

## Supporting information

**Investigate the processability of biobased thermoplastics used in nonwoven fabrics**

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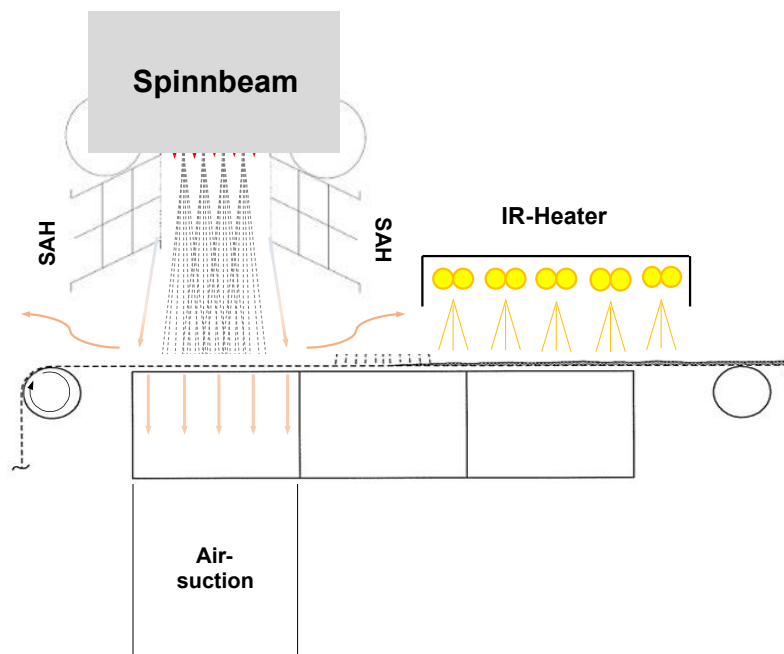


Fig.S1 IR heater in the Melt blow technology.

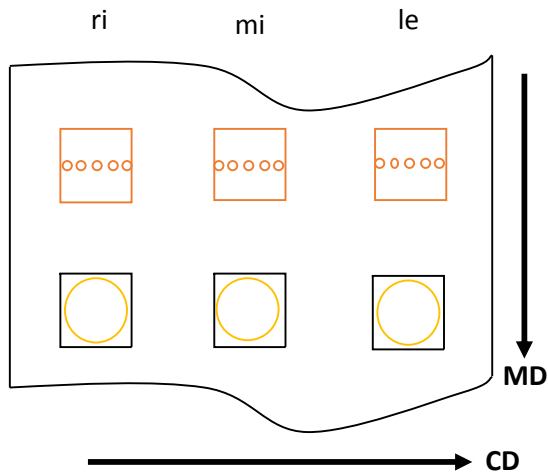


Fig.S2 Scheme of the sampling on the produced nonwovens for analysis of nonwoven properties and homogeneity (distribution); squares:  $10 \times 10$  cm for area base weight measurements; blue dots: sampling of area base weight in finer resolution ( $0.782 \text{ cm}^2$ ); green circles: air permeability ( $20 \text{ cm}^2$ ); yellow dots: thickness measurements ( $1 \text{ cm}^2$ ); abbreviations: machine direction (MD), cross direction (CD), left (le), middle (mi), and right (re).

### SEM Characterization

Meltblown PLA nonwoven textiles were seen at magnifications ranging from  $\times 100$  to  $\times 1000$ , revealing a consistent arrangement of PLA fibers over many layers (Fig.S3). The comprehensive visual representation of the meltblown PLA nonwoven fabric is depicted in Fig. S4. The aforementioned photos provide confirmation that the longitudinal bonding occurring at different fiber positions contributes to enhanced tensile characteristics, resulting in a smoother texture.

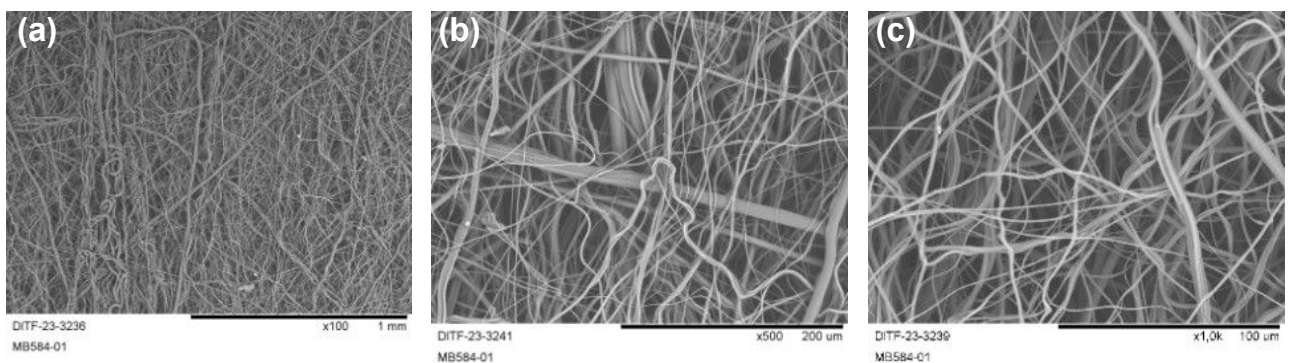


Fig.S3 SEM images of PLA meltblown nonwoven fabric with different resolution.

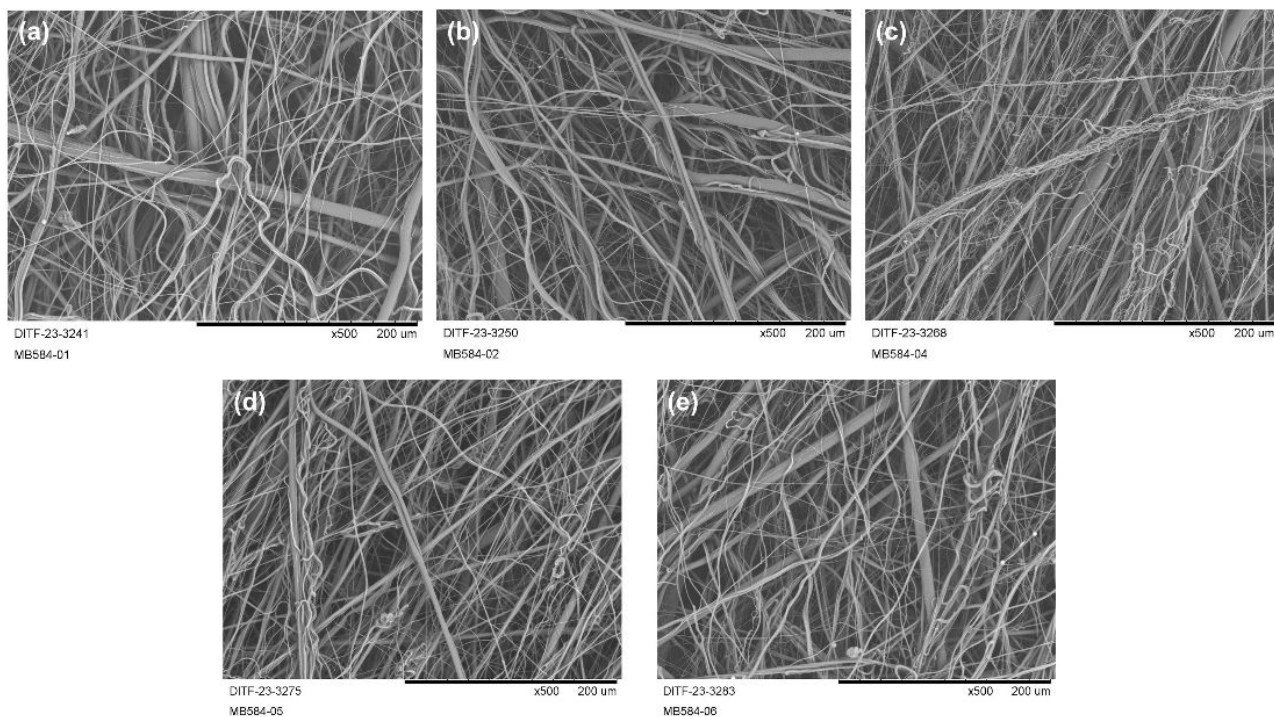


Fig. S4 SEM images of PLA meltblown nonwoven fabric (x500).

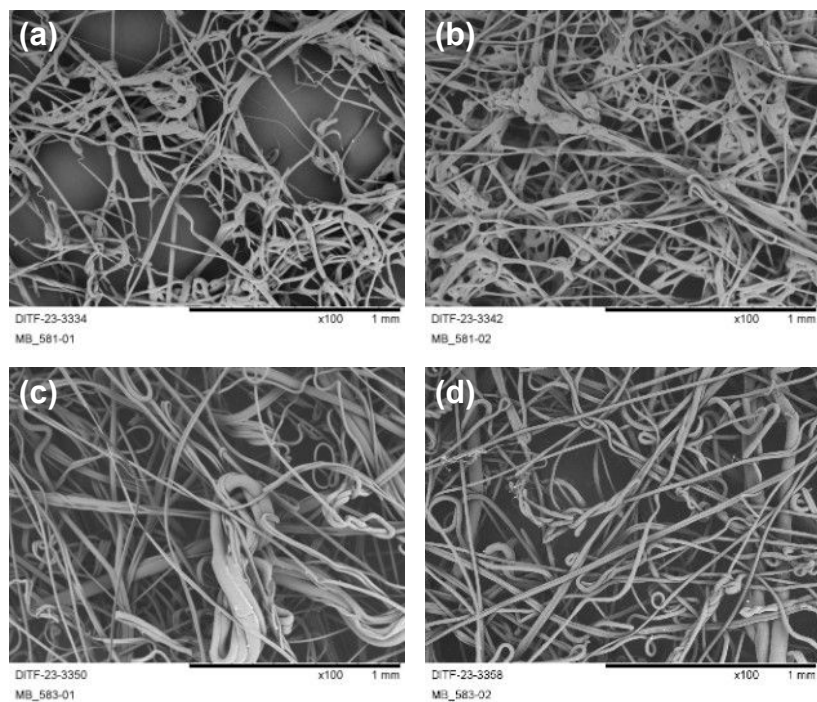


Fig. S5 SEM images of PBS (a and b); PE (c and d) meltblown nonwoven fabric.

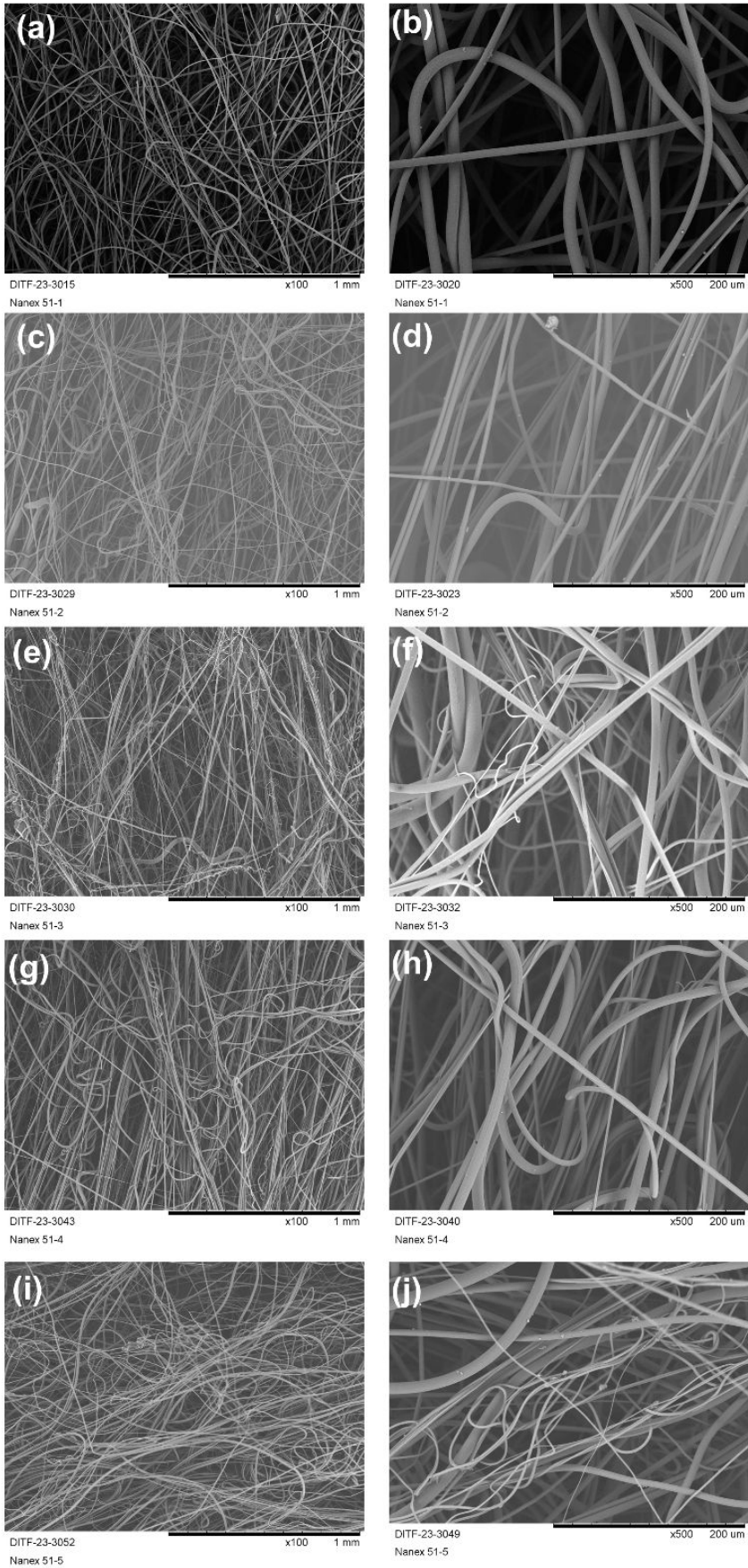


Fig. S6 SEM images of PLA NanEx nonwoven fabric.

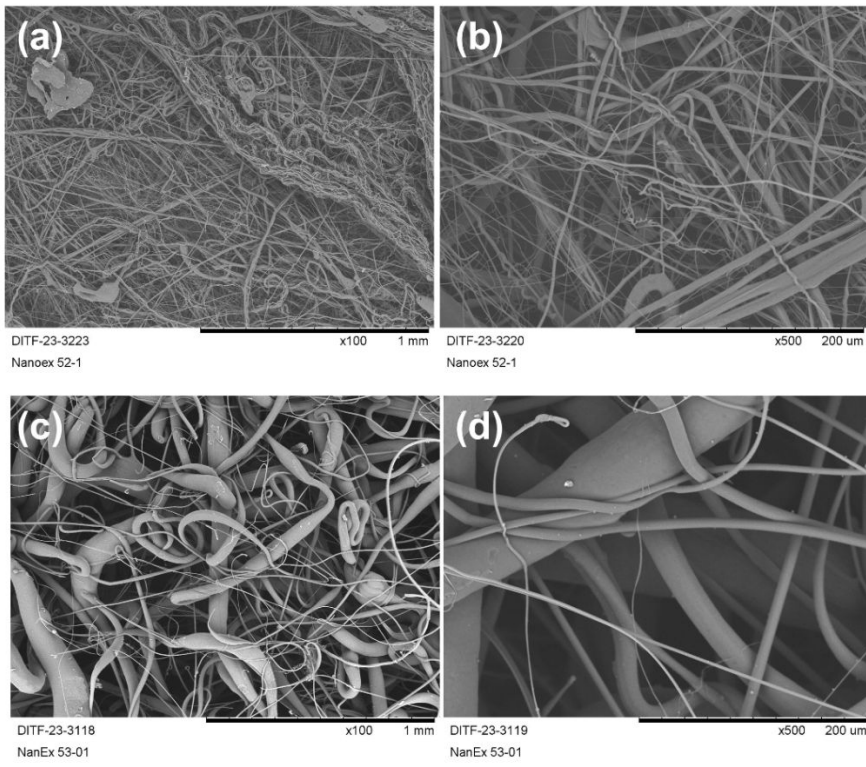


Fig. S7 SEM images of PBS (a and b); PE (c and d) NanEx nonwoven fabrics.

Table S1 Various physical properties of produced Nonwoven fabrics.

Procedure	Material	Sample-Nr.	Fiber diameter / $\mu\text{m}$		Area Base Weight / gsm			Thickness / mm			Air permeability / (l/min)	
			Median	Mean	left	middle	right	left	middle	right	(200 Pa, 20cm <sup>2</sup> )	Stdev.
			(SEM x1000)	(SEM x1000)	DIN EN ISO 29073 T1			EN ISO 9037			EN ISO 9237	
Meltblown	PLA	PLA-MB-01	5.6	5.5	39	43	38	0.16	0.22	0.15	1530	55
Meltblown	PLA	PLA-MB-03	1.83	2.59	37	42	38	0.17	0.17	0.16	662	21
Meltblown	PLA	PLA-MB-02	3.57	3.83	41	39	42	0.17	0.19	0.17	998	18
Meltblown	PLA	PLA-MB-04	3.9	4.11	22	26	23	0.1	0.08	0.09	1610	45
Meltblown	PLA	PLA-MB-05	5.52	5.62	24	25	23	0.07	0.09	0.08	2620	156
Meltblown	PLA	PLA-MB-06	2.52	3.09	21	24	23	1	0.08	0.09	1020	25
Meltblown	PLA	PLA-MB-07	2.15	3.18	24	26	21	0.08	0.1	0.1	1040	21
Meltblown	PBS	PBS-MB-01	11.59	12.68	25	28	28	0.17	0.16	0.14	8380	170
Meltblown	BioHDPE	PE-MB-011	12.9	13.3	33	38	35	0.19	0.25	0.2	6570	714
Meltblown	BioHDPE	PE-MB-02	15.4	14.4	32	38	28	0.13	0.2	0.21	8100	320
Nanoval	PLA	PLA-NV_0113	8.15	8.05	35	40	30	0.205	0.22	0.145	4400	900
Nanoval	PLA	PLA-NV-02	4.25	5.6	28	38	35	0.115	0.185	0.165	3000	300
Nanoval	PLA	PLA-NV-03	2.59	3.84	30	42	37	0.155	0.21	0.14	3300	1500
Nanoval	PLA	PLA-NV-04	3.72	4.27	33	39	37	0.165	0.185	0.17	2800	300
Nanoval	PLA	PLA-NV-05	4.55	4.91	18	23	19	0.11	0.125	0.085	5500	400
Nanoval	PLA	PLA-NV-06	2.43	3.05	17	21	19	0.07	0.11	0.08	2750	335
Nanoval	PBS	PBS-NV-01	2.11	2.67	21	24	19	0.14	0.185	0.11	2300	300
Meltblown	PLA	PLA-MB-08	1.37	1.6	40	40	40	0.14	0.145	0.165	580	30
Meltblown	PLA	PLA-MB-09	1.49	1.77	26	26	26	0.085	0.095	0.14	900	100
Meltblown	PLA	PLA-MB-11	1.44	1.8	26	24	24	0.11	0.105	0.11	800	0
Meltblown	PLA	PAMB-10	1.56	1.9	38	40	39	0.145	0.15	0.14	540	20

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