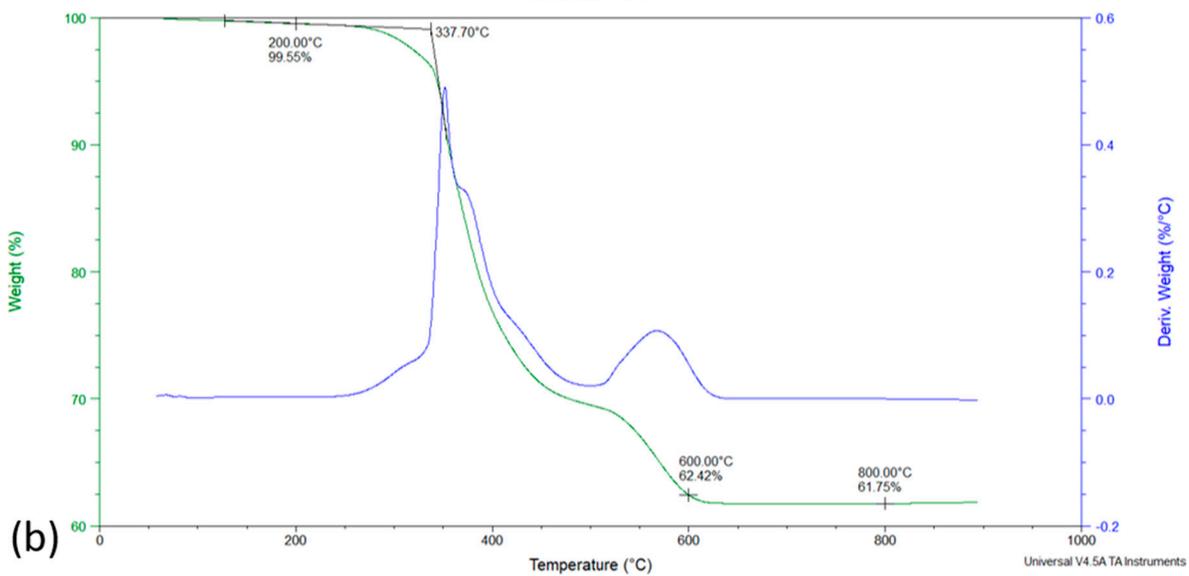
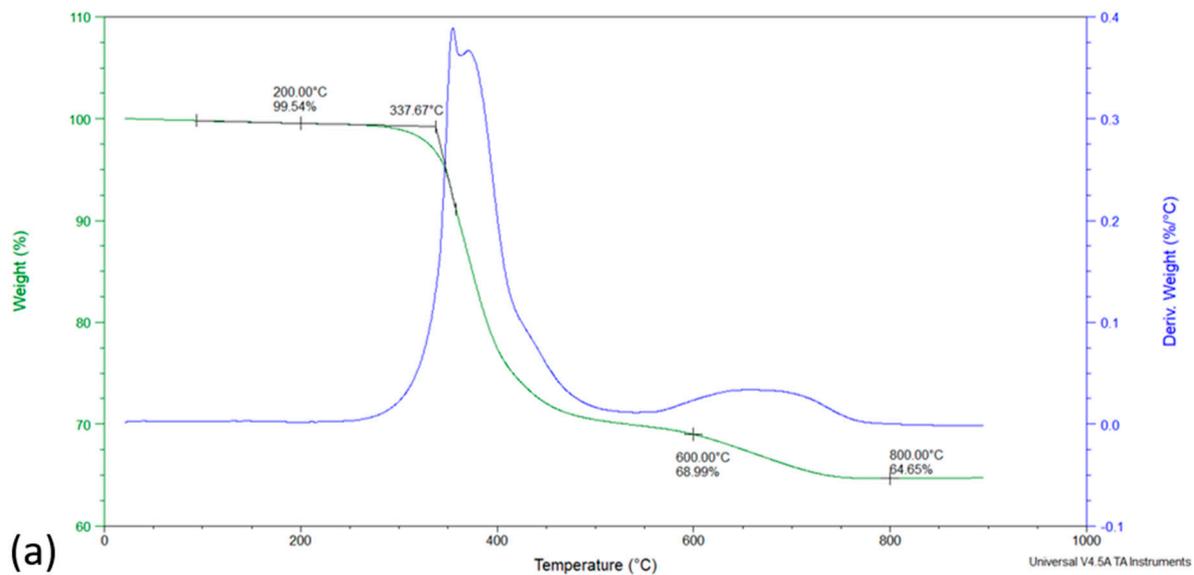


Figure S6. TGA Results of plate (a) 1, (b) 2 and (c) 3.

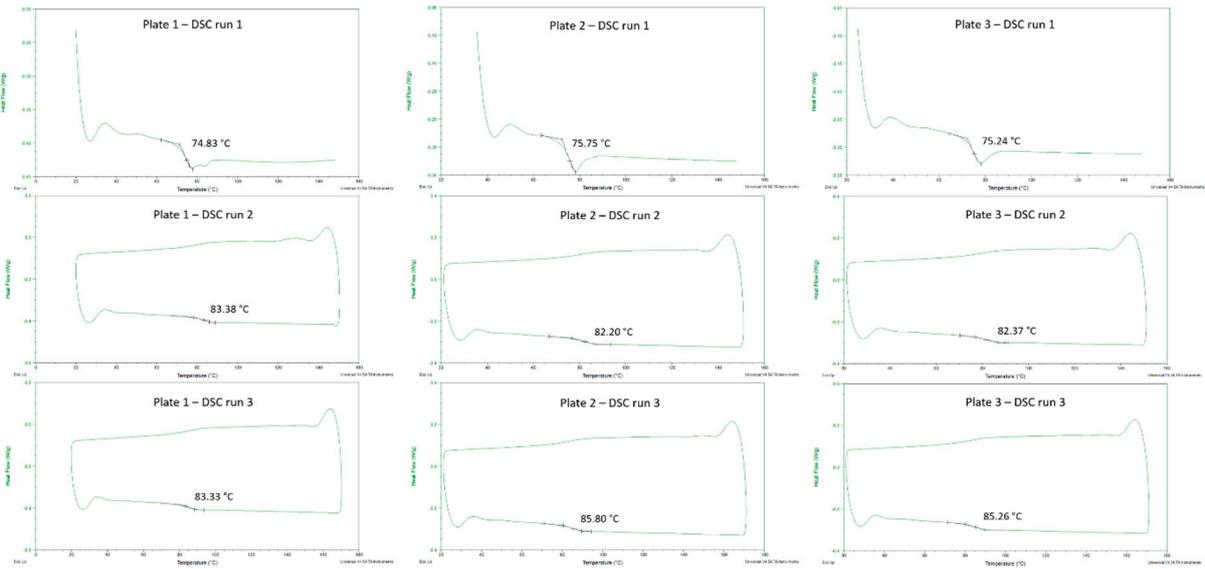


Figure S7. DSC results of tGFRP specimens after curing for 24 h at room temperature plus tempering for 15 h at 60 °C.

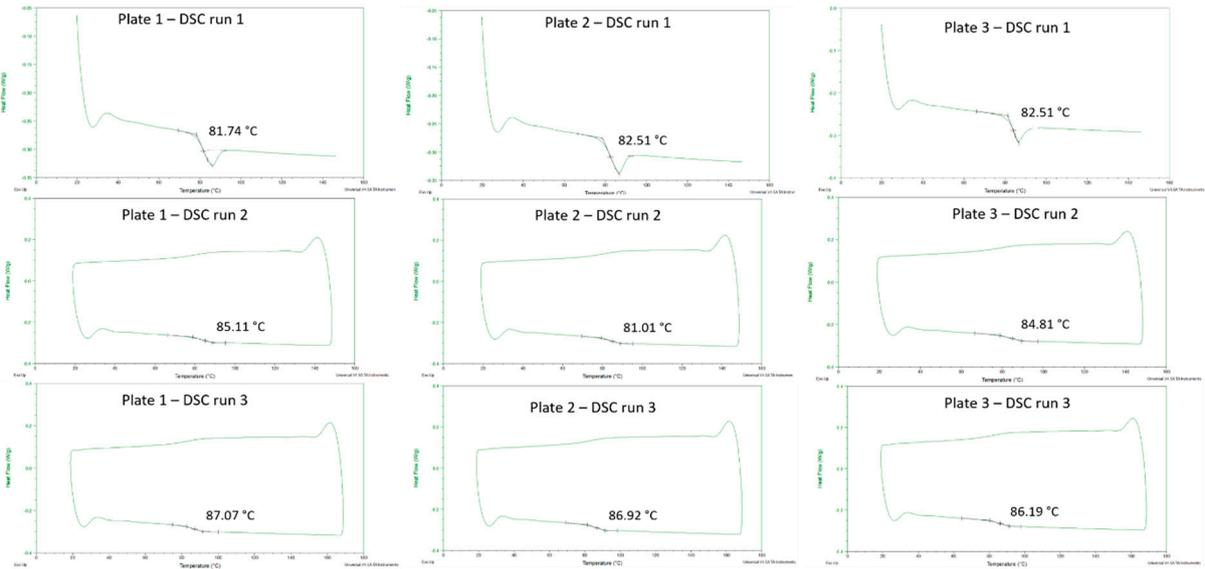


Figure S8. DSC results of tGFRP specimens after curing for 24 h at room temperature 39 h at 60 °C.

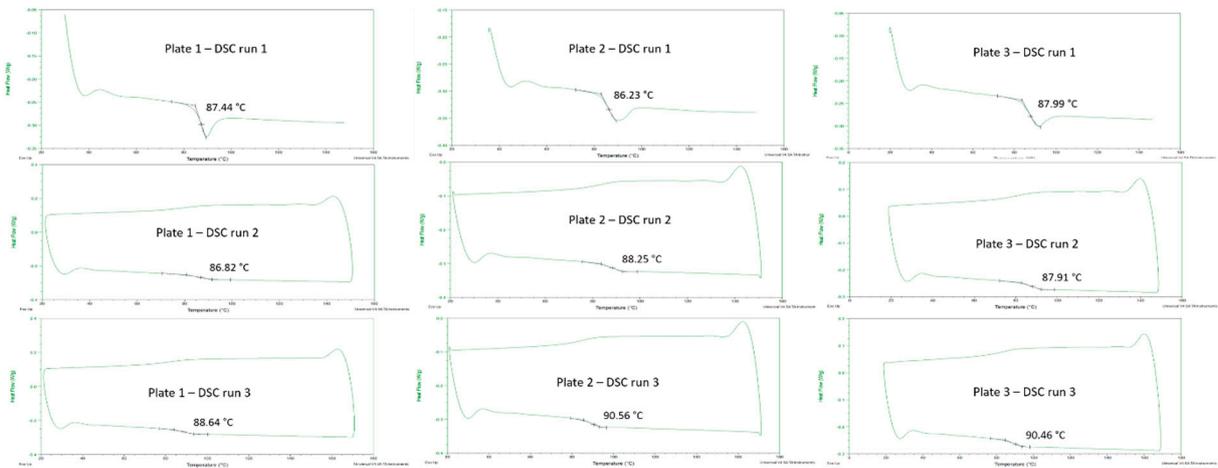


Figure S9. DSC results of tGFRP specimens after curing for 24 h at room temperature plus 87 h tempering at 60 °C.

Table S1. DSC results: 24 h at room temperature cure plus 15 h tempering at 60 °C.

tGFRP	Tg DSC run 1 [°C]	Tg DSC run 2 [°C]	Tg DSC run 3 [°C]
Plate 1	74.49	83.38	83.33
Plate 2	75.75	82.20	85.80
Plate 3	75.24	82.37	85.26
Mean	75.16	82.65	84.80
Standard deviation	0.63	0.64	1.30

Table S2. DSC results: 24 h at room temperature cure plus 39 h tempering at 60 °C.

tGFRP	Tg DSC run 1 [°C]	Tg DSC run 2 [°C]	Tg DSC run 3 [°C]
Plate 1	81.74	85,11	87,07
Plate 2	82.51	85,01	86,92
Plate 3	84.01	84,81	86,19
Mean	82.75	84.98	86.73
Standard deviation	1.15	0.15	0.47

Table S3. DSC results: 24 h at room temperature cure plus 87 h tempering at 60 °C.

tGFRP	Tg DSC run 1 [°C]	Tg DSC run 2 [°C]	Tg DSC run 3 [°C]
Plate 1	87.44	86.82	88.64
Plate 2	86.23	88.25	90.56
Plate 3	87.99	87.91	90.46
Mean	87.22	87.66	89.89
Standard deviation	0.90	0.75	1.08

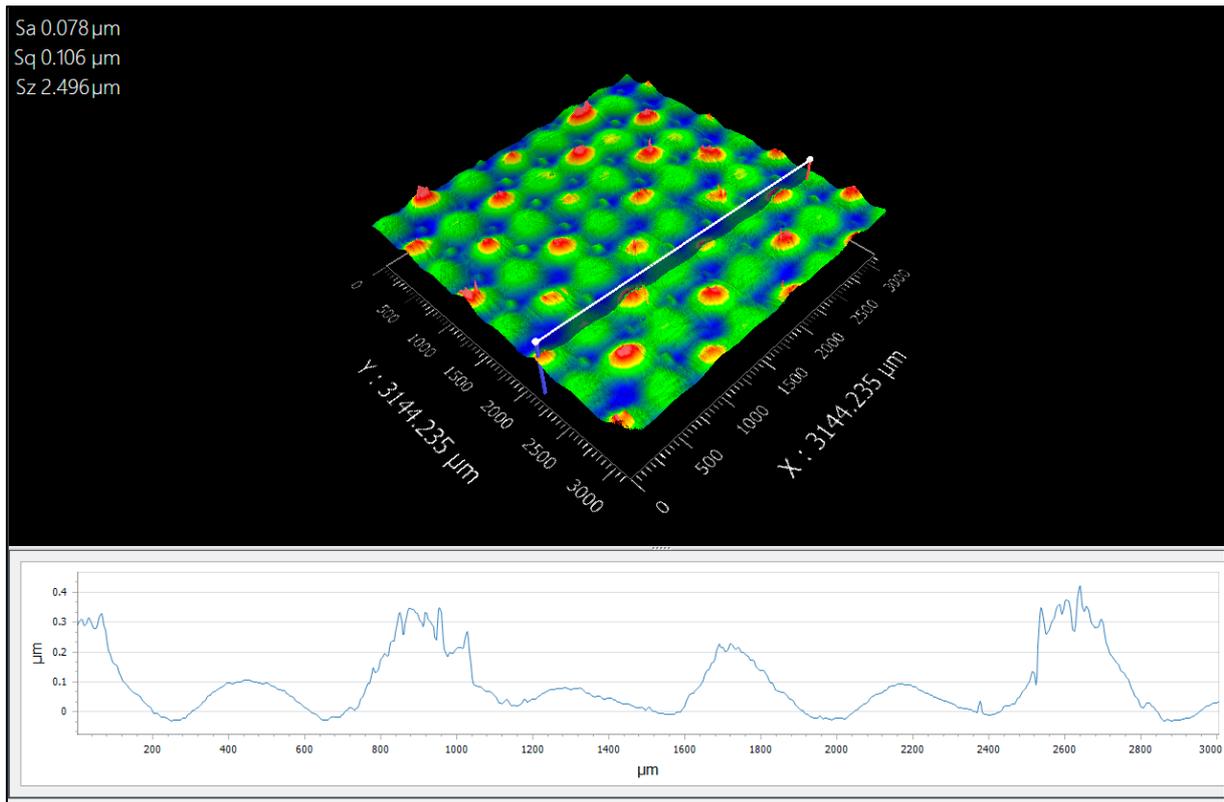


Figure S10. White light Interferometer data of the top surface of the Optical-RTM produced sample.

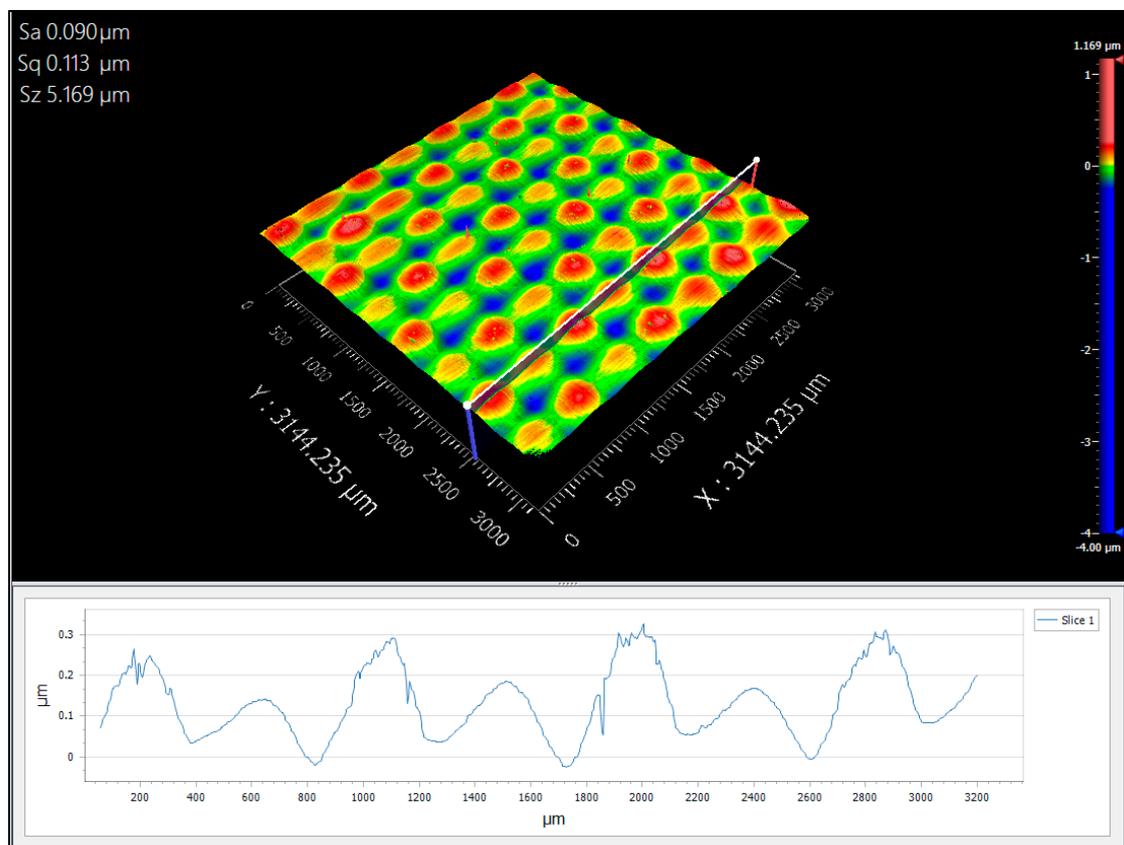


Figure S11. White light Interferometer data of the bottom surface of the Optical-RTM produced sample.

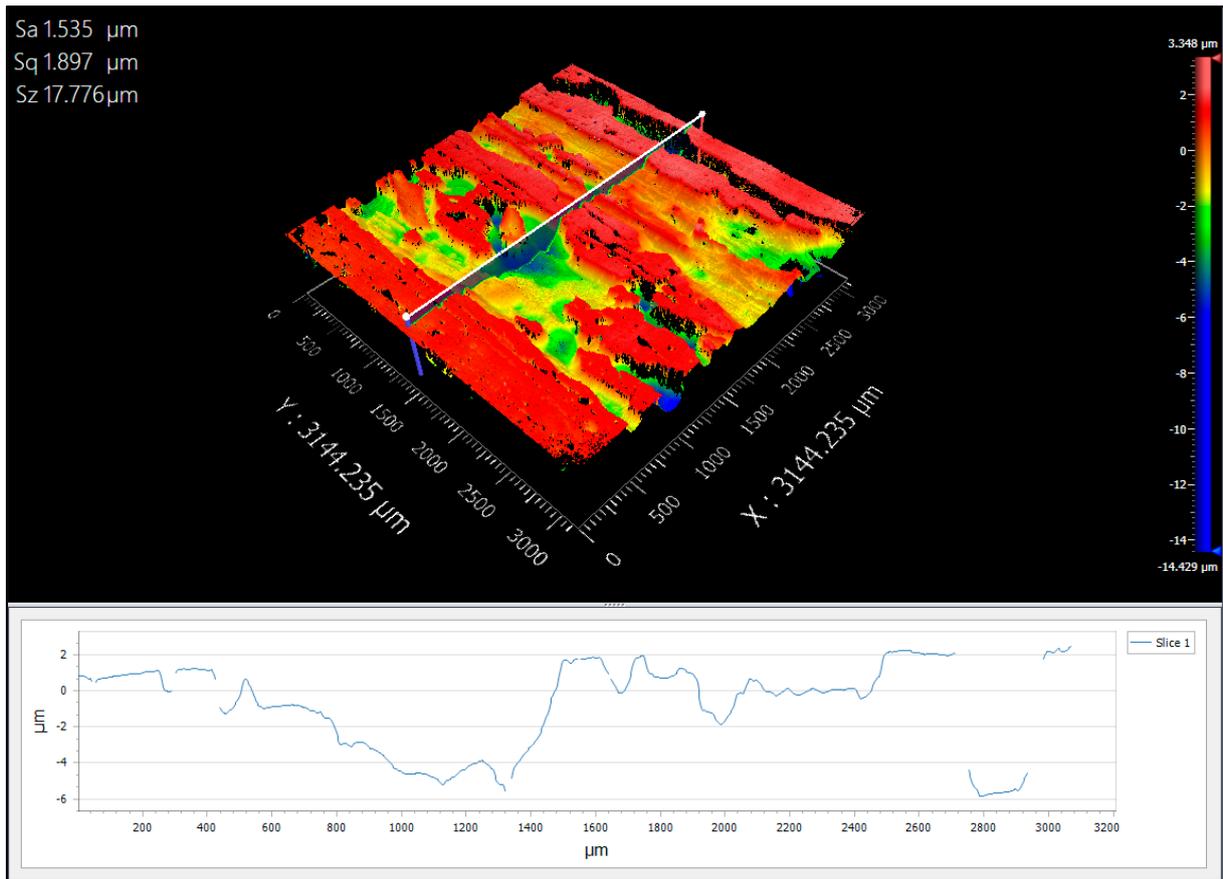


Figure S12. White light Interferometer data of the top surface of the standard-RTM produced sample.

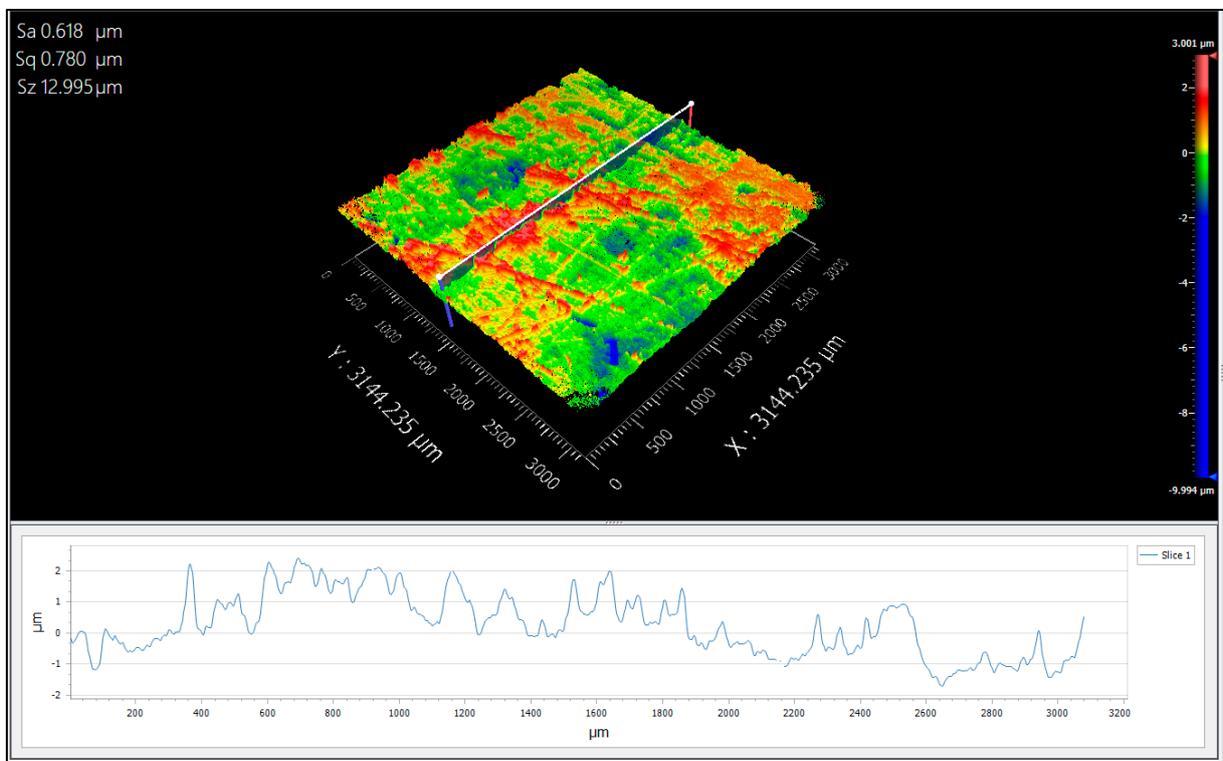


Figure S13. White light Interferometer data of the bottom surface of the standard-RTM produced sample.

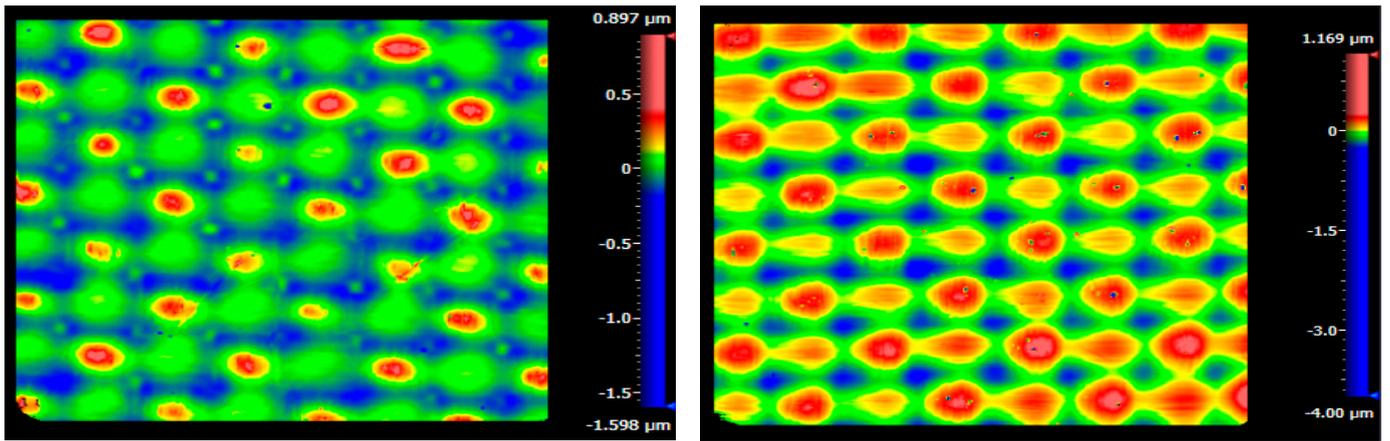


Figure S14. 2D view of the white light interferometer data of the Optical-RTM produced sample; left: top, right: bottom surfaces.

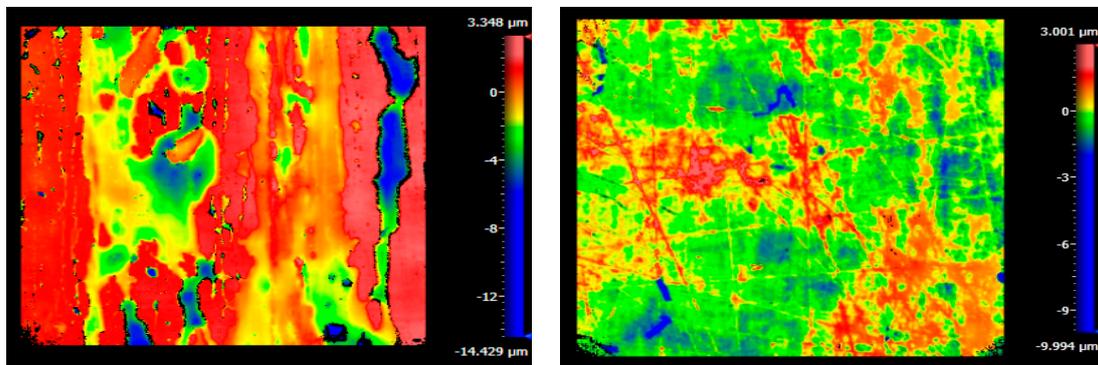


Figure S15. 2D view of the white light interferometer data of the standard-RTM produced sample; left: top, right: bottom surfaces.

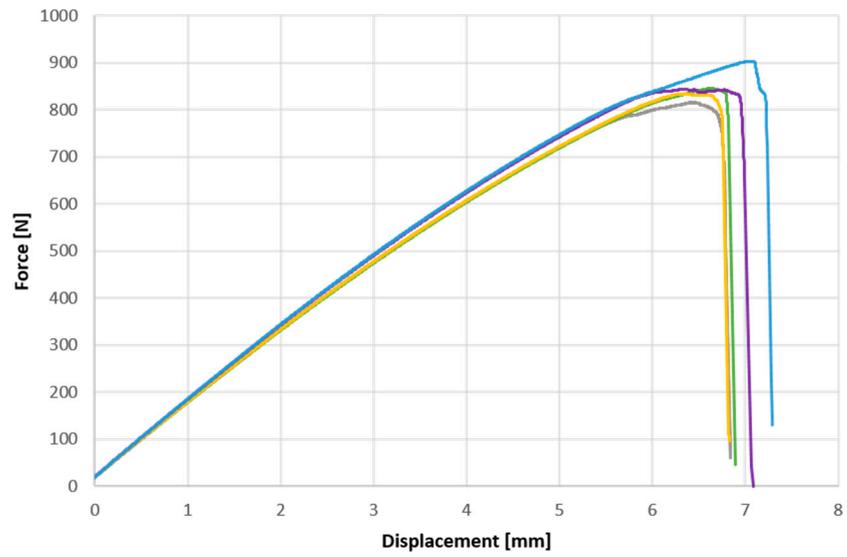
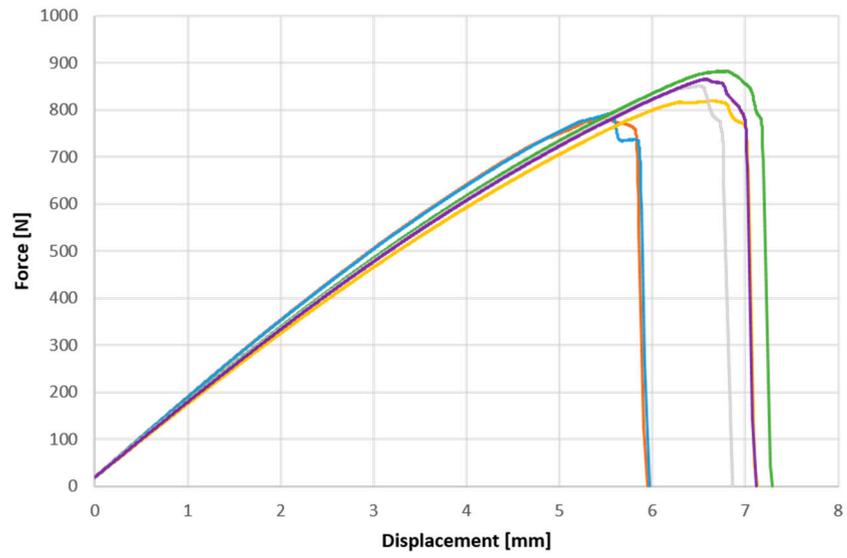
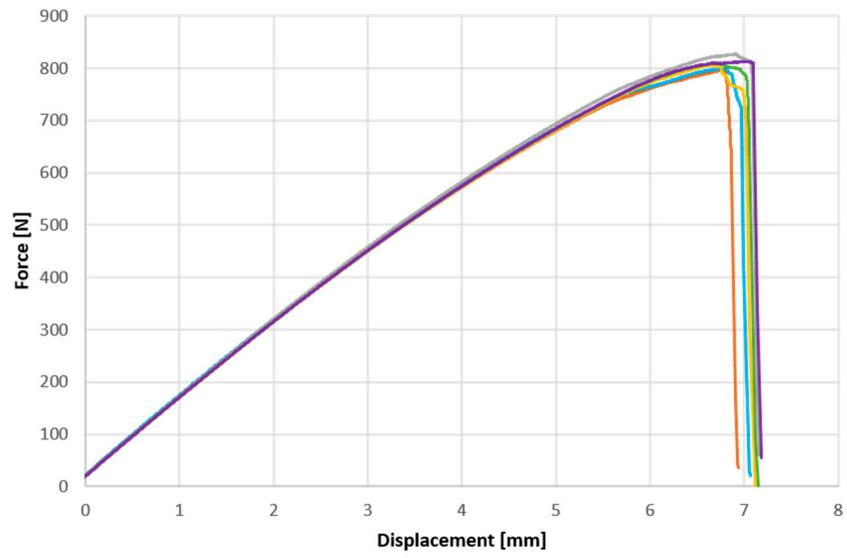


Figure S16. Force-Displacement diagrams of the four point bending characterization of tGFRP plate 1-3 (top to bottom).