Supporting Information

Balanced toughening and strengthening of ethylene-propylene rubber toughened isotactic polypropylene by using poly(styrene-\textit{b}-ethylene/propylene) diblock copolymer

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Fig. S1. Shrinkage curves of EPR and PP.

Fig. S1 gives the shrinkage behavior of EPR and PP upon cooling. Cooling from melt-state, PP firstly shrinks faster than EPR due to the crystallization process. At about -25 °C, EPR conversely has the larger shrinkage than PP. When EPR is dispersed in PP matrix, the shrinkage of EPR is larger than PP below -25 °C, meaning

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PP will give EPR particle a tension providing the interface is not broken, as indicated by Fig. S2. This tension resulting from the mismatch of thermal expansion coefficients increases the free volume fraction of EPR and leads to a lower glass transition temperature than pure EPR in Fig. 6A.

![Stress model of PP/EPR](image)

**Fig. S2.** Stress model of PP/EPR. The arrows in which stand for the thermal stress.