

Supporting Information

High Performance Carbon Nanotube – Polymer Nanofiber Hybrid Fabrics

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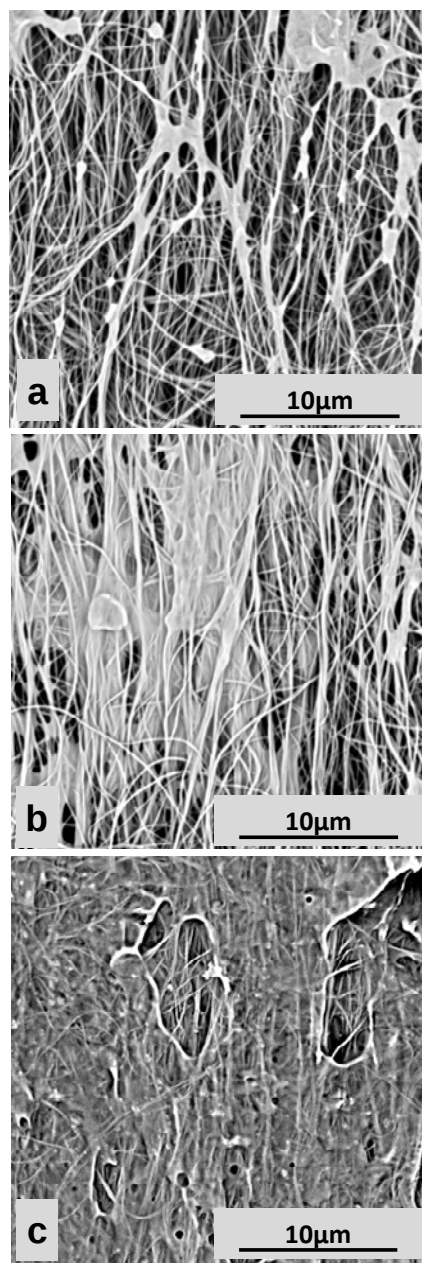


Figure S1. The SEM images of hybrid calendered fabrics a) 60% CNT, b) 30% CNT, c) 15% CNT.

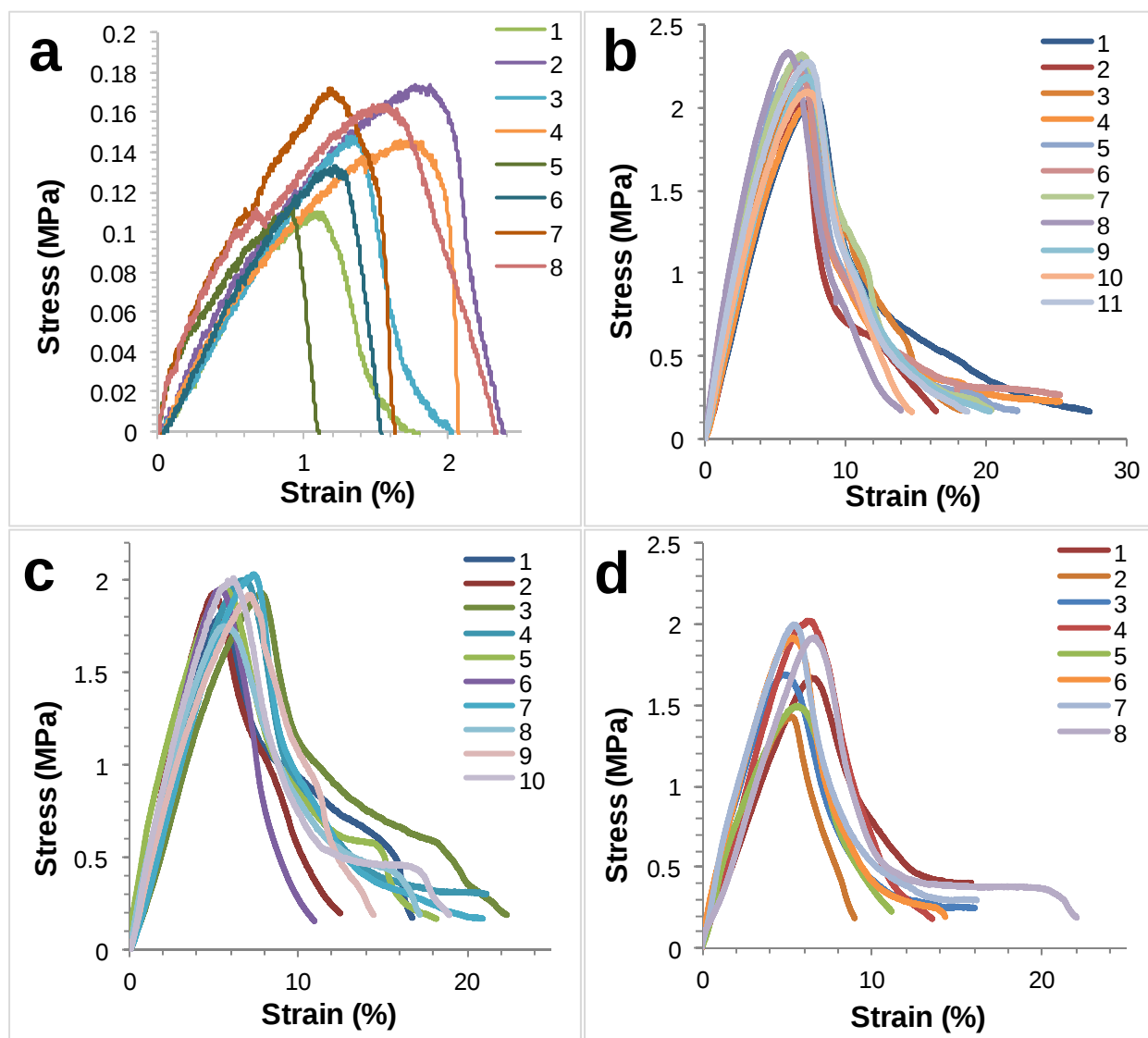


Figure S2. The mechanical properties of as-produced fabrics, a) electrospun nonwoven fabric (control sample), b) 15% CNT hybrid fabrics, c) 30% CNT hybrid fabrics, d) 60% CNT hybrid fabrics.

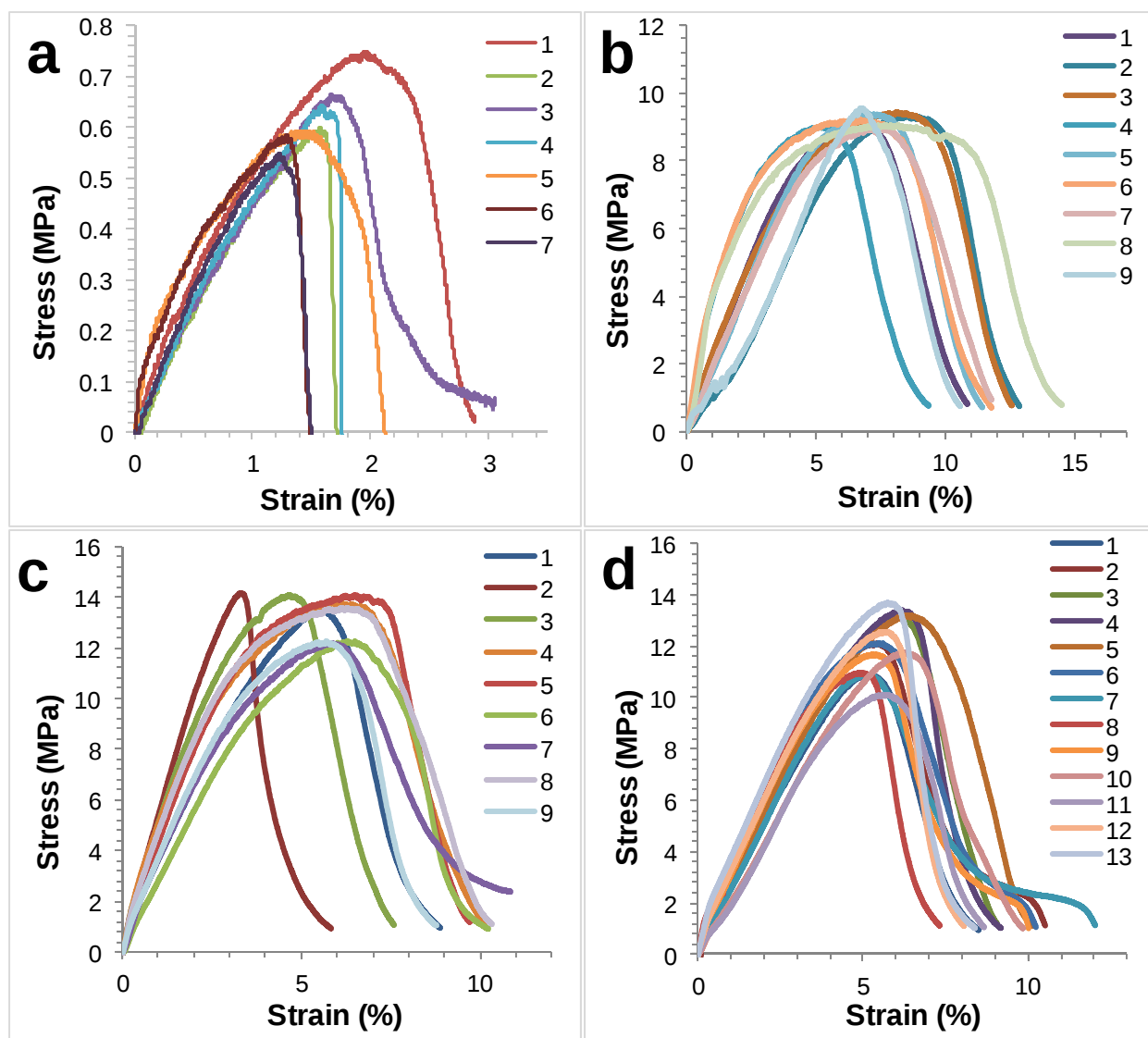


Figure S3. The mechanical properties of consolidated fabrics, a) electrospun nonwoven fabric (control sample), b) 15% CNT hybrid fabrics, c) 30% CNT hybrid fabrics, d) 60% CNT hybrid fabrics.

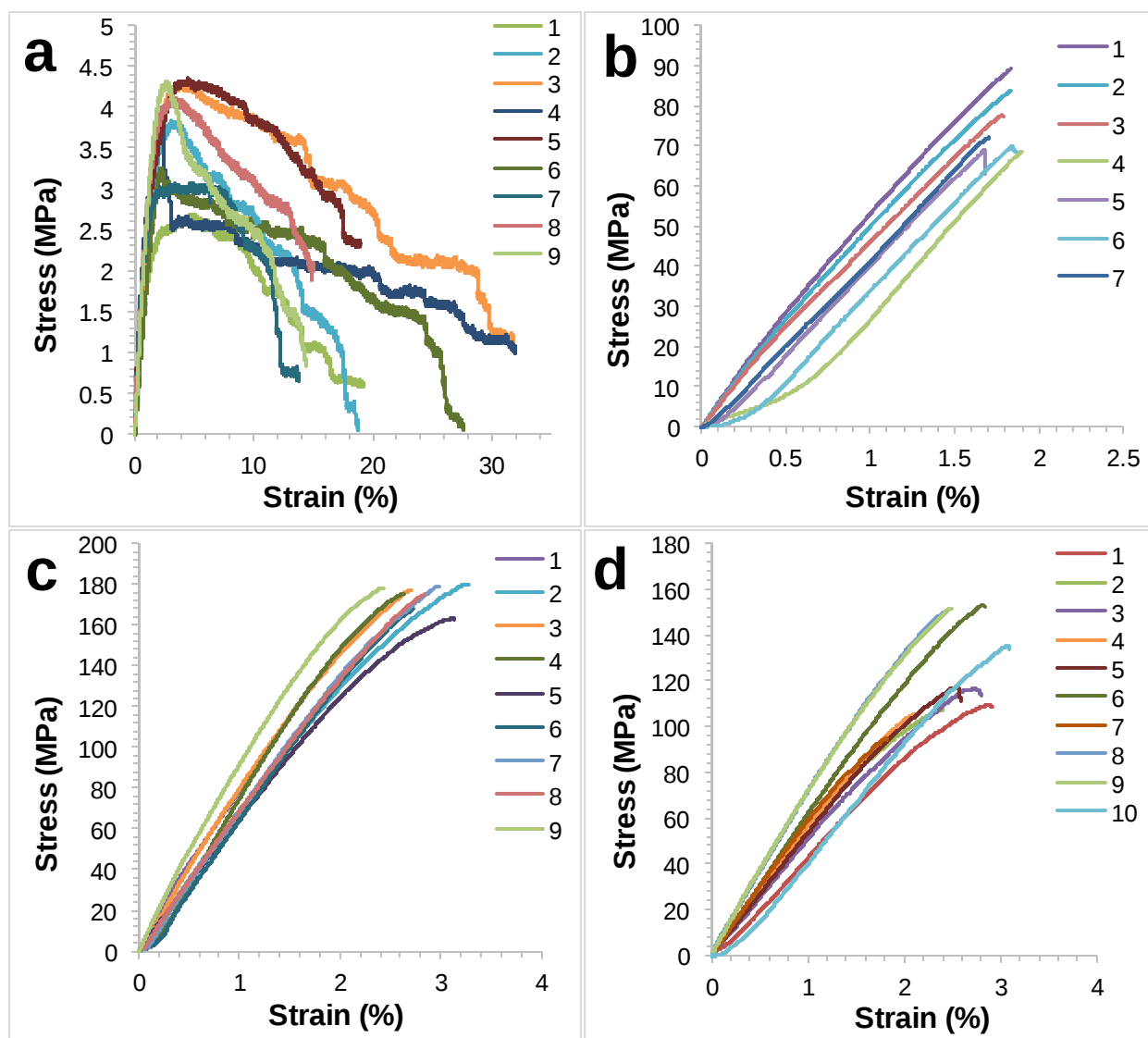


Figure S4. The mechanical properties of calendared fabrics, a) electrospun nonwoven fabric (control sample), b) 15% CNT hybrid fabrics, c) 30% CNT hybrid fabrics, d) 60% CNT hybrid fabrics.

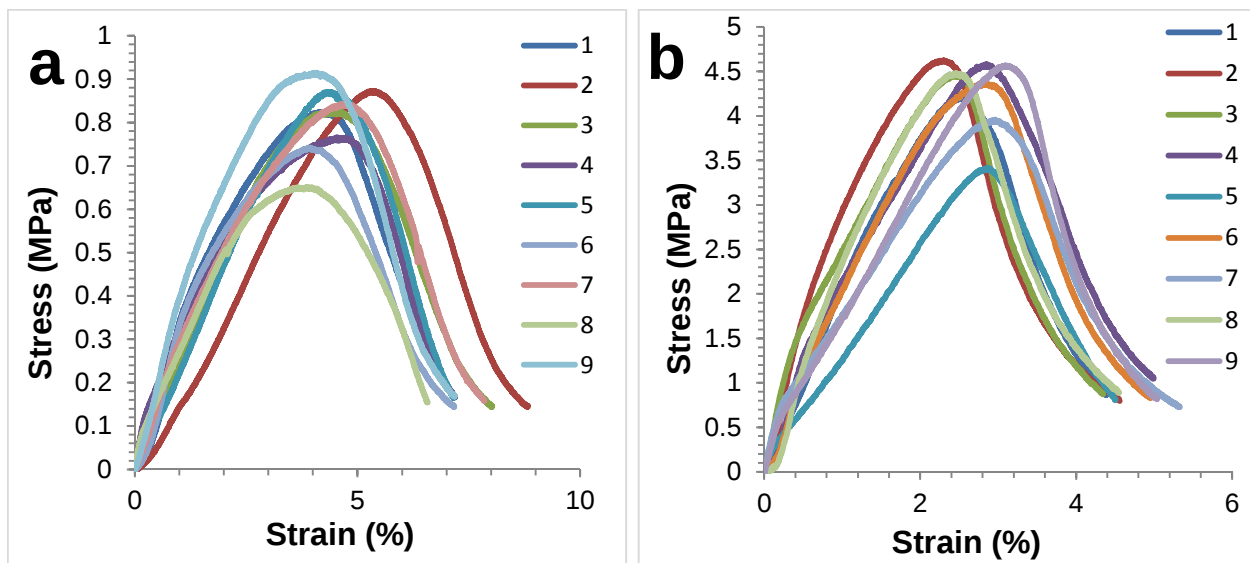


Figure S5. The mechanical properties of, a) as-produced 100% CNT fabric, b) consolidated 100% CNT fabric.

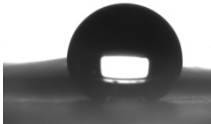
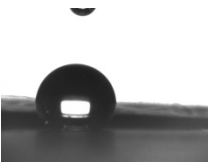
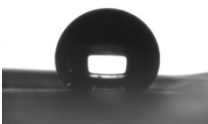
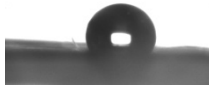
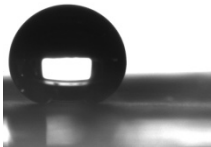
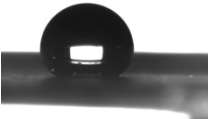
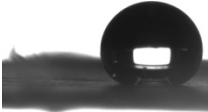
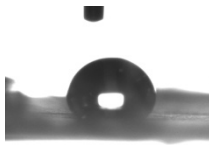
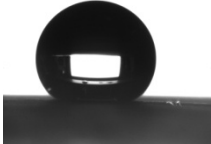
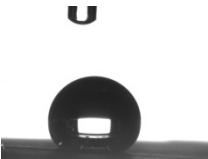
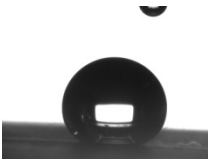
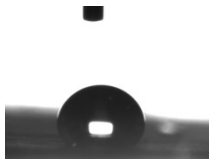
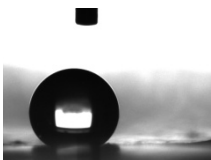
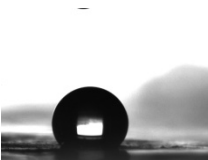
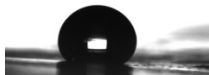
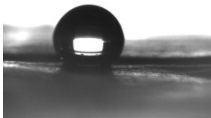
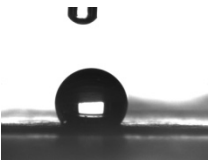
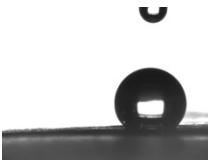
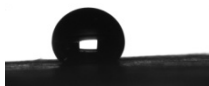
Table S1. Average max-stress and max-strain of control sample and hybrid fabrics.

Sample Type	CNT	Average Max-Stress	STDEV	Average Max-Strain	Modulus
	%	MPa		%	MPa
As-produced	0	0.15	0.03	1.64	15.69
	15	2.23	0.16	6.77	32.99
	30	1.93	0.08	6.465	38.79
	60	1.77	0.22	5.09	28.58
	100	0.82	0.08	8.79	22.74
Consolidated	0	0.63	0.07	1.83	50
	15	9.22	0.22	6.71	225.49
	30	13.32	0.84	5.18	281.91
	60	12.053	1.13	5.42	291.49
	100	4.3	0.39	4.74	225.75
Calendered	0	3.55	0.57	3.42	78.27
	15	75.55	8.35	1.75	5053.2
	30	172.54	7.98	2.47	9996.55
	60	124.12	18.95	2.51	5269.61
	100	4.29	0.399	4.75	225.75

Table S2. Density and Basis weight of the control sample and hybrid fabrics.

Sample Type	CNT	Density	Basis Weight
	%	g/cm ³	g/m ²
As-produced	0	0.11	14.06
	15	0.082	11.6
	30	0.059	7.1
	60	0.031	3.63
	100	0.0054	0.1
Consolidated	0	0.51	10.7
	15	0.45	8.52
	30	0.31	6.13
	60	0.21	3.2
	100	0.104	2.01
Calendered	0	0.21	31.68
	15	0.51	8.26
	30	0.45	6
	60	0.31	3.67
	100	0.104	2.01

Table S3. Contact Angle Measurements of pure CNT samples and Hybrid Fabrics.

Samples	Contact Angle (°)			
	Water	Hexadecane	Ethylene Glycol	Diodomethane
10 layer consolidated CNT sheet	 150 ± 3.2	 135 ± 5.3	 130.7 ± 4.9	 141 ± 2.8
10 layer consolidated 60% CNT hybrid fabric (CNTs on top surface)	 155 ± 2.3	 143.7 ± 4.3	 148.5 ± 1.5	 133.5 ± 3.4
10 layer as-produced 60% CNT hybrid fabric (CNTs on top surface)	 136 ± 5	 126.5 ± 5	 130.3 ± 6	 128 ± 6
10 layer consolidated 60% CNT hybrid fabric (polymer nanofibers on top surface)	 143.9 ± 6	 132.3 ± 3	 135.8 ± 3.5	 139.5 ± 1.8
10 layer as-produced 60% CNT hybrid fabric (polymer nanofibers on top surface)	 129.6 ± 5.4	 129.8 ± 4.2	 131.5 ± 4	 132.3 ± 3.8