

1 **Support information**

2 **Synergistic toughening of polypropylene with ultra-high molecular**  
3 **weight polyethylene and elastomer-olefin block copolymers**

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1 **Table S.1 The effect of ultrasonic irradiation on molecular weight and**  
 2 **molecular weight distribution of PP**

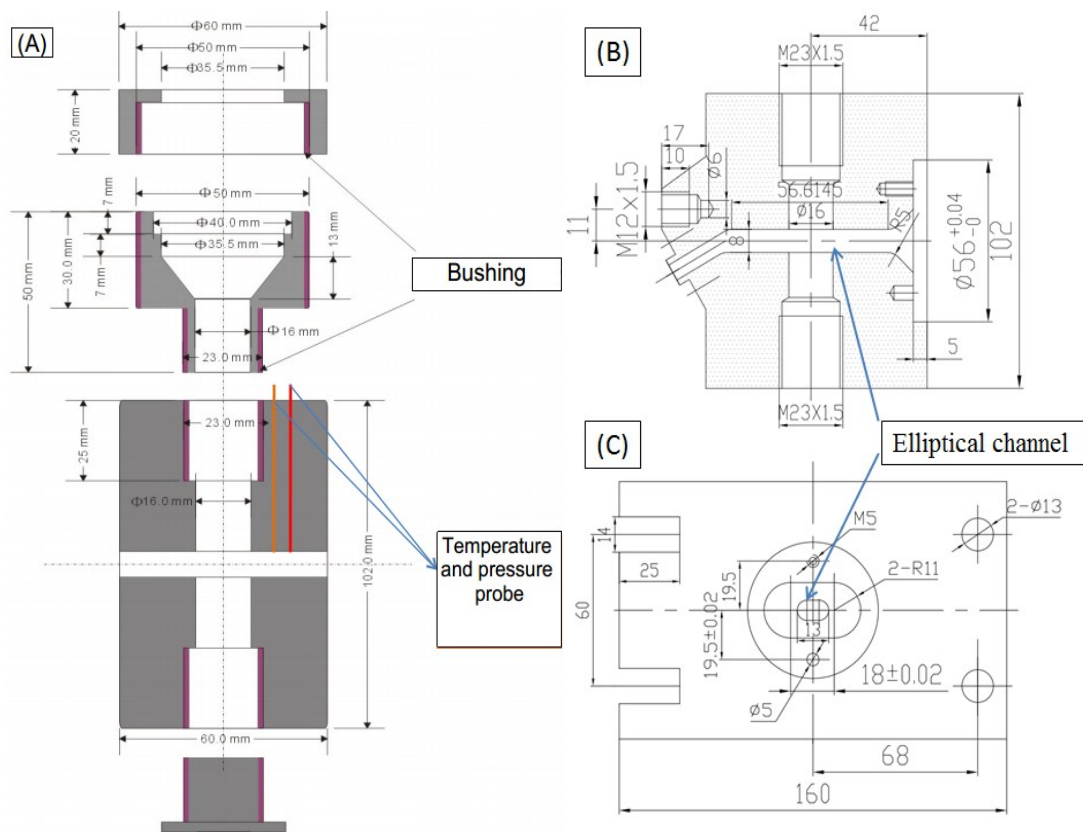
Sample	M <sub>w</sub> (kg/mol)	PDI
PP(0W)	410	4.9
PP(400W)	390	5.0
PP(600W)	380	5.0

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4 **Table S.2 The effect of ultrasonic irradiation on mechanical properties of PP**

Sample	Tensile yield strength (MPa)	Elongation at break (%)	Impact strength (23°C,kJ/m <sup>2</sup> )
PP(0W)	29.5	798	6.1
PP(400W)	29.4	810	6.3
PP(600W)	29.5	802	6.0

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**Fig. S.1** Schematics of ultrasonic reactor (A), lateral view (B) and front view of

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die (C).

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**Table S.3** The thermodynamic property data of the blends

Sample	$T_m$ (°C)	$T_c$ (°C)	$X_c$ (%)
PP	163.5	113.4	47.7
P/U (99/1)	163.6	113.8	47.8
P/O/U(99/3/1)	163.6	114.1	48.1
P/O/U(99/6/1)	163.3	114.2	48.6
P/O(99/6)	163.7	113.8	48.1
P/O/U(99/6/0.5)	163.8	114.0	48.5
P/O/U(99/6/1.5)	163.8	113.7	48.2
P/O/U(99/6/2.0)	163.4	113.5	47.5

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1 **Table S.4** The thermodynamic property data of the blends treated by different  
2 ultrasonic power

Sample	T <sub>m</sub> (°C)	T <sub>c</sub> (°C)	X <sub>c</sub> (°C)
P/O/U(99/6/1.5)	163.8	113.7	48.2
P/O/U(99/6/1.5)-200	163.9	113.9	48.5
P/O/U(99/6/1.5)-400	163.8	114.2	48.6
P/O/U(99/6/1.5)-600	163.9	114.6	49.1

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