< Supplementary Materials >

Study of Shape Memory and Tensile Property of 3D Printed Sinusoidal Sample/Nylon Composite Focused on Various Thickness and Shape Memory Cycle

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Table S1. Visual demonstration of shape change at three STEPs and corresponding shape recovery ratio of 0.2SM/NF during various cycles.

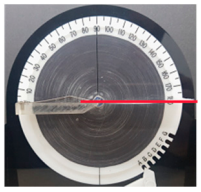
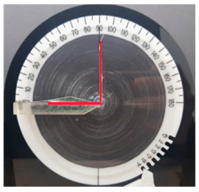
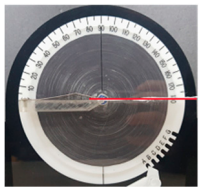
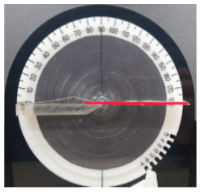
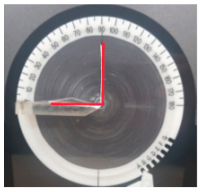
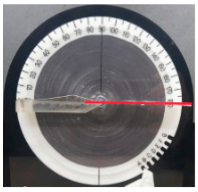
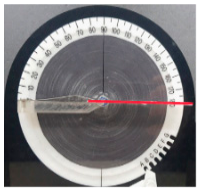
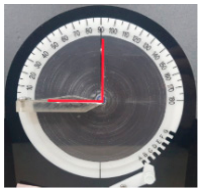
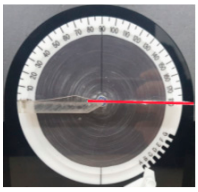
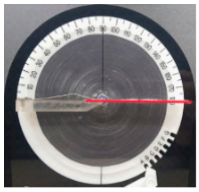
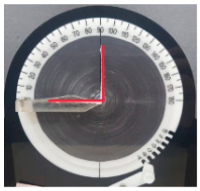
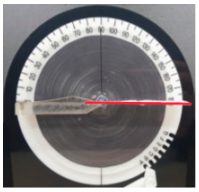
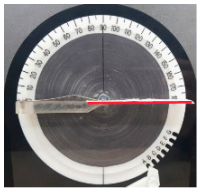
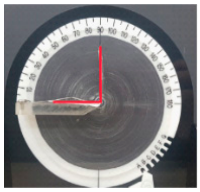
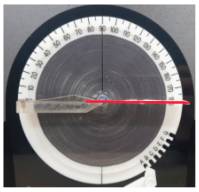
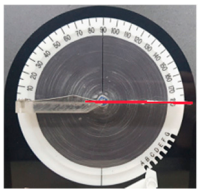
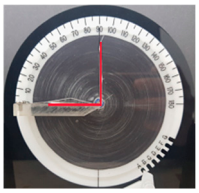
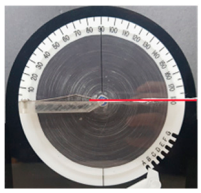
0.2SM/NF				
	STEP-1 (Angle: 0°)	STEP-2 (Angle: 90°)	STEP-3 (Angle: 0°)	Shape recovery (%)
Cycle-01				100
Cycle-10				100
Cycle-20				100
Cycle-30				100
Cycle-40				100
Cycle-50				100

Table S2. Visual demonstration of shape change at three STEPs and corresponding shape recovery ratio of 0.4SM/NF during various cycles.

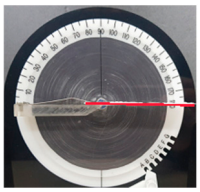
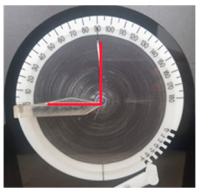
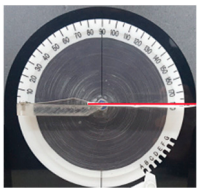
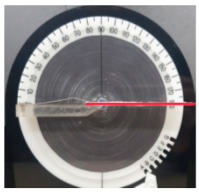
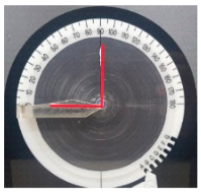
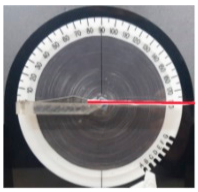
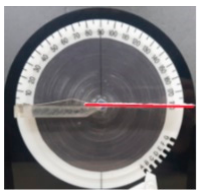
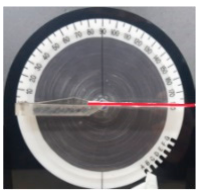
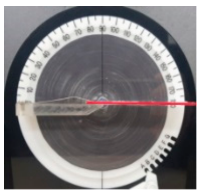
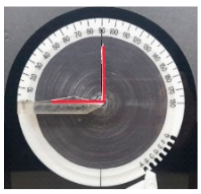
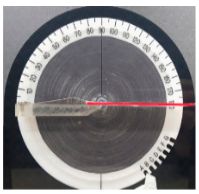
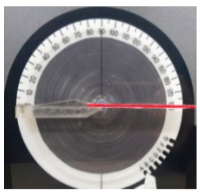
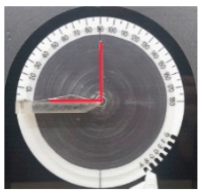
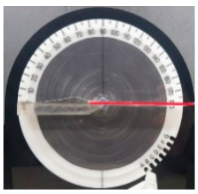
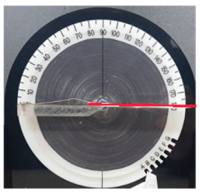
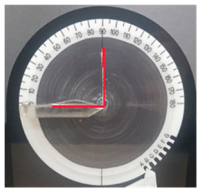
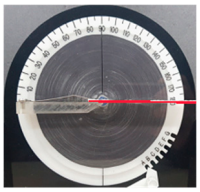
	0.4SM/NF			
	STEP-1 (Angle: 0°)	STEP-2 (Angle: 90°)	STEP-3 (Angle: 0°)	Shape recovery (%)
Cycle-01				100
Cycle-10				100
Cycle-20				100
Cycle-30				100
Cycle-40				100
Cycle-50				100

Table S3. Visual demonstration of shape change at three STEPs and corresponding shape recovery ratio of 0.6SM/NF during various cycles.

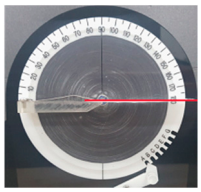
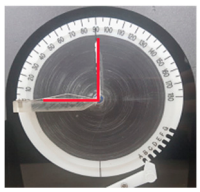
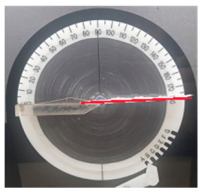
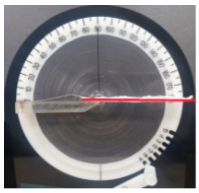
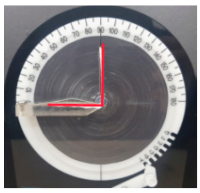
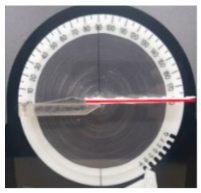
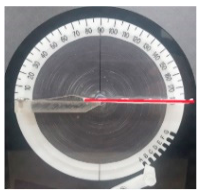
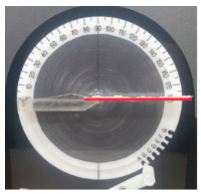
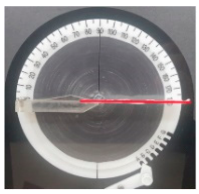
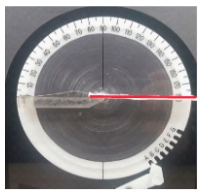
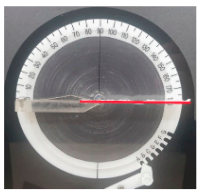
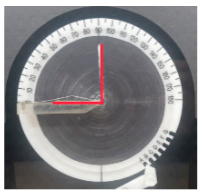
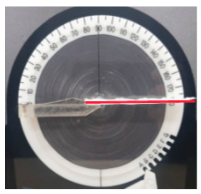
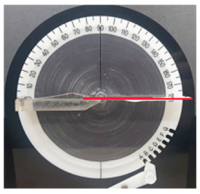
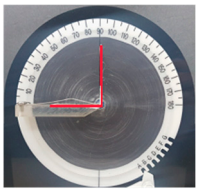
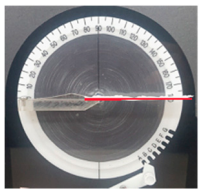
	0.6SM/NF			
	STEP-1 (Angle: 0°)	STEP-2 (Angle: 90°)	STEP-3 (Angle: 0°)	Shape recovery (%)
Cycle-01				100
Cycle-10				100
Cycle-20				100
Cycle-30				100
Cycle-40				100
Cycle-50				100

Table S4. Visual demonstration of shape change at three STEPs and corresponding shape recovery ratio of 0.8SM/NF during various cycles.

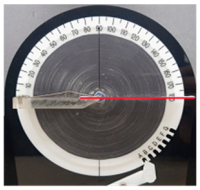
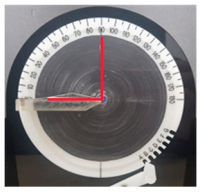
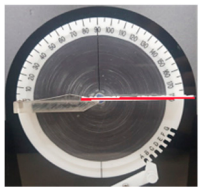
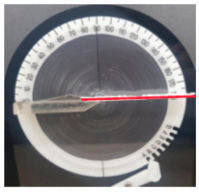
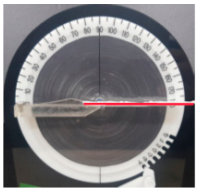
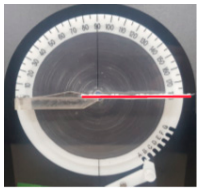
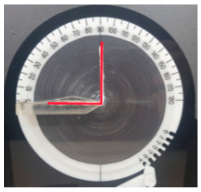
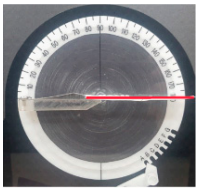
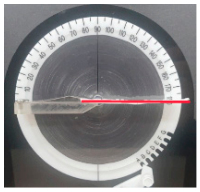
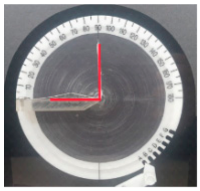
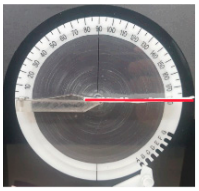
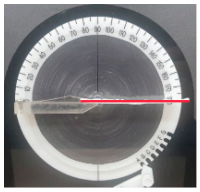
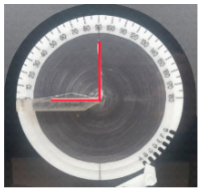
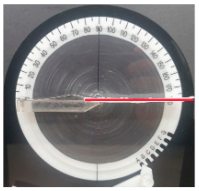
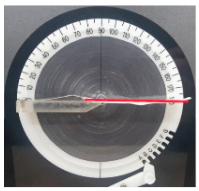
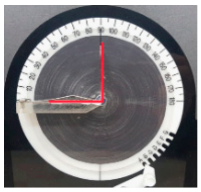
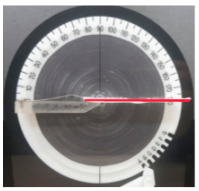
	0.8SM/NF			
	STEP-1 (Angle: 0°)	STEP-2 (Angle: 90°)	STEP-3 (Angle: 0°)	Shape recovery (%)
Cycle-01				100
Cycle-10				100
Cycle-20				100
Cycle-30				100
Cycle-40				100
Cycle-50				100

Table S5. Visual demonstration of shape change at three STEPs and corresponding shape recovery ratio of 1.0SM/NF during various cycles.

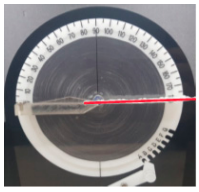
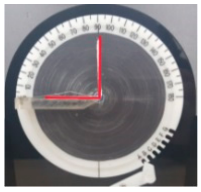
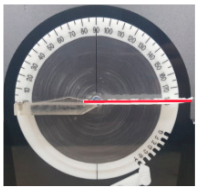
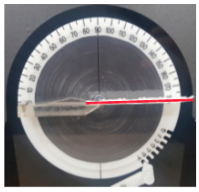
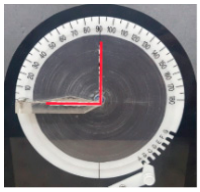
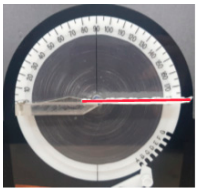
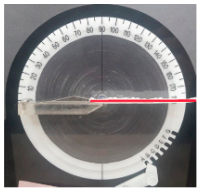
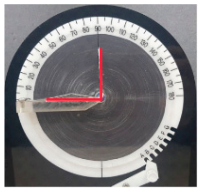
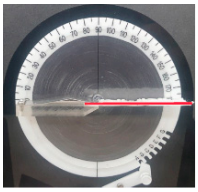
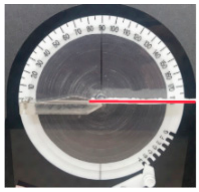
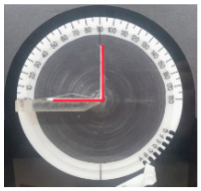
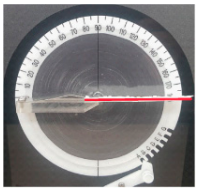
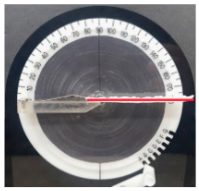
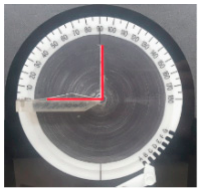
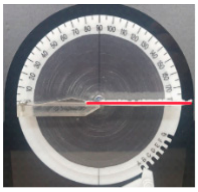
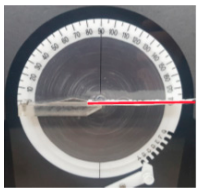
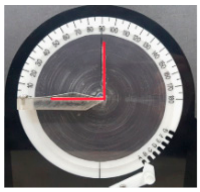
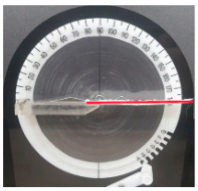
1.0SM/NF				
	STEP-1 (Angle: 0°)	STEP-2 (Angle: 90°)	STEP-3 (Angle: 0°)	Shape recovery (%)
Cycle-01				100
Cycle-10				100
Cycle-20				100
Cycle-30				100
Cycle-40				100
Cycle-50				100

Table S6. Visual demonstration of shape recovery process of 3D printed sinusoidal sample/nylon composite with various thickness during 1st cycle.

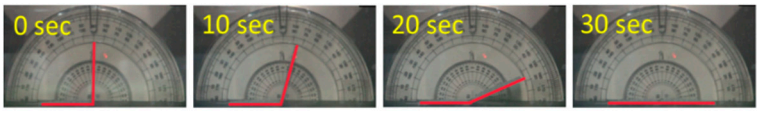
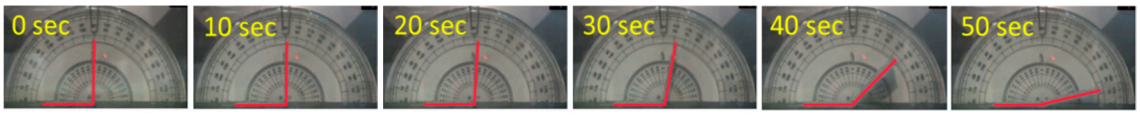
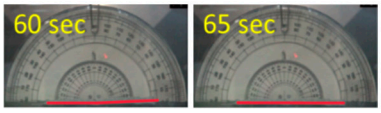
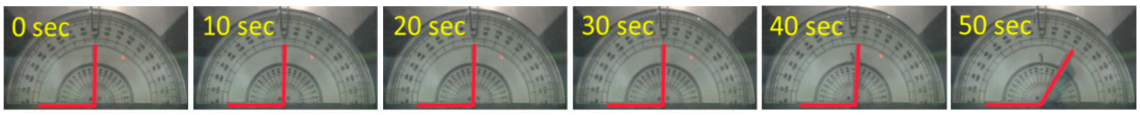
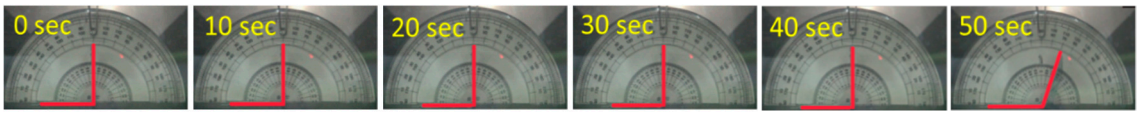
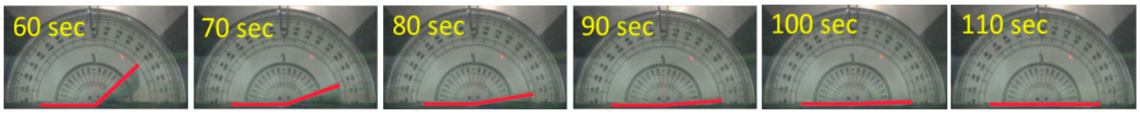
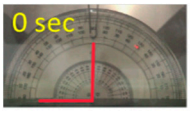
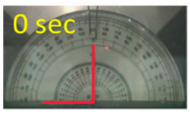
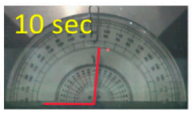
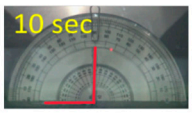
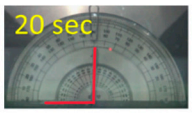
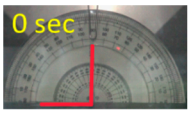
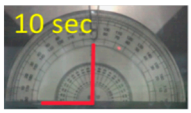
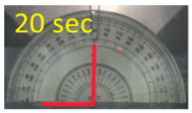
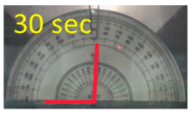
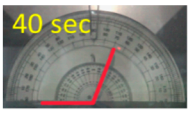
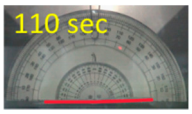
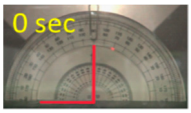
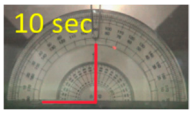
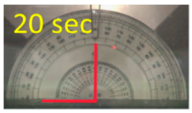
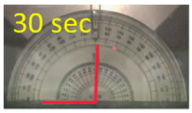
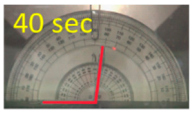
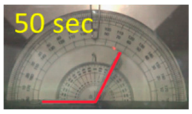
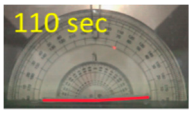
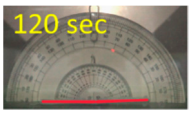
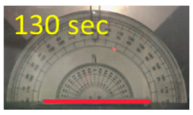
0.2SM/NF					–	–
	Angle: 0°	Angle: 15°	Angle: 67°	Angle: 90°	–	–
0.4SM/NF						–
	Angle: 0°	Angle: 03°	Angle: 20°	Angle: 67°	Angle: 90°	–
0.6SM/NF						
	Angle: 0°	Angle: 01°	Angle: 04°	Angle: 11°	Angle: 45°	Angle: 77°
			–	–	–	–
	Angle: 88°	Angle: 90°	–	–	–	–
0.8SM/NF						
	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 05°	Angle: 30°
						–
	Angle: 65°	Angle: 78°	Angle: 85°	Angle: 88°	Angle: 90°	–
1.0SM/NF						
	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 20°
						
	Angle: 50°	Angle: 72°	Angle: 81°	Angle: 86°	Angle: 88°	Angle: 90°

Table S7. Visual demonstration of shape recovery process of 3D printed sinusoidal sample/nylon composite with various thickness during 50th cycle.

0.2SM/NF						–
	Angle: 0°	Angle: 08°	Angle: 45°	Angle: 85°	Angle: 90°	–
0.4SM/NF						
	Angle: 0°	Angle: 05°	Angle: 12°	Angle: 50°	Angle: 83°	Angle: 90°
0.6SM/NF						
	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 19°	Angle: 56°	Angle: 80°
			–	–	–	–
	Angle: 87°	Angle: 90°	–	–	–	–
0.8SM/NF						
	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 02°	Angle: 20°	Angle: 45°
						
	Angle: 67°	Angle: 77°	Angle: 82°	Angle: 85°	Angle: 87°	Angle: 89°
		–	–	–	–	–
	Angle: 90°	–	–	–	–	–
1.0SM/NF						
	Angle: 0°	Angle: 0°	Angle: 0°	Angle: 01°	Angle: 07°	Angle: 26°
						
	Angle: 52°	Angle: 70°	Angle: 79°	Angle: 82°	Angle: 84°	Angle: 86°
			–	–	–	–
	Angle: 88°	Angle: 90°	–	–	–	–

Video S1-S5 show the shape recovery process of 3D printed sinusoidal sample/nylon composite with various thickness during 1st cycle: 0.2SM/NF (Video S1), 0.4SM/NF (Video S2), 0.6SM/NF (Video S3), 0.8SM/NF (Video S4) and 1.0SM/NF (Video S5). All the videos were sped up by 4x.