

# Textile Supercapacitors

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## Brief Overview

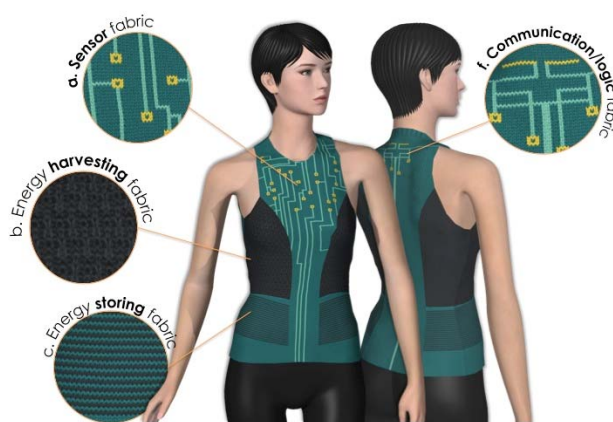
Textile supercapacitors are under development at Drexel University. These novel and wearable energy storage systems can be printed or knitted into textile structures. Screen printing can be used to incorporate a variety of carbon nanomaterials found commercially, and those developed here at Drexel. Knitting can incorporate capacitive yarns seamlessly into a fabric, by building the fabric from the ground up and in various device configurations. In both cases, printing inks and the knit programs are ready for mass manufacturing as they use techniques already used in the textile industry, meaning their production can be immediate.

## Applications

- Power other wearable electronics
- Power small portable electronics
- Can be incorporated into interiors to store charge collected from other renewable sources
- Flexible and stretchable electronic applications

## Advantages

- Mass customization in terms of size, carbon material, and device configuration (multi-layered vs. single layer)
- Manufacturing processes are simple and readily scalable



**Figure:** Concept drawing for a garment device embedded with energy storing fabrics to power sensors or communication devices.

## Intellectual Property and Development Status

Patent application covers materials, manufacturing methods, and applications. Sample materials have been created on industrial looms and are available for inspection.

## Commercialization Opportunities

Drexel is currently seeking commercial partners to license and/or sponsor research to further develop this technology.



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## Inventors

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## Web Site

<http://nano.materials.drexel.edu>

<http://drexel.edu/excite/research/shimaSeiki/>

## References

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2. K. Jost, D. Stenger, C.R. Perez, J.K. McDonough, K. Lian, Y. Gogotsi, G. Dion, "Knitted and screen printed carbon fiber textile-supercapacitors for applications in wearable electronics," Energy and Environmental Science, Vol. 6 (2013) 2698 - 2705
3. K. Jost, C.R. Perez, J.K. McDonough, V. Presser, M. Heon, G. Dion, Y. Gogotsi, "Carbon Coated Textiles for Flexible Energy Storage in Smart Garments." Energy and Environmental Science. 2011, 4, 5060-5067

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