



HydroGraph Oxygenated Graphene Coating Offers a Breakthrough in Microelectronics Cooling

Peer-reviewed Study Reveals that Graphene Ink Coatings Can Dissipate Over 150% of Heat in High-power Electronics and Energy Systems

VANCOUVER, British Columbia, Sept. 16, 2025 -- HydroGraph Clean Power Inc. (CSE: HG) (OTCQB: HGRAF) ("HydroGraph"), a leading producer of ultra-pure graphene, today announced that a new peer-reviewed study shows that aerogel ink made with HydroGraph graphene can increase the heat transfer coefficient (HTC) of copper by 152%. The study's results demonstrate the viability of using graphene for high-performance, scalable thermal management coatings in microelectronics.

The study, published in *Graphene and 2D Materials* (Springer), confirmed that HydroGraph's oxygenated graphene ink coatings dramatically enhanced cooling for high-powered microelectronics, such as those used in computers, electric vehicles, data centers, aerospace, and other solid-state applications. Using a scalable aerosol process, graphene coatings achieved over one and a half times the heat transfer of bare copper and a 40% increase in CHF (critical heat flux). The breakthrough not only represents superior heat conductivity but also an engineered surface texture that accelerates cooling due to bubble formation and evaporation.

From a commercial standpoint, the lab research illustrates the potential of using graphene aerogel ink as a cost-effective solution for microelectronics heat management. According to [Verified Market Reports](#), the market for thermal management materials in microelectronics was valued at \$7.21 billion in 2024 and is projected to reach \$12.6 billion by 2033.

"The study highlights the potential of graphene in developing new compounds for next-generation electronics cooling," said Ranjith Divigalpitiya, Chief Science Officer for HydroGraph. "This research shows that the surface texture and bubble behavior of graphene aerosol coatings are more effective at heat dissipation than raw thermal materials. By pushing the boundaries of conventional conductivity cooling, HydroGraph is positioned to deliver new scalable and sustainable heat management solutions that improve the efficiency and extend the useful life of electronic devices."

As semiconductors become smaller and more powerful, they generate more heat. Traditionally, circuit architectures have used heat sinks made of copper and aluminum, but as power densities increase, these materials have been supplemented with composites and coatings for improved heat dissipation. Delivering graphene coatings in an aerosol provides a sinter-free, manufacturable solution for cooling electronics, energy systems, and other high-power devices.

Graphene is atomically thin and demonstrates superior thermal conductivity. In this study, three graphene-based coatings were tested: two aerosol graphene inks synthesized using a one-step, gas-phase detonation procedure and a third coating made using liquid-phase, ultrasonic exfoliation. Each coating was applied to copper substrates in multiple layers, resulting in surfaces with flakes and ridges. The coating demonstrated a 62% enhancement in bubble growth over bare copper, resulting in improved heat dissipation.

About Hydrograph

HydroGraph is a leading producer of pristine graphene using an "explosion synthesis" process, which allows for exceptional purity, low energy use, and identical batches. The quality, performance, and consistency of HydroGraph's graphene follow the Graphene Council's Verified Graphene Producer® standards, of which very few graphene producers are able to meet. For more information or to learn about the HydroGraph story, visit: <https://hydrograph.com/>. For company updates, please follow HydroGraph on [LinkedIn](#) and [X](#).

Trademarks: HydroGraph™ and Fractal Graphene™

Forward-Looking Statements

This release contains certain "forward-looking statements" and certain "forward-looking information" as defined under applicable Canadian securities laws. Forward-looking statements and information can generally be identified by the use of forward-looking terminology such as "may", "will", "expect", "intend", "estimate", "upon", "anticipate", "believe", "continue", "plans" or similar terminology.

Forward-looking statements and information are based on forecasts of future results, estimates of amounts not yet determinable, and assumptions that, while believed by management to be reasonable, are inherently subject to significant business, economic, and competitive uncertainties and contingencies. Forward-looking statements and information are subject to various known and unknown risks and uncertainties, many of which are beyond the ability of HydroGraph to control or predict, that may cause HydroGraph's actual results, performance or achievements to be materially different from those expressed or implied thereby, and are developed based on assumptions about such risks, uncertainties and other factors set out herein, including but not limited to: HydroGraph's ability to implement its business strategies; risks associated with general economic conditions; adverse industry events; stakeholder engagement; marketing and transportation costs; loss of markets; volatility of commodity prices; inability to access sufficient capital from internal and external sources, and/or inability

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No forward-looking statement can be guaranteed, and actual future results may vary materially. Accordingly, readers are advised not to place undue reliance on forward-looking statements.

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