

Supplementary materials

The Impact of Elongation on Change in Electrical Resistance of Electrically Conductive Yarns Woven into Fabric

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Table S1. The mean values of maximum force F_B and the corresponding elongation ϵ_B , and the coefficients of variation CV.

Fabric Tag	ϵ_B (%)		F_B (N)	
	\bar{x} (%)	CV (%)	\bar{x} (%)	CV (%)
X-0	45.80	8.64	1031.1	8.58
Y-0	46.24	7.95	1045.4	8.02
Z-0	46.70	8.12	1068.8	8.15
X-45	64.04	7.32	843.8	7.42
Y-45	65.36	8.18	865.8	8.11
Z-45	65.98	8.46	884.2	8.32
X-90	25.22	7.46	809.1	7.65
Y-90	25.72	7.82	853.7	7.81
Z-90	26.02	7.65	880.6	7.93

Table S2. Mean values of initial R_0 and maximum electrical resistance R_E , and variation coefficients.

Fabric Tag	R_{01} (Ω)		R_{02} (Ω)		R_{E1} (Ω)		R_{E2} (Ω)		R_0 (Ω)	R_E (Ω)
	\bar{x} (Ω)	CV (%)	\bar{x} (Ω)	CV (%)	\bar{x} (Ω)	CV (%)	\bar{x} (Ω)	CV (%)	\bar{x} (Ω)	\bar{x} (Ω)
X-0	14.21	1.50	14.25	1.43	18.19	2.99	18.13	2.84	14.23	18.16
Y-0	10.55	1.46	10.52	1.29	11.42	2.87	11.40	2.78	10.53	11.41
Z-0	2.98	1.28	3.00	1.32	3.09	2.74	3.09	2.97	2.99	3.09
X-45	19.61	1.31	19.66	1.37	29.79	2.68	30.32	2.61	19.64	30.06
Y-45	14.67	1.42	14.72	1.41	20.67	2.61	20.37	2.71	14.70	20.52
Z-45	4.19	1.48	4.21	1.49	5.97	3.01	5.79	3.05	4.20	5.88
X-90	53.38	1.37	53.42	1.51	175.72	2.71	179.66	2.69	53.40	177.69
Y-90	40.71	1.34	40.68	1.33	101.34	2.83	99.65	2.71	40.70	100.50
Z-90	11.77	1.44	11.73	1.46	39.74	2.91	38.60	2.85	11.75	39.17

Table S3. Coordinates of point A and coefficients of the curves of the mathematical model k , a_0 , a_1 , a_2 , a_3 and correlation coefficient r .

Fabric Tag	A		Linear Coefficient		Nonlinear Coefficients				
	ϵ_A (%)	F_A (N)	k	r	a_0	a_1	a_2	a_3	r
X-0	1.38	8.41	4.81	0.9969	23.75	-13.91	2.062	-0.028	0.9960
Y-0	1.56	8.88	4.85	0.9945	26.50	-14.46	2.072	-0.028	0.9961
Z-0	1.74	10.40	4.97	0.9976	30.48	-15.10	2.096	-0.028	0.9962
X-45	3.78	8.49	1.76	0.9968	37.10	-9.94	0.644	-0.005	0.9938
Y-45	3.88	8.82	1.80	0.9989	43.48	-11.67	0.727	-0.005	0.9924
Z-45	3.96	9.15	1.85	0.9975	47.46	-12.65	0.775	-0.006	0.9918
X-90	1.12	21.19	17.24	0.9997	-34.47	49.69	0.036	-0.027	0.9883
Y-90	1.14	22.21	17.81	0.9998	-36.38	51.39	0.035	-0.027	0.9883
Z-90	1.16	22.96	18.14	0.9999	-37.91	52.47	0.030	-0.027	0.9883

Table S4. Coordinates of point D and coefficients of the curves of the mathematical model p , b_0 , b_1 , b_2 , b_3 and correlation coefficient r .

Fabric Tag	D		Linear Coefficient		Nonlinear Coefficients				
	ϵ_D (%)	R_D (Ω)	p	r	b_0	b_1	b_2	b_3	r
X-0	2.78	14.19	-0.012	0.9985	14.21	-0.020	0.0059	-0.0001	0.9962
Y-0	13.82	10.34	-0.015	0.9813	11.61	-0.185	0.0079	-0.0001	0.9886
Z-0	14.96	2.89	-0.007	0.9836	2.98	-0.007	0.0001	0.0000	0.9937
X-45	6.06	19.53	-0.017	0.9982	19.77	-0.096	0.0098	-0.0001	0.9990
Y-45	7.64	14.64	-0.009	0.9984	14.98	-0.065	0.0026	0.0000	0.9996
Z-45	7.82	4.17	-0.005	0.9980	4.30	-0.024	0.0009	0.0000	0.9991
X-90	2.18	54.87	0.650	0.9983	53.23	0.436	0.1426	0.0014	0.9999
Y-90	2.24	41.20	0.184	0.9982	41.10	-0.215	0.1164	-0.0007	0.9999
Z-90	2.34	11.81	0.016	0.9978	12.13	-0.284	0.0637	-0.0005	0.9997