

Commercialization of GN3 Graphene Material as the Active Electrode for High Energy Supercapacitors

Tomáš Zedníček⁽¹⁾, Michal Otyepka⁽²⁾, Veronika Šedajová⁽²⁾, Luca Primavesi⁽³⁾

⁽¹⁾*EPCI, European Passive Components Institute
T.G.Masaryka 477, 563 01 Lanškroun, Czech Republic
e-mail: tom@passive-components.eu*

⁽²⁾*Czech Advanced Technologies and Research Institute (CATRIN) of Palacký University
Regional Centre of Advanced Technologies and Materials (RCPTM)
Šlechtitelů 241/27, 779 00 Olomouc – Holice, Czech Republic*

⁽³⁾*Itelcond S.R.L.
Via C.Darwin, 19; 20019 Settimo Milanese (MI), Italy*

ABSTRACT

A novel preparation method of high energy density, nitrogen-doped graphene materials (GN3) prepared based on fluorographene chemistry was introduced during the last ESA SPCD 2022. This high nitrogen-doped (~16%) graphene (GN3), with diamond-like bonds and an ultra-high mass density of 2.8 g cm^{-3} , is an excellent host for the ions, delivering unprecedented energy densities of up to 200 Wh L^{-1} at a power of 2.6 kW L^{-1} and 143 Wh L^{-1} at 52 kW L^{-1} . High power and energy density supercapacitors bring downsizing and weight reduction benefits in power supplies and energy storage systems especially in all fly hardware devices.

The presentation will provide an overview on the latest achievements of the material development towards its mass manufacturing readiness and commercialization. The first GN3 wound and pouch supercapacitor prototypes will be introduced including its initial characterization. The next step qualification evaluation test plans will be also disclosed.