Zentek's ZenARMOR is potentially a major breakthrough in the US$23.8B+ Global Anti-Corrosion Coatings Market

written by InvestorNews | February 9, 2023

The anti-corrosion coatings market may not sound very glamorous, but it is a multi-billion dollar business. According to Vantage Market Research, the global anti-corrosion coatings market was valued at US$23.8 billion in 2021 and is forecast to grow to $43.2 billion by 2028. Zentek quoted from a 2012 U.S. Congressional Briefing that "corrosion-related costs amounted to US$452 billion per year in the US, including US$22 billion for the Department of Defense." This just highlights the importance of anti-corrosion coatings and the fact the market for coatings can grow much larger over time.

According to a November 2022 report: "The anti-corrosion coating material is widely used in marine industries, oil & gas, automotive, and infrastructure… Additionally, increased infrastructure investment, particularly in developing and emerging countries, has been a major driver of demand for anticorrosion coatings."

Canadian graphene technology specialist company Zentek Ltd. (NASDAQ: ZTEK | TSXV: ZEN) has just announced that they have developed a novel corrosion protection technology known as ZenARMOR™. The technology is based on graphene oxide and Zentek's CEO and Director Greg Fenton stated it is "better than the best existing anti-corrosion systems currently in the

marketplace.”

Given that Zentek trades on a market cap of just C$228 million, the opportunity to break into a US$23.8 billion market with a major breakthrough technology could be potentially game-changing for Zentek.

ZenARMOR™

ZenARMOR™ is a graphene oxide additive that can be added to existing paint and applied to surfaces to help prevent corrosion. Initial testing results on ZenARMOR™ showed no signs of corrosion even after 1,500 hours of salt spray testing. The best systems on the market start breaking down at 1,000 hours. Zentek spent 2 years developing ZenARMOR™ and it has been third-party validated. Greg Fenton commented (video here) that he sees ZenARMOR™ as a “potentially game-changing technology”.

The next steps will be further testing by potential end users over the next 6-9 months, if successful, it is to be followed with the commercialization of ZenARMOR™. If Zentek gets to the stage of selling the product, the Company believes it can ramp up supply to meet demand.

In the February 8, 2023 announcement, Zentek stated:

“The Company also reports that the ZenARMOR™ corrosion protection self-healing coating was submitted to the Innovative Solutions Canada (ISC) testing stream – Military Call for Prototypes. The Company is pleased to announce that it has been advised that ZenARMOR™ has met the mandatory and technical evaluation criteria of the Military Call for Prototypes, Military Component, and is considered conditionally qualified, pending further steps such as matching our innovation with a Government of Canada Organization (GCO) interested in testing

ZenARMOR™.”

ZenGUARD™

In further breaking news, Zentek’s Heating, Ventilation, and Air Conditioning (“HVAC”) filtration product ZenGUARD™ has performed well in Stage 2 testing. ZenGUARD™ is a graphene-based coating that can be used to upgrade existing HVAC filters. Zentek announced on February 7, 2023 that “ZenGUARD™-treated MERV 8 filters achieved 34.56% filtration efficiency of the Phi6 virus, a surrogate for COVID-19 during a single air exchange. This compares to 7.24% for uncoated MERV 8 filters, a 27.32% net improvement.”

Zentek CEO, Greg Fenton, stated: “The ZenGUARD™ technology is a simple and practical way to improve one of the biggest problems facing workspaces, planes, trains, buses, and other indoor spaces: indoor air quality……..we believe our patented ZenGUARD™ technology has the potential to not only protect people’s health by removing more pathogens from the air we breathe, but to do so in a way that reduces financial burden and environmental footprint.”

More details here in a CEO video discussing ZenGUARD™.

Zentek’s Guelph manufacturing center is one of the world’s largest graphene-based production facilities (produces the graphene oxide for coatings for ZenARMOR™ and ZenGUARD™)

Source: Zentek website

Closing remarks

Zentek continues to innovate at a rapid pace with all types of

graphene-related products. Commercialization is underway with their revolutionary ZenGUARD™ being used in face marks which remove 98.9% more bacteria and 97.8% more virus compared to standard surgical masks. Zentek is also developing numerous other graphene-based products such as icephobics (help prevent ice buildup), fuel additives (to reduce carbon emissions), and fire-retardant coatings just to name a few. Graphene is a revolutionary product and Zentek is at the cutting edge of developing and commercializing numerous uses for graphene-based products.

InvestorIntel will continue to keep investors up to date with Zentek's amazing progress in what promises to be another potentially superb year for the company.

Greg Fenton on ZenARMOR, Zentek's novel corrosion protection technology

written by InvestorNews | February 9, 2023

In this InvestorIntel interview, Tracy Weslosky talks to Zentek Ltd.'s (NASDAQ: ZTEK | TSXV: ZEN) CEO and Director Greg Fenton about their novel corrosion protection technology: ZenARMOR™. As a technology based on graphene oxide, Greg explains how ZenARMOR™ has shown performance that is "better than the best existing anti-corrosion systems currently in the marketplace."

Speaking about the potential environmental benefits of ZenARMOR™, Greg discusses how the initial results on ZenARMOR™

showed no signs of corrosion even after 1,500 hours of salt spray testing. With corrosion-related costs amounting to upwards of US$ 450 billion per year in the US alone, Greg explains how ZenARMOR™ may find application in naval and marine infrastructure, bridges, buildings, pipelines, and many other industries.

To access the full InvestorIntel interview, click here

Don't miss other InvestorIntel interviews. Subscribe to the InvestorIntel YouTube channel by clicking here.

About Zentek Ltd.

Zentek is an IP development and commercialization company focused on the research, development and commercialization of novel products using graphene and nanomaterials for use in the healthcare industry and beyond.

Zentek's patented ZenGUARD™ coating is shown to have 99% antimicrobial activity and to significantly increase the bacterial and viral filtration efficiency of both surgical masks and HVAC systems. Zentek's ZenGUARD™ production facility is located in Guelph, Ontario.

To know more about Zentek Ltd., click here

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If you have any questions surrounding the content of this interview, please contact us at +1 416 792 8228 and/or email us direct at info@investorintel.com.

Zentek sets its sights on

treating skin conditions as it expands potential uses for its ZenGUARD graphene coating

written by InvestorNews | February 9, 2023

As the world becomes increasingly interconnected, we have seen how the risks of disease transmission have also increased. In response, companies like Zentek Ltd. (NASDAQ: ZTEK | TSXV: ZEN) are leveraging cutting-edge nanotechnology to develop new ways of protecting people from harmful pathogens. It is dedicated to researching and developing new technologies, specifically around nanomaterials. Their graphene-based solutions have the potential to revolutionize many industries beyond healthcare, including electronics, energy storage, water treatment, and more. They have partnered with leading companies in each of these sectors to commercialize their technology.

This need is why Zentek created an antimicrobial coating known as ZenGUARD™, a proprietary graphene-oxide silver compound shown to be highly effective at filtering out bacteria and viruses. The product has been measured to filter 98.9% more bacteria and 97.8% more viruses than standard surgical masks.

Recently, Zentek's team has been focused on commercializing the patent-pending ZenGUARD™ coating. InvestorIntel's Tracy Weslosky recently spoke with Zentek CEO and Director Greg Fenton about their current efforts and their recently announced success of its commercialization efforts.

Zentek announced that it has entered into a Reciprocal Supply Agreement on March 31, 2022, with EkoMed Global Inc., an international manufacturer and distributor of personal protective equipment (PPE). In this agreement, Zentek will sell

quantities of its coated material to be used initially for surgical masks made by EkoMed and eventually other PPE in the future. Zentek continues to work to expand its network of partnerships and is looking to get FDA approval for ZenGUARD-coated products.

In July Zentek filed a provisional patent on the use of ZenGUARD as an anti-inflammatory agent for dermatological conditions. Further expanding its potential as a dermatological product, it is currently being researched for treatment of various skin conditions, including both infectious and inflammatory conditions like acne, psoriasis, eczema, sunburn, poison ivy, warts, seborrheic dermatitis and toenail fungal infections.

Zentek is also positioned strategically from a supply chain perspective. The Albany Graphite project is located in Northern Ontario, Canada, and they own 100% of the project. The graphene from this source has a combination of graphite purity, particle size, and consistency which could make it ideal for certain solutions. This project could be a significant advantage as Zentek continues to develop graphene-based solutions for various industries.

As the ZenGUARD brand is based on graphene, controlling their own source of graphene can lead to cost and quality control advantages. Their team is also developing surgical masks, HVAC filters, personal protective equipment, rapid detection point of care diagnostics tests, and pharmaceutical products that are all based on graphene-based compounds.

Zentek could have large potential upside if it can capitalize on its technology. They are well positioned to continue growing their business through a combination of strong IP protection, continued innovation, and strategic partnerships. The key will be whether Zentek can continue to expand the market for its

ZenGUARD coated products and partner with enough manufacturers to win enough market share in Canada and abroad.

Bristow goes with technology and selects the stock to watch in 2022

written by InvestorNews | February 9, 2023

Welcome to 2022! I’m cautiously optimistic that this will be the year we get to put Covid in the rear-view mirror and get on with life without always waiting for the next shoe to drop (or a new variant to take hold). I’m happy to put 2021 in the history books and anticipate the bright future that could be. In that vein, I’d like to look ahead to what I think could be an exciting story for 2022. Now don’t get me wrong, I’m not saying this is my top pick or suggesting it will go up. This is simply my perspective on a company that has a lot going on that could be rewarded by the market this year.

The path of least resistance, after this week’s market action, would be to pick a uranium stock. Between how this group performed in 2021 and even more impressively, the first couple of trading days of 2022, it would certainly make for an easy article to write. I’m also a fan of junior base and precious metal mining companies, especially ones with plenty of results pending, but not today. The future is technology, so my exciting stock for 2022 is a technology company that posted a respectable 35% return in 2021 but is well positioned for 2022. It also happened to evolve out of a junior mining exploration company so

it’s the best of both worlds.

If you haven’t figured out what company I’m talking about yet, it’s Zentek Ltd. (TSXV: ZEN), formerly known as ZEN Graphene Solutions Ltd. There is so much going on at Zentek it’s hard to know where to start. The Company currently describes itself as an IP development and commercialization company focused on next-gen healthcare solutions in the areas of prevention, detection and treatment. Zentek is currently focused on commercializing ZENGuard™, a patent-pending coating shown to have 99% antimicrobial activity, including against COVID-19, and the potential to use similar compounds as products against infectious diseases. The Company also has an exclusive agreement to be the global commercializing partner for a newly developed aptamer-based rapid pathogen detection technology. But that’s just the tip of the iceberg in my opinion.

The near-term catalyst is all about the antimicrobial coating ZENGuard™, which was developed as a virucidal graphene-oxide (“GO”) based compound to be applied as a coating onto fabrics, which included personal protective equipment such as face masks in an effort to increase protection afforded by such products. In September 2021 the Company received Health Canada approval for the sale of ZENGuard™ coated masks and entered into a binding definitive license and supply agreement with Trebor Rx Corp. for the supply of ZENGuard™ to coat face masks and potentially other health care products. To date, Trebor has purchased, and the Company has delivered, quantities of ZENGuard™ coating sufficient for the production of 10,000,000 masks currently done via third parties. However, development is underway of the Company’s industrial scale facility to produce ZENGuard™ and to coat materials. The Company anticipates assembly and installation of the industrial scale production equipment to be completed during Q1 2022, at which point

production is expected to commence while commissioning, optimization and production ramp-up occurs over the following two to three months. Once this industrial process is in operation, the Company expects the production capacity of ZENGuard™ to increase significantly.

Zentek recently closed a bought deal public offering and a non-brokered private placement for aggregate proceeds of C$33 million to assist in the build out of their facility as well as research and development, acceleration of business growth opportunities and working capital. Other growth opportunities include the development of a new carbon-based nanotechnology-enhanced icephobic coating to reduce ice accretion. The Company anticipates applications for aircraft, wind turbines, ocean vessels, and building structures to increase safety and efficiency outcomes in ice-forming weather conditions. In late November Zentek announced it had been awarded an R&D test contract through the Innovation Solutions Canada Testing Stream to test ZENGuard™ coated HVAC filters with interest from 3 different units within the National Research Council of Canada. Other innovations include the development of a stable diesel fuel additive, which increased the performance of diesel fuel by up to 10% in initial testing.

There is an awful lot going on at Zentek so I would encourage you to go check out their website to learn more because I've only scratched the surface of this stock to watch in 2022. Granted it's not a small cap with a market cap of roughly $466 million after the closing of the latest capital raise earlier this week. Nevertheless, there are plenty of near-term catalysts with having their own production facility operational in the next few months and some pretty creative and unique opportunities being developed to propel this Company into the future.

Dr. Dube on competitive graphene technology and the recent testing partnership between ZEN, the Royal Canadian Navy and Evercloak

written by InvestorNews | February 9, 2023

In a recent interview with **InvestorIntel,** Tracy Weslosky speaks with Dr. Francis Dube, CEO and Director of ZEN Graphene Solutions Ltd. (TSXV: ZEN) about their partnership with Royal Canadian Navy and Evercloak to test graphene oxide dehumidification membrane technology.

In an InvestorIntel interview that can also be viewed on our InvestorIntel YouTube channel, Dr. Dube said, “We can make a membrane that is based on our graphene oxide and that material now enables a new technology that filters out moisture in air before this air gets into an air conditioning unit.” He added that by removing moisture from air, the air conditioning unit uses less energy and requires less maintenance. “We can reduce air conditioning energy requirement by 75%…” Dr. Dube claimed.

Dr. Dube also provided an update on ZEN’s graphene oxide production method and the competitive environmental advantages of this technology.

To watch the full interview, click here

To learn more about ZEN Graphene Solutions Ltd., click here

Disclaimer: *ZEN Graphene Solutions Ltd. is an advertorial member of InvestorIntel Corp.*

Scaling up graphene production to meet forecast demand, ZEN Graphene shares double since April

written by InvestorNews | February 9, 2023

In recent years we have heard that graphene can be the next super material due to its immense strength and electrical conduction properties. The next step is for large scale, low cost, graphene production to occur so as to supply the market demand. It looks like graphene's time has now come.

A 2019 Canaccord UK research report estimated worldwide graphene sales were likely to take off over the next few years reaching US$4.8 billion by 2030, growing at a CAGR of 45%. That is a huge forecast demand increase, effectively forecasting in the next 2 years graphene demand will double, then double again, and so on.

Graphene – Properties, Facts, and Applications

Source

One company is currently scaling up their graphene production from their new facility in Canada to meet what should be

extremely strong demand this decade. That company is ZEN Graphene Solutions Ltd. (TSXV: ZEN) ("ZEN").

ZEN is an emerging graphene technology solutions company with a focus on the development of graphene-based nanomaterial products and applications. ZEN sources its graphite to make graphene from its 'unique' Albany Graphite Project. I say unique because independent labs in Japan, UK, Israel, USA and Canada have independently demonstrated that ZEN's Albany Pure™ Graphite is an ideal precursor material which easily converts (exfoliates) to graphene using a variety of methods.

Some of the numerous applications for ZEN's graphene include:

- **Aerospace and aircraft** – Graphene coatings that can greatly improve corrosion resistance, reduce friction and can be hydrophobic reducing ice formation. Graphene composites also help to increase strength and flexibility while potentially reducing overall weight.
- **Fuel Additive** – Graphene oxide in diesel/jet fuel improves fuel economy and reduces greenhouse emissions.
- **Electromagnetic shielding** and electrostatic dissipation.
- **Desalinization membranes** and low-energy dehumidification.
- **Heavy metal scavenging** –Graphene quantum dot/nanocellulose membranes are a recyclable material capable of removing industrial contamination.
- **Photovoltaics, displays**, **biomedical applications** using graphene quantum dots. Graphene based virucidal inks embedded in protective clothing to fight COVID-19 are another useful application right now.
- **Material enhancement** using graphene. Graphene is also useful to boost tires strength and performance as well as a concrete additive to boost performance. Graphene can also be used to strengthen clothing for military applications. Graphene also strengthens aluminum, rubber,

plastics and other materials.

- **Hydrogen storage and production** – Graphene is an ideal catalyst for water splitting (10x more efficient than platinum catalysts) and can store hydrogen in a solid state.
- **Advanced batteries** –Anode energy densities are 1500mAh/g in graphene-enhanced aerogels and 840mAh/g with reduced graphene oxide. Graphene has greater conductivity and improves cold weather performance. Samsung is developing an advanced graphene phone battery.

ZEN Graphene Solutions Guelph, Ontario facility is scaling up graphene production in 2020

The Guelph graphene facility opened in March 2020 and is now scaling up graphene production to sell to the many potential buyers as discussed above.

Source

In addition to ZEN's Guelph facility ramping up production, ZEN announced in July 2020 a new partnership with Evercloak and NGen for a 'Graphene in Cleantech Manufacturing Project'. The announcement states:

"The project entitled "Advancing Large-Scale Graphene and Thin-Film Membrane Manufacturing" will support the scale up of graphene oxide (GO) production by ZEN to supply GO to Evercloak for their scale up and optimizing activities."

For ZEN this is another significant endorsement and step forward along the pathway of commercializing their graphene. Evercloak is commercializing a manufacturing platform for producing continuous, large-area, monolayers of exfoliated 2D

nanomaterials, including graphene, graphene oxide, molybdenum disulfide, and carbon nanotubes. These films are increasingly used for a wide range of applications such as energy storage, smart packaging, electronic devices, corrosion inhibitors, and membranes. Evercloak's initial focus is on manufacturing graphene-based membranes for dehumidification to significantly reduce the energy use and associated greenhouse gas related with building cooling.

ZEN's CEO Francis Dubé commented: "ZEN is pleased to support Canadian graphene-based innovations and Evercloak is a wonderful example of what can be achieved with nanomaterials and Canadian entrepreneurship. NGen supports the accelerated development of high potential technologies such as our graphene collaboration. We look forward to helping Evercloak bring breakthrough technology to everyday life."

Closing remarks

Success in the manufacturing sector is about collaboration with your supply chain. ZEN continues to win interest in their graphene products and continues to develop a supply chain, on this latest occasion with Evercloak.

A recent C$2 million capital raise means ZEN has cash to accelerate their near term expansion activities, which will include funds for the Albany Graphite Project, further graphene research, graphene production scale up, COVID-19 initiatives, and other graphene applications development. Also the recent engagement of Hybrid Financial to help market ZEN should boost the number of eyes on the stock.

Combine the above with continuing commercial success selling graphene products and 2020 should see a successful year for ZEN. Late 2020 and 2021 should start to see revenues coming in and a lot more interest in both graphene and ZEN Graphene Solutions.

Despite the stock price more than doubling since April 2020, the stock still looks reasonably priced trading on a market cap of C$57 million.

Graphene oxide fights antibiotic pollution

written by InvestorNews | February 9, 2023

Antibiotics have saved my life. They may have saved your life too dear readers. However there is a very real possibility that they may stop working in the future. Part of the problem is antibiotic pollution and some new research shows that graphene oxide may be able to help. Read on to find out how…

What are Antibiotics and what is the problem?

Antibiotics are medicines used to prevent and treat bacterial infections. The World Health Organisation (WHO) states that *'Antibiotic resistance is rising to dangerously high levels in all parts of the world'* and *'without urgent action, we are heading for a post-antibiotic era, in which common infections and minor injuries can once again kill'*.

Antibiotic resistance

Like other living things bacteria evolve. They change in response to their environment. When a population of infectious

bacteria inside our bodies is totally killed this stops the disease. The symptoms can disappear but when the bacteria have not been totally killed off and they can return with increased resistance to the drugs. This is why doctors always state that we must complete the course of treatment.

The problem comes when a population of bacteria is partially killed. The survivors may be slightly less affected by the antibiotic and so live to reproduce offspring that carry increased resistance to the medicine.

Overuse of antibiotics is part of the problem. Another critical problem is that when our animals or we are given antibiotics some of the medicine passes straight though the body, straight through the sewage system and into our watercourses.

The link between pollution and antibiotic resistance

When antibiotics pass through our bodies and wastewater treatment systems they enter our lakes, rivers and seas. From there antibiotics enter the food chain and end up in fish and shellfish that we later eat. Water is also abstracted from rivers to grow crops and feed farm animals that we consume. The problem with small amounts of antibiotics in the environment is that disease-causing bacteria get exposed to less-than-lethal doses of the medicine. You'll probably be familiar with the expression 'what doesn't kill you makes you stronger' well that applies to bacteria too and this is how we end up with antibiotic resistant microorganisms in our environment.

Why don't we develop new antibiotics?

Because it is really hard to do. A paper in the journal Biochemical pharmacology laid out the problem clearly: '*Most*

pharmaceutical companies have stopped or have severely limited investments to discover and develop new antibiotics to treat the increasing prevalence of infections caused by multi-drug resistant bacteria, because the return on investment has been mostly negative for antibiotics that received marketing approved in the last few decades.'

How does Graphene Oxide help clean up pollution?

Researchers at Qingdao University in China made graphene oxide fibres with calcium alginate.

Tetracycline is one of the most frequently used antibiotics, ranking second in production and usage worldwide. The Chinese team found that this material could selectively adsorb tetracycline from water making it a possible pollution removal treatment for wastewater.

Tetracycline dissolves in water. Most sewage treatment plants are configured to separate solids from water so anything that is dissolved will pass straight through and enter the environment.

Graphene oxide adsorbs 131.6 mg of tetracycline for every gram of graphene oxide and works best at pH6, which is a neutral or slightly acidic condition. The calcium alginate makes graphene fibres that can be separated out as a solid. This is how the pollution control process works.

Summary

This is brand new research just emerging from the laboratory at present. Antibiotic pollution is a pressing public health issue for which there is a government response.

In Europe the Joint Programming Initiative on Antimicrobial

Resistance (JPIAMR) supports innovations against antibiotic resistance. It has funded microbial resistance projects with £67.3M over the past four years. These graphene oxide fibres would be an ideal project for governments to fund. Many successful niche businesses start with government support. Expect to hear more about this in the future.

Graphene Oxide 'Swiss Army knife' fights cancer

written by InvestorNews | February 9, 2023
Cancer research is a noble cause. Graphene Oxide has joined the fight, read on to find out how…

Cancer cells

The world health organisation (WHO) defines cancer as a generic term for a large group of diseases that can affect any part of the body. One defining feature of cancer is the rapid creation of abnormal cells that grow beyond their usual boundaries. These can then invade adjoining parts of the body and spread to other organs. This process is referred to as metastasizing. Metastases are a major cause of death from cancer.

So, cells that don't stop growing cause cancer. Ordinary cells have an auto-destruct switch but in cancer cells this switch doesn't work.

The auto-destruct switch

Our bodies contain structures we call organs. Similarly cells have structures inside them called organelles. Mitochondria are one of these organelles and are present within most cells. This is where processes such as respiration and energy production occur. Mitochondria are also where programmed cell death takes place. When cells become cancerous their mitochondria ignore the programmed death signals (called Apoptosis) and cancerous tumours form.

To activate the auto-destruct switch any treatment must first pierce the cell wall. Then once inside the cell it has to find and pierce the mitochondria and then switch on the programmed death signal to kill the cancer cell.

Cancer treatment strategy

Medical researchers know that a compound called Glycerrhetinic Acid (GA) can break through the cell wall and mitochondria wall, then once inside the mitochondria another compound called Doxorubicin (DOX) can cause a cascade of reactions that trigger the cancer cell to die (activating the auto-destruct switch).

The problem is that when using the compounds separately, very high dosage levels have to be used. This causes damage to the brain, liver and kidney. These toxic effects prevent the drugs from being used in practise.

If the two drugs can be combined somehow then the dosage can be reduced to safe levels. This is where graphene oxide comes in.

Graphene Oxide drug delivery system

Graphene Oxide is an ideal nanoscale drug delivery system.

First, it is a two dimensional material. This means it has a high surface area with plenty of room to attach things. Graphene Oxide nanoplates are very small so they can be injected into the body.

Second, graphene oxide contains alcohol, epoxy and carboxylic acid groups that are familiar to our bodies, making it both biocompatible and providing plenty of sites on which to anchor the drugs.

A research team from the China Pharmaceutical University in Nanjing have done the clever chemistry to attach both the GA and DOX drugs to the same graphene oxide nanoplates. They made a nano-carrier for the drugs.

More than that, the Chinese team have tested this system in the laboratory. The early trials have found that the graphene oxide nano-carrier system can target cancer cells and successfully cause them to self-destruct. The dosage levels are so small that the team believe it is perfectly safe. In short, it works!

There are many hurdles before a new anti-cancer treatment is used in real people to cure the disease. However if it passes the safety testing and regulatory requirements, we could find this nanoscale graphene oxide Swiss Army knife curing cancer in hospitals of the future.