Zentek's revolutionary graphene based icephobic coating targets billion dollar ice-resistant market

written by Tracy Hughes | October 26, 2022

Ice build-up on wind turbines, airplanes, and cars in cold regions is a real problem. For example, Texas residents may remember the February 2021 ice storms and extreme cold weather that hit south-central USA. The storm resulted in over 4.5 million homes and businesses being without power for several days. Frozen gas lines and ice buildup on wind turbines were key factors in the power failure as wind generation dropped by almost 50% over the entire state of Texas.

The airline industry spends significant time and money 'deicing' (removing ice and snow build-up) on their planes before take-off. Consumers in cold countries often have to do the same with their car windscreen. The drone market is another industry where deicing is important.

Now there is a better solution to de-icing. Today's company has developed an 'icephobic coating' technology that is effective at preventing ice build-up. 'Icephobic' effectively translates to 'repelling ice'. It is also sometimes referred to as 'ice-resistant coating'.

The global market for ice-resistant (icephobic) coatings

It has been reported that the global market for ice-resistant coatings is forecast to reach **more than $1 billion in 2023**, growing at a CAGR of 23.3%.

An excerpt from a 2021 report on the ice-resistant coatings and surfaces market

Source: ResearchAndMarkets

Zentek Ltd. (NASDAQ: ZTEK | TSXV: ZEN) announced in September strong test results supporting their patent-pending, graphene-based, icephobic coating technology. The testing concluded that Zentek's icephobic technology is durable in adverse conditions for both wind turbine and drone industries, which are the initial focus markets for Zentek's icephobic coating.

Zentek state that their icephobic "coatings have demonstrated an adhesion strength repeatedly around 20 kPa (results under 100 kPa are considered to demonstrate low adhesion), a significant improvement over the current commercial products. Testing at the National Research Council (NRC) and Anti-icing Materials International Laboratory (AMIL) in Quebec is ongoing."

Some of the September announcement highlights included:

- "Flight tests in real-world icing conditions demonstrated good performance of Zentek's coating, with results indicating retardation of ice accretion (icephobicity) and low adhesion to accreted ice….
- Sand erosion testing demonstrated medium to good performance at a high speed of 540 km/h.
- Rain erosion testing at AMIL demonstrated good performance at 160 km/h and 320 km/h based on our interpretation, speeds at which the leading edge of wind turbines blade tips are exposed.
- NRC drone testing demonstrated consistent results of maintaining control of rotor thrust in icing conditions…..
- Zentek has filed a full patent application with the Patent

> Cooperation Treaty, the international patent office, on August 2nd, 2022, for Nanomaterial-Enhanced Elastomer for Passive Ice Accretion Prevention."

Source

Icephobic coatings have many applications and significant demand

An exciting part of the above news is the potential for Zentek's technology to be used in a huge variety of uses globally, particularly the energy and aviation/aerospace industries.

Zentek states:

"*Commercial applications of our patent-pending coating could be used in drone technologies allowing for efficient all-weather operation. Other additional applications include powerlines, large wind turbines, ship structures (railings, etc.), and oil rigs, especially in Arctic operations, along with tall buildings where ice buildup could pose a public hazard.*"

Icephobic coatings could revolutionize aviation and wind power generation industries

Source: Zentek website/icephobics

In addition to their icephobic coatings Zentek is also advancing multiple other initiatives including the commercialization of their "Canada patent allowed" ZenGUARD™ (a 'graphene-silver coating' shown to have 99% antimicrobial activity used on masks or PPE, also used in HVAC systems to improve air quality), aptamer enabled Pathogen Detection Technology, anti-inflammatory therapies, fuel additives (to reduce carbon emissions), conductive filaments for 3D printing, fire retardant coatings, and graphene wrapped silicon anodes for batteries.

Zentek Ltd. trades on a market cap of C$235 million on the TSXV or US$175 million on the Nasdaq.