

1 Article

2 **Mimicking the Mechanical Properties of Aortic**  
 3 **Tissue with Pattern-Embedded 3D Printing for a**  
 4 **Realistic Phantom**

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12 **Table 1.** Mean and standard deviation of the R-square and RMSE values of the polynomial fitting of  
 13 the tensile test results of the base materials.

Materials	R-Square	RMSE
Agilus	0.9999 ± 0	0.0127 ± 0.0008
VeroCyan	0.9957 ± 0.0008	0.0019 ± 0.0002
Dragonskin 30	0.9999 ± 0.0001	0.0044 ± 0.0031
TPU 94A	0.9962 ± 0.0007	0.5998 ± 0.1136

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15 **Table 2.** Mean and standard deviation of the R-square and RMSE values of the polynomial fitting of  
 16 the tensile test results of the specimens with embedded patterns.

Materials	Diameter (mm)	Pattern Type	R-Square	RMSE
Agilus-VeroCyan	0.7	A major	0.9996 ± 0.0004	0.0034 ± 0.0021
		A minor	0.9947 ± 0.0034	0.0094 ± 0.0030
		B major	0.9984 ± 0.0021	0.0075 ± 0.0047
		B minor	0.9988 ± 0.0005	0.0064 ± 0.0012
		C	0.9998 ± 0.0001	0.0023 ± 0.0006
Dragonskin 30–TPU 94A	0.7	A major	0.9997 ± 0.0004	0.0049 ± 0.0013
		A minor	0.9999 ± 0	0.0035 ± 0.0004
		B major	0.9995 ± 0.0004	0.0082 ± 0.0029
		B minor	0.9996 ± 0.0004	0.0062 ± 0.0028
		C	0.9995 ± 0.0002	0.0075 ± 0.0020
Agilus-VeroCyan	1.4	A major	0.9999 ± 0.0001	0.0034 ± 0.0013
		A minor	0.9998 ± 0.0001	0.0043 ± 0.0003
		B major	0.9998 ± 0.0002	0.0101 ± 0.0059
		B minor	0.9993 ± 0.0011	0.0034 ± 0.0035
		C	0.9998 ± 0.0002	0.0094 ± 0.0023
Dragonskin 30–TPU 94A	1.4	A major	0.9995 ± 0.0002	0.0105 ± 0.0030
		A minor	0.9998 ± 0.0002	0.0049 ± 0.0022
		B major	0.9998 ± 0.0001	0.0060 ± 0.0014
		B minor	0.9990 ± 0.0007	0.0101 ± 0.0045
		C	0.9986 ± 0.0010	0.0178 ± 0.0059

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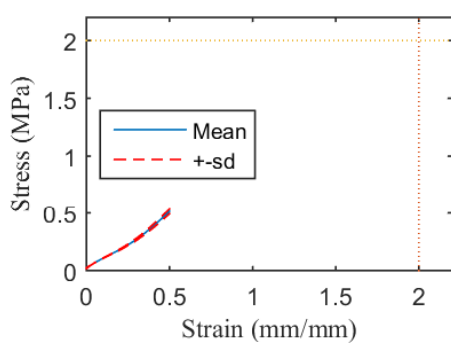
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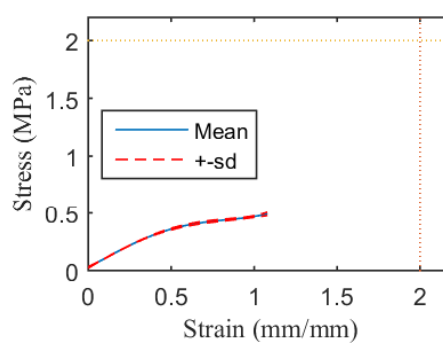
**Table 3.** Mean and standard deviation of the R-square and RMSE values from the polynomial fitting of the tensile test results of the patterned TPU 94A specimens.

Diameter (mm)	Pattern Type	R-Square	RMSE
0.7	A major	$0.9983 \pm 0.0004$	$0.0476 \pm 0.0001$
	A minor	$0.9994 \pm 0.0001$	$0.0216 \pm 0.0048$
	B major	$0.9974 \pm 0.0004$	$0.0661 \pm 0.0018$
	B minor	$0.9992 \pm 0.0001$	$0.0281 \pm 0.0010$
	C	$0.9986 \pm 0.0002$	$0.0613 \pm 0.0032$
1.4	A major	$0.9987 \pm 0.0001$	$0.0373 \pm 0.0011$
	A minor	$0.9999 \pm 0$	$0.0084 \pm 0.0005$
	B major	$0.9983 \pm 0.0001$	$0.0631 \pm 0.0036$
	B minor	$0.9969 \pm 0.0004$	$0.0556 \pm 0.0048$
	C	$0.9978 \pm 0.0003$	$0.0799 \pm 0.0051$

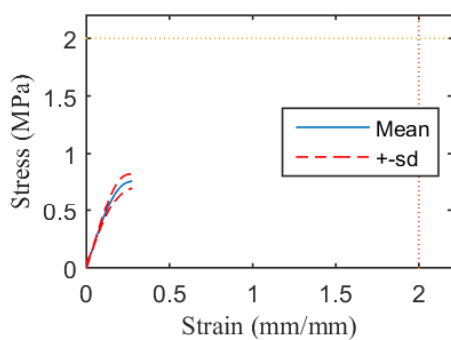
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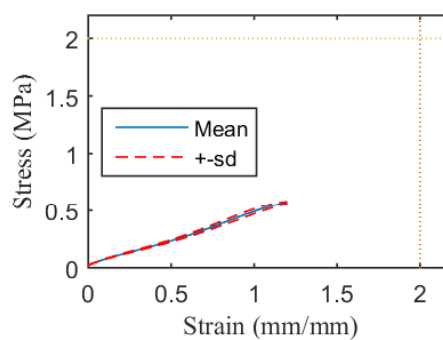
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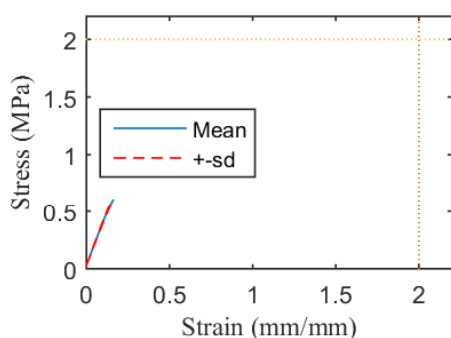
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(c)



(d)

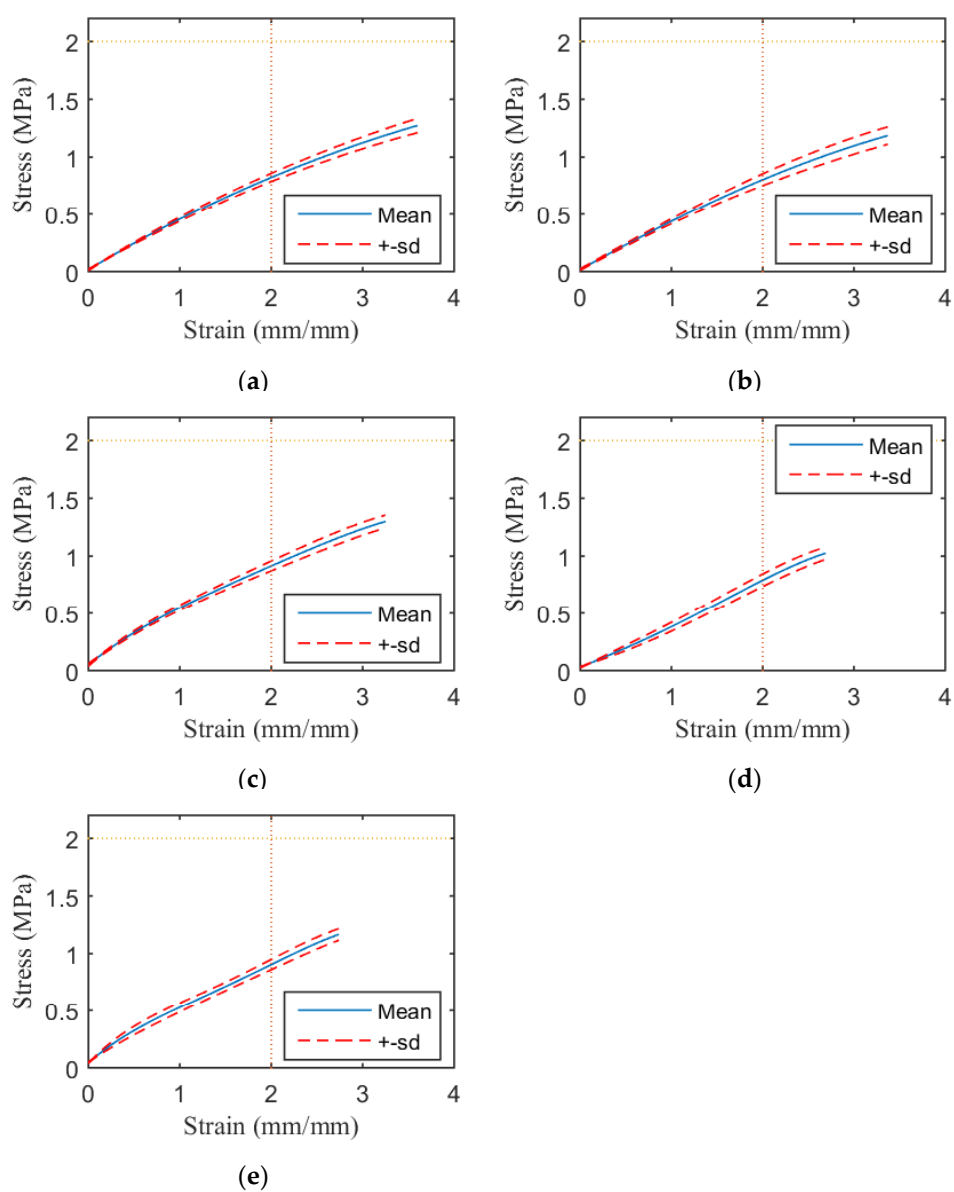


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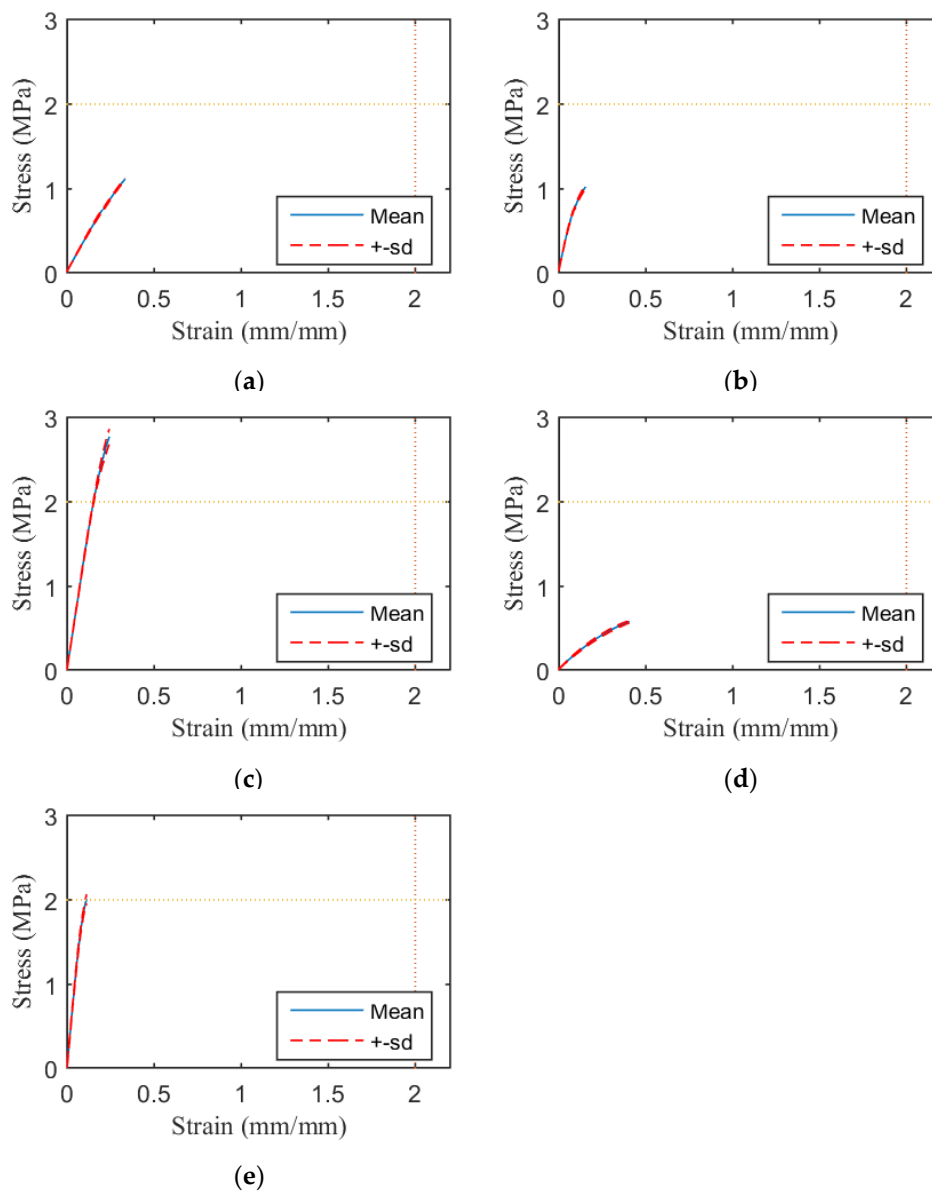
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**Figure 1.** Mean stress-strain curves of the Agilus–VeroCyan specimens with the 0.7 mm embedded patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C before yield.



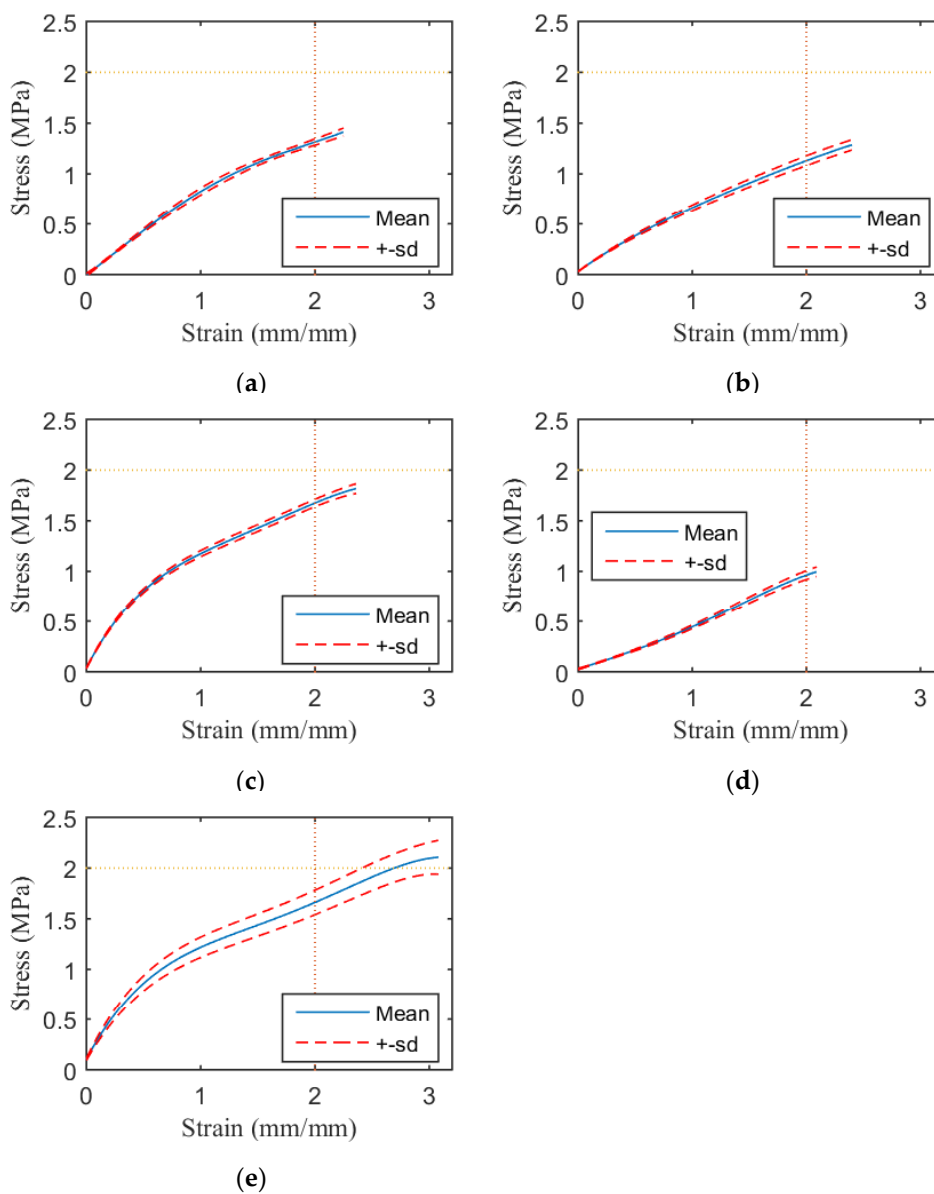
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**Figure 2.** Mean stress-strain curves of the Dragonskin 30–TPU 94A specimens with the 0.7 mm embedded patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C before yield.



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**Figure 3.** Mean stress-strain curves of the Agilus–VeroCyan specimens with the 1.4 mm embedded patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C before yield.



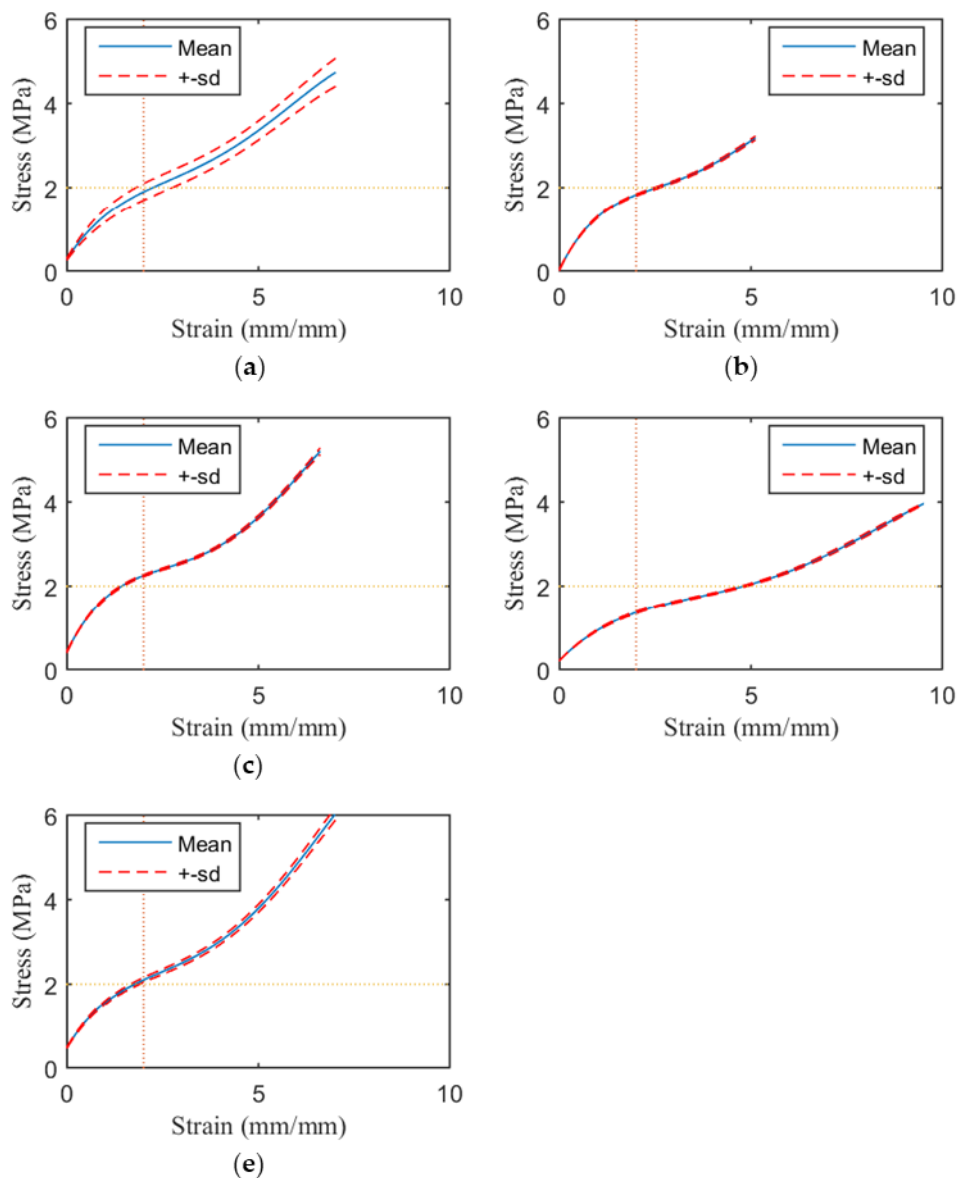
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**Figure 4.** Mean stress-strain curves of the Dragonskin 30-TPU 94A specimens with the 1.4 mm embedded patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C before yield.



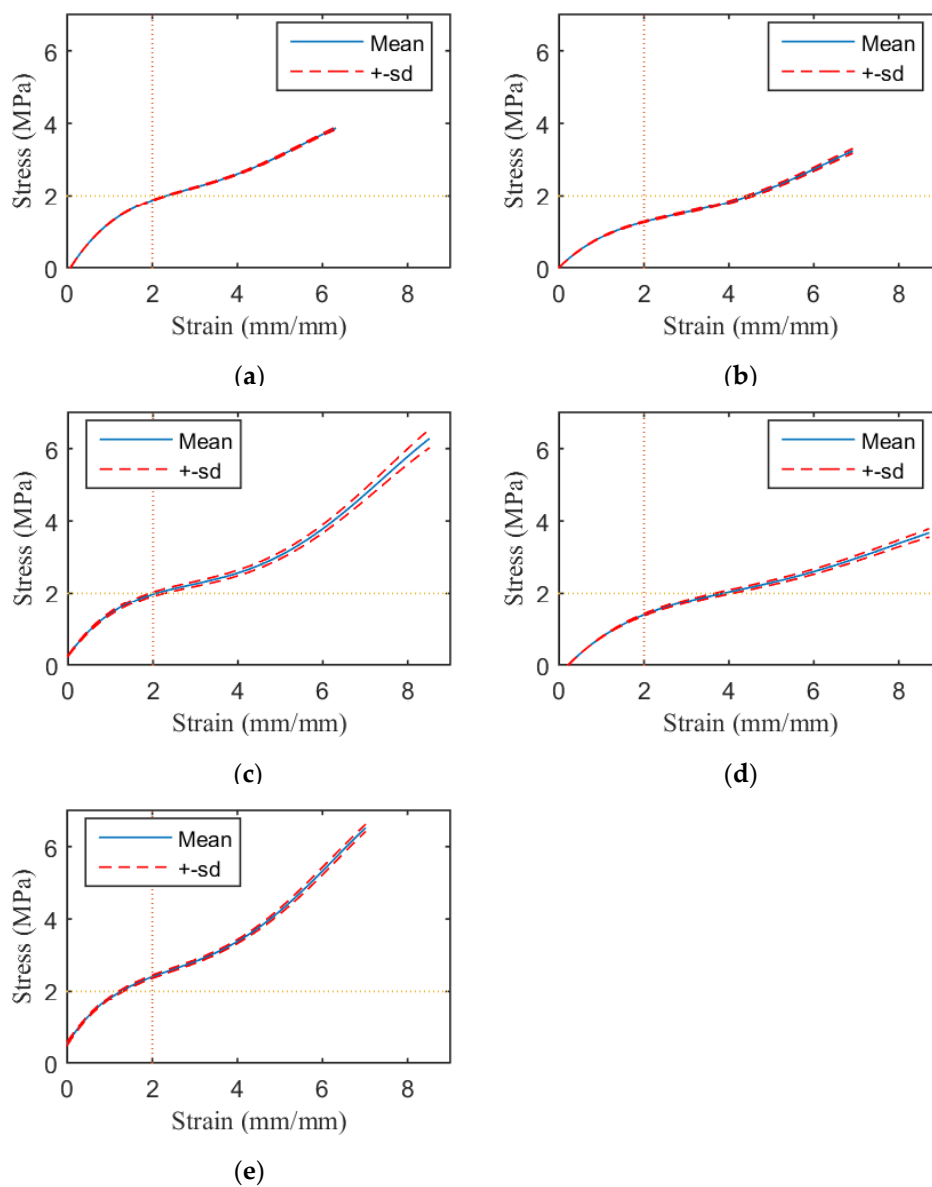
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**Figure 5.** Mean stress-strain curves of the TPU 94A specimens with the 0.7 mm embedded patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C before yield.

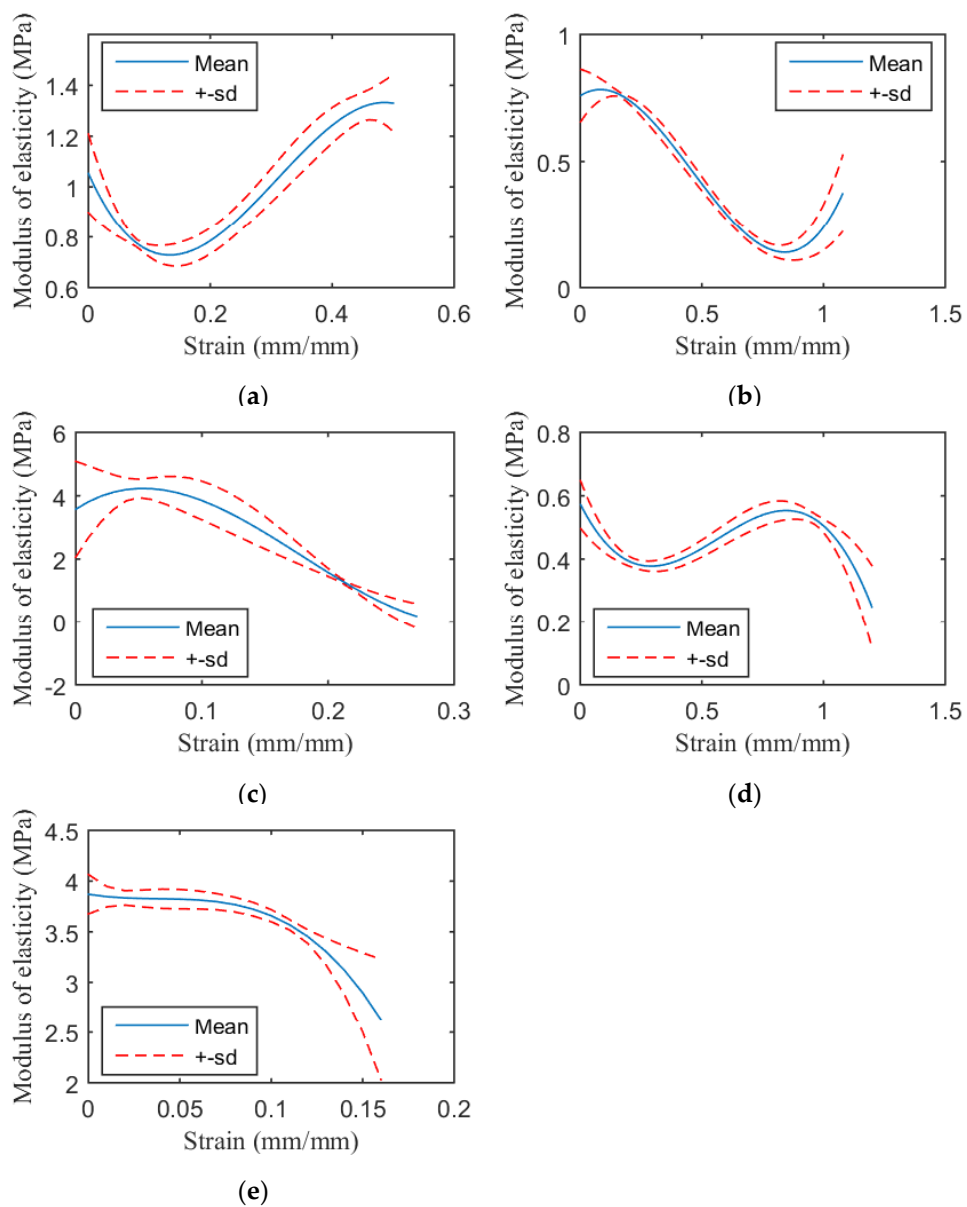


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**Figure 6.** Mean stress-strain curves of the TPU 94A specimens with the 1.4 mm patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C before yield.



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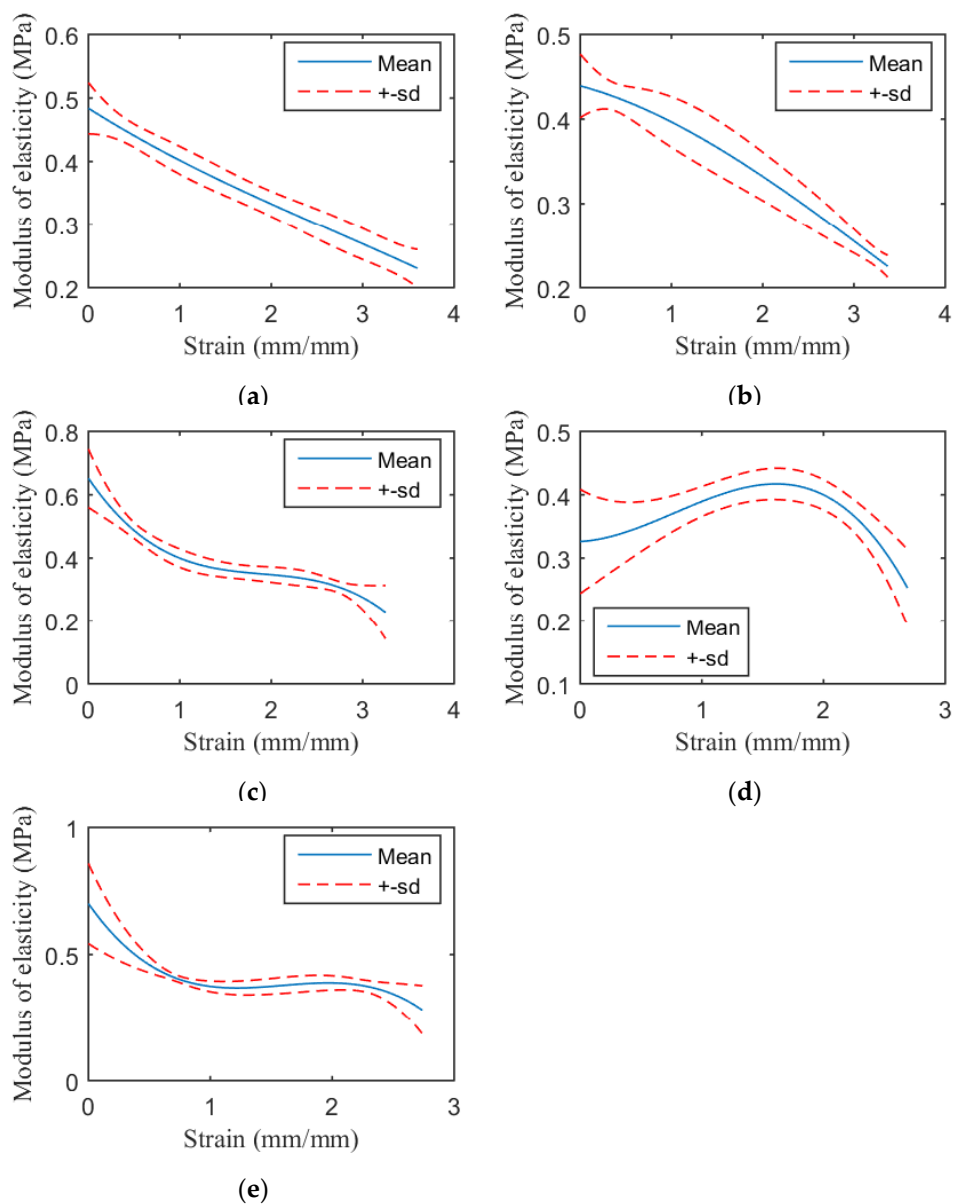
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**Figure S7.** Modulus of elasticity of the Agilus-VeroCyan specimens with the 0.7 mm embedded patterns: **(a)** Pattern A-major; **(b)** Pattern A-minor; **(c)** Pattern B-major; **(d)** Pattern B-minor; **(e)** Pattern C.





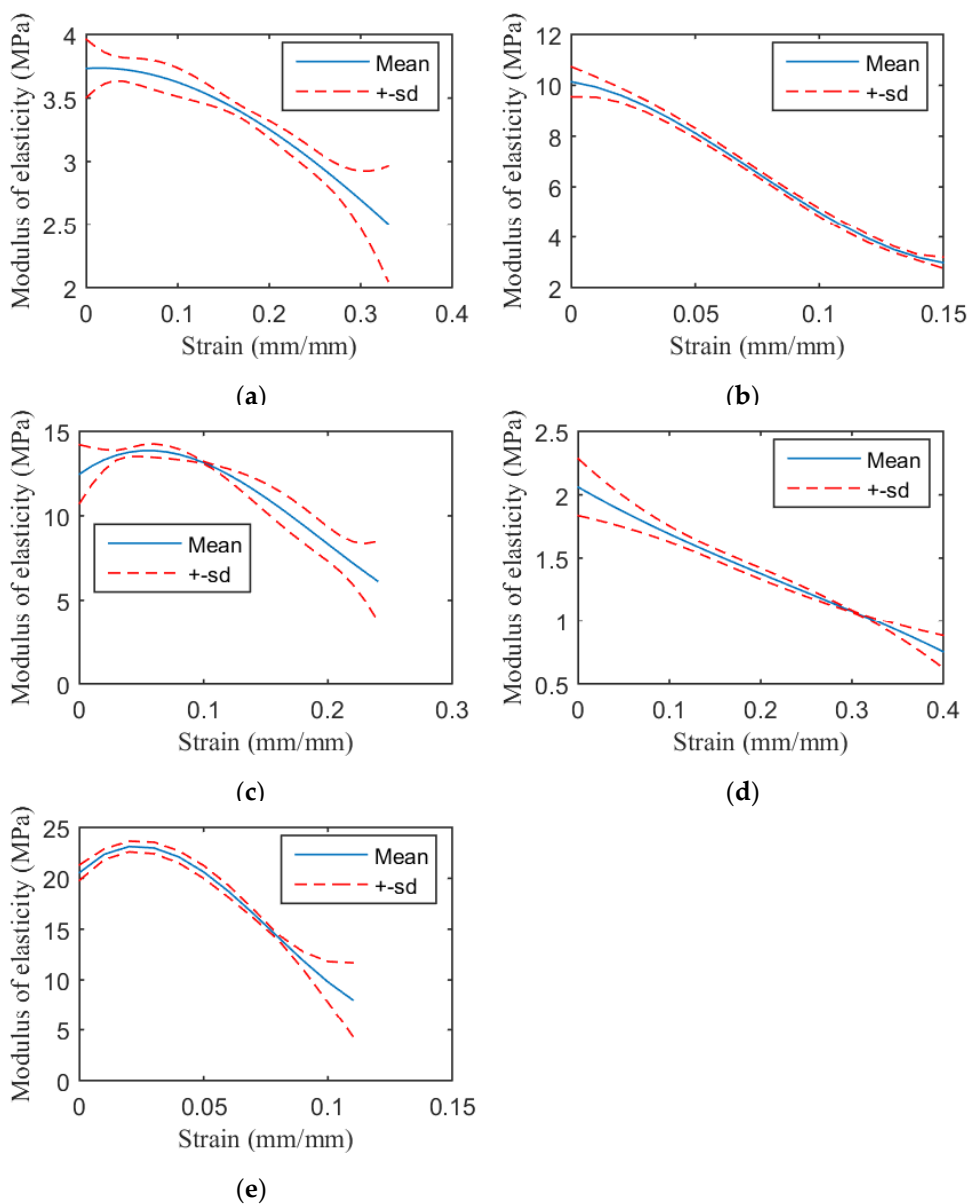
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**Figure 8.** Modulus of elasticity of the DragonSkin 30-TPU 94A specimens with the 0.7 mm embedded patterns: **(a)** Pattern A-major; **(b)** Pattern A-minor; **(c)** Pattern B-major; **(d)** Pattern B-minor; **(e)** Pattern C.



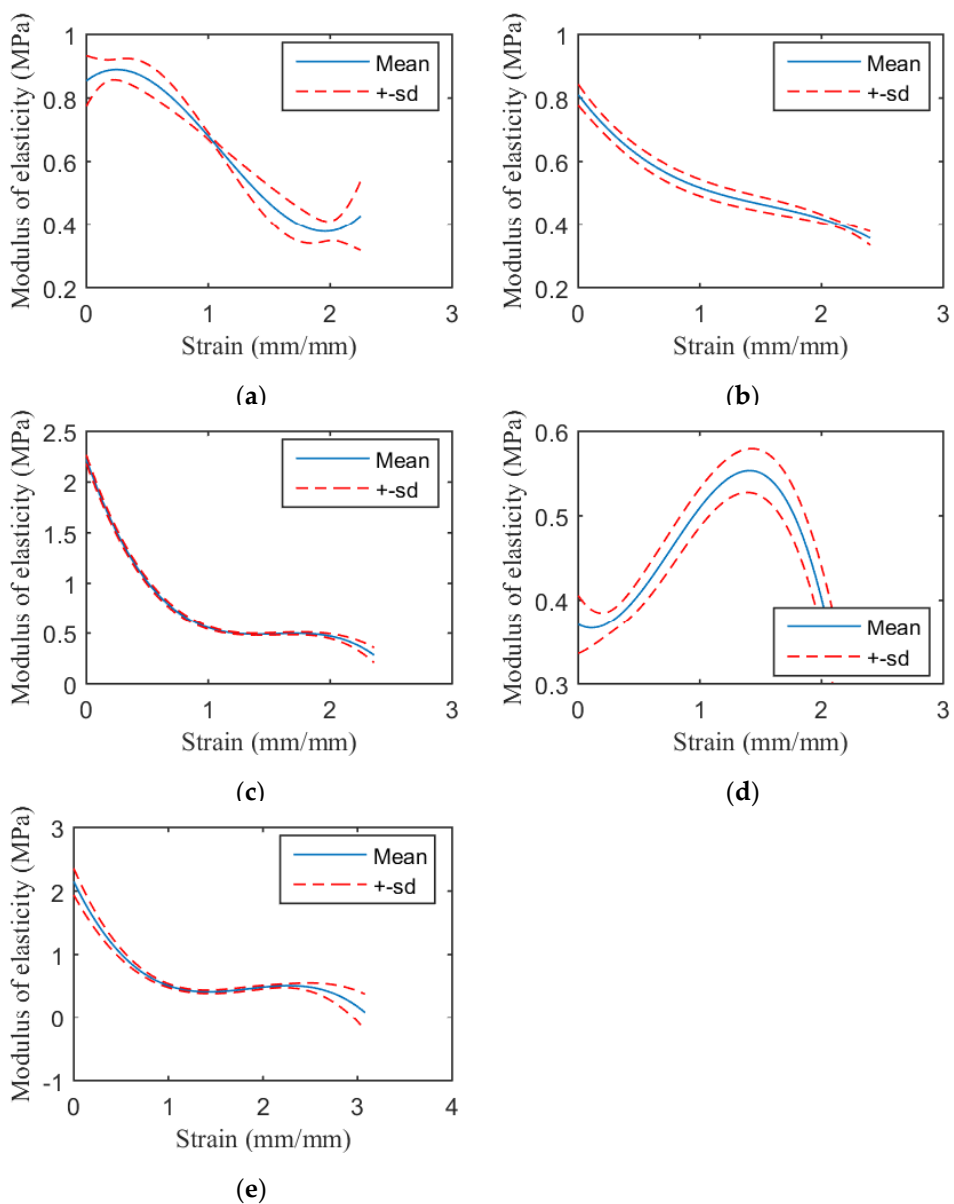
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**Figure 9.** Modulus of elasticity of the Agilus-VeroCyan specimens with the 1.4 mm embedded patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C.



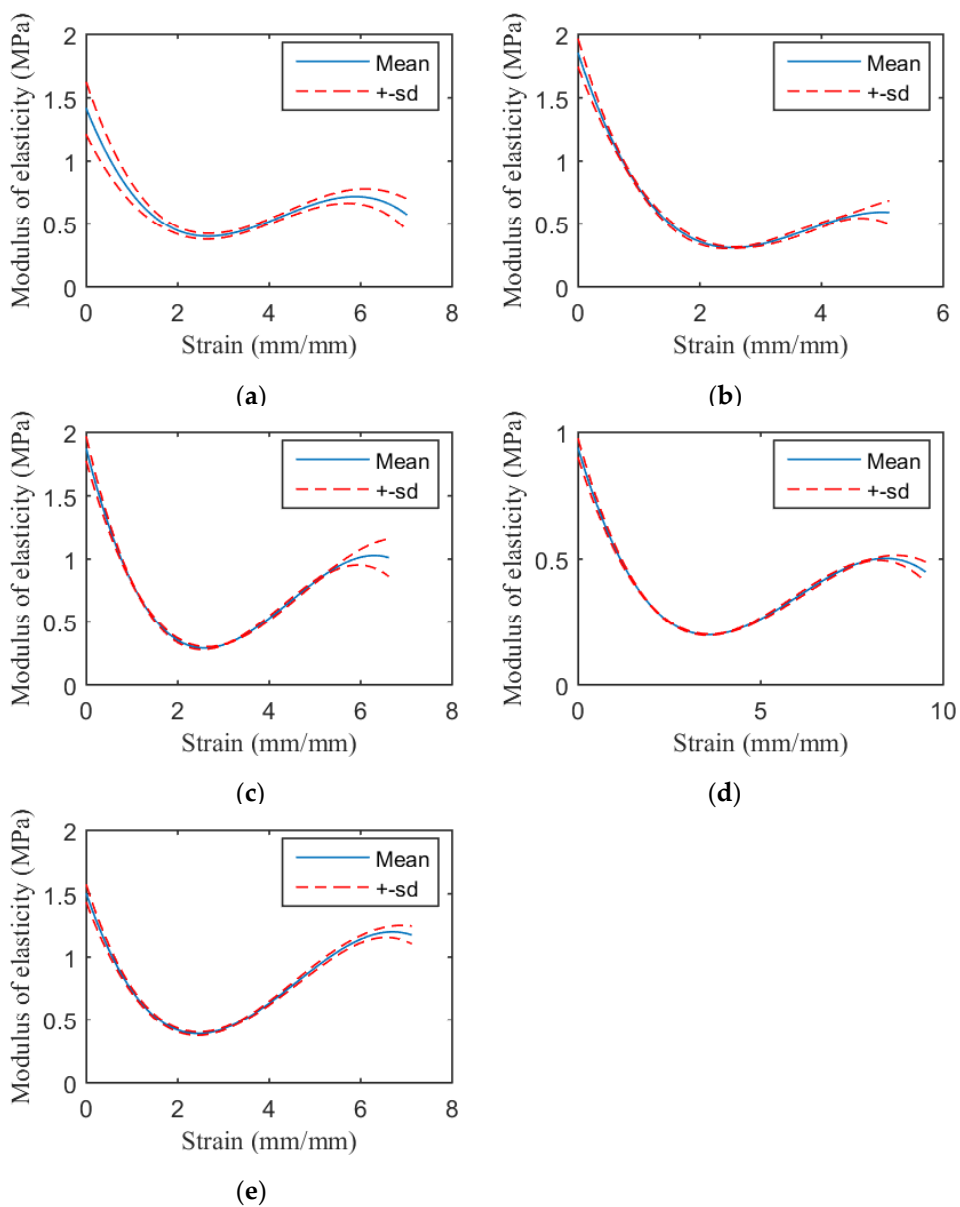
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**Figure 10.** Modulus of elasticity of the Dragonskin 30-TPU 94A specimens with the 1.4 mm embedded patterns: **(a)** Pattern A-major; **(b)** Pattern A-minor; **(c)** Pattern B-major; **(d)** Pattern B-minor; **(e)** Pattern C.

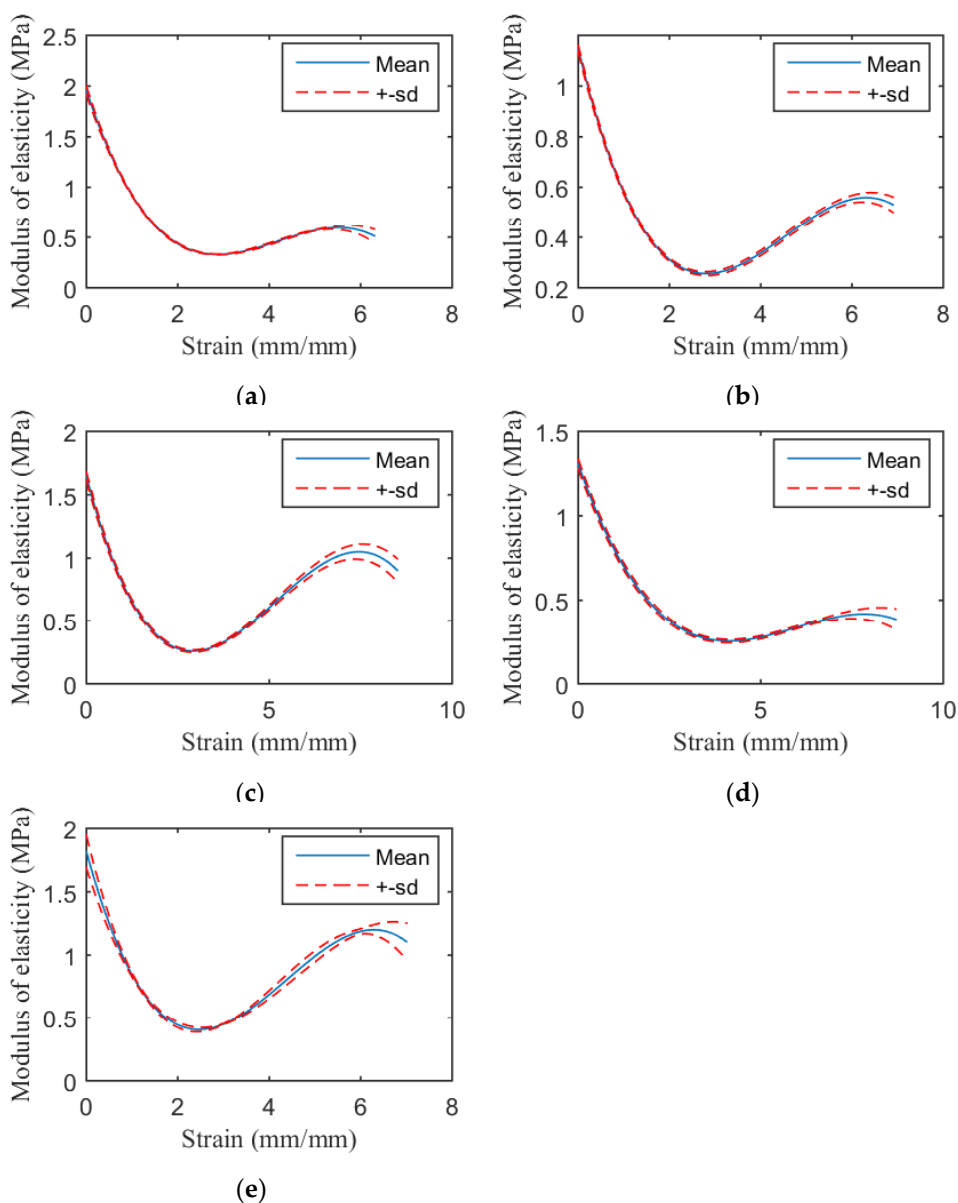


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**Figure 11.** Modulus of elasticity of the TPU 94A specimens with the 0.7 mm embedded patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C.



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**Figure 12.** Modulus of elasticity of the TPU 94A specimens with the 1.4 mm patterns: (a) Pattern A-major; (b) Pattern A-minor; (c) Pattern B-major; (d) Pattern B-minor; (e) Pattern C.

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