

## Supplementary Files

**Supplementary Table 1.** The filtration efficiency [n%] at different particle size for single layered filter printed with various temperatures.

Sample	Particle size [ $\mu\text{m}$ ]	Filtration efficiency [n%]
210 °C	0.3	$59.54 \pm 8.26$
	0.5	$77.43 \pm 5.34$
	1	$88.72 \pm 4.19$
	5	$96.60 \pm 1.75$
	10	$99.14 \pm 0.62$
	25	$98.83 \pm 1.12$
220 °C	0.3	$56.87 \pm 10.04$
	0.5	$75.08 \pm 8.80$
	1	$86.30 \pm 7.49$
	5	$96.34 \pm 2.43$
	10	$98.68 \pm 0.77$
	25	$97.60 \pm 2.96$
230°C	0.3	$42.77 \pm 7.86$
	0.5	$62.62 \pm 6.06$
	1	$77.85 \pm 3.56$
	5	$91.78 \pm 1.71$
	10	$99.28 \pm 0.45$
	25	$99.18 \pm 1.84$

**Supplementary Table 2.** The filtration efficiency [wt%] of multiple layers fillers with different number of layers.

Sample	Number of layers [-]	Filtration efficiency [wt%]
210 °C	1	79.12 ± 4.96
	2	87.78
	3	92.63
	4	95.48
	5	98.22
220 °C	1	77.35 ± 8.20
	2	91.80
	3	96.59
	4	93.96
	5	96.65
230°C	1	66.32 ± 4.61
	2	86.82
	3	93.98
	4	95.72
	5	95.24

**Supplementary Table 3.** The filtration efficiency [n%] at different particle size for multiple layered filters printed with 210 °C.

Number of layers	Particle size [ $\mu\text{m}$ ]	Filtration efficiency [n%]
2	0.3	81.13
	0.5	87.00
	1	91.27
	5	96.91
	10	96.74
	25	97.46
3	0.3	88.00
	0.5	91.87
	1	94.83
	5	98.56
	10	99.69
	25	95.45
4	0.3	92.00
	0.5	94.62
	1	97.18
	5	99.60
	10	100.00
	25	100.00
5	0.3	95.57
	0.5	98.13
	1	99.34
	5	99.78
	10	99.84
	25	100.00

**Supplementary Table 4.** The filtration efficiency [n%] at different particle size for multiple layered filters printed with 220 °C.

Number of layers	Particle size [ $\mu\text{m}$ ]	Filtration efficiency [n%]
2	0.3	80.77
	0.5	91.37
	1	96.26
	5	98.93
	10	99.18
	25	100.00
3	0.3	91.74
	0.5	96.84
	1	98.45
	5	99.64
	10	99.51
	25	97.25
4	0.3	88.75
	0.5	92.96
	1	96.35
	5	98.16
	10	99.51
	25	97.09
5	0.3	91.48
	0.5	96.36
	1	98.57
	5	97.41
	10	92.09
	25	88.45

**Supplementary Table 5.** The filtration efficiency [n%] at different particle size for multiple layered filters printed with 230 °C.

Number of layers	Particle size [ $\mu\text{m}$ ]	Filtration efficiency [n%]
2	0.3	72.61
	0.5	86.01
	1	93.45
	5	97.94
	10	99.72
	25	100.00
3	0.3	85.24
	0.5	94.35
	1	97.83
	5	99.33
	10	99.72
	25	100.00
4	0.3	89.84
	0.5	96.10
	1	98.24
	5	99.65
	10	100.00
	25	100.00
5	0.3	90.04
	0.5	94.77
	1	97.55
	5	99.68
	10	99.34
	25	97.00