

3D Printing of Sustainable Infrastructure using Rapid-Set Clay

Concrete with Biobased Additives

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Supporting Information

Video 1: Printing and compression of 3D printed uncured concrete wall.

Video 2: Printing, slump, and compression of uncured 3D printed hollow pyramid.

Video 3: Printing, slump, and compression of 3D printed uncured hollow concrete box with roof compared to the printing and compression of frontal polymerized 3D printed hollow concrete box with roof.

Video 4: Printing of rapid-set concrete over a gap.

Video 5: Printing of rapid-set concrete wall.

Video 6: Printing of rapid-set concrete Pyramid.

Video 7: Printing of rapid-set freestanding concrete structure.

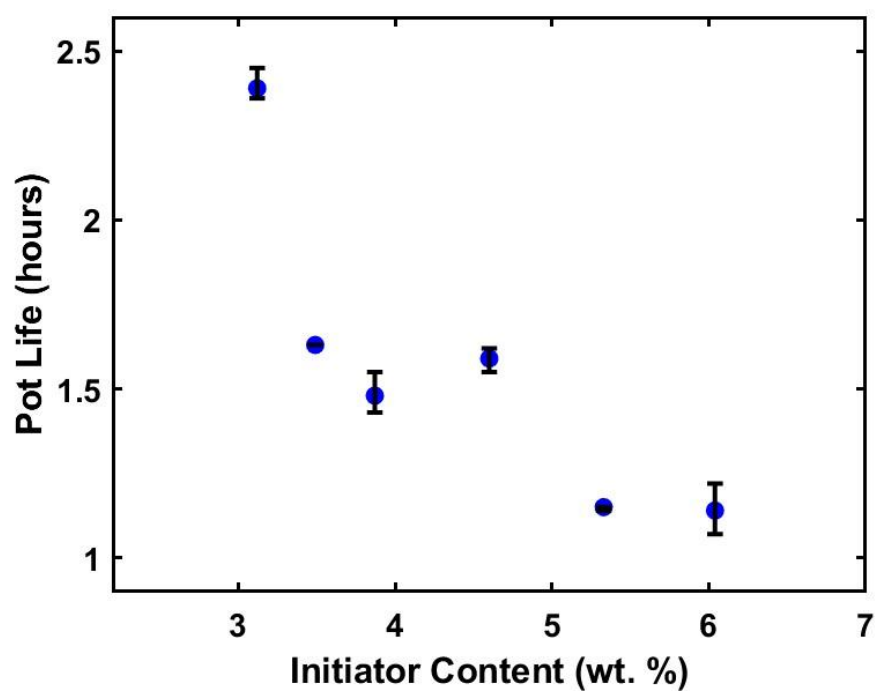


Figure S1: Pot life of clay concrete versus polymer initiator content.

Table S1: Cost Analysis of the mixture used in this work.

Component		Wholesale Cost (\$/kg)	grams		Wt. %
Sample Mass (g)			64.62	-	Cost per component
Soil	k30	\$1.00	45	69.64%	
Monomer	Acrylamide	\$12.50	7.65	11.84%	\$0.05
Crosslinker	Methylenebisacrylamide	\$9.00	0.77	1.18%	\$0.10
Initiator	Ammonium Persulfate	\$0.50	2.104	3.26%	\$0.01
Water	tap	\$0.00	8.20	12.69%	\$0.00
Hemp	0.5-1 mm	\$4.40	0.3	0.46%	\$0.00
Biochar	pine	\$0.00	0.3	0.46%	\$0.00
Lueco-dye	black to pink	N/A	0.3	0.46%	\$0.00
Total Cost (USD)					
Cost per unit mass (USD/kg)					\$0.15