

Supplementary Information

Multi-layered laminate architectures enhance the electromechanical response of PVDF-TrFE films

Anna Šutka¹, Artis Linarts¹, Maksims Jurinovs², Krišjānis Šmits^{3,4}, Sergejs Gaidukovs², Peter C. Sherrell⁵, Andris Šutka^{1*}

¹ Institute of Physics and Materials Science, Faculty of Natural Sciences and Technology, Riga Technical University, Paula Valdena 7, LV-1048 Riga, Latvia

² Institute of Chemistry and Chemical Technology, Faculty of Natural Sciences and Technology, Riga Technical University, Paula Valdena 7, LV-1048 Riga, Latvia

³ Institute of Solid State Physics, University of Latvia, Kengaraga 8, Riga LV-1063, Latvia

⁴ Institute of Biomaterials and Bioengineering, Faculty of Natural Sciences and Technology, Riga Technical University, Riga, 1048, Latvia

⁵ School of Science, STEM College, RMIT University, Melbourne, Victoria 3000, Australia

Email: andris.sutka@rtu.lv

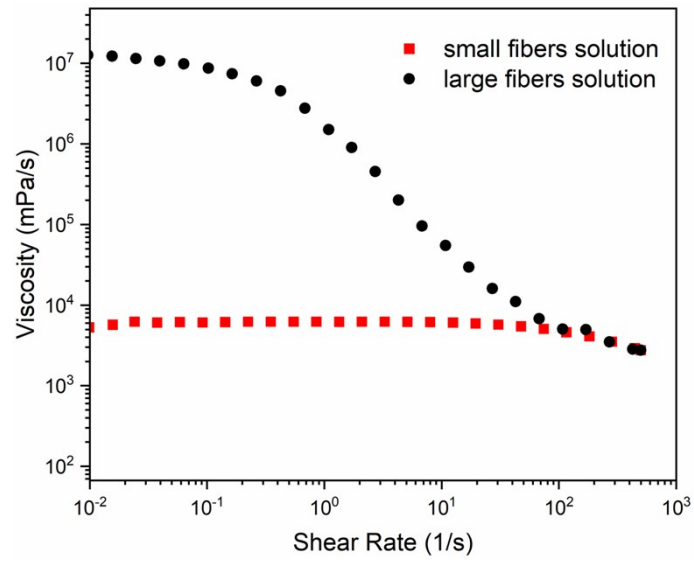


Figure S1. The viscosity versus shear rate behavior for 10 vol% PVDF-TrFE in DMF/SDS (small fibers) and 10 vol% PVDF-TrFE in AC/NaCl (large fibers) solutions

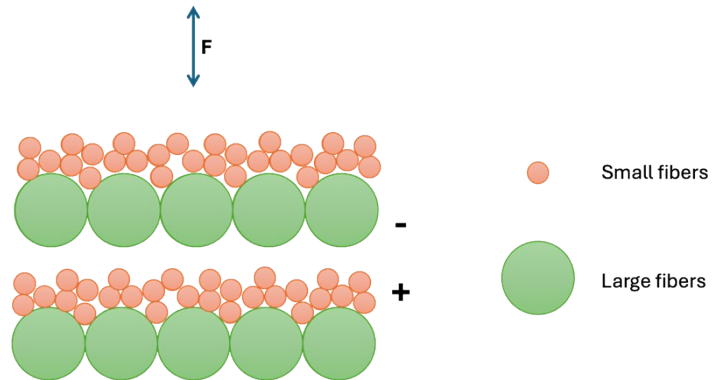


Figure S2. Schematic representation of electrospun triboelectric laminate.

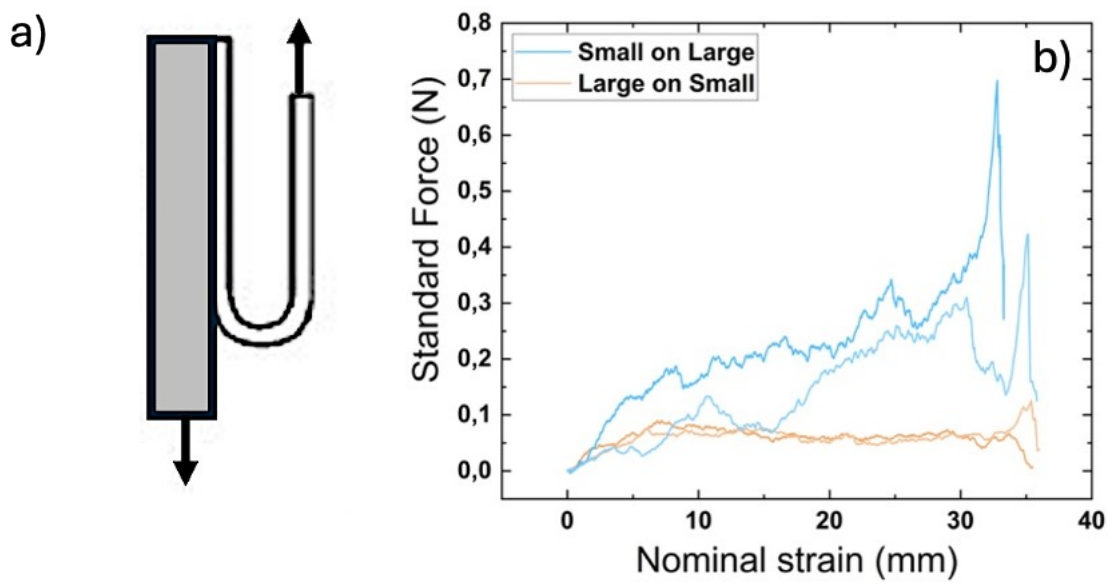
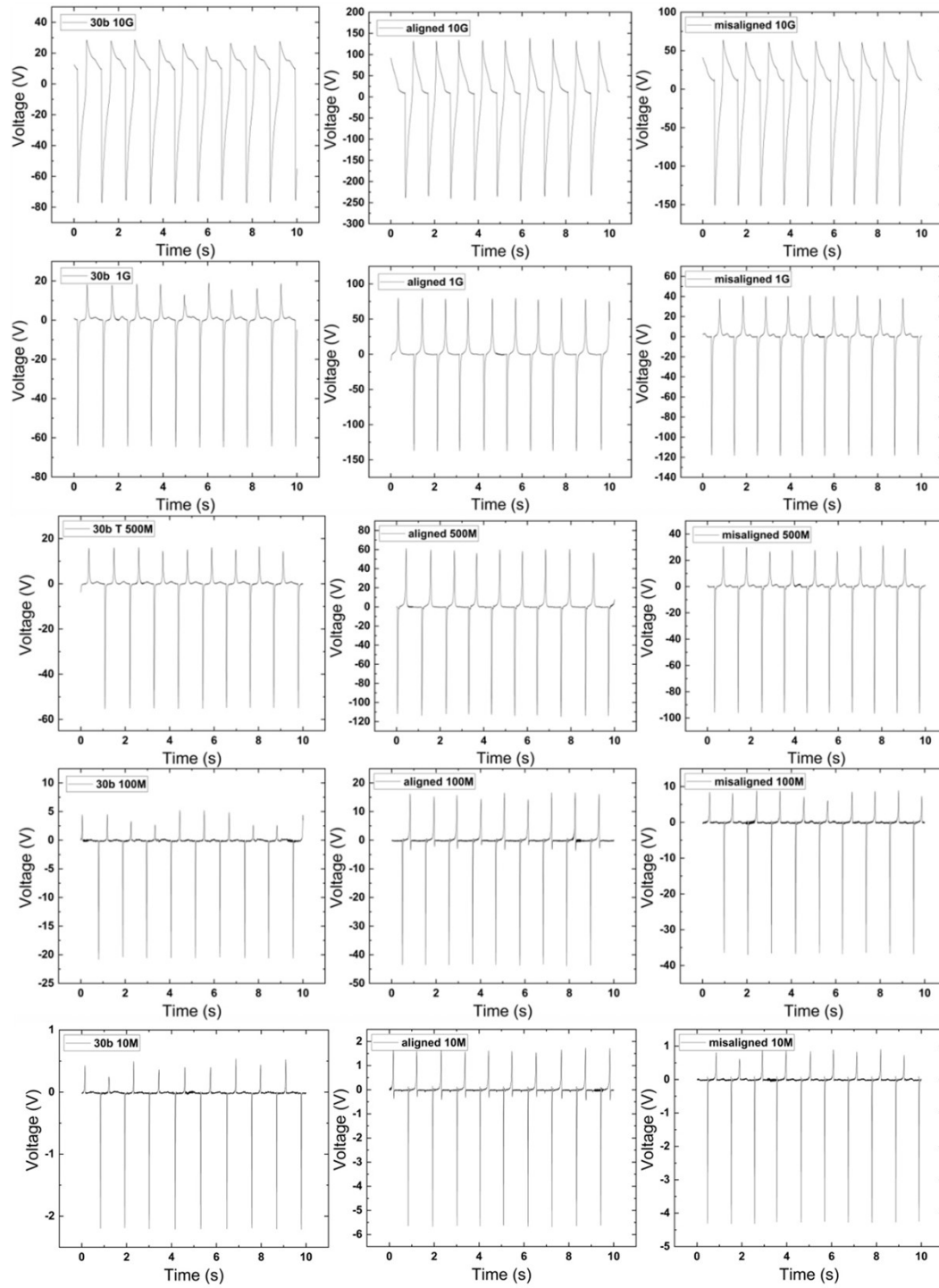


Fig S3. Measurement of the adhesion force between electrospun PVDF-TrFE layers by a 180° peel test: a) schematic of the testing approach; b) raw force data for peeling at 100 mm min-1 (sample size 10 mm x 10 mm).



S4. TENG test on INSTRON two 30b samples with large fibers versus small ones (left column unpolarized; middle – polarization direction coincides with tribo direction; right column – polarization direction opposite tribo)

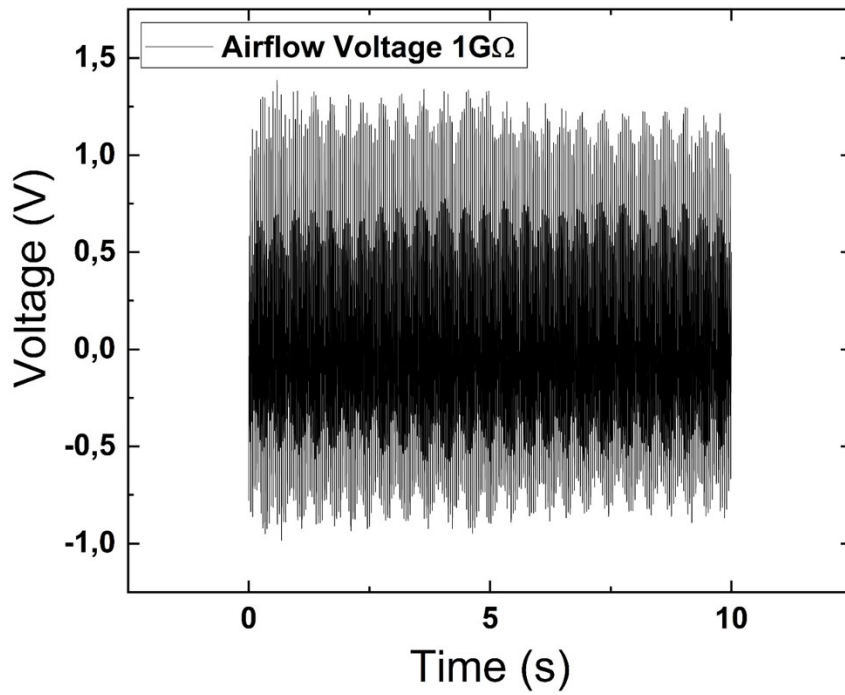


Fig. S5. Voltage measured under load resistance 1 G Ω in air-flow test for laminate sample.

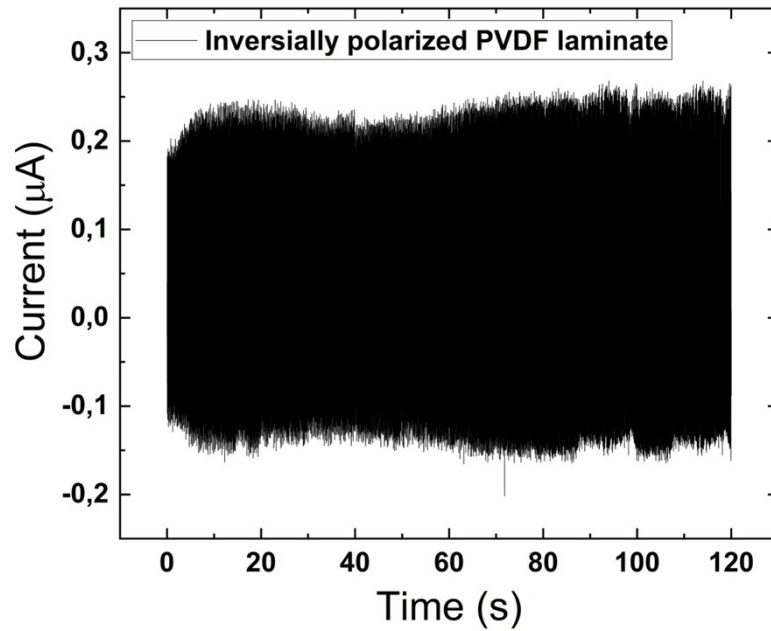


Figure S6. Stability test of PVDF-TrFE 30-bilayer laminate-based device in response to airflow for 2500 cycles.

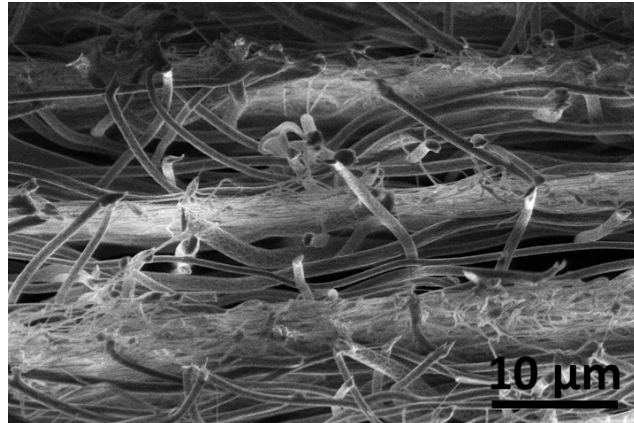


Figure S7. SEM image of 30-bilyers laminate after the piezoelectric buzzer test

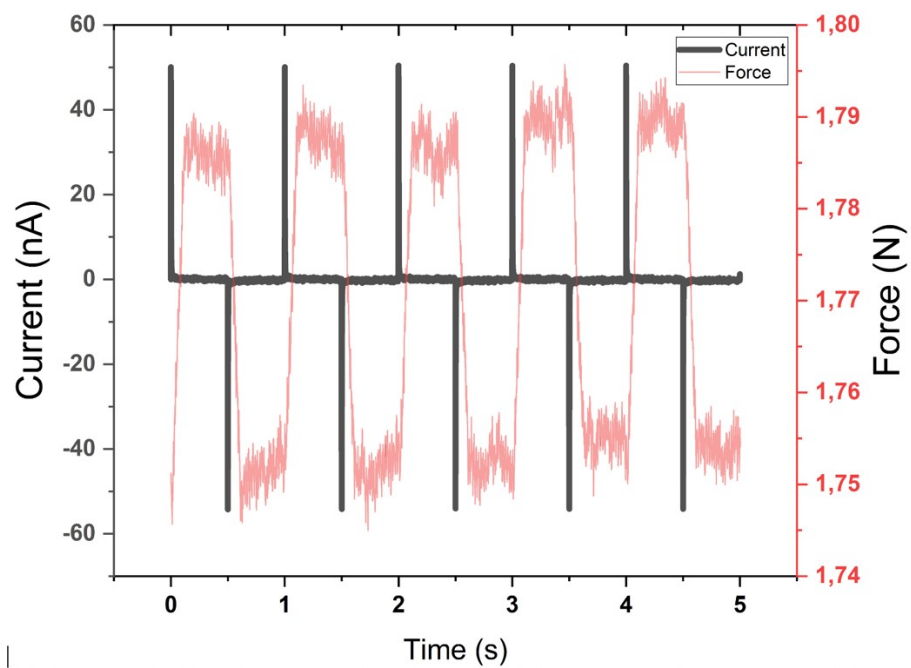


Figure S8. Force oscillation during the buzzer test as measured by INSTRON.

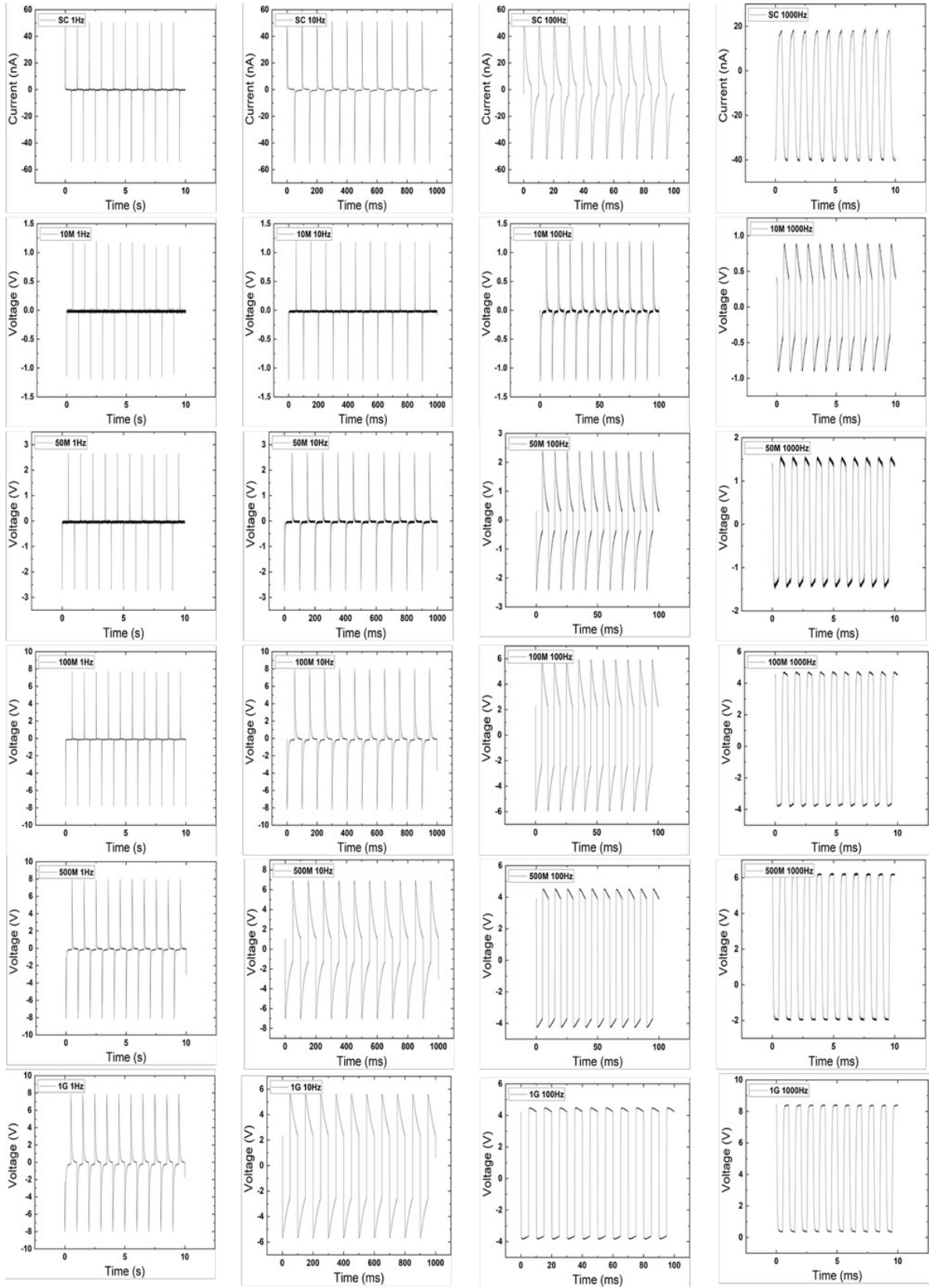


Fig. S9. Short circuit current and voltage measured under different frequencies and load resistances in buzzer test.