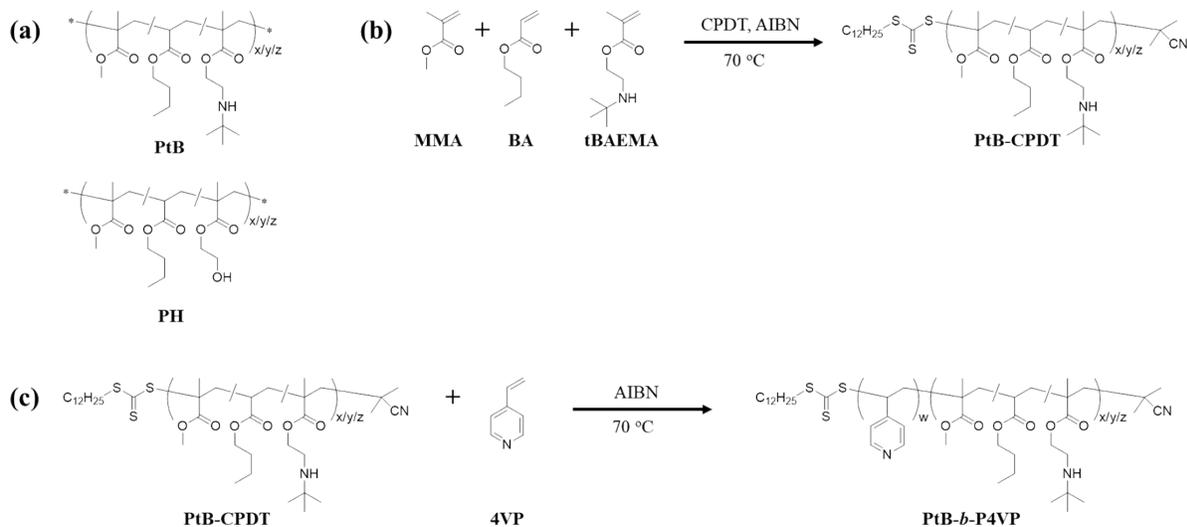


Electronic Supplementary Information

Enhanced Thermomechanical Property of Self-healing Polymer via Self-assembly of Reversibly Crosslinkable Block Copolymer

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Scheme S1. (a) Chemical structures of PtB and PH matrix polymers, (b) synthesis of PtB-CPDT of macro-RAFT agent, and (c) synthesis of PtB-*b*-P4VP block copolymer.

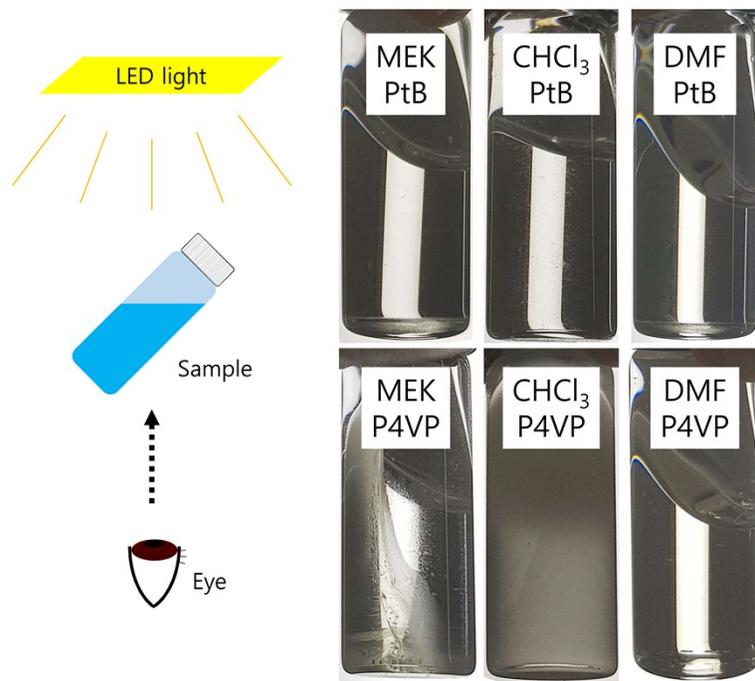


Figure S1. Photographic images for solvent solubilities of PtB and P4VP homopolymers in MEK, CHCl₃ or DMF. The vertical white line seen on the vial in the photo is LED backlight. P4VP is not soluble in MEK and CHCl₃, so the solutions under a LED light are opaque.

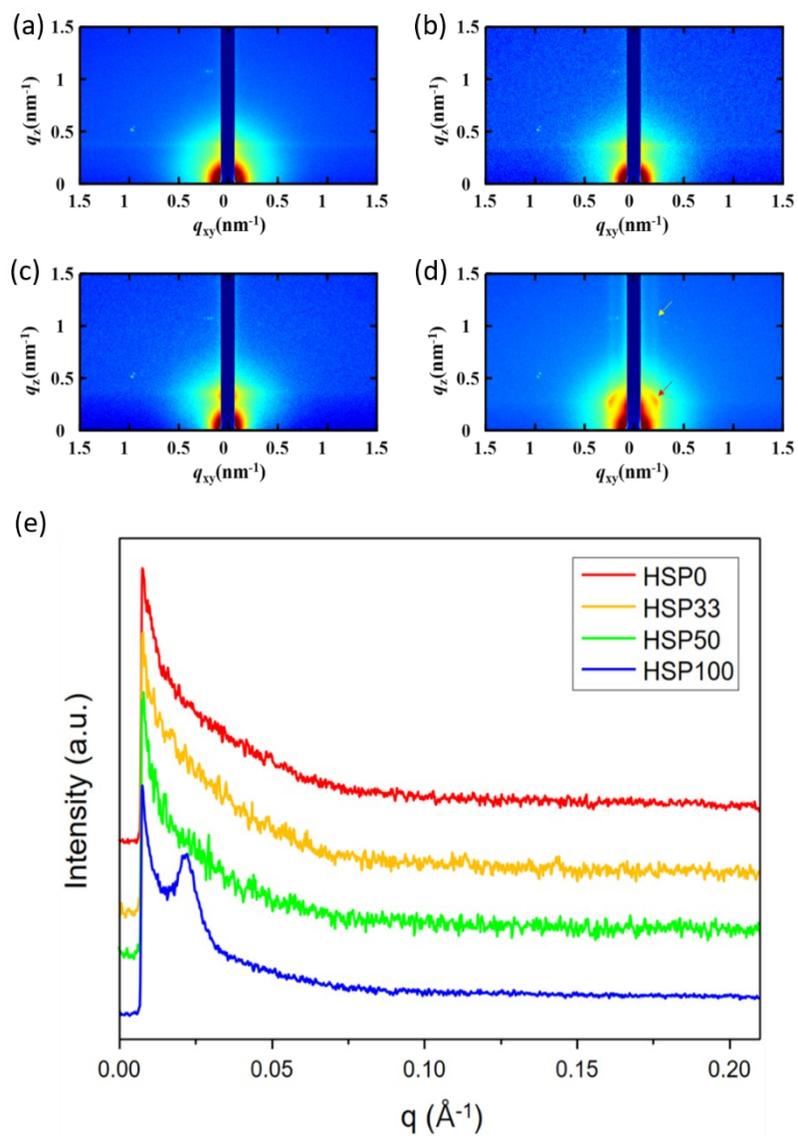


Figure S2. Representative GISAXS patterns of (a) HSP0, (b) HSP33, (c) HSP50 and (d) HSP100 thin film samples measured using synchrotron light source of $\lambda = 1.223$ nm. (e) 1-D in-plane profiles extracted along $q_z = 0.16$ nm⁻¹ from the GISAXS pattern of **Figure S2(a-d)**.

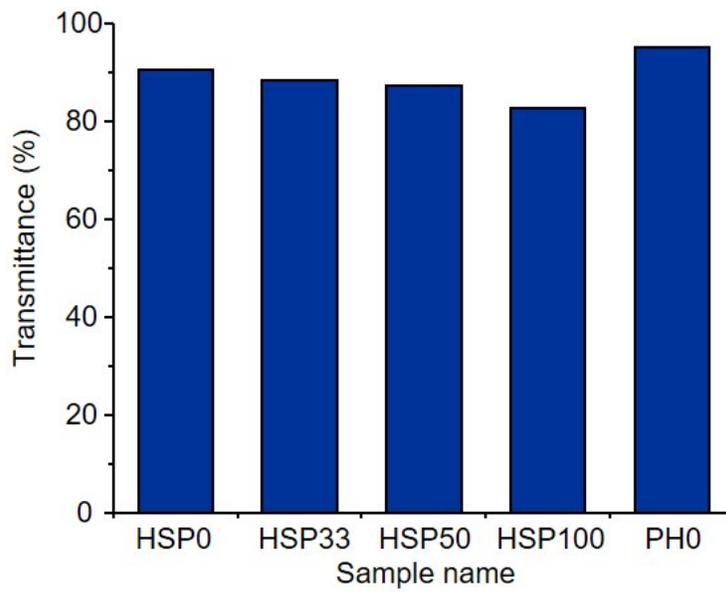


Figure S3. Transmittance of thin coatings of HSP0~100 and PH0 on glass plate measured at 600 nm wavelength.

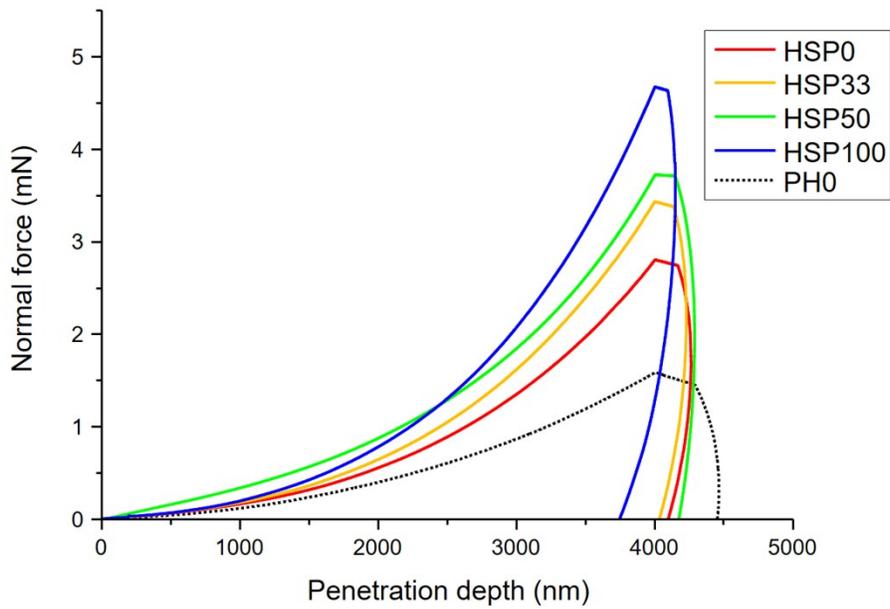


Figure S4. Load–displacement curves for of PH0 and HSP0~100 as recorded in nano-indentation measurements.

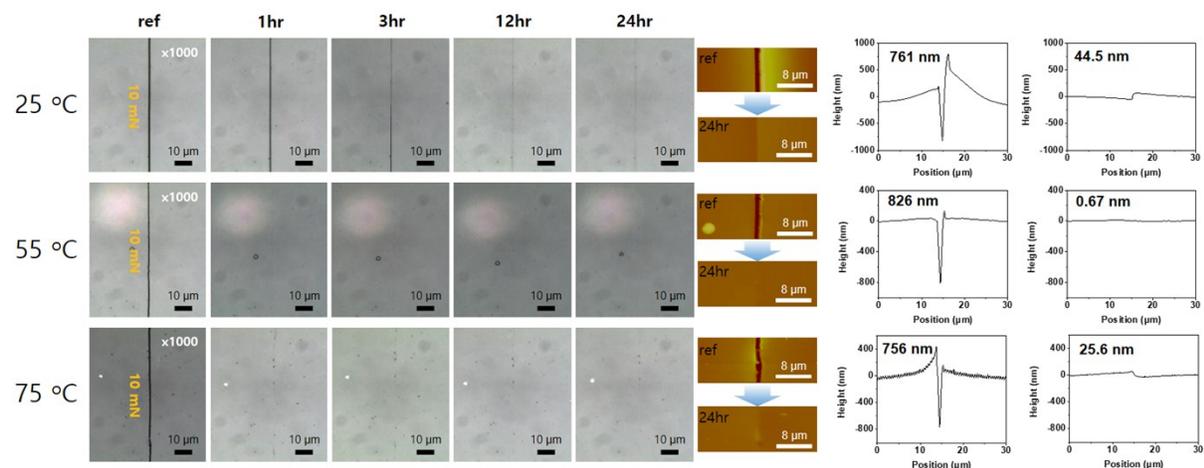


Figure S5. OM images (left), AFM images (middle), and corresponding height profiles (right) of single-scratch self-healing tests for HSP0 at 25, 55, and 75 °C.

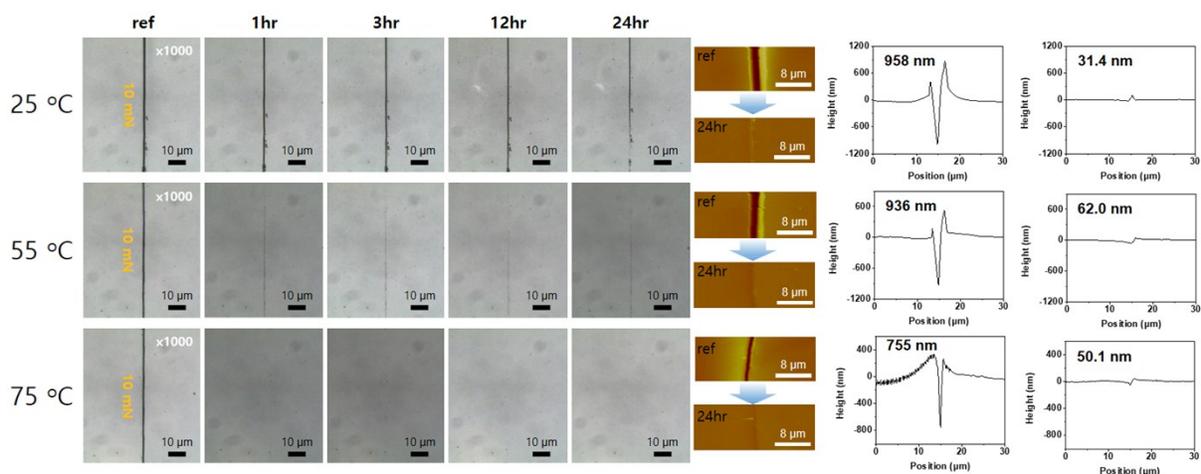


Figure S6. OM images (left), AFM images (middle), and corresponding height profiles (right) of single-scratch self-healing tests for HSP33 at 25, 55, and 75 °C.

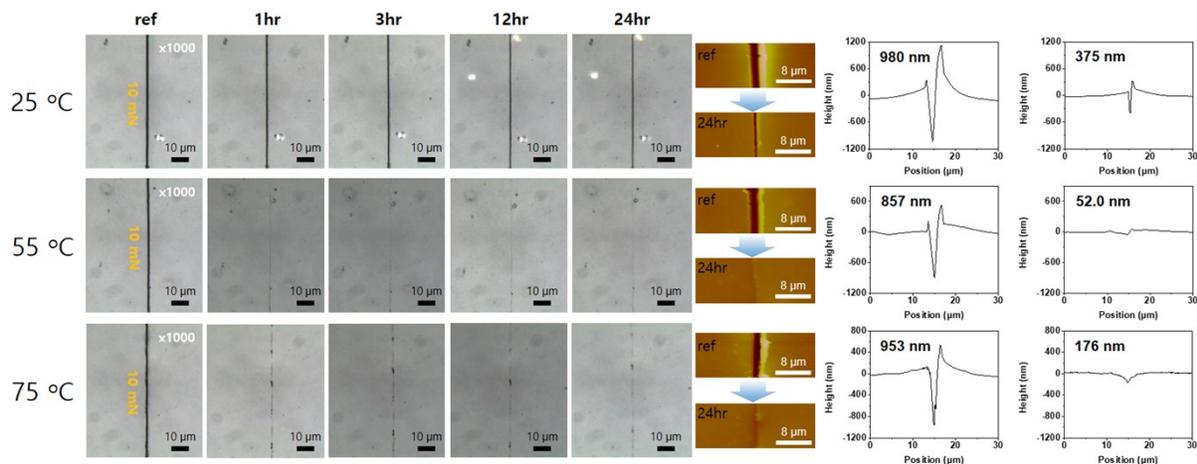


Figure S7. OM images (left), AFM images (middle), and corresponding height profiles (right) of single-scratch self-healing tests for HSP50 at 25, 55, and 75 °C.

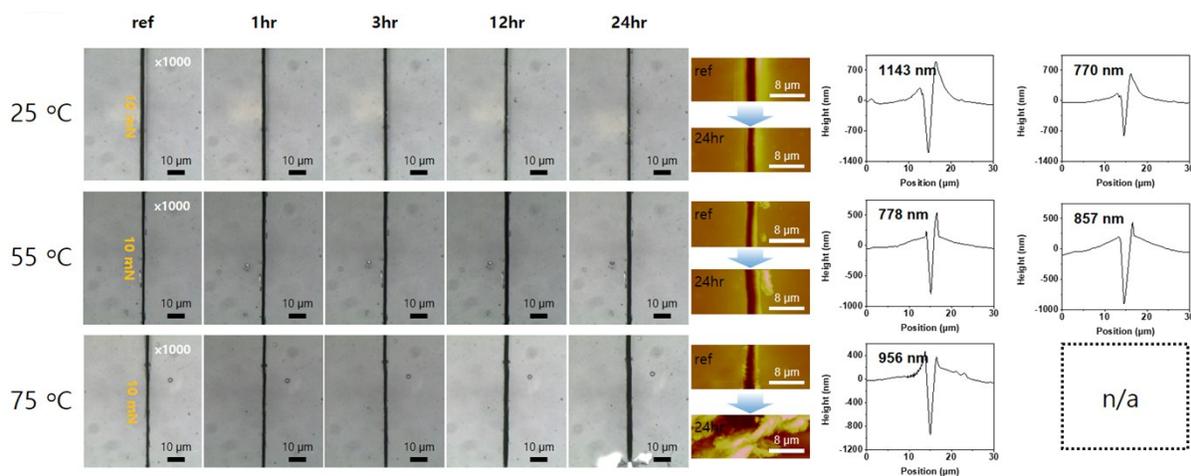


Figure S8. OM images (left), AFM images (middle), and corresponding height profiles (right) of single-scratch self-healing tests for HSP100 at 25, 55, and 75 °C.

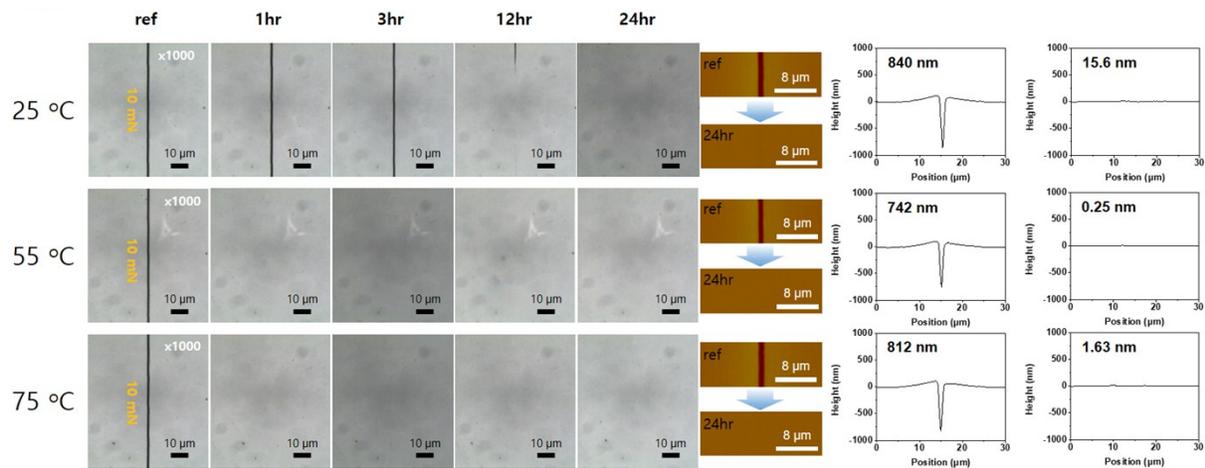


Figure S9. OM images (left), AFM images (middle), and corresponding height profiles (right) of single-scratch self-healing tests for PH0 at 25, 55, and 75 °C.

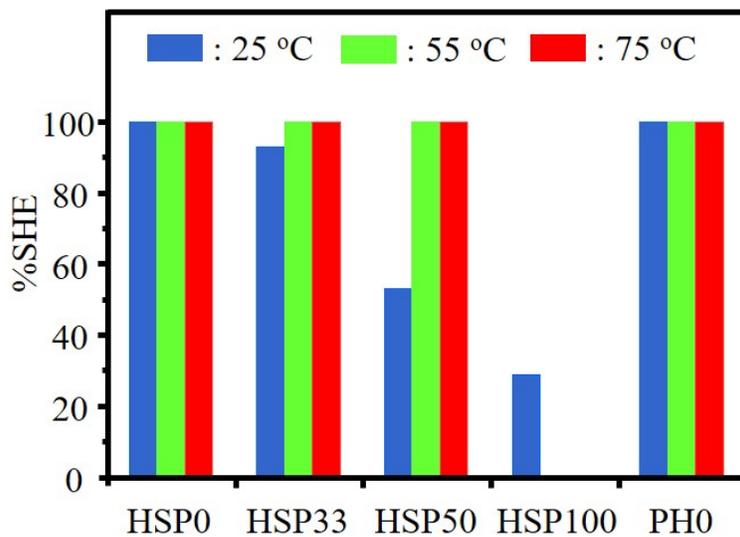


Figure S10. Self-healing efficiency (%SHE) values of HSP0~100 and PH0 obtained from the width changes in single-scratch self-healing tests at 25, 55, and 75 °C.

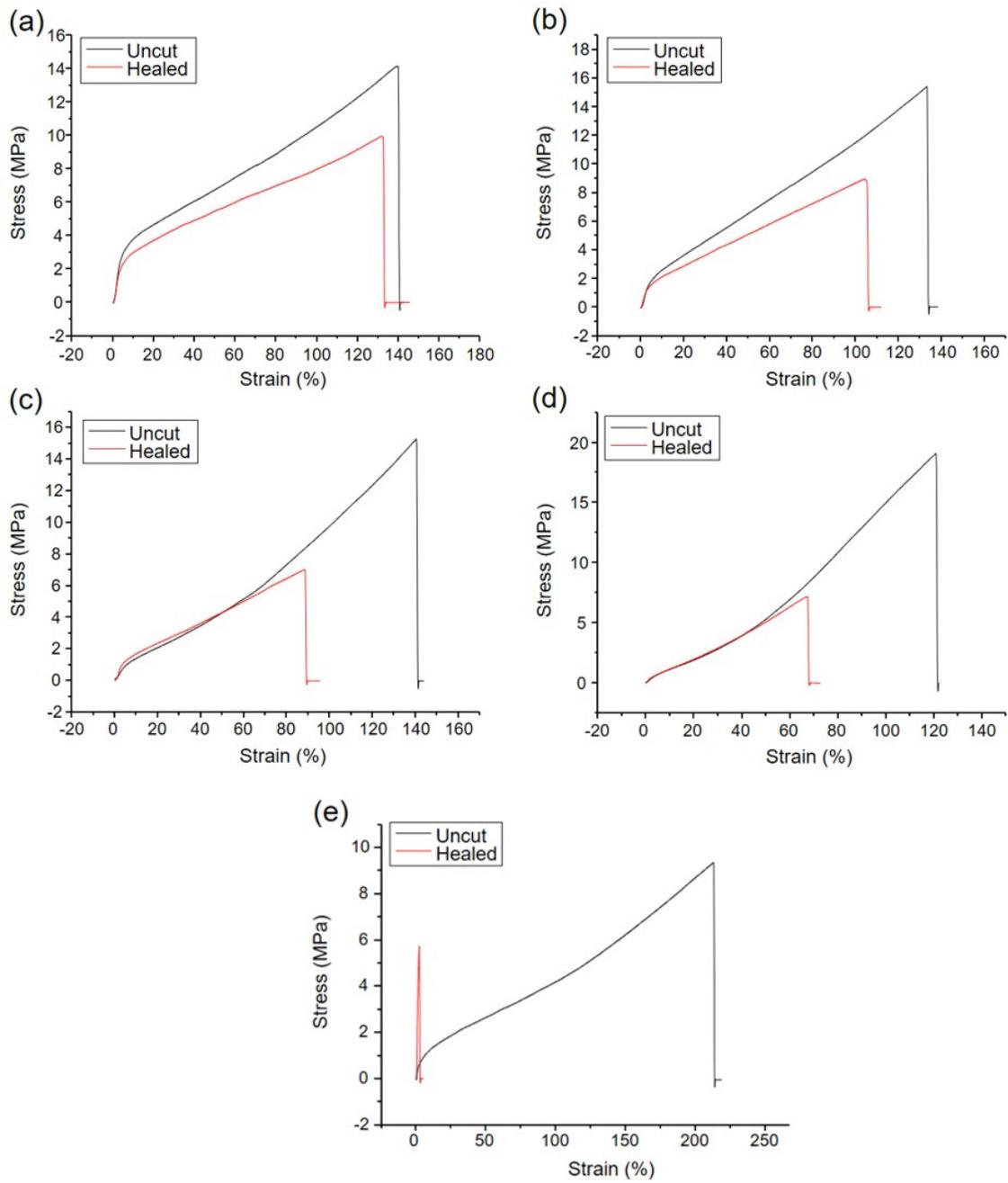


Figure S11. Stress-strain curves for uncut (in black) and self-healed specimens (in red) of (a) HSP0, (b) HSP33, (c) HSP50, (d) HSP100, and (e) PH0 after crosscut and rebonding.