

An Analysis of Screen-Printed Stretchable Conductive Tracks on Thermoplastic Polyurethane

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Results from cyclic strain test with 25 % and 50 % elongations
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TABLE I
 DC RESISTANCE (Ω) READINGS ACQUIRED BEFORE AND AFTER ELONGATIONS

Curing temperature	Time	3 minutes			10 minutes			20 minutes			30 minutes		
	Line width (cm)	Initial printed	25 % stretched	50 % stretched	Initial printed	25 % stretched	50 % stretched	Initial printed	25 % stretched	50 % stretched	Initial printed	25 % stretched	50 % stretched
110 °C	1	4.63	51.9	174.4	4.08	156.2	206.8	3.96	90.1	201.4	2.43	48.1	179.7
	0.5	7.44	65.2	211.6	7.11	226.4	291.7	6.73	119.3	341.1	4.15	64.5	128.6
	0.25	11.82	106.5	364.5	13.35	374.1	564.3	11.43	209.1	467.7	6.39	132.3	158.8
	0.125	20.84	195.1	537.1	36.01	721.8	1368.0	21.03	230.4	519.8	10.81	172.1	233.9
	0.0625	50.09	244.3	563.2	42.07	1450.3	1255.4	37.11	184.2	226.2	16.06	162.2	261.8
	0.0312	88.91	362.3	1051.9	60.01	1367.5	1972.4	48.09	NaN	NaN	27.49	266.4	NaN
120 °C	1	4.54	145.6	205.5	2.65	23.2	45.6	2.04	18.3	41.7	1.71	16.7	53.4
	0.5	7.14	159.2	258.4	4.11	38.6	99.1	3.67	24.4	52.6	2.91	38.3	70.5
	0.25	11.53	176.7	566.4	7.73	65.2	168.9	6.89	38.1	76.4	4.63	42.5	91.9
	0.125	19.17	217.1	694.1	14.27	97.3	149.7	12.08	71.2	144.2	9.21	56.7	83.2
	0.0625	26.99	264.4	613.7	26.19	121.7	198.5	27.52	328.1	745.3	17.27	48.5	73.0
	0.0312	55.01	594.3	912.4	53.91	404.4	763.1	67.02	NaN	NaN	30.41	92.1	106.6
130 °C	1	2.12	8.5	44.0	1.72	14.9	18.3	1.07	5.0	7.2	0.81	0.9	1.5
	0.5	3.69	15.4	76.3	3.14	40.0	79.6	1.82	6.6	11.4	1.22	1.8	2.7
	0.25	6.37	34.1	126.1	5.02	60.4	89.2	2.92	9.1	14.2	1.98	3.1	4.9
	0.125	11.96	62.2	194.5	8.65	70.7	121.6	6.23	17.9	24.5	4.69	7.3	11.2
	0.0625	17.21	101.4	237.4	14.43	137.2	243.1	10.05	26.8	38.2	7.51	14.3	19.3
	0.0312	40.75	236.1	440.1	21.39	114.4	295.7	19.11	409.1	582.6	14.59	30.8	44.9
150 °C	1	1.01	7.6	5.6	0.74	2.9	3.1	0.66	1.3	2.1	0.59	1.5	3.3
	0.5	1.81	13.5	9.3	1.26	3.8	4.2	1.14	2.2	3.4	1.09	2.6	5.2
	0.25	3.18	20.7	15.5	2.32	7.4	9.4	2.03	3.8	6.0	2.02	5.1	10.2
	0.125	6.73	41.5	34.5	4.98	13.5	18.4	4.51	8.4	12.6	4.36	11.6	19.4
	0.0625	10.45	57.1	46.1	8.02	18.8	30.6	7.17	14.9	19.5	7.08	15.8	30.1
	0.0312	17.19	72.2	67.2	15.34	39.8	64.4	12.31	43.1	41.6	10.13	46.1	52.7