Supporting Information

Shape Memory Respirator Mask for Airborne Viruses

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Table S1. Summary of the mechanical properties of PP/PCL blends obtained from tensile tests [30].

Sample	Elastic Modulus (MPa)	Tensile Strength (MPa)	Elongation at Break (%)
PP100	1866 ± 350	38.3 ± 2.3	926 ± 1
PP90PCL10	1234 ± 70	28.5 ± 4.2	926 ± 1
PP80PCL20	1117 ± 80	25.4 ± 1.3	926 ± 1
PP70PCL30	890 ± 80	27.6 ± 6	549 ± 247
PCL100	327.4 ± 10	19.3 ± 1.5	926 ± 1

Table S2. Summary of the mechanical properties of PP/PCL/PP-g-ma blends obtained from tensile tests [30].

Sample	Elastic Modulus (MPa)	Tensile Strength (MPa)	Elongation at Break (%)
PP90PCL10C10	1233 ± 90	30.2 ± 1.5	32.7 ± 26.3
PP90PCL10C5	1540 ± 268	30.7 ± 5.38	98.9 ± 51.7
PP90PCL10C1.25	1356 ± 77	32.3 ± 1.1	104.3 ± 32.4
PP80PCL20C10	1160 ± 140	30.1 ± 0.6	65.8 ± 9.7
PP80PCL20C5	1457 ± 106	30.7 ± 5.7	178.8 ± 158
PP80PCL20C1.25	1402 ± 46	33.5 ± 0.8	80.3 ± 12.5
PP70PCL30C10	1152 ± 140	27.7 ± 3.8	134 ± 46.4
PP70PCL30C5	1424 ± 173	31.4 ± 3.6	69.3 ± 15.7
PP70PCL30C1.25	1307 ± 52	32.0 ± 1.4	116.8 ± 36.3

Table S3. Summary of the mechanical properties of PLA/PCL blends obtained from tensile tests [30].

Sample	Tensile Strength (MPa)	Elastic Modulus (MPa)	Elongation at Break (%)
PLA100	58.4 ± 4.3	2883 ± 220	8.62 ± 3.9
PLA90PCL10	52.8 ± 9.3	3087 ± 440	13.2 ± 2.0
PLA80PCL20	44.5 ± 1	2628 ± 76	17.9 ± 7.5
PLA70PCL30	37.8 ± 4.7	2252 ± 73	535 ± 0.3
PLA60PCL40	32.8 ± 5.7	1989 ± 510	127 ± 99.2
PLA50PCL50	25.2 ± 3.5	1604 ± 276	225.2 ± 78.7
PCL100	19.3 ± 1.5	327.4 ± 10	926 ± 1

Table S4. Summary of the mechanical properties of PP/PCL/P-123blends obtained from tensile tests [30].

Sample	Tensile Strength (MPa)	Elastic Modulus (MPa)	Elongation at Break (%)
PLA80PCL20C2.5	39.3 ± 20.3	2555 ± 216	54.7 ± 38.9
PLA80PCL20C5	45.3 ± 2.6	2710 ± 170	41.0 ± 34.4
PLA80PCL20C7.5	41.7 ± 1.9	2609 ± 285	25.6 ± 9.1
PLA80PCL20C10	33.5 ± 9.4	2172 ± 464	45.9 ± 65.4
PLA70PCL30C5	33.96 ± 2.3	1814 ± 184	108.1 ± 38.0
PLA70PCL30C7.5	32.2 ± 3.28	2001 ± 136	43.9 ± 35.4
PLA70PCL30C10	31.3 ± 5.9	2110 ± 270	50.6 ± 35.9
PLA60PCL40C5	31.3 ± 3.9	1691 ± 276	535.6 ± 355.1
PLA60PCL40C7.5	37.6 ± 2.7	1958 ± 229	137.2 ± 67.1
PLA60PCL40C10	34.8 ± 5.6	1769 ± 113	119.9 ± 56.4

Table S5. Summary of the mechanical properties of LDPE/PCL blends and LDPE/PCL/PE-g-ma blends obtained from tensile tests [30].

Sample	Tensile Strength (MPa)	Elastic Modulus (MPa)	Elongation at Break (%)
LDPE100	12.9 ± 1.7	289.5 ± 50	926 ± 1
LDPE90PCL10	11.6 ± 2.1	250.1 ± 20	926 ± 1
LDPE80PCL20	12.7 ± 1.1	284.3 ± 40	926 ± 1
LDPE70PCL30	12.8 ± 1.4	340.6 ± 70	926 ± 1
LDPE90PCL10C10	11.2 ± 15	274.9 ± 30	926 ± 1
LDPE80PCL20C10	12.1 ± 1.1	295.7 ± 20	926 ± 1
LDPE70PCL30C10	12.4 ± 1.1	353.7 ± 50	488 ± 302
PCL100	19.3 ± 1.5	327.4 ± 10	926 ± 1

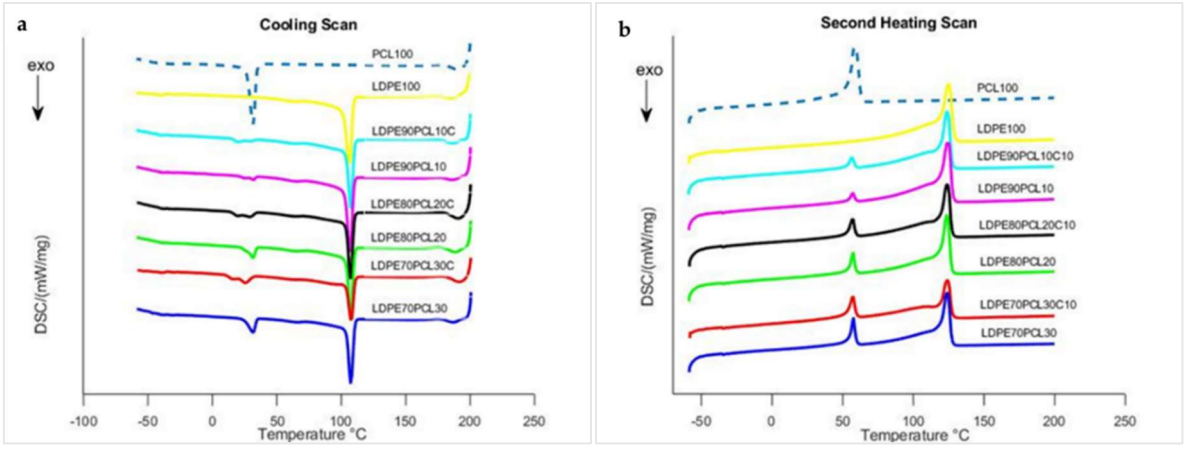

Figure S1. DSC plots of LDPE, PCL, LDPE/PCL compatibilized blends: (**a**) Cooling scans and (**b**) Second heating scans.

Table S6. Thermal parameters of LDPE, PCL, LDPE/PCL, and LDPE/PCL/ PE-g-ma [30].

Sample	LDPE					PCL				
	T_m (◦C)	T_{mc} (◦C)	H_m (Jg^{-1})	H_{mc} (Jg^{-1})	X_c (%)	T_m (◦C)	T_{mc} (◦C)	H_m (Jg-1)	H_{mc} (Jg-1)	X_c (%)
LDPE100	125.7	107.2	99.85	103.70	34.08	-	-	-	-	-
LDPE90PCL10	124.6	107.3	93.41	95.23	35.42	57.55	32.38	3.04	2.86	22.37
LDPE80PCL20	123.8	107.4	78.43	85.59	33.46	57.40	31.31	8.56	9.73	31.47
LDPE70PCL30	123.7	107.2	71.18	77.21	34.71	57.67	31.32	11.06	13.08	27.11
LDPE90PCL10C10	124.3	107.3	83.80	92.06	31.78	56.56	30.50	4.44	3.51	32.66
LDPE80PCL20C10	124.2	107.3	75.62	87.13	32.26	57.59	29.32	8.01	8.35	29.46
LDPE70PCL30C10	124.7	107.3	58.47	69.04	28.51	57.63	26.33	10.98	10.45	26.91
PCL100	-	-	-	-	-	58.64	32.33	65.80	57.31	48.38

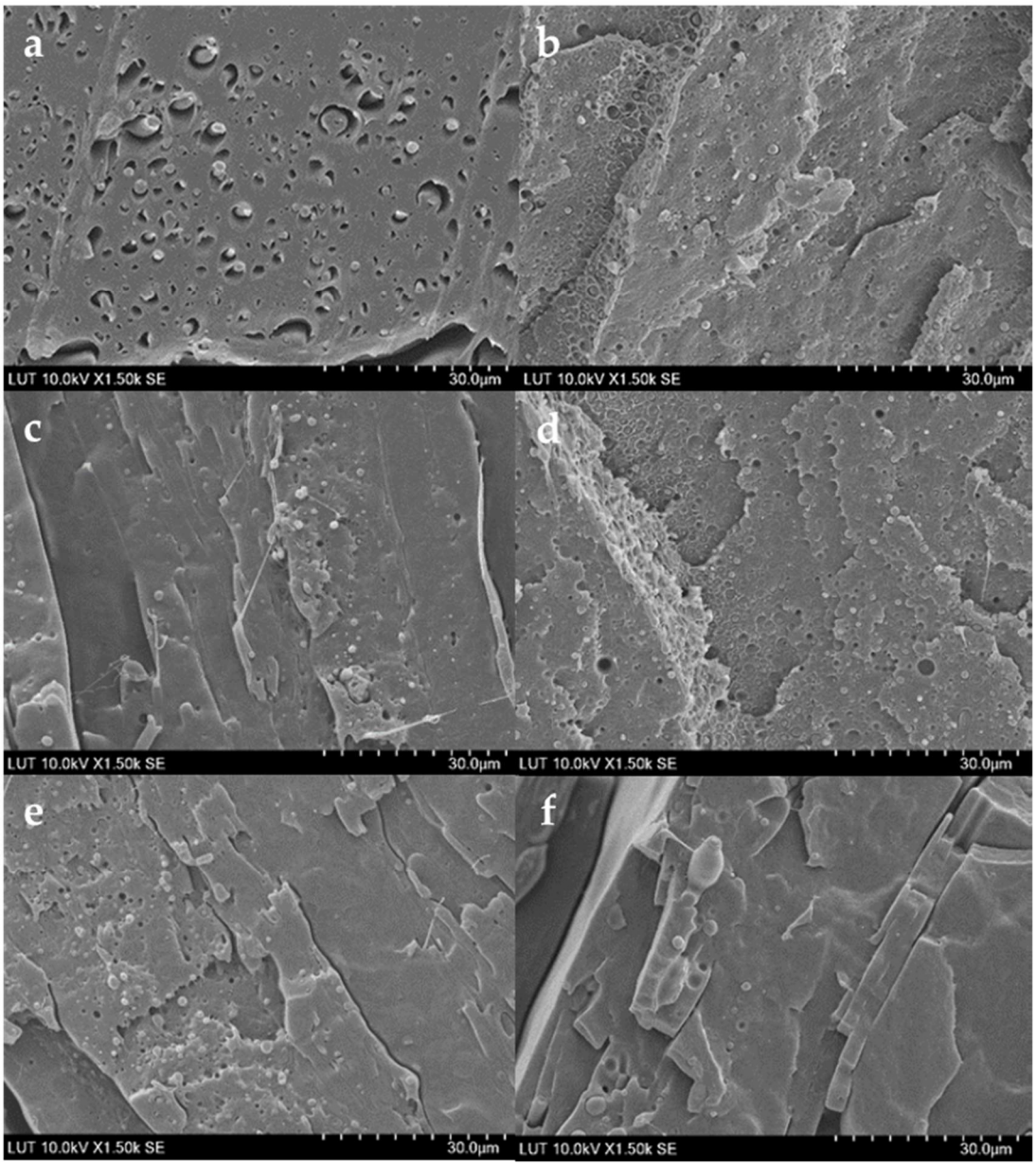

Figure S2. SEM images of: (**a**) LDPE90/PCL10 (**b**) LDPE90/PCL10C10 (**c**) LDPE80/PCL20 (**d**) LDPE80/PCL20C10 (**e**) LDPE70/PCL30 and (**f**) LDPE70/PCL30C10 [30].

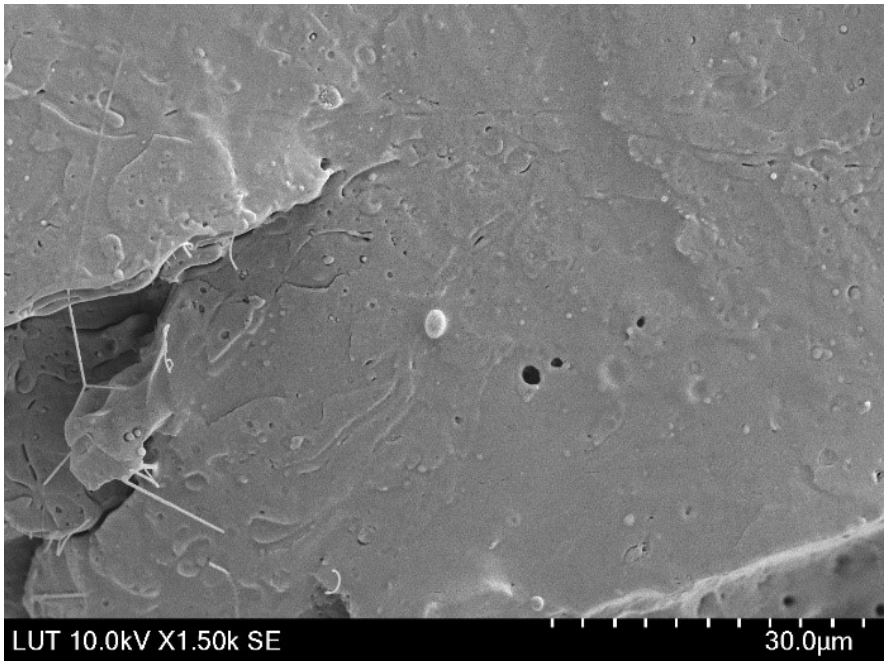

Figure S3. SEM image of PLA80/PCL20C5 [30].

Table S7. Printing parameters used in printing mask.

Sample	Bed Temperature (°C)	Nozzle Temperature (°C)	Raster Angle (°)	Printing Speed (mm/min)	Infill Density (%)
Mask body	50	205	45	6000	15
Other parts	50	210	45	6000	15