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Electronic Supplementary Information (ESI)

Shape memory polymer-based self-healing triboelectric nanogenerator

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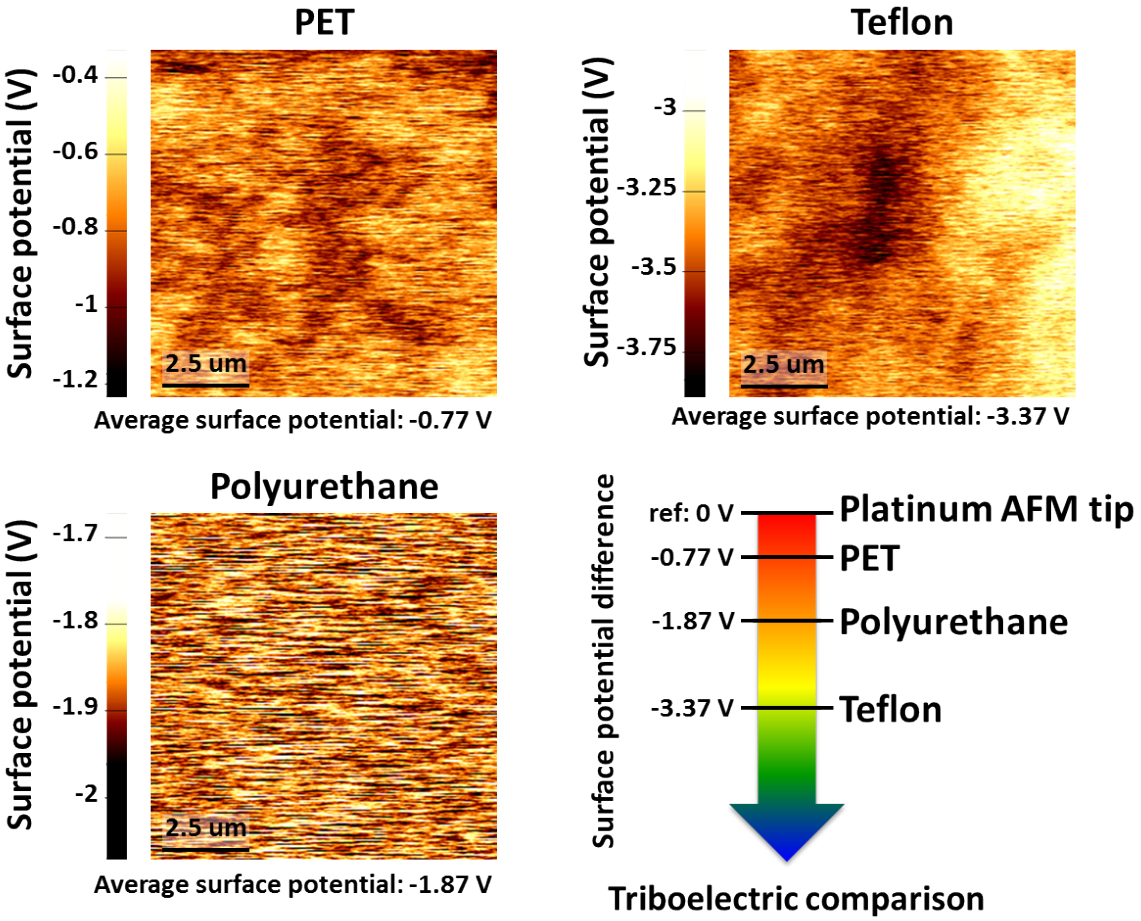

Figure S1| KPFM measurements of the surface potential of three negative triboelectric materials. a) Difference of surface potential between a platinum (Pt)-coated AFM tip and polyethylene terephthalate, b) polytetrafluoroethylene and c) PU. The average potential of each KPFM images have been extracted and added under the images. The variations of the potential are mainly due to the topography. d) Comparison of the average surface potential of PET, PU and Teflon compared to the Pt tip. This reveals the triboelectric relationship between these materials.

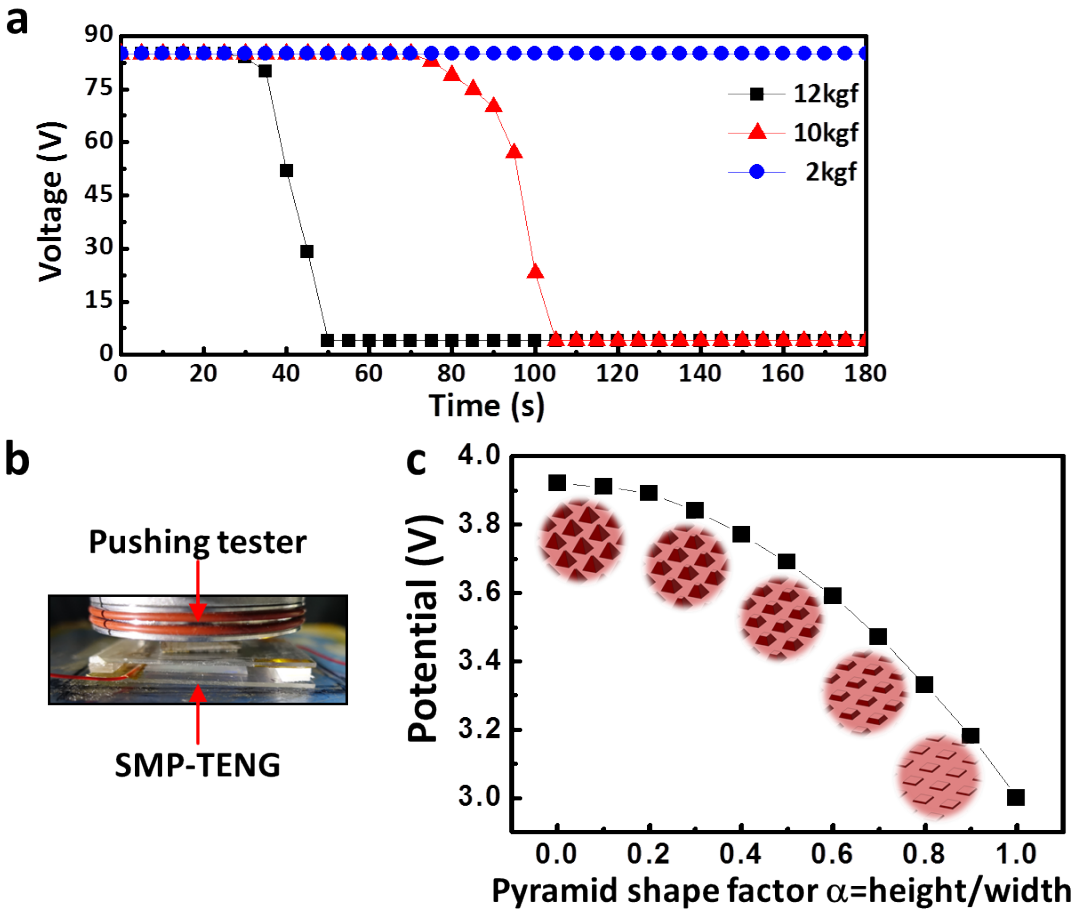

Figure S2| Degradation of the output voltage of a SMP-TENG over time and under different forces. a) Output voltage of a SMP-TENG compressed under different forces and depending on the time. b) Picture of a SMP-TENG under compression. c) FEM simulation of the potential generated by a SMP-TENG depending on the micro pyramid pattern shape. The pyramids have a square base of 1 um and a height of 1 um. The different pyramids are cut at a height of 1-α μm (from 1 μm to 0.1 μm height). The triboelectric charge density used for the simulation is $\sigma = 8.3\times10^{10}$ m^{-2} and does not take into account the friction phenomenon.

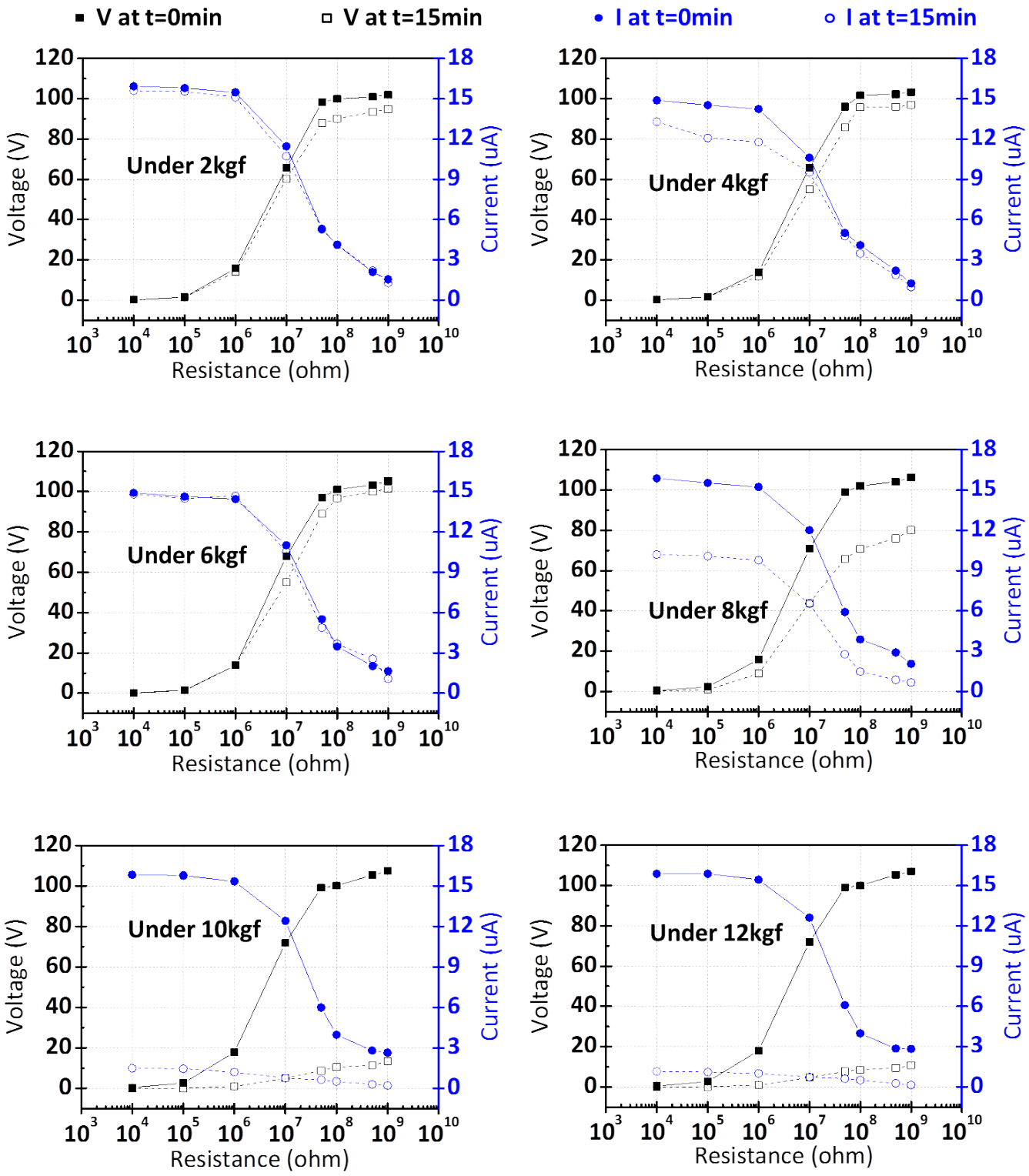

Figure S3| Voltage and current depending on the load resistance before and after 15 min of compression under various forces. The optimum resistance is around 10 MΩ.

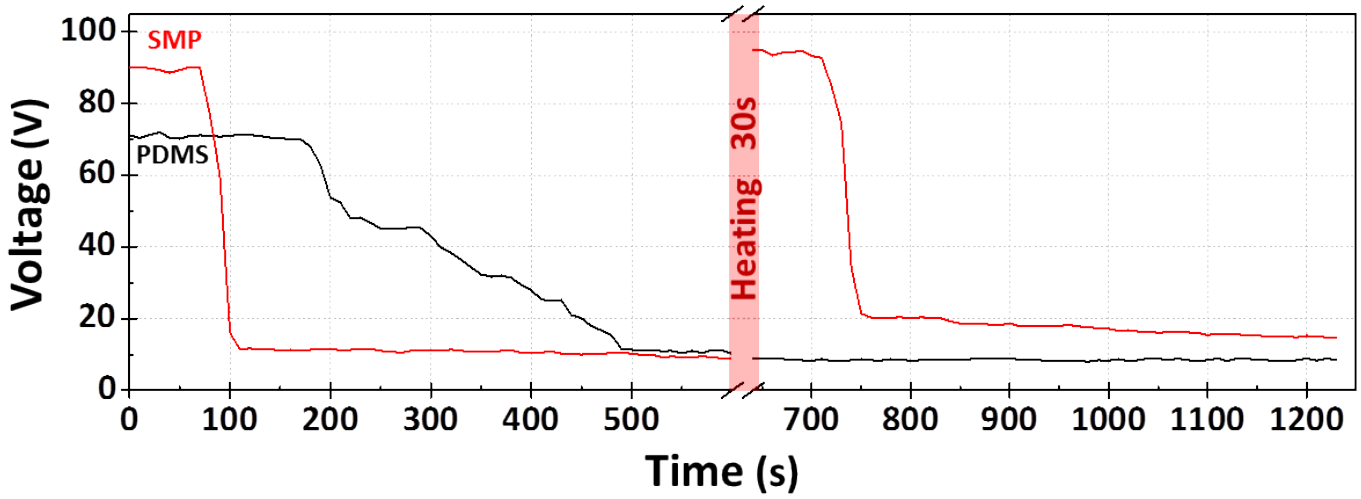

Figure S4| Open circuit voltage of a SMP based TENG and a PDMS based TENG compressed by a strong force of 12 kgf at a frequency of 12.5 Hz. The SMP-TENG was healed during 30 s by heating it at 55 °C.