January 31, 2017

Grafoid Introduces *GrafeneX* – a Cost-Effective Graphene Adherent, Tunable and Multi-Functional Coating Technology for Large Surface Industrial Applications

A Novel Platform for Industrial Scale Hydrophobic/Hydrophilic Ultra-Thin Graphene Coatings for Metal, Glass, Polymer, Ceramic and Other Substrate Applications

KINGSTON, Ontario – Grafoid Inc., a world leading graphene R&D and investment company announced today its entry into the global industrial coatings market with the introduction of its patent pending GrafeneX graphene coatings technology.

GrafeneX is a novel technology that creates a platform for the deposition of Graphene and chemically functionalized Graphene coatings.

This enabling process provides Grafoid with the capability to apply its diverse graphene-based coatings to many different types of material substrates with controllable levels of surface coverage, thickness etc. to meet precise end user requirements.

One of the key obstacles to graphene's broad, universal industrial acceptance is the absence to date of low-cost, high performing graphene applications that can be successfully adapted for use across all industrial sectors. BCC Market Research reports the global market for paints and coatings is anticipated to rise to $164.1 billion in 2021 at a compound annual growth rate of 4.4% from 2016-2021.

Other market research indicates even higher revenue values.

Grafoid President and CEO Gary Economo described the GrafeneX technologies as a cost-effective way of laying down graphene coatings on large surface areas.

"Demand exists for advanced multifunctional technologies capable of successfully disrupting existing business models," Mr. Economo said. "We believe our novel, low-cost, coating technologies will encourage interest from those industries developing next generation materials and products."

About GrafeneX

The GrafeneX process applies Graphene based coatings to substrate materials including polymers, glasses, most metals and refractories (See Figure 1).

Images

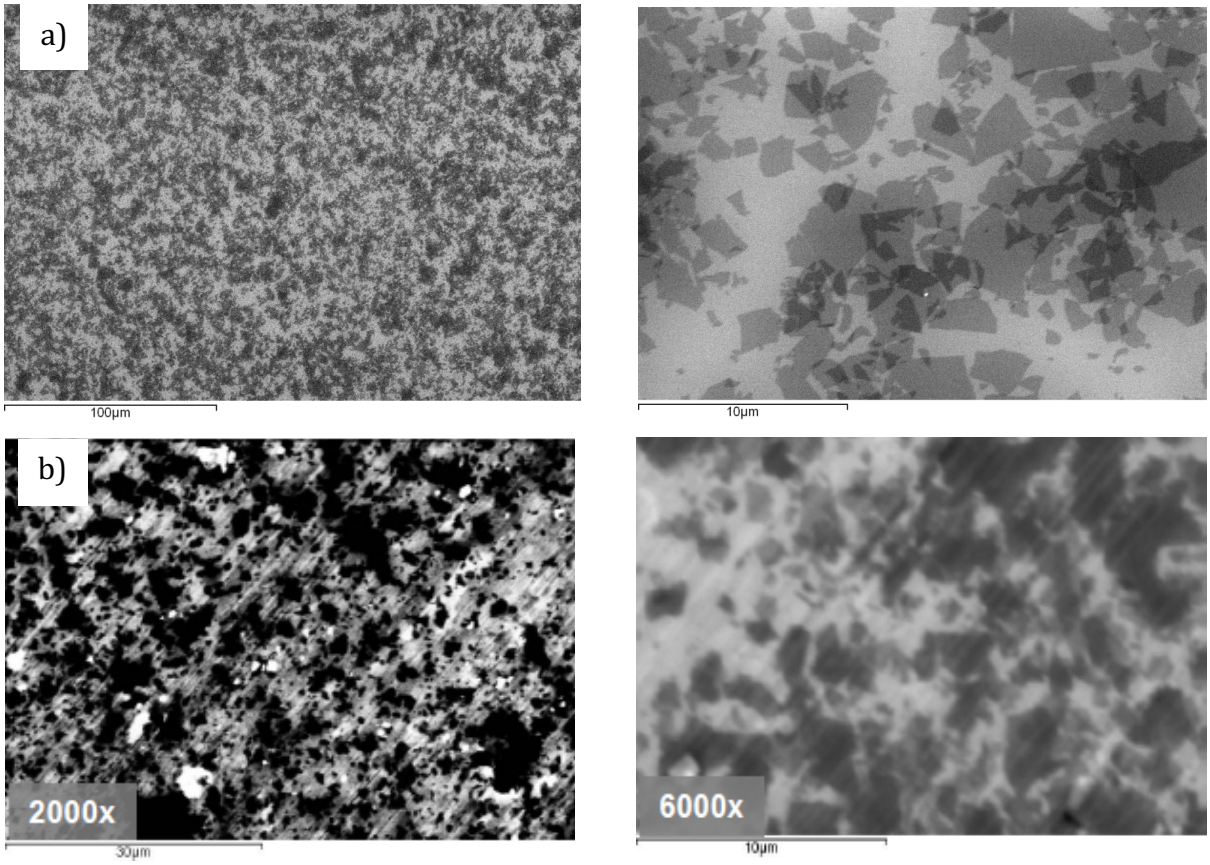

Figure 1. Scanning Electron Images at various magnifications showing the structure of graphene-based coatings deposited on a) Si wafers, and b) Al substrate which were intentionally partially covered.

GrafeneX is applied using a proprietary, room temperature, top-down process, designed as an inline continuous surface conversion process compatible with most conventional industrial coil-to-coil and roll-to-roll coating facilities.

In its typical embodiment, the process sequence would include: surface preparation (cleaning & activation), graphene oxide application, removal of a benign carrier and conversion to a Graphene based surface coating.

To the greatest degree, the GrapheneX process uses commonly available conversion coating technologies, has a straightforward modular design with a compact footprint that is scalable with production speed. A GrafeneX line can either be retrofitted to existing finishing lines, or function as a stand-alone finishing system.

Mr. Economo said that the GrafeneX line of technologies and services are consistent with Grafoid's business model for long-term growth and revenue sustainability through joint venturing, licensing and fees for services.

“As of today, with near zero competition, our GrafeneX technologies position our Company us as a front-runner for large area graphene coatings development,” Mr. Economo said.

GrafeneX enabling characteristics and properties include:

- The ability to coat large surfaces on metals, semiconductors, ceramics, polymers and glass and the ability to coat fibers, rods and bars
- Designed for coil-to-coil and conveyor applications from batch to continuous process
- Environmentally safe to benign, flexible technology in terms of coatings uses for: hydrophobic, hydrophilic, super hydrophobic, oleophobic and oleophilic applications
- Variable coating thickness (from monolayer to few layer)
- Many of the physical/chemical properties are tunable (Figure 2)
- Good adhesion to substrates (as tested using the ASTM E-335 on aluminum foil) (Figure 3)

GrafeneX coating technology may be used in various industrial, consumer, military, marine, avionics, energy storage, packaging, building materials, electronics, transportation, environmental remediation, intelligent fabrics, sporting goods and medical industries.

Four versions of GrafeneX coatings labeled A to D are available, namely:

GrafeneX (A) which serves many sectors as a precursor coating with hydrophilic properties.

GrafeneX (B) are electrically conductive, hydrophobic coatings, or with tunable electric conduction and may be used for:

- Li-ion battery electrode materials, or other energy storage devices
- Supercapacitors
- EMI shielding applications
- Transparent and flexible electronics
- Nanoelectronics
- Nanogenerators
- Solar cells
- Fuel cells and hydrogen storage
- Photodetectors
- Organic LEDs (OLEDs) and displays
- Corrosion protection

GrafeneX (C) are super-hydrophobic coatings which may be used as:

- Water-repellant and anti-fouling coatings

- Self-cleaning surfaces
- Anti-icing and anti-fogging coatings for:
  - Windows
  - Eyeglasses
- Corrosion protective coatings for a variety of industries, including:
  - Automotive
  - Marine

GrafeneX (D) coatings have hydrophilic properties and may be used as:

- Paint primers and pre-treatments
- Adhesion-promoting coatings for joining two dissimilar materials, such as attaching polymers to metals (example: automotive industry)

More intensive applications can potentially include:

- Surface modification of implants or scaffold materials in tissue engineering
- Drug delivery & cancer therapy
- Bio-sensors, electrochemical biosensors
- Other types of sensors, such as: Contact sensors, nanoelectromechanical sensors, chemical sensors, non-contact sensors, etc.

About Grafoid Inc.

Grafoid is focused on three areas of graphene-related technology development seen as "low-hanging fruit" for industrial adoption.

They are graphene based materials for energy creation, storage and transmission; graphene based polymers and; graphene coatings for all industrial sectors.

Grafoid is a world leading graphene R&D and investment company. The company provides expertise as well as product and processes for transformative, industrial-scale graphene applications in partnership with leading corporations and institutions around the world.

A privately held Canadian corporation, Grafoid invests in graphene applications and economically scalable production processes for graphene and graphene derivatives from raw, unprocessed graphite ore. Focus Graphite Inc. holds a significant interest in Grafoid Inc.

Incorporated in 2011, Grafoid's global enterprise platform includes 17 subsidiary companies engaged in the development of Mesograf™ materials and products, and GrafeneX ultra-thin graphene industrial coatings and commercialization development services. They include, but are not limited to: Mesograf™ lithium batteries for electric vehicles, consumer electronics, and industrial energy storage; polymers, plastics, rubber,

elastomers, and composite materials; fiber science including aluminum alloys; lubricants; fire retardant materials; thermal management solutions; EMI/RFI/EMP shielding; solar solutions, and analytical testing; and laboratory services.

Grafoid's research is supported through the Industrial Research Assistance Program (IRAP) of the National Research Council of Canada, and, on February 20, 2015, Grafoid received an $8.1 million investment from the SD Tech Fund™ of Sustainable Development Technology Canada (SDTC) to develop a technology that will automate Mesograf™ graphene production and end-product development. SDTC is mandated by the Government of Canada to support clean technology companies as they move their technologies to market.

For more information about Grafoid, please visit http://www.grafoid.com

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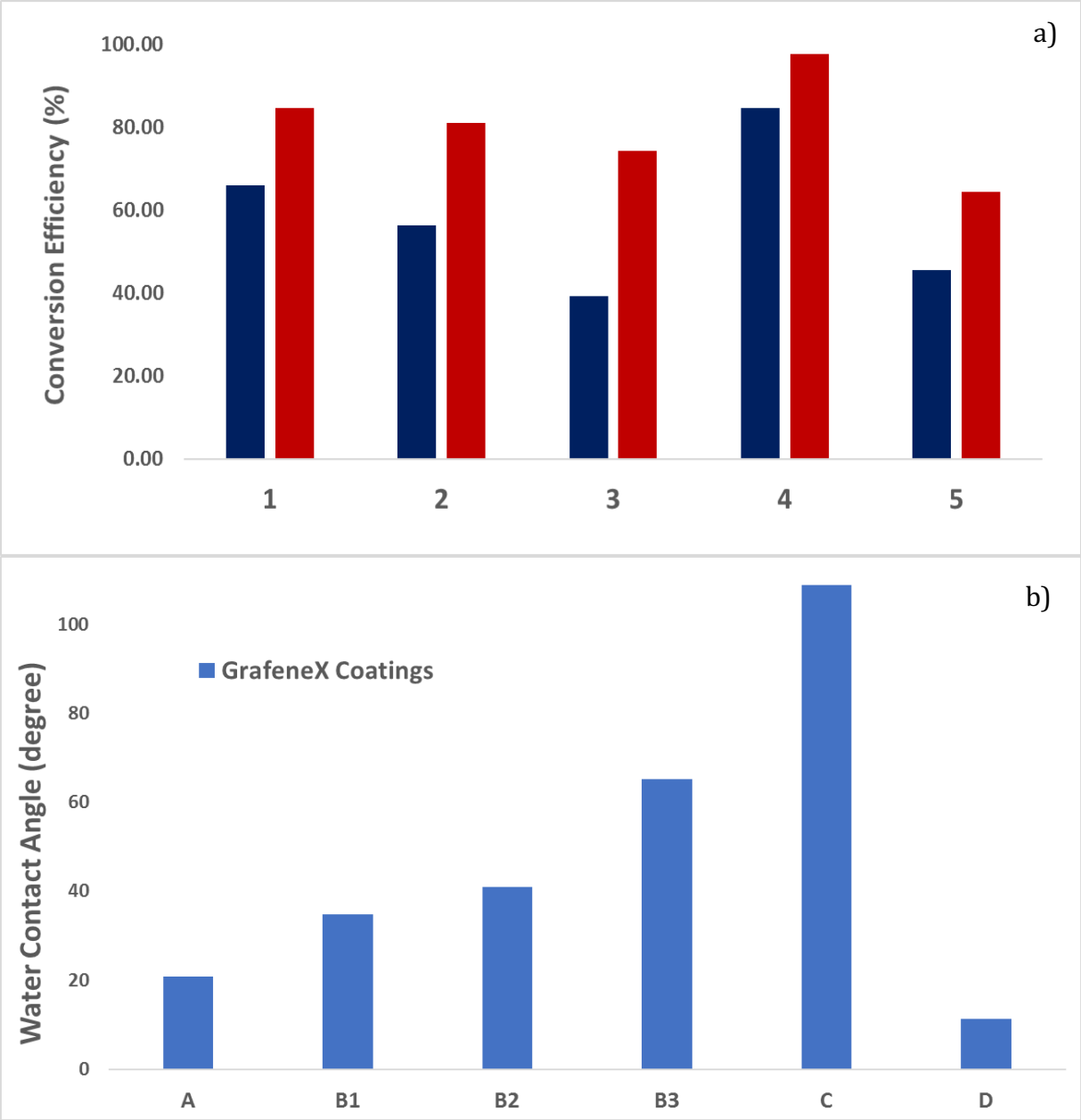

Figure 2. a) Conversion efficiencies for different process conditions, and b) Examples of water contact angle values measured on various GrafeneX coatings.

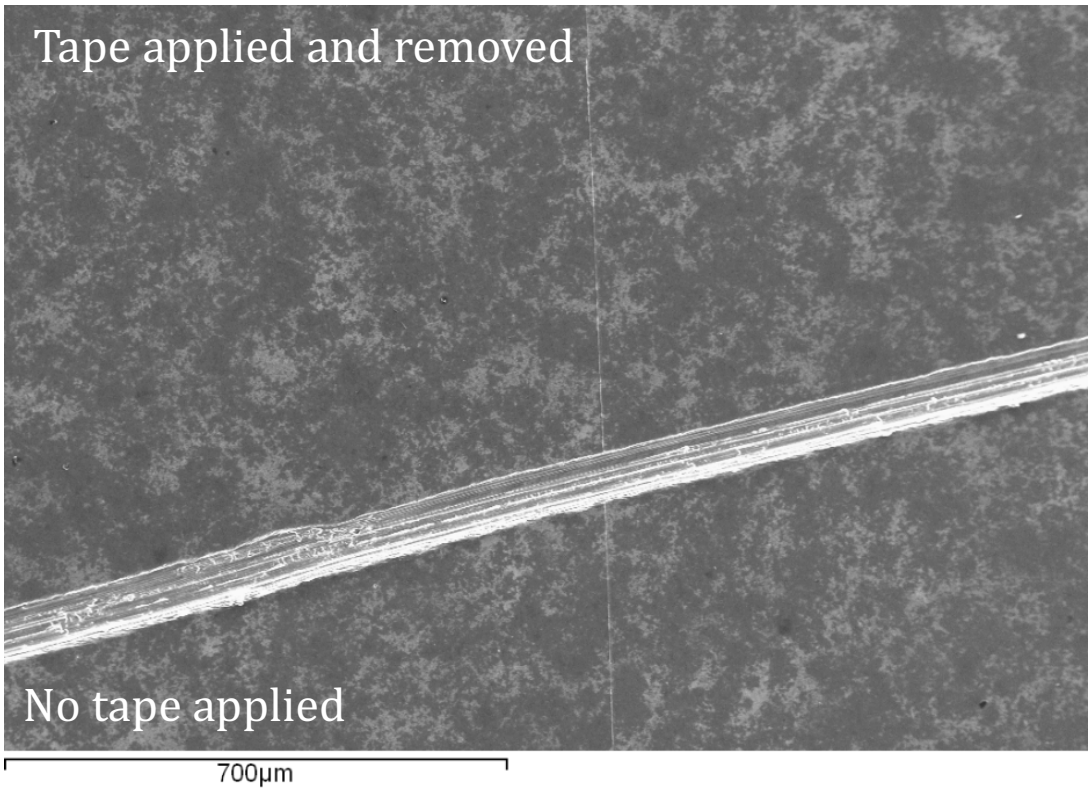

Figure 3. Scanning Electron Image showing the ASTM D 3359 test results for a GrafeneX B coating deposited on an aluminum substrate. The test applies a Permacel 99 polyester fiber packaging tape to one portion of the sample in order to quantify the coating adhesion. The scratch has been applied to surface of Al to indicate where tape has and has not been applied.