Supporting Information: 3D printable adhesive elastomers with dynamic covalent bond rearrangement

Shiwanka V. Wanasinghe[1,+], Brent Johnson[2,+], Rebekah Revadelo[2], Grant Eifert[2], Allyson Cox[3], Joseph Beckett[5], Timothy Osborn[3], Carl Thrasher[4,*], Robert Lowe[2,*], and Dominik Konkolewicz[1,*]

[1]Department of Chemistry and Biochemistry, Miami University, Oxford, OH 45056
[2]Department of Mechanical and Aerospace Engineering, University of Dayton, Dayton, OH 45469
[3]Additive Manufacturing Technology Development Group, University of Dayton Research Institute, Dayton, OH 45469
[4]Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA 02142
[5]Department of Mechanical Engineering, University of Michigan, Ann Arbor, MI 48109

+Contributed Equally
*Corresponding authors

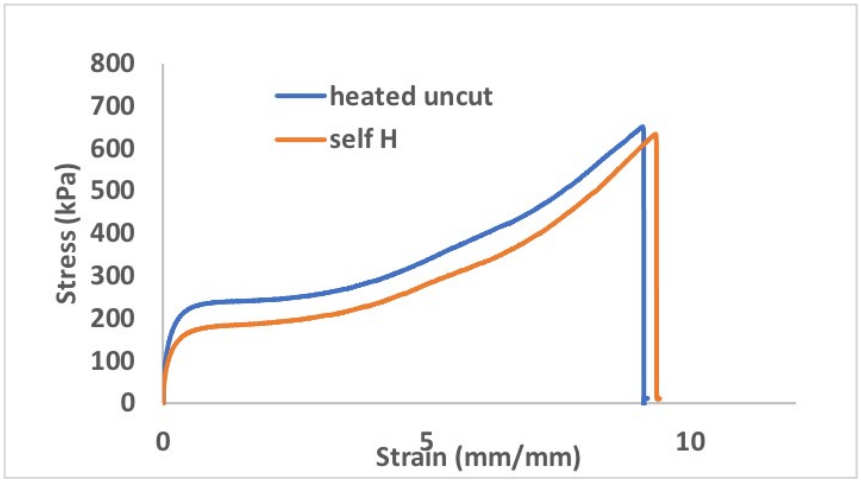

Figure S1: Self-Healing of HEA:BA (100:0) with TMSDA: EDDT (1:1) (Formulation 7)

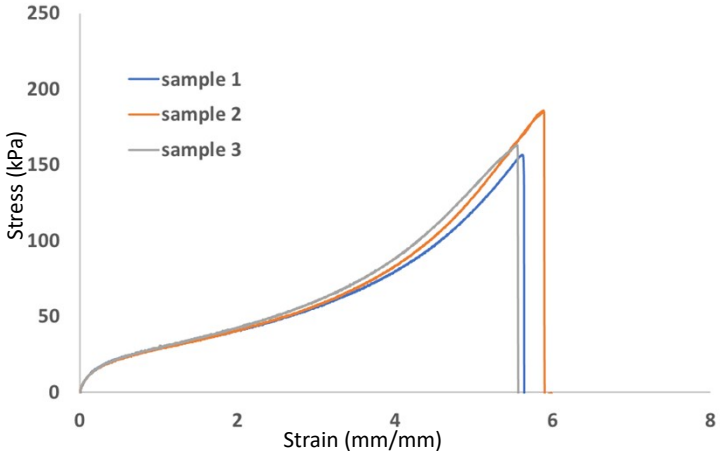

Figure S2: Stress-strain curves for the materials with HEA:BA (100:0) with TMSDA: EDDT (1:0.75) (Formulation 6).

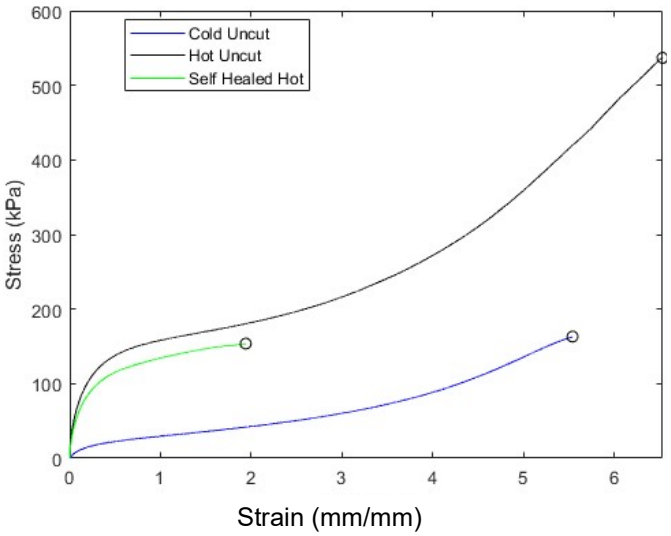

Figure S3: Self-Healing curves of HEA:BA (100:0) with TMSDA: EDDT (1:0.75) (Formulation 6)

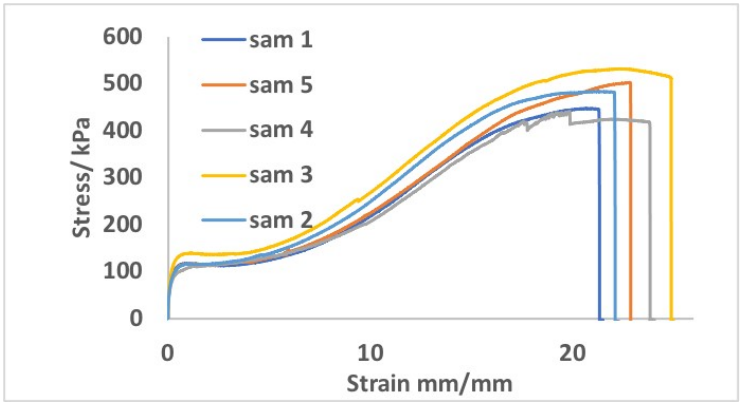

Figure S4: Stress-strain curves for the materials with HEA:BA (100:0) with TMSDA: EDDT as (1:1) (Formulation 7)

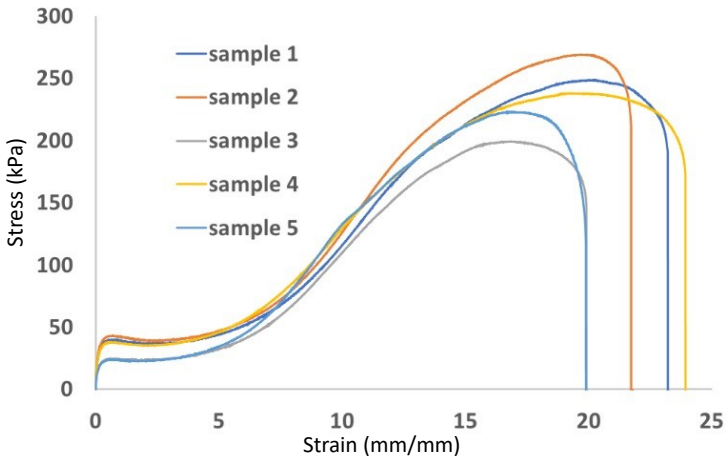

Figure S5: Stress-strain curves for the materials with HEA:BA (80:20) with TMSDA:EDDT (1:1) (Formulation 5)

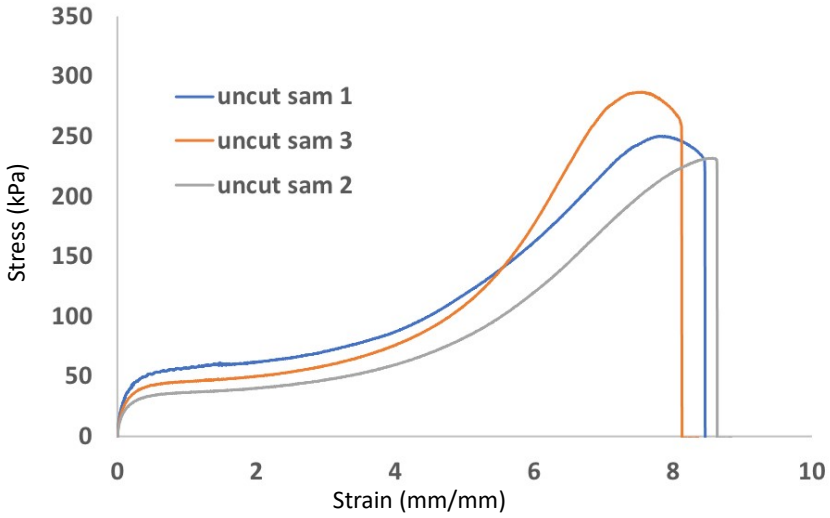

Figure S6: Stress-strain curves for the heated materials with HEA:BA (80:20) with TMSDA:EDDT (1:1) (Formulation 5)

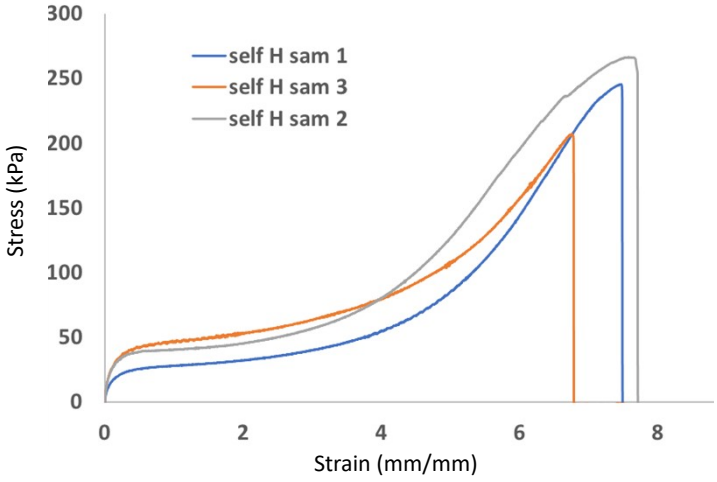

Figure S7: Stress-strain curves for the self-healed materials with HEA:BA (80:20) with TMSDA:EDDT (1:1) (Formulation 5)

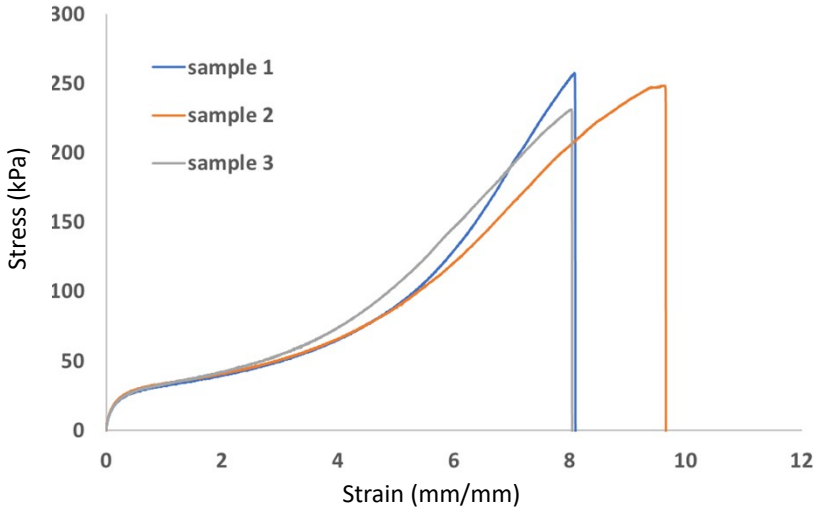

Figure S8: Stress-strain curves for the materials with HEA:BA (80:20) with TMSDA:EDDT (1:0.75) (Formulation 4)

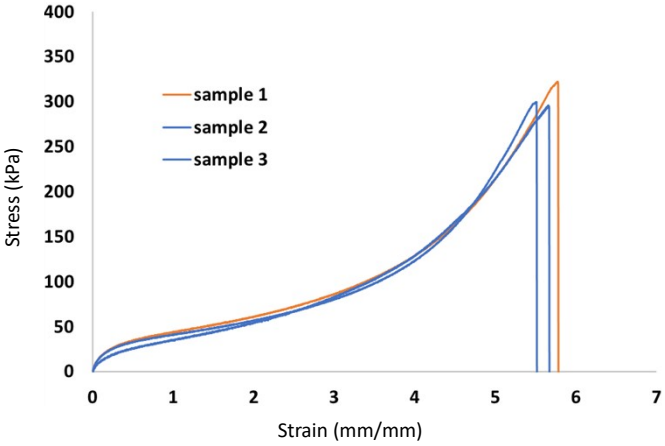

Figure S9: Stress-strain curves for the heated materials with HEA:BA (80:20) with TMSDA:EDDT (1:0.75) (Formulation 4)

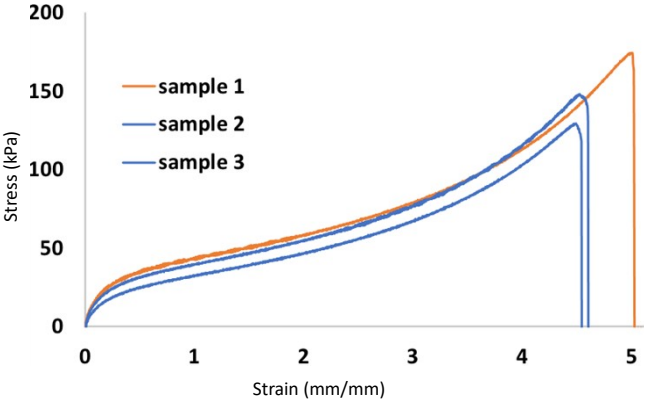

Figure S10: Stress-strain curves for the self-healed materials with HEA:BA (80:20) with TMSDA:EDDT (1:0.75) (Formulation 4)

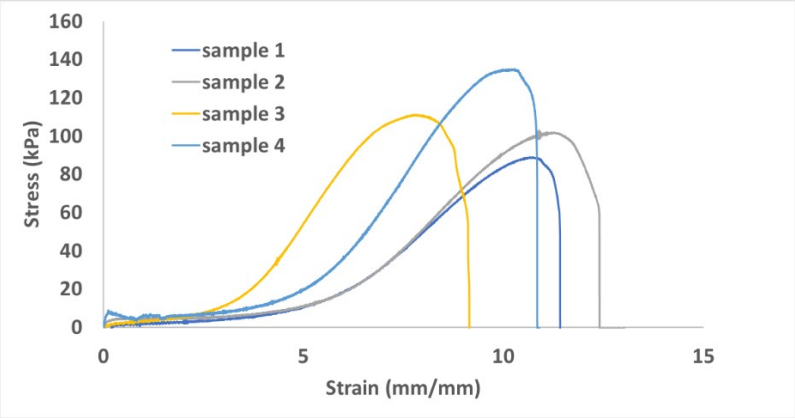

Figure S11: Stress-strain curves for the materials with HEA:BA (50:50) with TMSDA:EDDT (1:1) (Formulation 2)

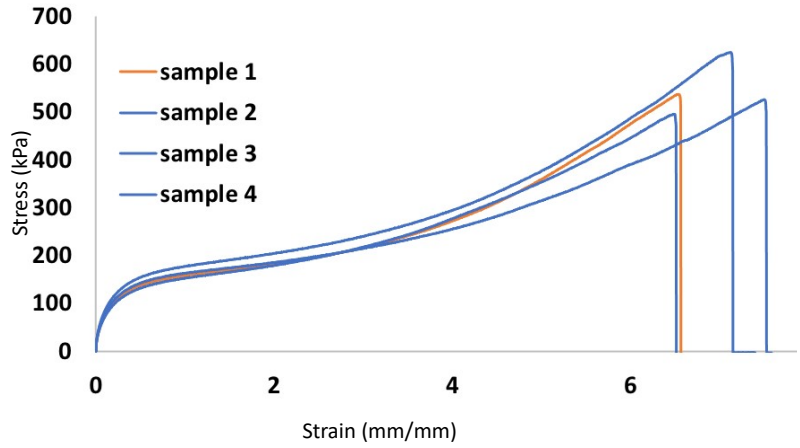

Figure S12: Stress-strain curves for the heated materials with HEA:BA (100:0) with TMSDA:EDDT (1:0.75) (Formulation 6)

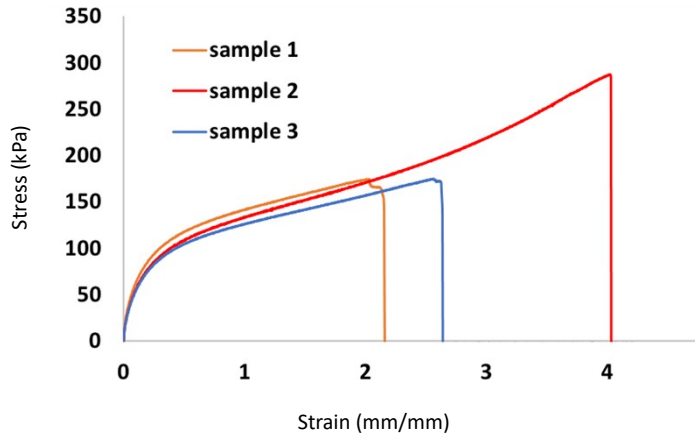

Figure S13: Stress-strain curves for the self-healed materials with HEA:BA (100:0) with TMSDA:EDDT (1:0.75) (Formulation 6)

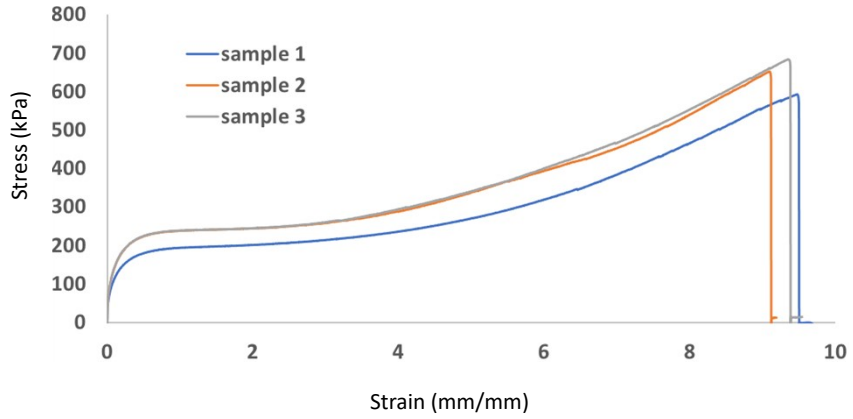

Figure S14: Stress-strain curves for the heated materials with HEA:BA (100:0) with TMSDA:EDDT (1:1) (Formulation 7)

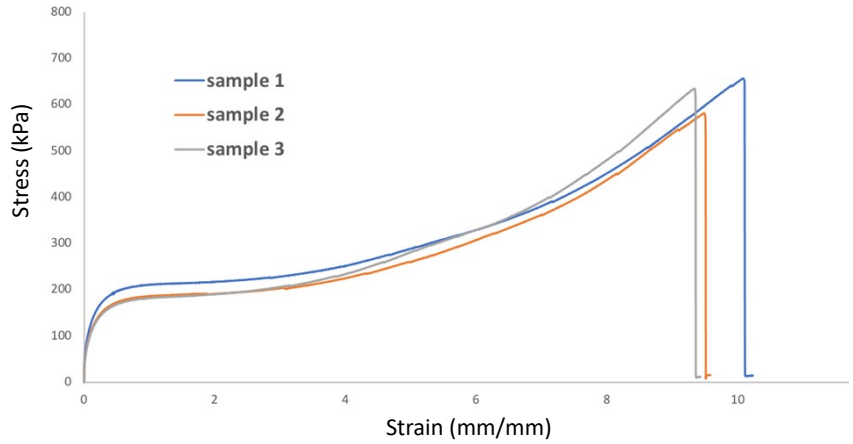

Figure S15: Stress-strain curves for the self-healed materials with HEA:BA (100:0) with TMSDA:EDDT (1:1) (Formulation 7)

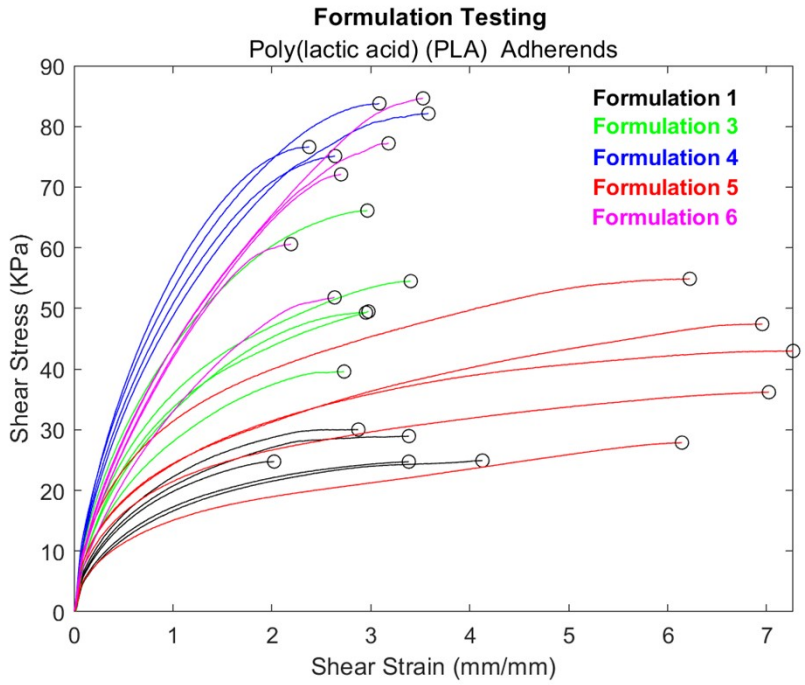

Figure S16: Stress-strain curves for various formulations in lap shear, with 3D-printed PLA as the lap adherend

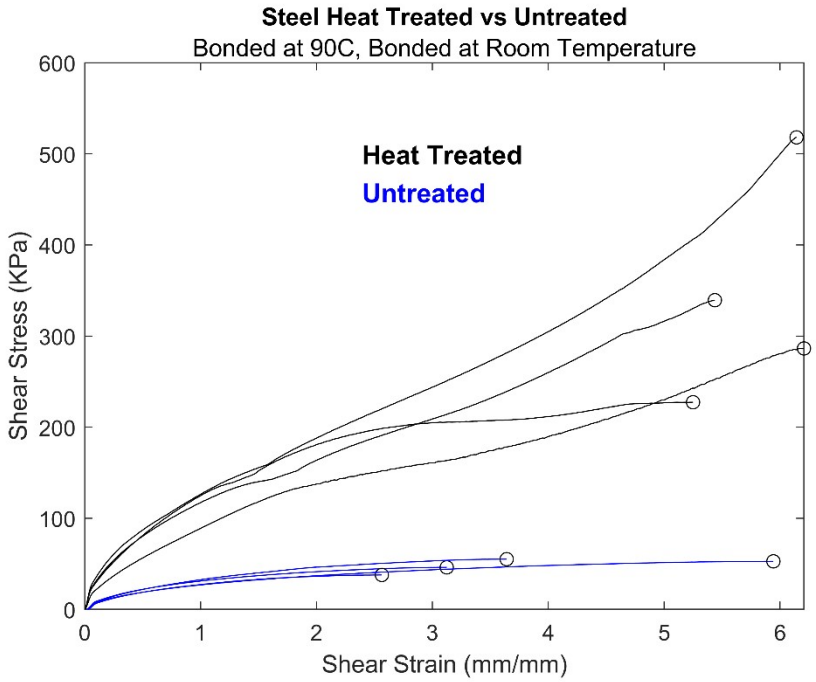

Figure S17: Stress-strain curves for Formulation 4, TMSDA:EDDT (1:0.75) with HEA:BA (80:20), bonded at room temperature and bonded at 90 °C for 16 hours.

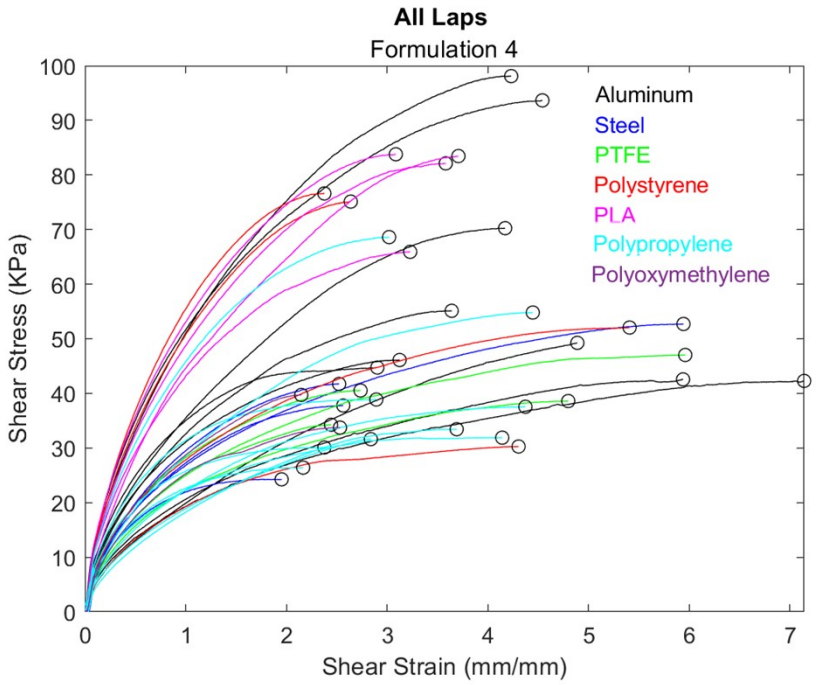

Figure S18: Stress-strain curves for Formulation 4, TMSDA:EDDT (1:0.75) with HEA:BA (80:20), against various lap adherend materials.

Table S1: Percent Method of Failure for different formulations on 3D printed PLA laps

Formulation	Adhesive	Cohesive	Inconclusive*
1	100%		
3	100%		
4	50%	25%	25%
5		80%	20%
6	100%		

**Inconclusive indicated the tester either did not record or could not conclude a failure method (i.e. failure method was not visible / could not be determined, or failure occurred both cohesively and adhesively)*