

## Supporting Information

# Thermo-mechanical recyclability of additively manufactured polypropylene and polylactic acid parts and polypropylene support structures

Niko Nagengast<sup>1</sup>, Christian Bay<sup>2,3</sup>, Frank Döpfer<sup>2,3</sup>, Hans-Werner Schmidt<sup>4,5</sup>, Christian Neuber<sup>4\*</sup>

1 Biomechanics, University of Bayreuth, Universitaetsstrasse 30, 95447 Bayreuth, Germany

2 Research Center for Additive Innovations, University of Bayreuth, Universitaetsstrasse 30, 95447 Bayreuth, Germany

3 Manufacturing and Remanufacturing Technology, University of Bayreuth, Universitaetsstrasse 30, 95447 Bayreuth, Germany

4 Macromolecular Chemistry, University of Bayreuth, Universitaetsstrasse 30, 95447 Bayreuth, Germany

5 Bavarian Polymer Institute, University of Bayreuth, Universitaetsstrasse 30, 95447 Bayreuth, Germany

\* Correspondence: christian.neuber@uni-bayreuth.de

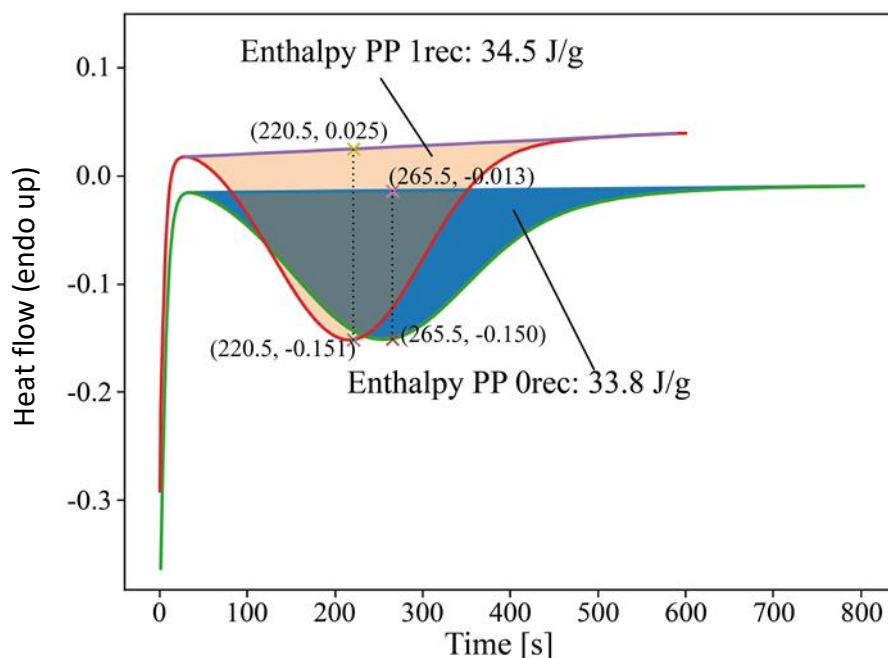


Figure S1: DSC curves of isothermal crystallization measurements of the virgin (PP 0rec) and recycled (PP 1rec) Polypropylene at  $T = 110^{\circ}\text{C}$ .

Table S1: E-Modulus of the investigated polymers in 0°- direction

	0° E-Modulus values [MPa]					
	PLA 0rec	PLA 1rec	PP 0rec	PP 1rec	PP Sup 0rec	PP Sup 1rec
<b>MAX</b>	3538	3380	545	521	1479	1491
<b>MIN</b>	2483	2230	413	482	1430	1212
<b>MEAN</b>	2971	2836	445	500	1456	1401
<b>STDV</b>	312	377	47	20	21	70

Table S2: Tensile strain values of investigated polymers in 0°- direction

	0° Tensile strain at break values [%]					
	PLA 0rec	PLA 1rec	PP 0rec	PP 1rec	PP Sup 0rec	PP Sup 1rec
<b>MAX</b>	7.3	10.8	1856	1930	283	252
<b>MIN</b>	1.9	3.0	1553	1915	132	56
<b>MEAN</b>	3.6	6,0	1697	1929	199	163
<b>STDV</b>	1.7	2.4	88	8.5	58	66

Table S3: Tensile yield strenth values of investigated polymers in 0°- direction

	0° Tensile yield strength values [MPa]					
	PLA 0rec	PLA 1rec	PP 0rec	PP 1rec	PP Sup 0rec	PP Sup 1rec
<b>MAX</b>	56	57	18	19	18	19
<b>MIN</b>	45	47	14	16	15	13
<b>MEAN</b>	52	53	16	17	16	16
<b>STDV</b>	3.1	2.9	2.6	0.5	1.4	1.1

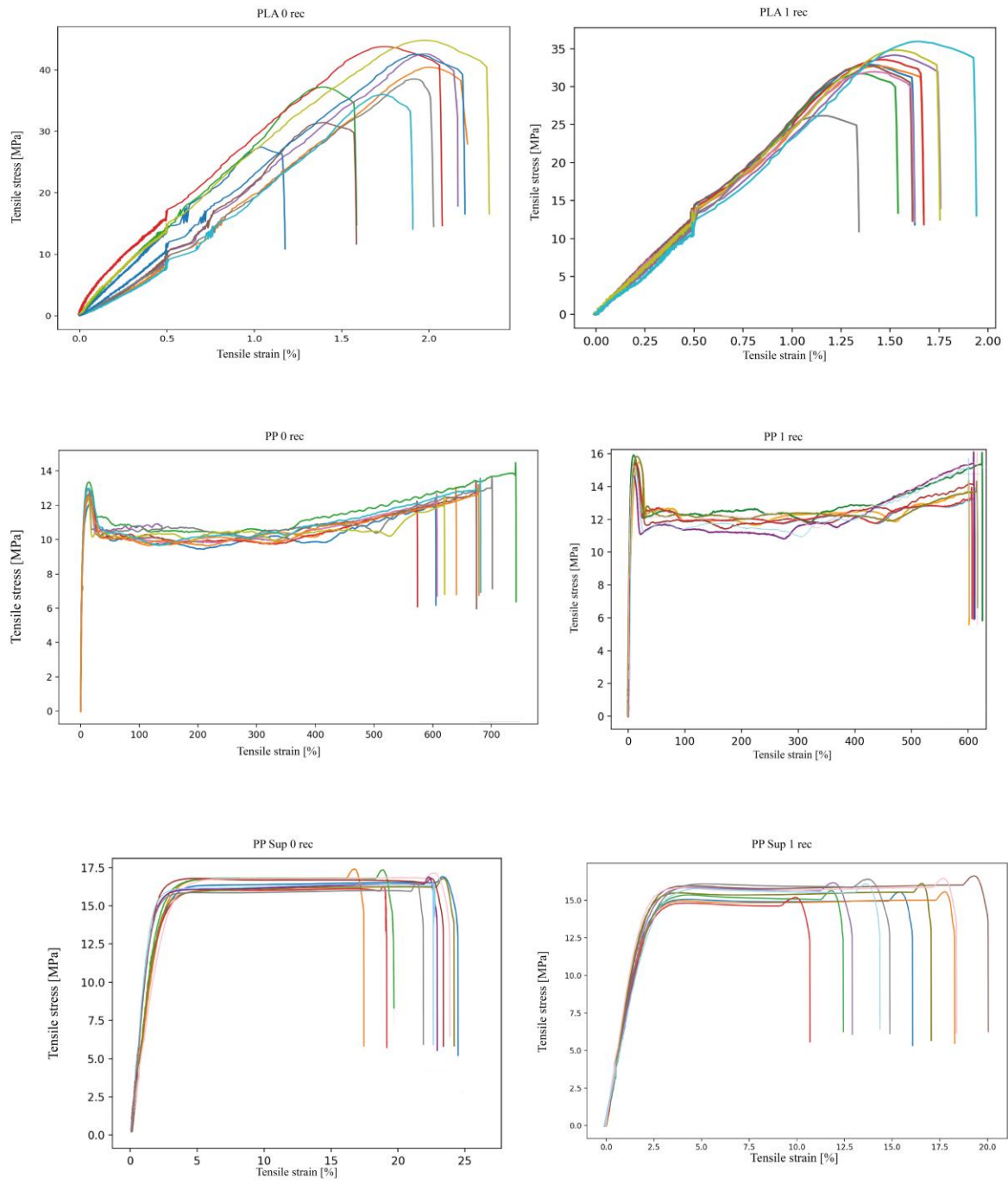


Figure S2: Tensile stress-strain curves of investigated polymers in 90°- direction.