RESEARCH ARTICLE

A state-of-the-art guide about the effects of sterilization processes on 3D-printed materials for surgical planning and medical applications: A comparative study
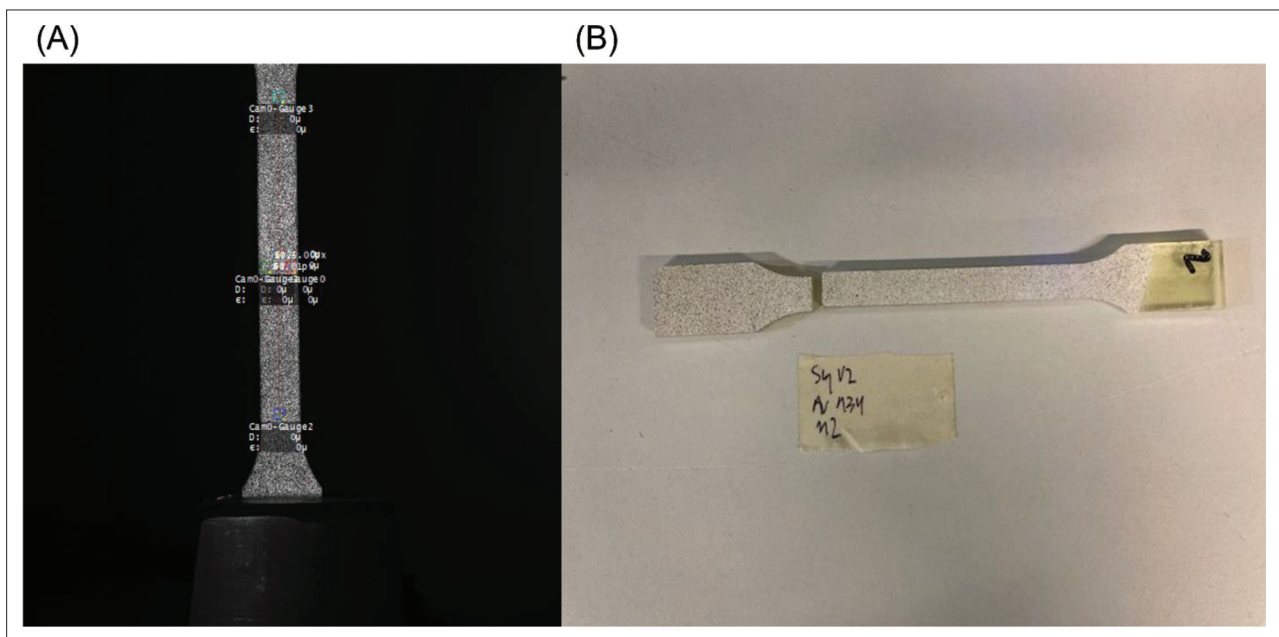
Supplementary File

Figure S1. (A) Image analysis. (B) 3D-printed sample after the mechanical testing.

Table S1. Dimensions of 3D-printed samples

Material	Sterilization method	Dimensions of 3D-printed samples			
		Thickness (mm)	Width (mm)	Thin width (mm)	Area (mm²)
PLA	Control	3.94	20.2	10.17	40.0698
		4	20.36	10.3	41.2
		4.02	20.2	10.18	40.9236
	HPO	3.93	20.29	10.28	40.4004
		3.93	20.28	10.33	40.5969
		4.03	20.13	10.23	41.2269
ABS	Control	4.1	20.5	10.4	42.64
		4	20.2	10.4	41.6
		3.95	20.33	10.57	41.7515
	HPO	4	19.91	10.44	41.76
		3.93	19.98	10.19	40.0467
		3.91	19.71	10.62	41.5242
MED610	Control	4.04	20	10.16	41.0464
		4.04	20	10.01	40.4404
		4.06	20	9.99	40.5594
	HPO	4.01	20.19	10.13	40.6213
		4.01	20.06	9.95	39.8995
		4.03	20.07	10.01	40.3403
	AU121	3.99	20.01	10.02	39.9798
		4.03	20.04	10.03	40.4209
		4.02	20.06	10.03	40.3206
	AU134	4.04	20.04	10	40.4
		4.05	20	10.03	40.6215
		4.02	20.08	10.08	40.5216
VERO	Control	4.01	20.06	9.98	40.0198
		4	19.96	9.97	39.88
		4.01	19.99	9.93	39.8193
	HPO	3.95	19.99	9.95	39.3025
		3.95	20.01	10.02	39.579
		3.96	19.99	10	39.6
	AU121	3.99	20.09	10.06	40.1394
		3.97	20.05	10.01	39.7397
		3.98	20.06	10	39.8
	AU134	4.25	20.06	10.01	42.5425
		4.21	20.07	10.02	42.1842
		4.2	20.05	10.04	42.168

Material	Sterilization method	Dimensions of 3D-printed samples			
		Thickness (mm)	Width (mm)	Thin width (mm)	Area (mm²)
Surgical Guides	Control	4.23	20.03	10.03	42.4269
		4.13	20.21	10.02	41.3826
		4.07	20.1	9.99	40.6593
	HPO	4.2	20.4	10.02	42.084
		4.3	20	10.01	43.043
		4.1	20.1	10	41
	AU121	4.1	20.1	10	41
		4.4	20.1	10	44
		4.3	20.4	10.2	43.86
	AU134	4.38	20.34	10.22	44
		4.22	20.07	10.06	42
		4.45	20.19	10.15	45
Durable	Control	4.14	20.02	9.97	41.2758
		4.05	20.12	9.99	40.4595
		4.1	20.02	10	41
	HPO	4.21	20.08	10	42.1
		4.11	20.09	10.02	41.1822
		4.1	19.98	10	41
	AU121	4.01	20	9.99	40.0599
		4.19	20.06	10.11	42.3609
		4.25	20.22	10.16	43.18
	AU134	4	19.92	10	40
		4.12	20.09	10.05	41.406
		4.11	20.02	10.05	41.3055
PA12	Control	4.03	20.4	10.2	41.106
		4.03	20.6	10.5	42.315
		4	20.4	10.2	40.8
	HPO	4	20.3	10.2	40.8
		4.1	20.3	10.2	41.82
		4	20.6	10.4	41.6
	AU121	4.1	20.3	10.5	43.05
		4.2	20.6	10.4	43.68
		4.1	20.2	10.01	41.041
	AU134	4	20.1	10.2	40.8
		4.1	20.6	10.4	42.64
		4.2	20.4	10.3	43.26

Abbreviations: ABS, acrylonitrile butadiene styrene; PLA, polylactic acid.

Figure S2. Acrylonitrile butadiene styrene (ABS) control and HPO samples prealigned before the mesh analysis.
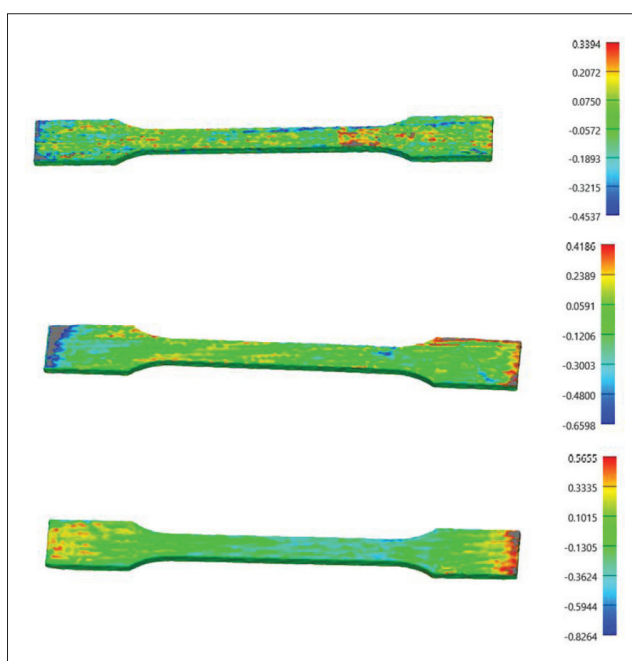

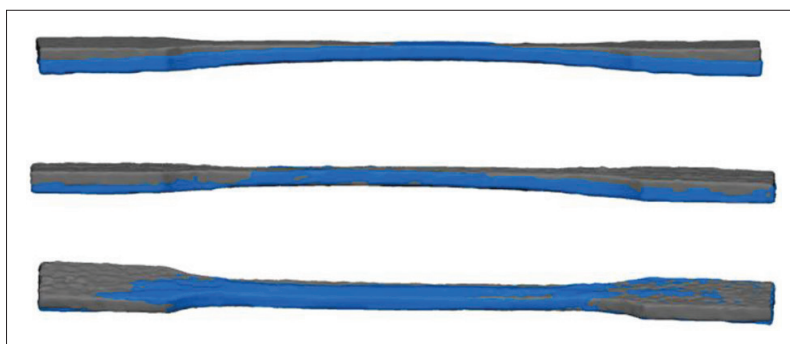**Figure S3**. Mesh analysis of acrylonitrile butadiene styrene (ABS) control and HPO samples.

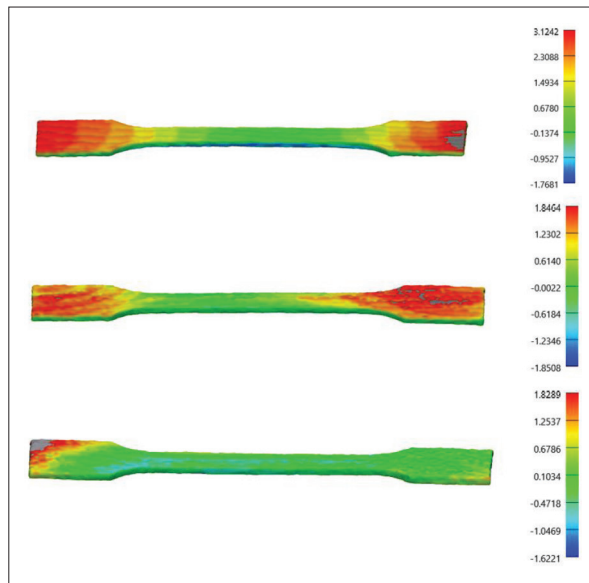**Figure S4**. Durable control and HPO samples prealigned before the mesh analysis.

Figure S5. Mesh analysis of Durable control and HPO samples.

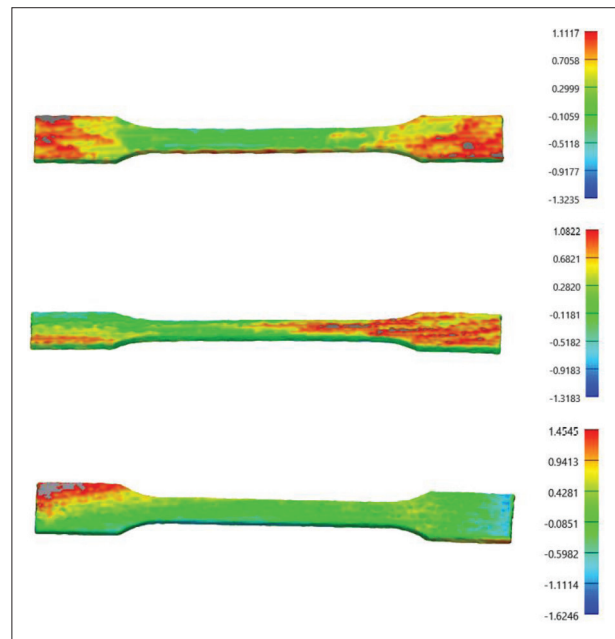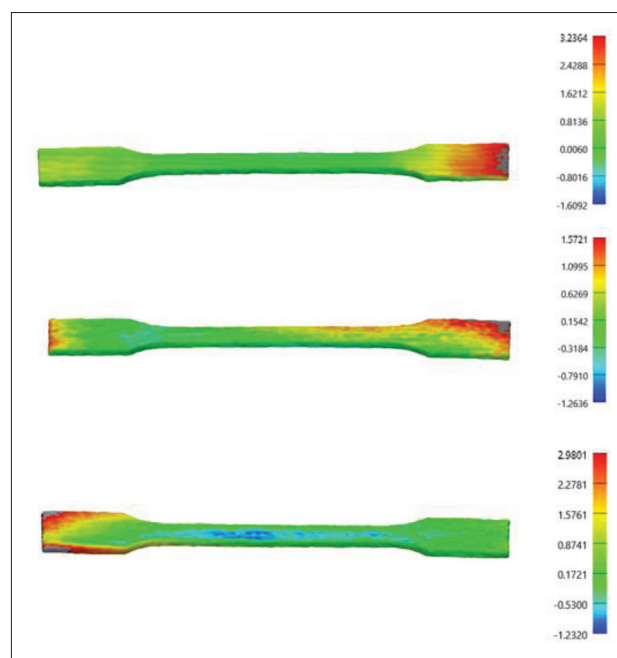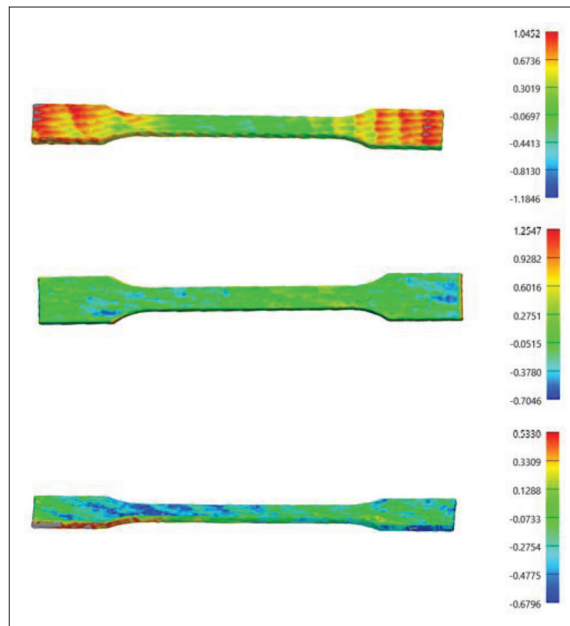**Figure S6**. Durable control and AU121 samples prealigned before the mesh analysis.
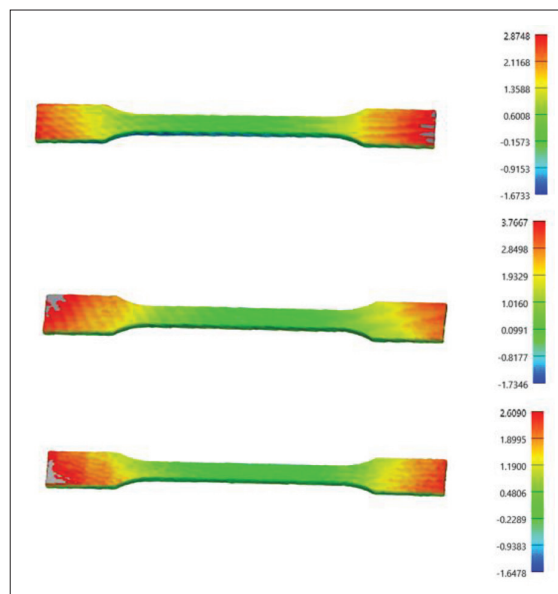

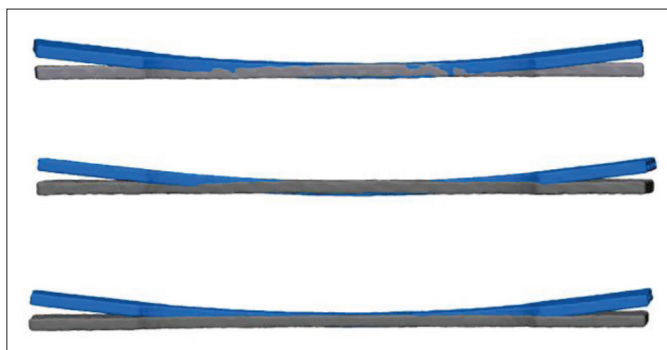**Figure S7**. Mesh analysis of Durable control and AU121 samples.

Figure S8. Durable control and AU134 samples prealigned before the mesh analysis.
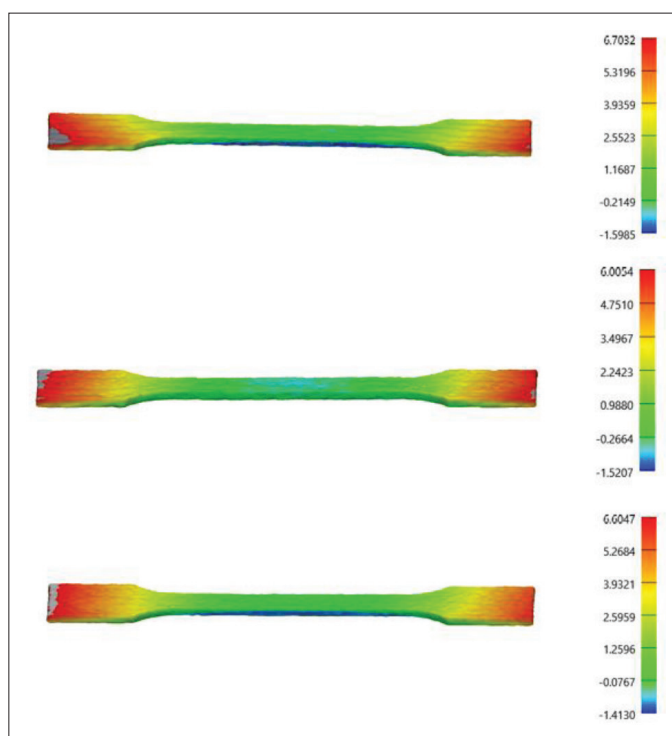

Figure S9. Mesh analysis of Durable control and AU134 samples.

Figure S10. MED610 control and HPO samples prealigned before the mesh analysis.
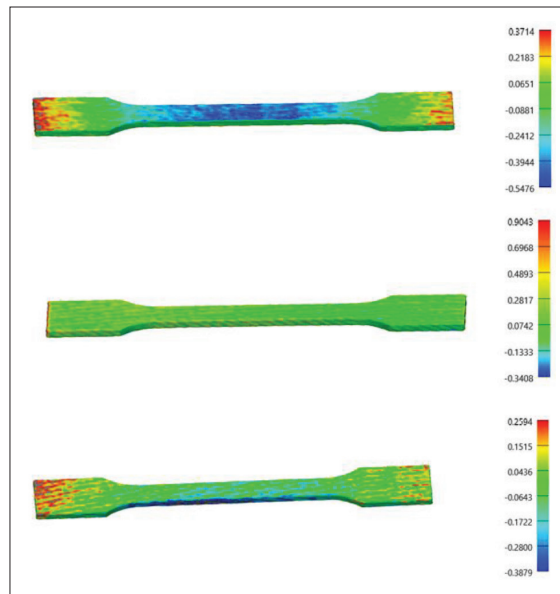
Figure S11. Mesh analysis of MED610 control and HPO samples.

Figure S12. MED610 control and AU121 samples prealigned before the mesh analysis.

Figure S13. Mesh analysis of MED610 control and AU121 samples.

Figure S14. MED610 control and AU134 samples prealigned before the mesh analysis.

Figure S15. Mesh analysis of MED610 control and AU134 samples.

Figure S16. PA12 control and HPO samples pre-aligned before the mesh analysis.

Figure S17. Mesh analysis of PA12 control and HPO samples.

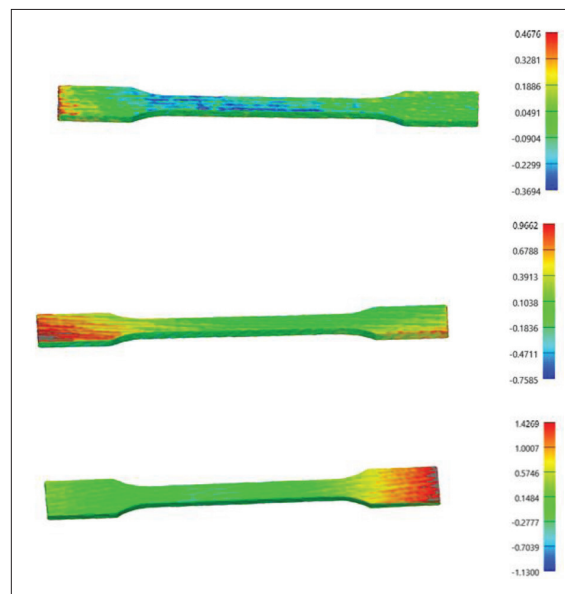**Figure S18**. PA12 control and AU121 samples prealigned before the mesh analysis.

Figure S19. Mesh analysis of PA12 control and AU121 samples.

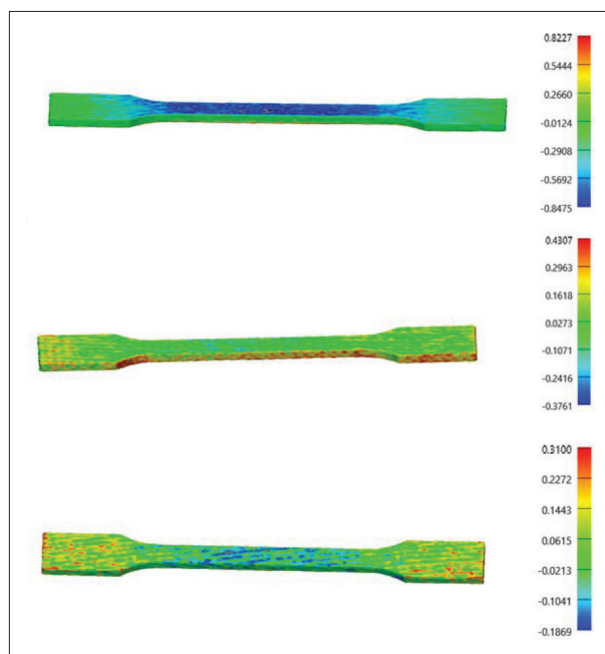**Figure S20**. PA12 control and AU134 samples prealigned before the mesh analysis.

Figure S21. Mesh analysis of PA12 control and AU134 samples.

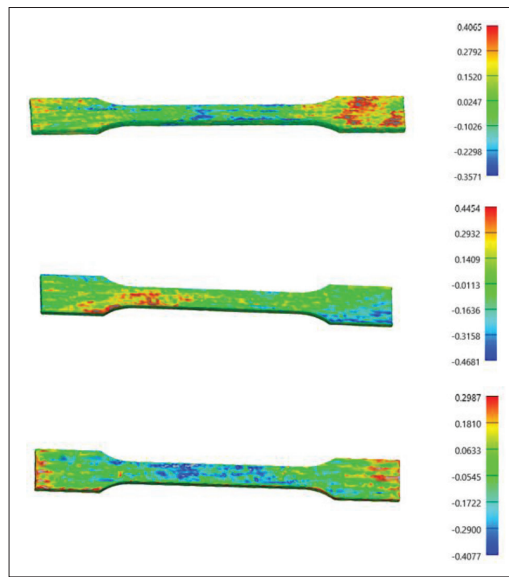**Figure S22**. PLA control and HPO samples prealigned before the mesh analysis.

Figure S23. Mesh analysis of PLA control and HPO samples.

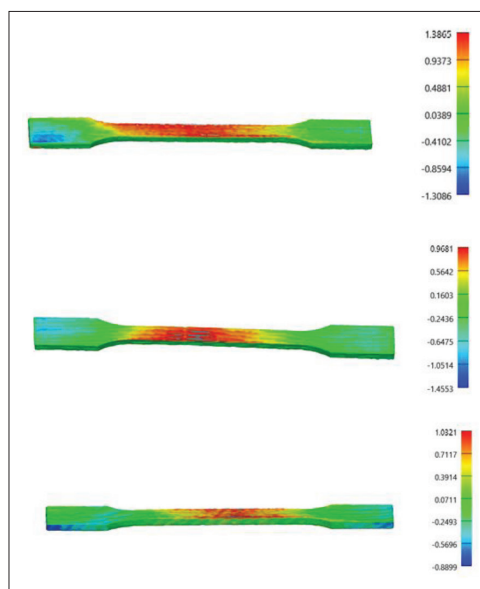**Figure S24**. Surgical Guide resin control and HPO samples prealigned before the mesh analysis.

Figure S25. Mesh analysis of Surgical Guide resin control and HPO samples.

Figure S26. Surgical Guide resin control and AU121 samples prealigned before the mesh analysis.
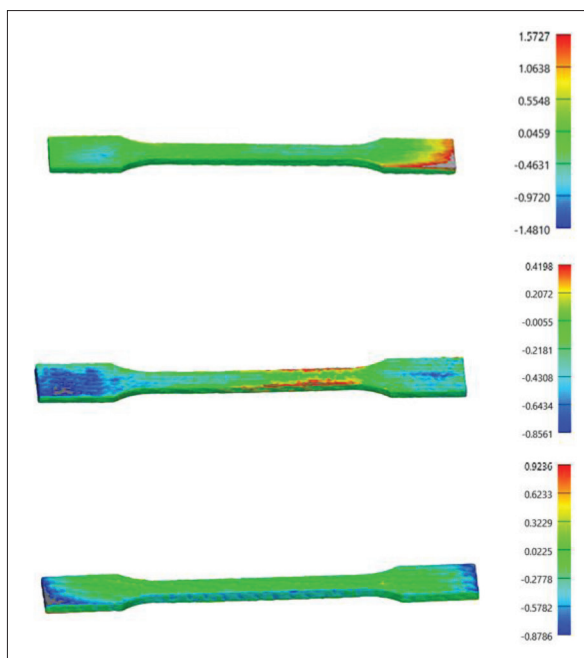

Figure S27. Mesh analysis of Surgical Guide resin control and AU121 samples.

Figure S28. Surgical Guide resin control and AU134 samples prealigned before the mesh analysis.
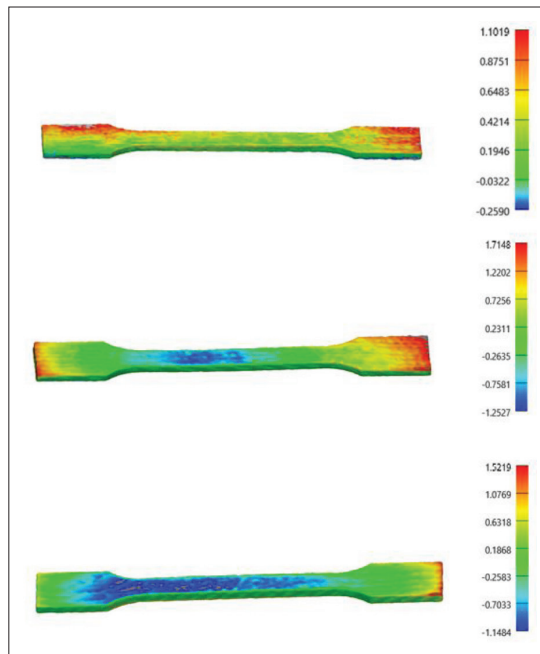
Figure S29. Mesh analysis of Surgical Guide resin control and AU134 samples.

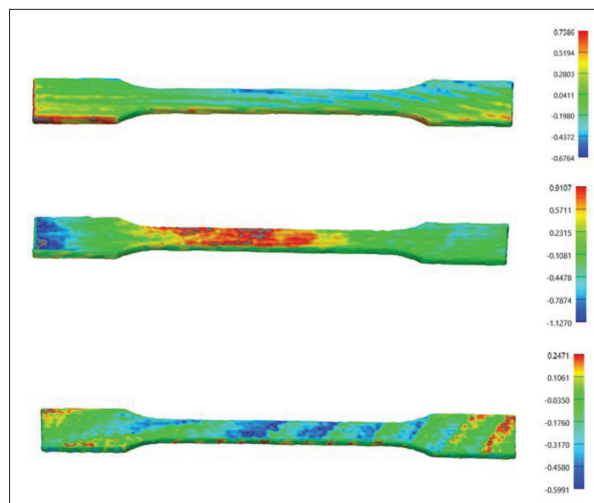**Figure S30**. VERO control and HPO samples prealigned before the mesh analysis.

Figure S31. Mesh analysis of Surgical Guide resin control and HPO samples.

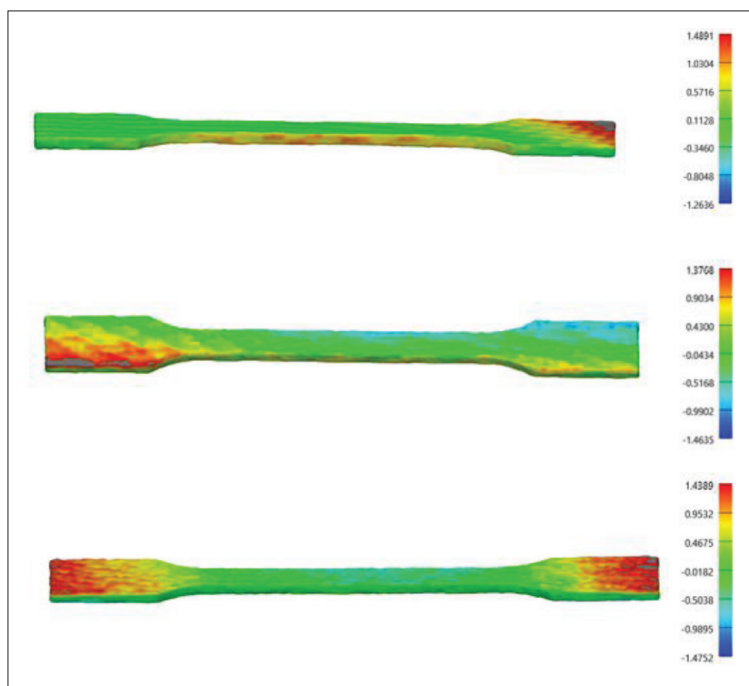**Figure S32**. VERO control and AU121 samples prealigned before the mesh analysis.

Figure S33. Mesh analysis of VERO control and AU121 samples.

Figure S34. VERO control and AU134 samples prealigned before the mesh analysis.
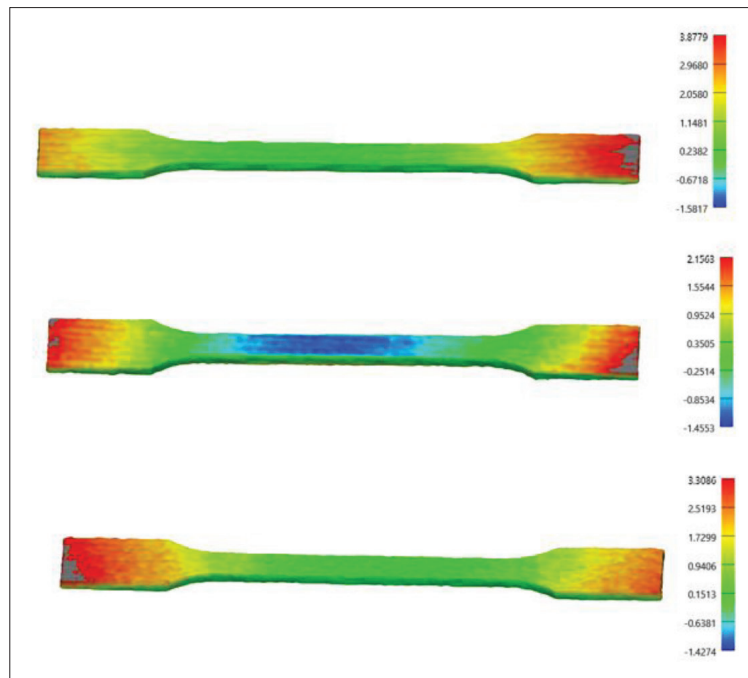

Figure S35. Mesh analysis of VERO control and AU134 samples.

```
% Legend
% ======
% Units: mm
% Transformation Matrix Relative to WCS:
% 1.0000000000000000 0.0000000000000000 0.0000000000000000 0.0000000000000000
% 0.0000000000000000 1.0000000000000000 0.0000000000000000 0.0000000000000000
% 0.0000000000000000 0.0000000000000000 1.0000000000000000 0.0000000000000000
% 0.0000000000000000 0.0000000000000000 0.0000000000000000 1.0000000000000000
%
% X,Y,Z: coordinates of the node
% A:     analysis value
% R:     R value according to RGB color model
% G:     G value according to RGB color model
% B:     B value according to RGB color model
%
% X Y Z A R G B
-181.2277 160.5530 -610.4089 -0.2348 0 255 103
-181.2277 161.0530 -610.3998 -0.2794 0 255 123
-181.2277 159.5530 -610.3994 -0.0775 0 255 34
-181.7277 161.0530 -610.3962 -0.2099 0 255 92
-181.2277 160.0530 -610.3960 -0.1655 0 255 72
-181.7277 160.5530 -610.3650 -0.1855 0 255 81
-182.2277 161.0530 -610.3607 -0.1633 0 255 71
-183.7277 160.5530 -610.3530 -0.0883 0 255 38
-181.2277 159.0530 -610.3493 -0.0826 0 255 36
-181.7277 159.0530 -610.3422 -0.0716 0 255 31
-183.2277 160.5530 -610.3358 -0.0868 0 255 38
-182.7277 160.5530 -610.3289 -0.0920 0 255 40
-182.7277 161.0530 -610.3235 -0.1353 0 255 59
-180.7277 159.5530 -610.3162 -0.2751 0 255 121
-184.2277 160.5530 -610.3144 -0.1492 0 255 65
-182.2277 160.5530 -610.3064 -0.1544 0 255 67
-182.2277 159.0530 -610.2869 -0.1404 0 255 61
-181.7277 159.5530 -610.2770 -0.0808 0 255 35
-184.2277 160.0530 -610.2739 -0.1490 0 255 65
-182.7277 159.0530 -610.2701 -0.1878 0 255 82
-183.7277 160.0530 -610.2675 -0.1172 0 255 51
-180.7277 160.0530 -610.2668 -0.3820 0 255 168
```

Figure S36. Example of MED610 HPO analysis text file obtained in the dimensional analysis part. This text file is obtained for each of the analysis and contains the transformation matrix, coordinates of the node, analysis value, and RGB values.