

# Supplementary Materials: Direct Powder Extrusion of Paracetamol Loaded Mixtures for 3D Printed Pharmaceuticals for Personalized Medicine via Low Temperature Thermal Processing

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**Table S1.** Percentual mass losses of the individual constituents attributable to the moisture.

Mass Loss	
Material	Loss [%]
Guar Gum	6
Starch	10
Paracetamol	0
HPC	0

**Table S2.** Recovery percentages of each API containing mixture at different Guar gum content.

Guar Gum 0%wt				Guar Gum 5%wt				Guar Gum 10%wt			
Sample	Mean [%]	SD	CV	Sample	Mean [%]	SD	CV	Sample	Mean [%]	SD	CV
F05702500A	103	2	2	FG05652505A	104	2	3	FG05602510A	86	9	5
F20552500A	98	5	3	FG20502505A	96	2	5	FG20452510A	84	1	11
F35402500A	80	9	10	FG35352505A	79	5	6	FG35302510A	81	6	2
F50252500A	87	4	4	FG50202505A	96	7	7	FG50152510A	72	8	11

**Table S3.** Release curve of extruded mixtures containing 5% wt of Guar gum and different proportions of paracetamol and commercial acetamol tablet at different sampling times.

FG05702505A				FG20552505A				FG35402505A				FG50252505A			
Time [min]	Mean [%]	SD	CV	Time [min]	Mean [%]	SD	CV	Time [min]	Mean [%]	SD	CV	Time [min]	Mean [%]	SD	CV
0	5	1	29	0	3	1	22	0	3	1	26	0	2	0	15
5	23	0	2	5	21	1	2	5	19	2	12	5	18	2	9
10	37	1	3	10	34	2	3	10	35	4	11	10	30	1	2
15	49	3	5	15	46	3	4	15	44	5	11	15	40	4	4
30	83	6	7	30	77	6	5	30	75	5	5	30	67	2	7
60	109	1	1	60	102	1	5	60	104	1	4	60	95	3	7

**Table S4.** Release curve of commercial paracetamol tablet at different sampling times.

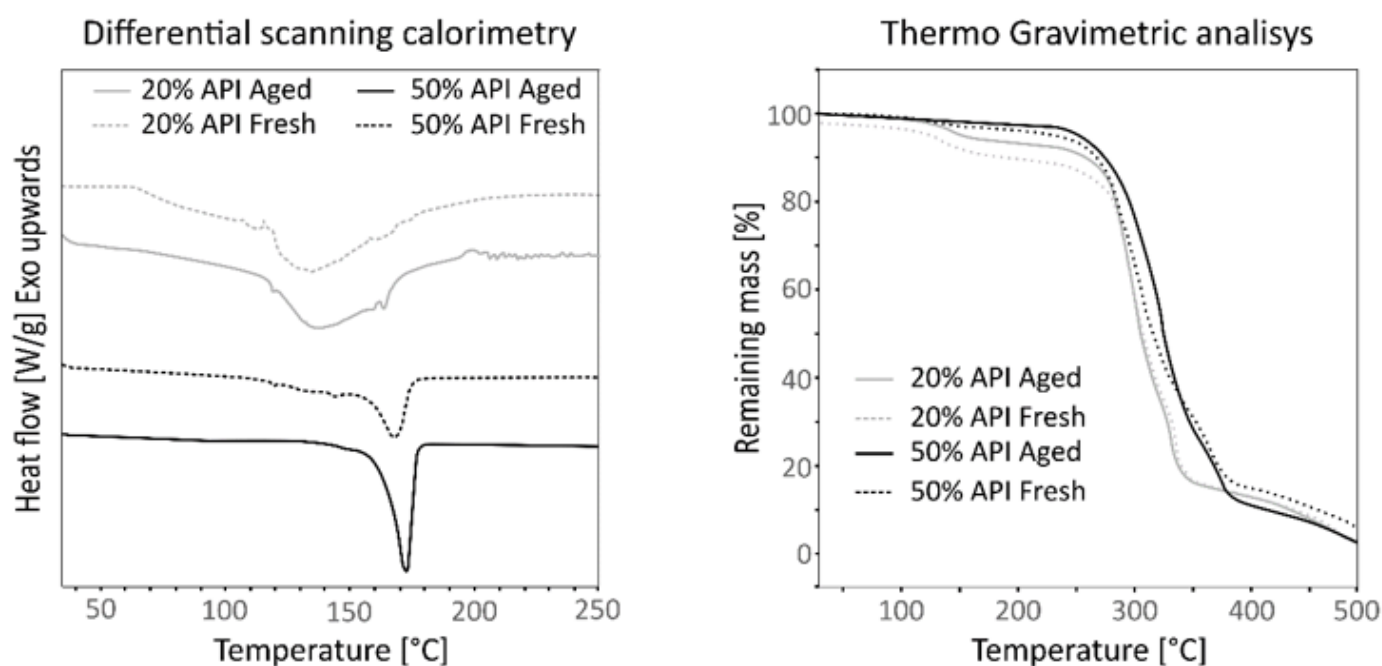
Paracetamol			
Time [min]	Mean [%]	SD	CV
0	1	1	48
5	78	8	10
10	98	1	1
15	98	1	1
30	99	1	0

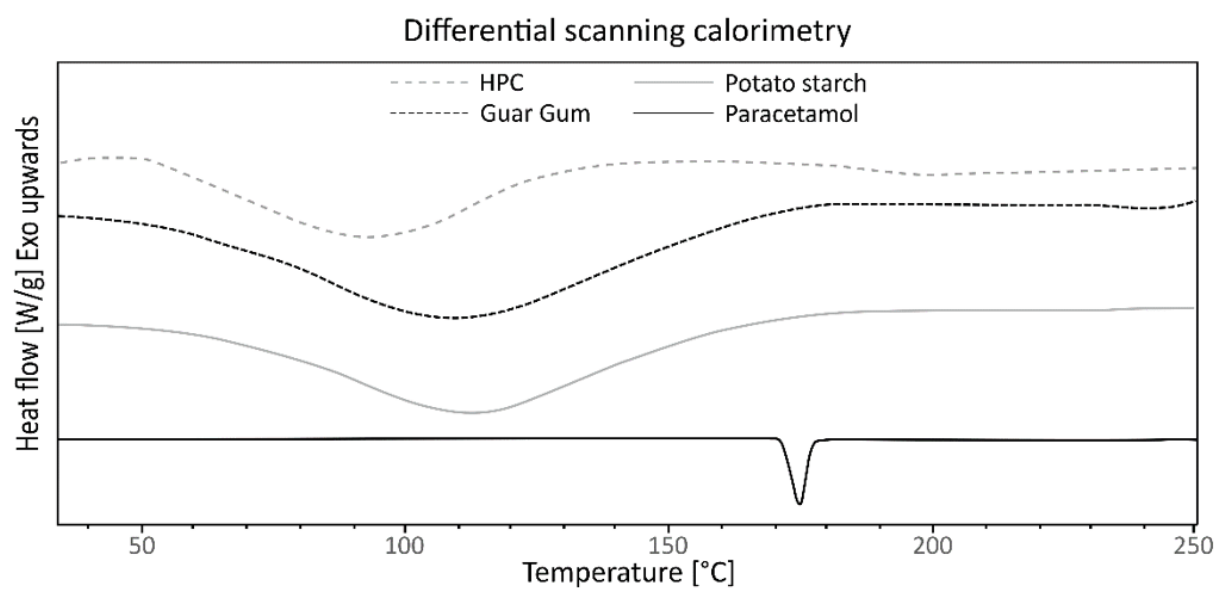
**Table S5.** Recovery percentages of samples containing 5% of Guar gum tested in fresh condition and stored for 6 weeks at room temperature.

Sample	Fresh Conditions		Aged Conditions	
	Mean [%]	SD	Mean [%]	SD
FG05702505A	88	3	80	1
FG20552505A	90	0	73	2
FG35402505A	93	2	74	3
FG50252505A	98	2	74	3

**Table S6.** Recovery percentages of preliminary tests with water quantity proportional to excipient amount instead to starch amount.

Sample	Mean [%]	SD
FG05702503	98	3
FG20552503	96	4
FG35402503	N/A	-
FG50252503	N/A	-

**Figure S1.** Differential scanning calorimetry (left panel) and thermogravimetric analysis (right panel) of samples containing 5% wt of Guar gum and 20% wt (grey) and 50% wt (black) of paracetamol in freshly extruded condition (dashed line) and in aged for 6 weeks condition (continuous line).



**Figure S2.** Differential scanning calorimetry of all the constituents of the mixture. HPC (dashed grey), Guar gum (dashed black), potato starch (continuous grey) and paracetamol (continuous black).