

Appendices for:
Experimental and numerical evaluation of multi-directional compressive
and flexure behavior of three-dimensional printed concrete

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Fig. S1 An example of TPB test using SHIMADZU universal testing machine.

Table S1 Compressive strength of each specimen in the *x*-direction

Specimen	length (mm)	width (mm)	area (mm ²)	compressive strength (MPa)
Specimen 1	50	50	2500	23.2
Specimen 2	50	50	2500	25.3
Specimen 3	50	50	2500	28.2
Specimen 4	50	50	2500	25.7
Specimen 5	50	50	2500	26.5

average	25.8
CoV	7.09%

Table S2 Compressive strength of each specimen in the y-direction

Specimen	length (mm)	width (mm)	area (mm ²)	compressive strength (MPa)
Specimen 1	50	50	2500	36.1
Specimen 2	50	50	2500	34.9
Specimen 3	50	50	2500	33.3
Specimen 4	50	50	2500	36.2
Specimen 5	50	50	2500	35.5
average				35.2
CoV				3.4%

Table S3 Compressive strength of each specimen in the z-direction

Specimen	length (mm)	width (mm)	area (mm ²)	compressive strength (MPa)
Specimen 1	50	50	2500	34.9
Specimen 2	50	50	2500	32.6
Specimen 3	50	50	2500	33.4
Specimen 4	50	50	2500	32.1
Specimen 5	50	50	2500	33.4
average				33.3
CoV				3.2%

Table S4 Flexural strength of each specimen in the x-direction

Specimen	length (mm)	width (mm)	area (mm ²)	compressive strength (MPa)	Specimen
Specimen 1	1.07	120	40	40	3.03
Specimen 2	0.98	120	40	40	2.75
Specimen 3	1.10	120	40	40	3.11
Specimen 4	1.03	120	40	40	2.89
Specimen 5	1.12	120	40	40	3.17
Specimen 6	1.04	120	40	40	2.94
average					2.98
CoV					5.1%

Table S5 Flexural strength of each specimen in the y-direction

Specimen	load (kN)	span length (mm)	width (mm)	depth (mm)	flexural strength (MPa)
Specimen 1	0.96	120	40	40	2.72
Specimen 2	1.03	120	40	40	2.90
Specimen 3	0.97	120	40	40	2.74
Specimen 4	0.97	120	40	40	2.74
Specimen 5	1.14	120	40	40	3.21
Specimen 6	0.84	120	40	40	2.37
average					2.78
CoV					9.8%

Table S6 Flexural strength of each specimen in the z-direction

Specimen	load (kN)	span length (mm)	width (mm)	depth (mm)	flexural strength (MPa)
Specimen 1	1.26	120	40	40	3.56
Specimen 2	1.22	120	40	40	3.45
Specimen 3	1.33	120	40	40	3.76
Specimen 4	1.27	120	40	40	3.57
Specimen 5	1.29	120	40	40	3.62
Specimen 6	1.23	120	40	40	3.45
average					3.56
CoV					3.2%