Supporting Information

Research on the comparison properties of PDMS Specimens Demolding Processes and the mechanical Performance of Hollow-Solid Ratios of flexible telescopic rods
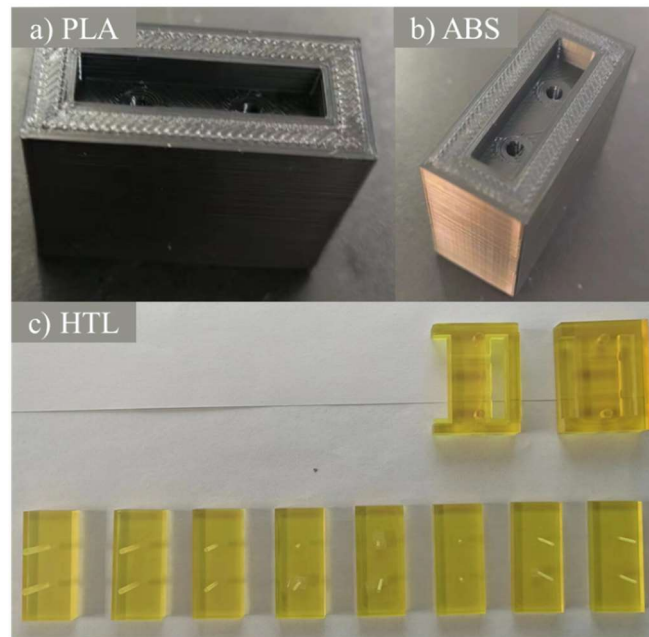
Figure S1. (a, b, c) respectively representing PLA-mold, ABS-mold, HTL-mold.

Table S1. Mechanical parameters of PDMS.

Material	Density (kg/m³)	Poisson's ratio	Young's modulus (MPa)
Sylgard 184	0.97	0.49	1.47

Table S2. The test-bar size difference between design and fabrication.

Exp.no.	Sample hollow rod height: (mm)				Sample hollow rod radius: (mm)				Mold-material
	Designed	Molding	Difference	%Increase/decrease	Designed	Molding	Difference	%Increase/decrease	
1	0	0	0	0	0.5	0.49	0.01	-2%	HTL
2	3.75	3.74	0.01	-0.27%	0.5	0.49	0.01	-2%	HTL
3	7.5	7.49	0.01	-0.13%	0.5	0.49	0.01	-2%	HTL
4	11.25	11.23	0.02	-0.18%	0.5	0.5	0	0	HTL
5	15	14.97	0.03	-0.2%	0.5	0.49	0.01	-2%	HTL
6	7.5	7.48	0.02	-0.27%	0.6	0.59	0.01	-1.67%	HTL
7	7.5	7.49	0.01	-0.13%	0.7	0.68	0.02	-2.86%	HTL
8	7.5	7.51	0.01	+0.13%	0.8	0.78	0.02	-2.5%	HTL
9	7.5	7.61	0.11	+1.46%	0.5	0.55	0.05	10%	ABS
10	7.5	7.63	0.13	+1.72%	0.5	0.57	0.07	14%	PLA

Table S3. Material models of PDMS and their corresponding material constants obtained from experimental data.

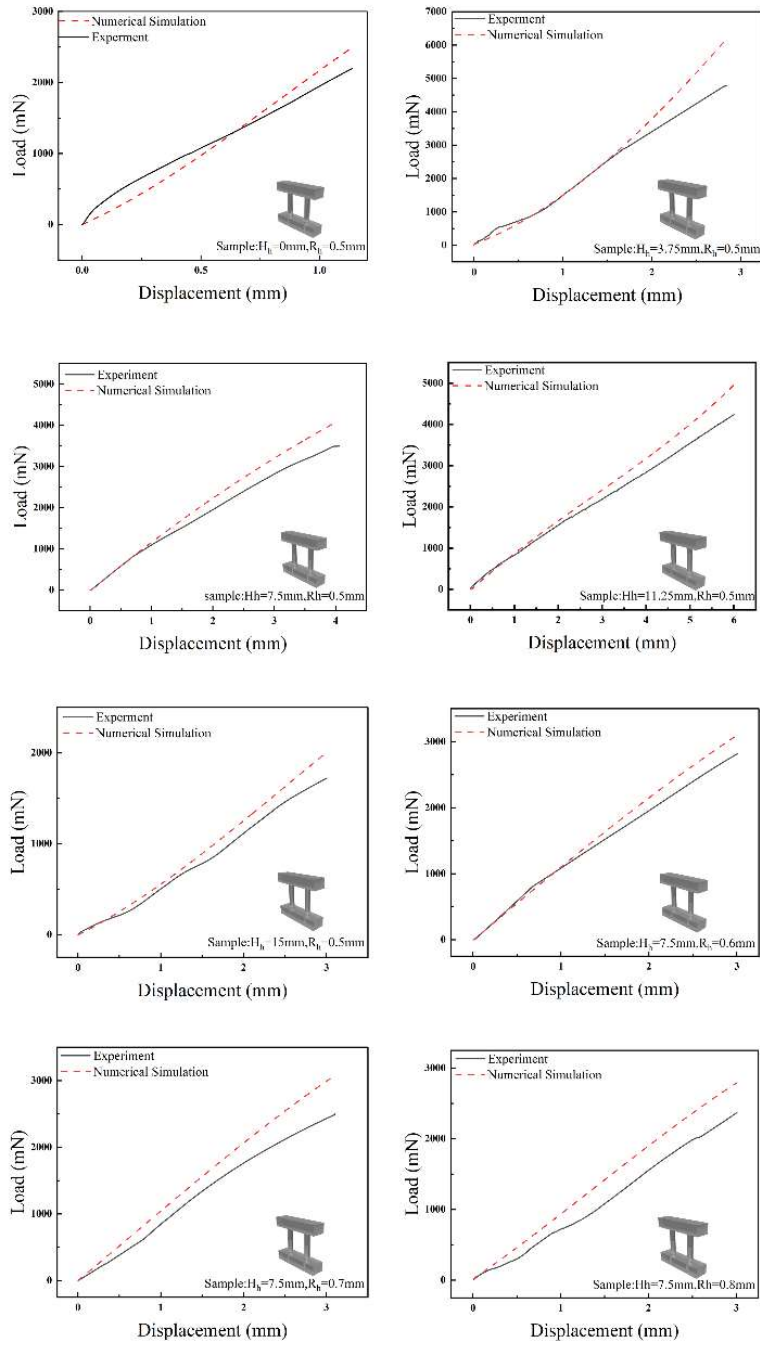| Material model	Material constants	PDMS-AB(base polymer:curing agent)
Mooney-Rivlin	$C01$(MPa)	-1.6047
	$C10$(MPa)	2.0019
Neo-Hooken	Initial shear Modulus μ(MPa)	1.1994
	Incompressibility parameter D_1	0
Yeoh	Incompressibility parameter D_1	0
	$C10$(MPa)	0.59968
Odgen	Incompressibility parameter D_1	0
	α	6.0593
	μ(MPa)	0.24937

Figure S2. Experimental load-displacement curves of telescopic rod of different heights of hollow rod.

(a) H_h = 0 mm, R_h = 0.5 mm, (b) H_h = 3.75 mm, R_h = 0.5 mm. (c) H_h = 7.5 mm, R_h = 0.5 mm. (d) H_h = 11.25 mm, R_h = 0.5 mm.

(e) H_h = 15 mm, R_h = 0.5 mm. (f) H_h = 7.5 mm, R_h = 0.6 mm. (g) H_h = 7.5 mm, R_h = 0.7 mm. (h) H_h = 7.5 mm, R_h = 0.8 mm.
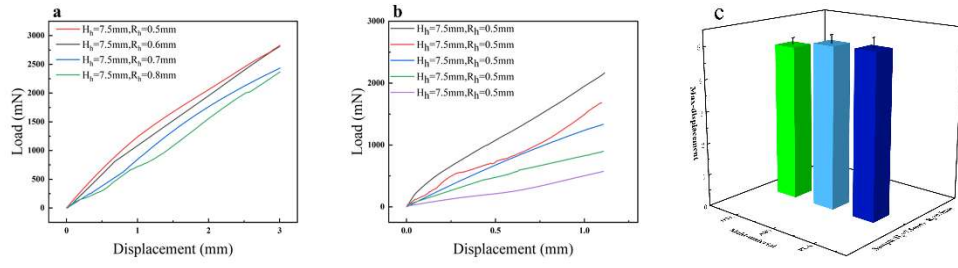
Figure S3. (a) Comparison of experimental load-displacement curves of hollow telescopic rods of different radii.

(b) Comparison of experimental load-displacement curves of hollow telescopic rods of different heights.

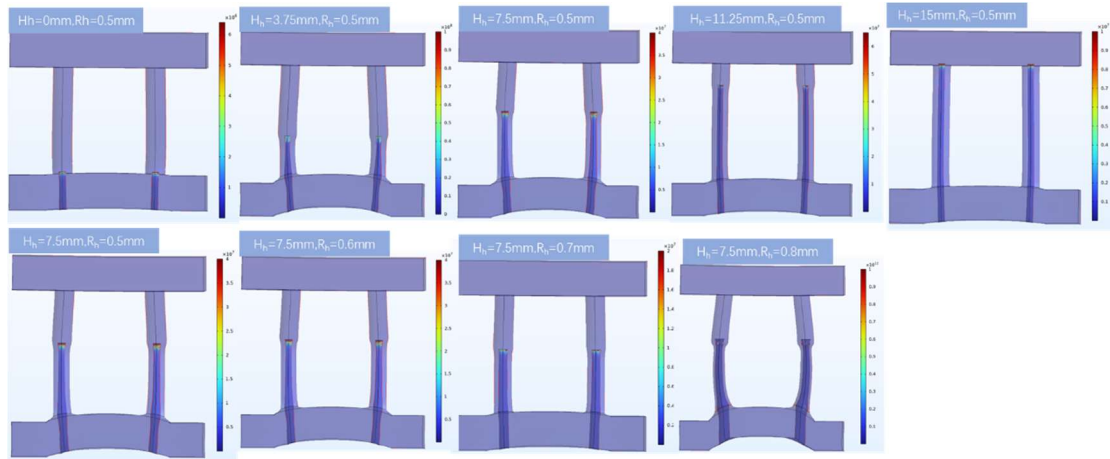(c) Comparison of maximum stretch-displacement of specimens produced via various turn-flipped-molding processes.

Figure S4. strain of FEA-cloud-map.