Supplementary Information (SI) for Green Chemistry.
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Supporting information

Additive Manufacturing via Protein Denaturation

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Table S1. Results from compressive tests on cylinders of BSA with glycerol, BSA with glycerol after post-curing, and BSA after post-curing and hydration.

Sample	Compressive modulus (MPa)	Stress at 60% strain (MPa)
BSA after post-curing at 120 °C and hydration[a]	62 ± 9	53 ± 8
BSA with glycerol after post-curing	60 ± 5	39 ± 4
BSA with glycerol	23 ± 0.6	12 ± 2
BSA with hydration[a]	2.3 ± 0.4	2.9 ± 0.4

a. Without hydration, cylinders were too brittle for the compressive tests.

Table S2. Storage modulus (E') and tanδ of BSA with glycerol with or without post-curing by DMA.

	E' at 25 ˚C (MPa)	Peak at β transition (˚C)	Glass transition (˚C)	Peak at tanδ at glass transition	Crosslinking density (ν_e, kmol/m^3)
BSA with glycerol	159	-45	80	0.387	0.58
BSA with glycerol after post-curing	131	-43	70	0.301	0.61
BSA without glycerol after post-curing and no hydration	616[a]	-[b]	123	0.148	14.41

a. E' at 40 ˚C
b. We were not able to measure β transition for BSA after post-curing and no hydration since the sample became too brittle at low temperature from -80 ˚C.

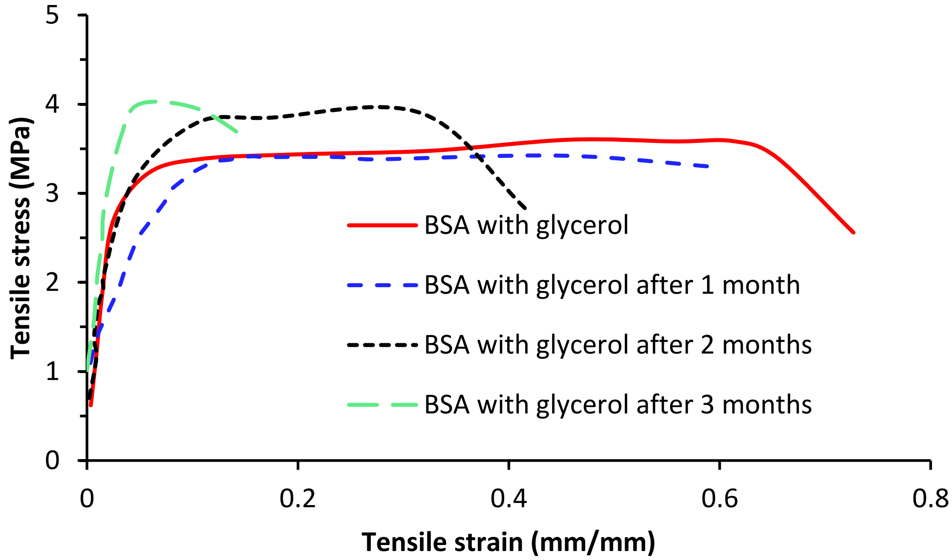

Figure S1. Results from tensile tests on dogbones of BSA with glycerol after aging for 2 weeks, 1 month, 2 months or 3 months under ambient conditions.

Table S3. Results from tensile tests on dogbones of BSA with glycerol after aging for 2 weeks, 1 month, 2 months or 3 months under ambient conditions.

	Young's modulus (MPa)	Ultimate strength (MPa)	Elongation at break (%)	Moisture content (%)
BSA with glycerol (after 2 weeks)	79 ± 17	4 ± 0.3	66 ± 7	10 ± 0.5
BSA with glycerol after 1-month aging	41 ± 9	3 ± 0.4	42 ± 17	13 ± 1.1
BSA with glycerol after 2-month aging	101 ± 23	4 ± 0.4	44 ± 10	12 ± 0.8
BSA with glycerol after 3-month aging	140 ± 47	4.8 ± 1.1	18 ± 9	13 ± 1.5

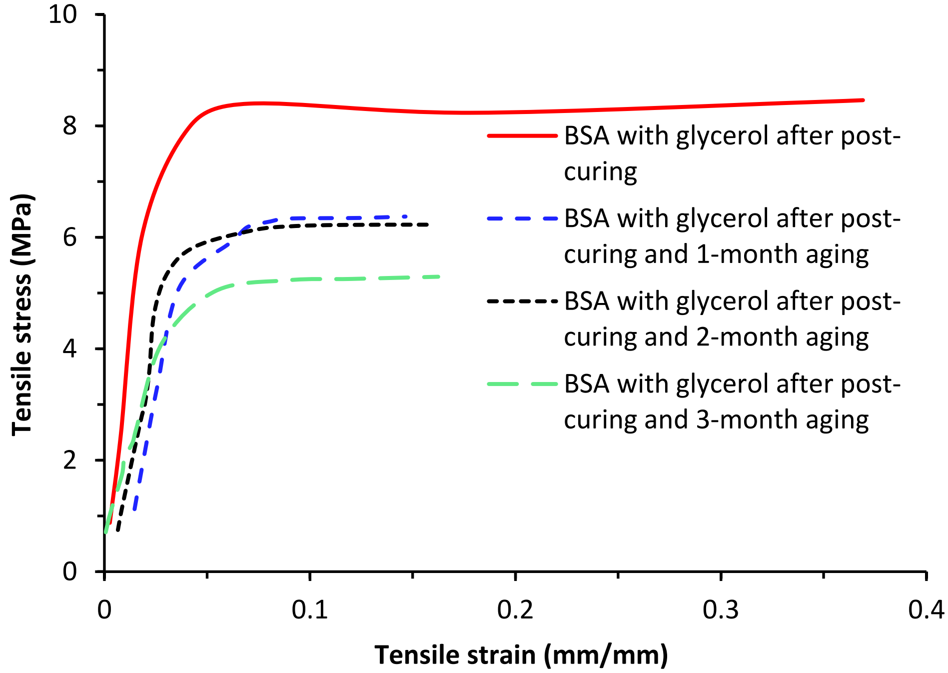

Figure S2. Results from tensile tests on dogbones of BSA with glycerol after post-curing and aging for 2 weeks, 1 month, 2 months or 3 months under ambient conditions.

Table S4. Results from tensile tests on dogbones of BSA with glycerol after post-curing and aging for 2 weeks, 1 month, 2 months or 3 months under ambient conditions.

	Young's modulus (MPa)	Ultimate strength (MPa)	Elongation at break (%)	Moisture content (%)
BSA with glycerol after post-curing (2 days)	233 ± 9	8 ± 1	31 ± 6	8.0 ± 1.4
BSA with glycerol after post-curing and 1-month aging	180 ± 47	5 ± 1	14 ± 2	11.0 ± 0.1
BSA with glycerol after post-curing and 2-month aging	187 ± 39	6 ± 0.3	12 ± 3	11.4 ± 0.4
BSA with glycerol after post-curing and 3-month aging	131 ± 14	5 ± 0.2	20 ± 9	13.4 ± 0.8

Table S5. Degradation profiles of printed BSA cylinders without or after post-curing at 120 ℃.

	Mass (%) after 5 days	Mass (%) after 10 days	Mass (%) after 13 days	Mass (%) after 17 days
Cylinders without post-curing	64.5 ± 13.3	12.0 ± 8.7	0	-
Cylinders after post-curing	71.4 ± 5.0	33.1 ± 6.7	-	0

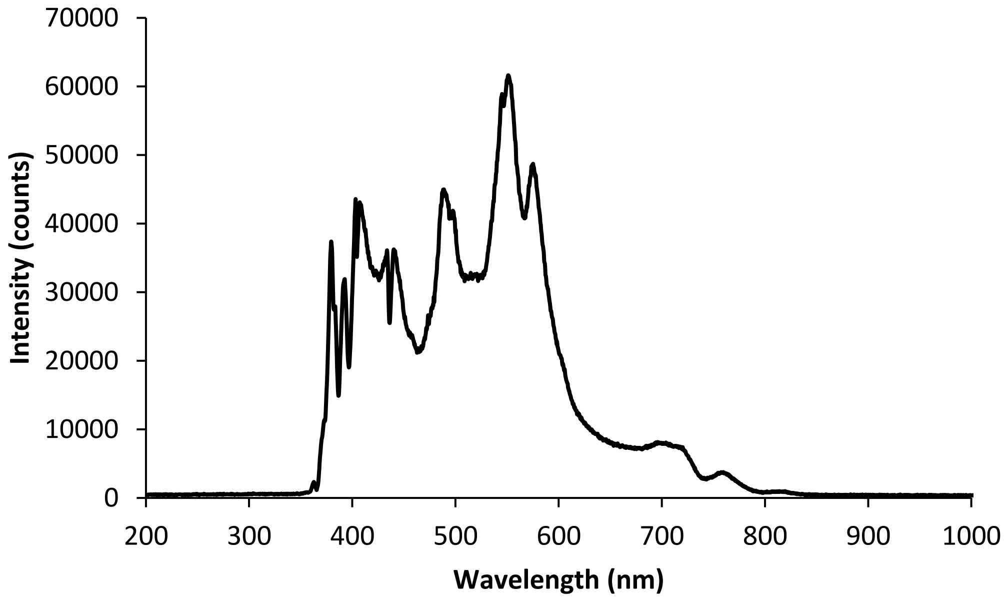

Figure S3. Emission spectrum of the DLP projector for HAPPI.