

Supplementary document

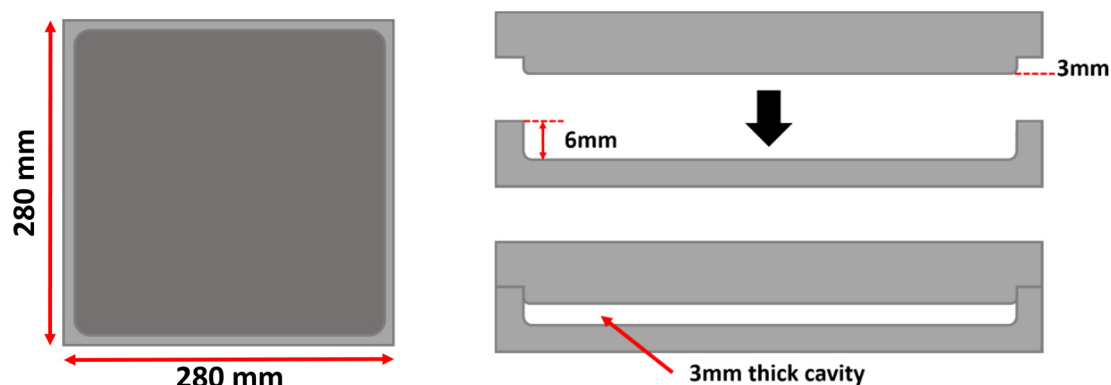


Figure S1: Closed two-part metal mould used to manufacture plastic plaques in hydraulic press.

Table S1: Typical melting ranges of polyolefin materials [1-5].

Material	Melting range (°C)
Low Density Polyethylene	105 – 123
Linear Low Density Polyethylene	120 – 127
High Density Polyethylene	122 – 137
Polypropylene	160 – 170
Waste Mixed Plastics	105 – 140 (+165 for rPP*)

*1 out of 5 wMP samples showed a peak at 165 °C

Table S2: Crystallinity of wMP and segregated recycled thermoplastics calculated from DSC analysis.

Sample	Crystallinity (%)	Average Crystallinity (%)
wMP 1	40.6	40.4
wMP 2	40.3	
wMP 3	40.3	
rLDPE 1	38.9	39.1
rLDPE 2	39.2	
rLLDPE 1	38.6	36.7
rLLDPE 2	34.8	
rHDPE 1	75.1	76.8
rHDPE 2	78.5	
rPP 1	51.2	54.1
rPP 2	57.0	

vLDPE 1	37.9	38.6
vLDPE 2	39.2	

Table S3: Onset and endset temperatures for thermal degradation of wMP and recycled plastics.

Sample	Degradation Onset (°C)	Degradation Endset (°C)
wMP	350	485
rLDPE	390	487
rLLDPE	380	495
rHDPE	410	490
rPP	380	475
vLDPE	400	485

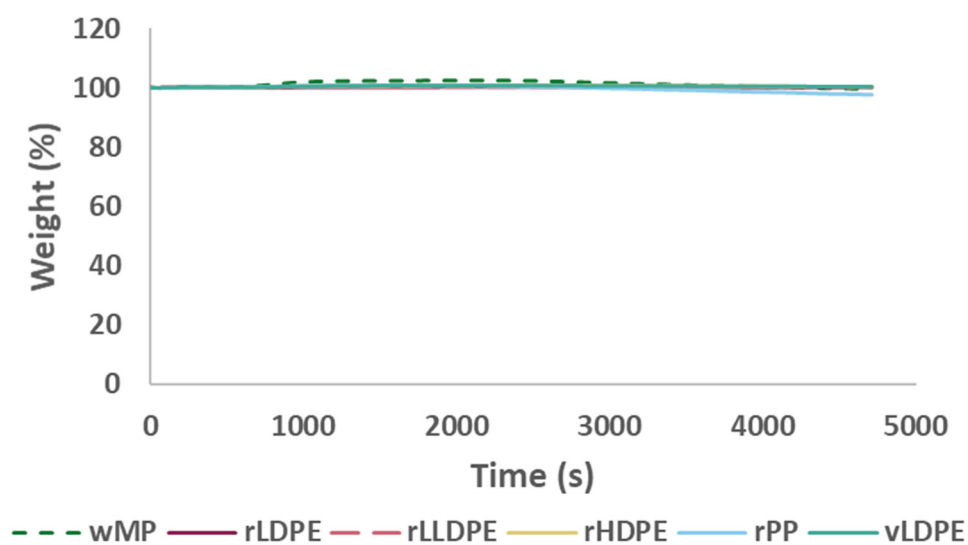


Figure S2: Change in weight of the samples after holding at 200 °C for 1 hour in air.

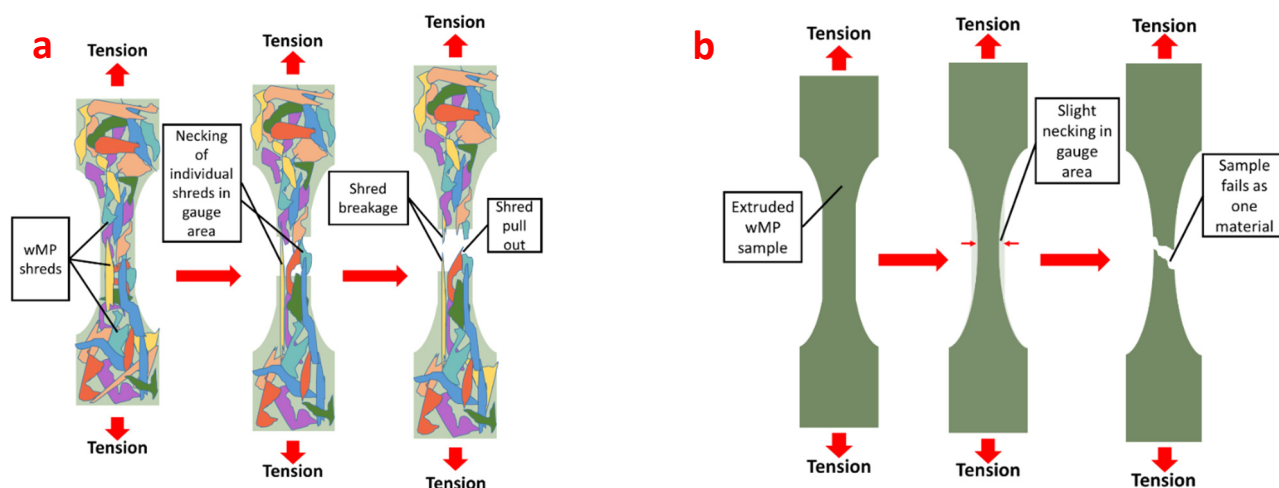


Figure S3: Schematic showing the failure behaviour in (a) wMP-2 and (b) wMP-2-ex during tensile testing.

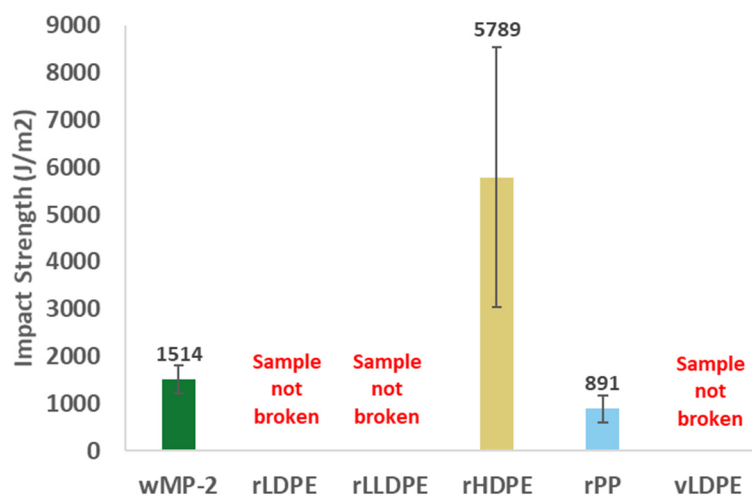


Figure S4: Izod impact strength (un-notched) of wMP-2 in comparison to recycled plastics (rPP and rHDPE).

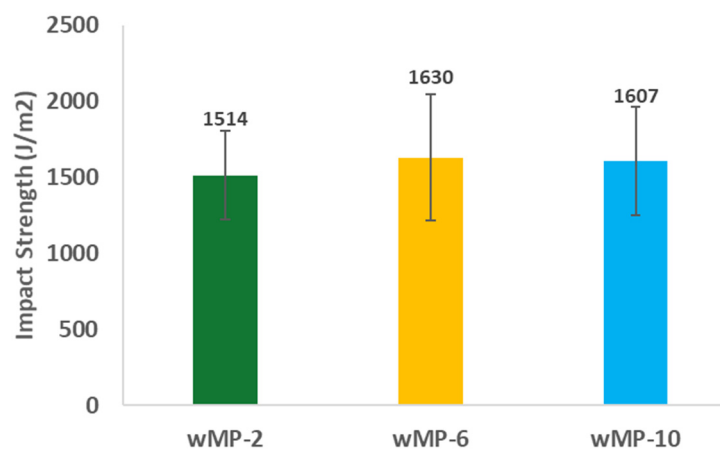


Figure S5: Comparison of Izod impact strength (un-notched) of wMP manufactured under different pressures.

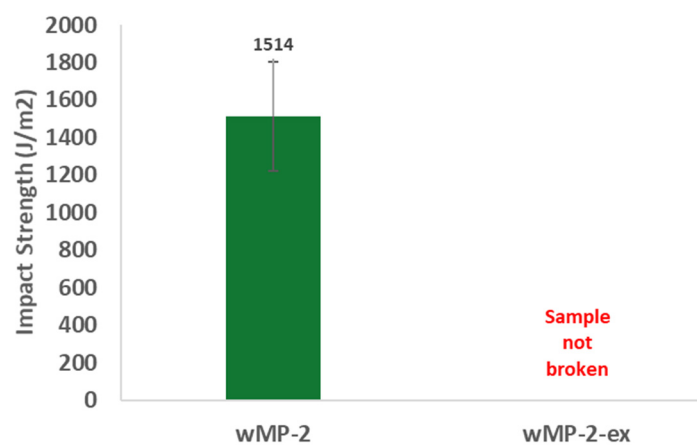


Figure S6: Comparison of Izod impact strength (un-notched) of wMP samples produced by compression moulding of wMP shreds and by compression moulding of an extruded block of wMP.



Figure S7: Representative tensile test specimens of (a) wMP-2, (b) rLDPE, (c) rLLDPE, (d) rHDPE, (e) rPP and (f) vLDPE during tensile testing with additional close up images of (g) rLDPE and (h) rLLDPE, due to the high amount of stretching.

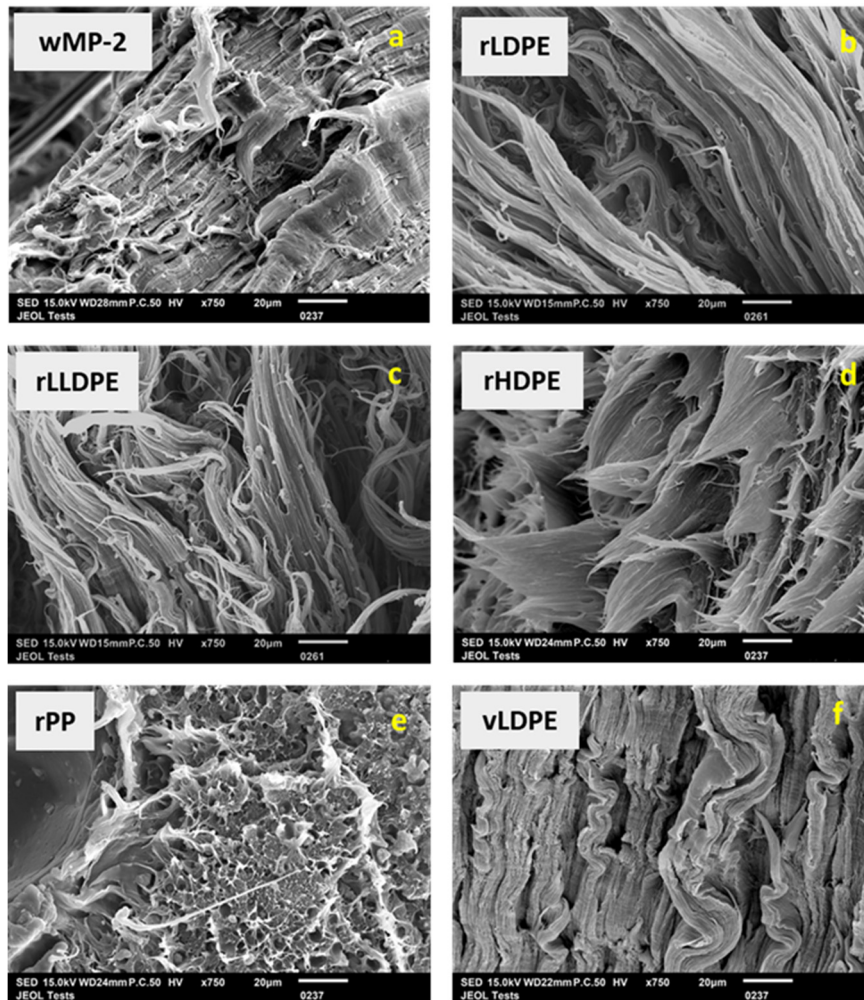


Figure S8: SEM images of the fracture surface of tested tensile specimens at x750 magnification.

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2. Jin, H., et al., *The effect of extensive mechanical recycling on the properties of low density polyethylene*. *Polymer Degradation and Stability*, 2012. **97**(11): p. 2262–2272.
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