

**Liquid-phase Exfoliated Graphene and
Polytetrafluoroethylene for Highly Durable and
Reusable Chemical Leak Detection Sensors**

SUPPLEMENTARY INFORMATION

Table S1. Electrical conductivity analysis results

Sr. No	Load [kgf]	Thickness [mm]	Resistance [Ω]	SR [Ω /sq]	VR [Ω cm]	Conductivity [S/cm]	Density [g/cm ³]
1	196.50	1.45	0.61	2.76	0.40	2.50	0.6337
2	201.00	1.20	0.16	0.73	0.09	11.50	0.767
3	197.00	1.07	0.80	3.62	0.39	2.58	0.86



Figure S1: Fabrication of LPEG-PTFE composite and sensor strips.

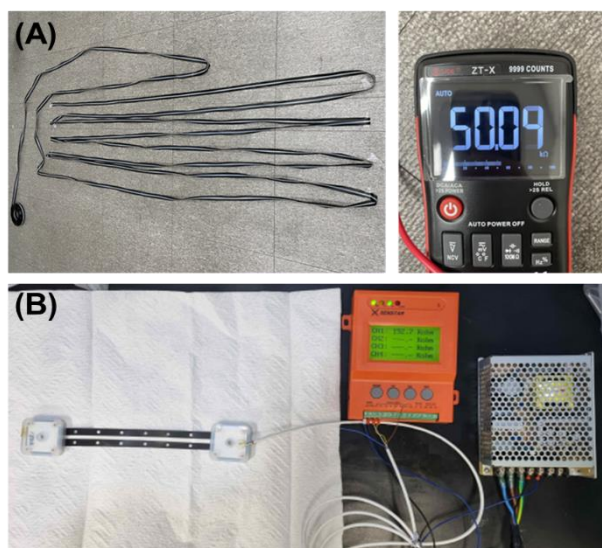


Figure S2. Photographs of LPEG-PTFE sensor and system.

Table S2. Corrosion Resistance Test of the LPEG-PTFE sensor.

Solvents for treatment	Before Immersion (kΩ)	After Immersion (kΩ)	%age Difference
<i>H₂SO₄</i> #1	187.1	191.5	2.35
<i>H₂SO₄</i> #2	171.6	187.6	9.32
<i>H₂SO₄</i> #3	190.6	191.2	0.31
HF #1	183.1	187.4	2.35
HF #2	184.1	192.0	4.29
HF #3	182.2	192.9	5.87
NaOH #1	194.8	191.5	-1.69
NaOH #2	181.8	189.6	4.29
NaOH #3	174.3	186.8	7.17

Table S3. Sheet Resistance measurements of LPEG-PTFE sensor strip.

Probe Position	Surface Resistance	Probe Position	Surface Resistance
#1	8.40Ω	#6	8.16Ω
#2	7.92Ω	#7	8.37Ω
#3	9.03Ω	#8	8.64Ω
#4	8.22Ω	#9	7.52Ω
#5	8.35Ω	#10	8.85Ω

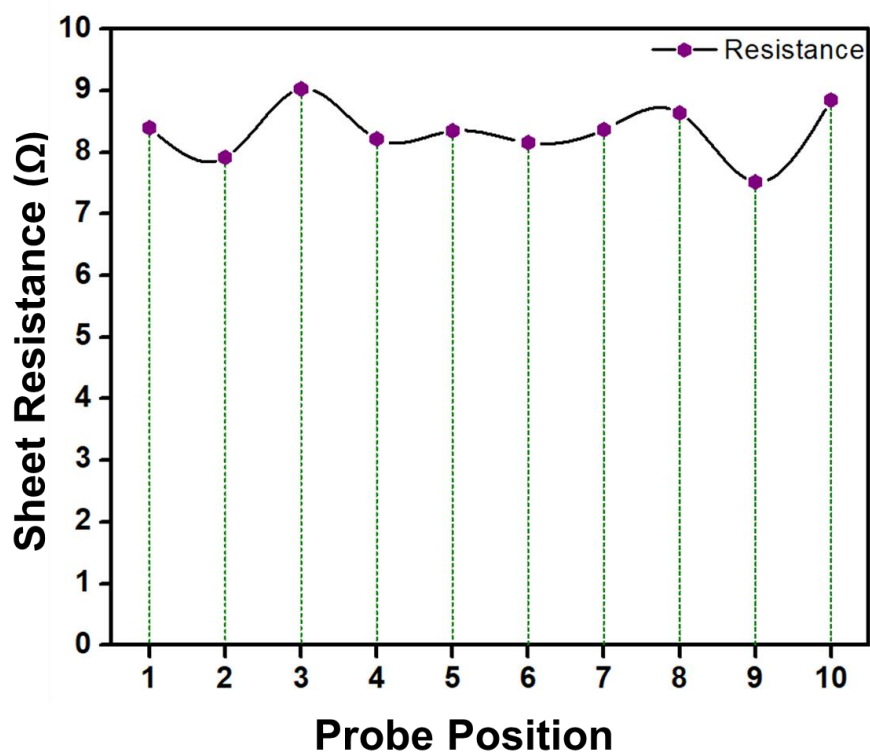


Figure S3: Sheet resistance measurements of the LPEG-PTFE sensors.

Table S4: Dust resistance test of the LPEG-PTFE sensors

Sr. No	Before Dust Resistance Test (kΩ)	After Dust Resistance Test (kΩ)	%age Difference
#1	194.1	194.8	0.4
#2	193.8	193.8	0.0
#3	196.1	195.0	-0.6

Table S5: Thermal Shock Test of the LPEG-PTFE sensors

Sr. No	Before Thermal Shock Test (kΩ)	After Thermal Shock Test (kΩ)	%age Difference
#1	194.1	194.6	-0.26
#2	193.5	193.4	-0.10
#3	195.7	195.2	-0.26

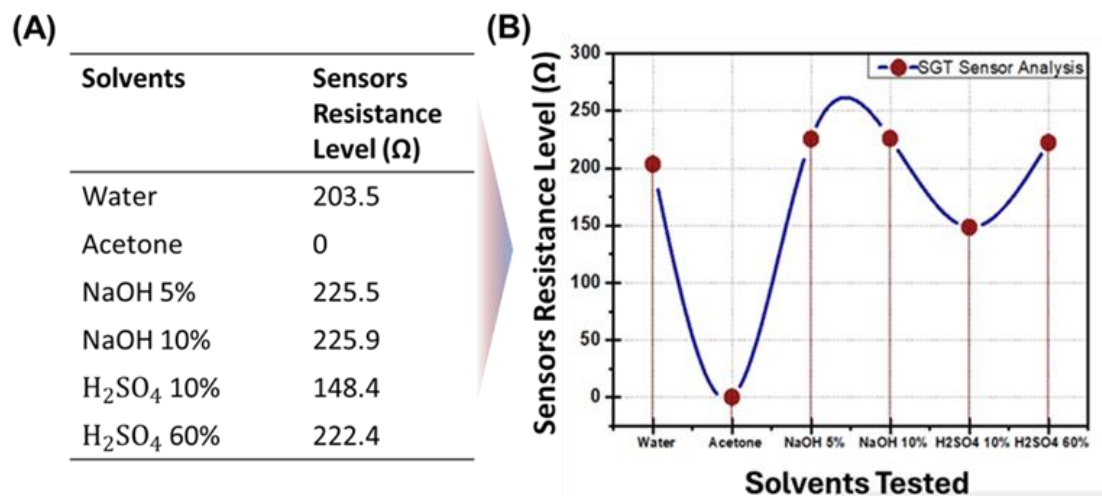


Figure S4. Resistance of the LPEG-PTFE sensors upon contact with water, 10% H₂SO₄, and 5% NaOH solution.