

Article

Hydrostatic High-Pressure Post-Processing of Specimens Fabricated by DLP, SLA, and FDM: An Alternative for the Sterilization of Polymer-Based Biomedical Devices

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The 3D-printed probes used for the surface and geometrical characterization are shown in Figure 1. Figure 2 contains the Alicona machine obtained surface characterization images example and tables 1 through 6 show the dimensions before and after the HHP processing.

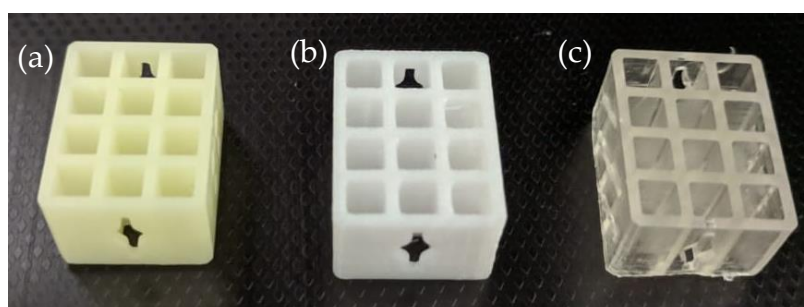


Figure S1. Example of the specimens manufactured with (a) DLP, (b) FDM and (c) SLA technologies, used for the surface and geometrical characterization.

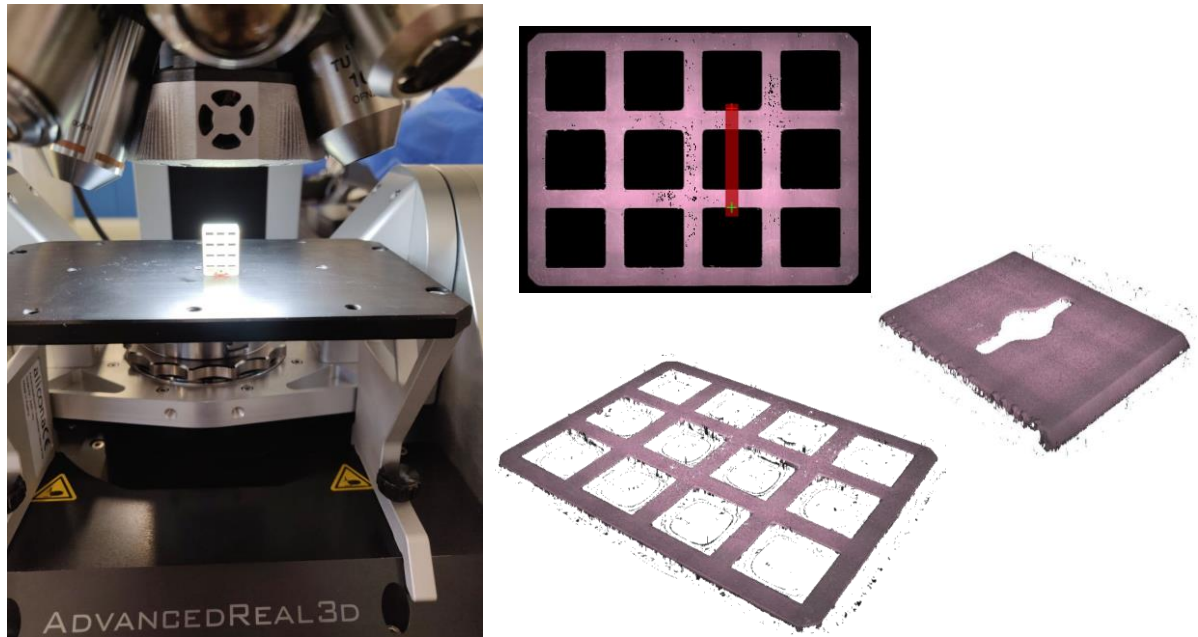


Figure S2. Alicona machine surface characterization sample images.

Table S1. Measurements with digital caliper **before** HHP processing. Dimensions are in mm.

Dimension	DLP			FDM			SLA		
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
x	17.88	17.91	17.92	19.08	19.09	19.13	19.33	19	19.33
y	13.68	13.68	13.7	14.71	14.63	14.67	14.29	14.19	14.33
z	10.42	10.39	10.48	10.39	10.35	10.39	10.22	10.27	10.47
t ₁	0.96	0.98	0.99	1.04	1	1.06	0.99	1.01	0.99
t ₂	0.98	1.02	0.99	1.03	1.02	1.06	1.05	1.06	1.02
t ₃	0.98	1	1.02	1.04	1.04	1.06	1.07	1.04	1.03
t ₄	0.98	0.98	1.01	1.04	1.05	1.07	1.05	0.99	1.05
t ₅	0.96	0.98	0.97	1.02	1.03	1.06	0.98	0.96	0.98
L ₁	6.65	6.64	6.59	6.85	6.9	6.85	6.99	6.55	7
D ₁	2.75	2.78	2.78	2.99	2.96	2.9	2.99	2.95	2.99
L ₂	6.6	6.66	6.6	6.89	6.87	6.86	7.06	6.96	7.03
D ₂	2.75	2.75	2.78	2.97	2.99	2.89	3.03	2.95	3.01

Table S2. Measurements taken with the Alicona **before** HHP processing on DLP sample #1.
Dimensions are in mm.

Dimension	Measure
x	17.836
y	13.625
a ₁	3.319
a ₂	3.300
a ₃	3.280
a ₄	3.297
b ₁	3.242
b ₂	3.217
b ₃	3.244
b ₄	3.262

Table S3. Measurements with digital caliper **after** HHP processing. Dimensions are in mm.

Dimension	DLP			FDM			SLA		
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
x	17.88	17.93	17.93	19.09	19.1	19.13	19.33	19.01	19.34
y	13.68	13.68	13.69	14.7	14.64	14.67	14.31	14.2	14.34
z	10.42	10.41	10.48	10.38	10.36	10.38	10.2	10.25	10.47
t ₁	0.96	0.97	0.99	1.04	1.01	1.06	1	1.01	0.98
t ₂	0.98	1.02	0.98	1.03	1.02	1.05	1.04	1.06	1.02
t ₃	0.98	1	1.02	1.04	1.05	1.06	1.08	1.03	1.04
t ₄	0.98	1	1	1.04	1.05	1.06	1.06	0.99	1.05
t ₅	0.97	0.99	0.97	1.03	1.03	1.05	1	0.95	0.99
L ₁	6.68	6.62	6.59	6.85	6.89	6.85	6.98	6.55	7
D ₁	2.73	2.75	2.78	2.99	2.98	2.93	2.99	2.94	3.01
L ₂	6.59	6.67	6.59	6.87	6.87	6.84	7.07	6.95	7.02
D ₂	2.74	2.76	2.77	2.98	3	2.88	3.03	2.95	3.03

Table S4. Measurements taken with the Alicona **after** HHP processing on DLP sample #1. Dimensions are in mm.

Dimension	Measure
x	17.869
y	13.644
a ₁	3.301
a ₂	3.283
a ₃	3.294
a ₄	3.276
b ₁	3.272
b ₂	3.235
b ₃	3.254
b ₄	3.237

Table S5. Caliper-measured dimensions changes after HHP processing. Absolute maximum values shown in **bold**.

Dimension	DLP			FDM			SLA		
	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3	Sample 1	Sample 2	Sample 3
x	0.00%	0.11%	0.06%	0.05%	0.05%	0.00%	0.00%	0.05%	0.05%
y	0.00%	0.00%	-0.07%	-0.07%	0.07%	0.00%	0.14%	0.07%	0.07%
z	0.00%	0.19%	0.00%	-0.10%	0.10%	-0.10%	-0.20%	-0.19%	0.00%
t ₁	0.00%	-1.02%	0.00%	0.00%	1.00%	0.00%	1.01%	0.00%	-1.01%
t ₂	0.00%	0.00%	-1.01%	0.00%	0.00%	-0.94%	-0.95%	0.00%	0.00%
t ₃	0.00%	0.00%	0.00%	0.00%	0.96%	0.00%	0.93%	-0.96%	0.97%
t ₄	0.00%	2.04%	-0.99%	0.00%	0.00%	-0.93%	0.95%	0.00%	0.00%
t ₅	1.04%	1.02%	0.00%	0.98%	0.00%	-0.94%	2.04%	-1.04%	1.02%
L ₁	0.45%	-0.30%	0.00%	0.00%	-0.14%	0.00%	-0.14%	0.00%	0.00%
D ₁	-0.73%	-1.08%	0.00%	0.00%	0.68%	1.03%	0.00%	-0.34%	0.67%
L ₂	-0.15%	0.15%	-0.15%	-0.29%	0.00%	-0.29%	0.14%	-0.14%	-0.14%
D ₂	-0.36%	0.36%	-0.36%	0.34%	0.33%	-0.35%	0.00%	0.00%	0.66%

Table S6. Dimensions changes measured for DLP sample #1 on the Alicona machine. Dimensions are in mm.

Dimension	Measure
x	0.183%
y	0.142%
a ₁	-0.54%
a ₂	-0.52%
a ₃	0.43%
a ₄	-0.64%
b ₁	0.93%
b ₂	0.56%
b ₃	0.31%
b ₄	-0.77%