

# Dr Dube and Greg Fenton on ZEN's potential graphene-based antibiotic, antiviral and antifungal compound

written by InvestorNews | December 29, 2020

In a recent InvestorIntel interview, Peter Clausi speaks with Dr. Francis Dube, Executive Chairman, and Greg Fenton, CEO and Director of [ZEN Graphene Solutions Ltd.](#) (TSXV: ZEN), about ZEN Graphene's potential graphene-based antibiotic, antiviral and antifungal compound which could be a medical breakthrough in the treatment of numerous human-contracted pathogens including COVID-19.

In this InvestorIntel interview, which may also be viewed on YouTube ([click here](#) to subscribe to the [InvestorIntel Channel](#)), Greg went on to say, "We unfortunately had to shut down most of our research and development due to COVID-19." He continued, "Fortunate for us, we had just opened up our own research lab in Guelph. **We joined together with our research partners and tested to see if there was anything we could do to help beat this virus.**"

Dr. Dube told InvestorIntel that ZEN Graphene has already filed patent for a graphene-based virucidal ink to be used in masks, PPE and the HVAC (Heating, ventilation, and air conditioning) sector. He added that the company is now exploring graphene's use in the fight against the current global pandemic.

On December 22, 2020, ZEN Graphene Solutions [announced](#) that it had developed a potential graphene-based antibiotic, antiviral and antifungal compound. Commenting on this news release Greg

said, “The versatility of this product is way beyond anything even we could have imagined. Not only the range of pathogens that it is effective against, but how it can be deployed and utilized. **It went from us simply talking about bringing our product into coating, to us talking about actually bringing it into the body.**”

To watch the full interview, [click here](#)

### **About ZEN Graphene Solutions Ltd.**

ZEN is a graphene technology solutions company with a focus on the development of graphene based nanomaterial products and applications. The unique Albany Graphite Project provides the company with a potential competitive advantage in the graphene market as 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 mechanical, chemical and electrochemical methods. ZEN is focused on commercializing a patent pending graphene-based coating with 99% viricidal activity against

To learn more about ZEN Graphene Solutions Ltd., [click here](#)

**ZEN Graphene Disclaimer:** The Company is not making any express or implied claims that its product has the ability to eliminate, cure or contain the COVID-19 (or SARS-2 Coronavirus) at this time. The company must receive Health Canada or FDA approvals for any of the products or solutions discussed.

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# ZEN Graphene set to supply a virucidal coating for a minimum 100 million masks

written by InvestorNews | December 29, 2020

This week [ZEN Graphene Solutions Ltd.](#) (TSXV: ZEN) (“ZEN”) and Trebor RX Corp. (“Trebor”) [signed a Binding Letter of Intent](#) (LOI) that includes the initial purchase of ZEN’s patent pending graphene based virucidal coating for **a minimum of 100 million masks/filters** with pricing of these mask/filters being variable based on a number of factors.

This news follows the highly successful testing of ZEN’s graphene based silver colloidal coating [announced](#) on September 22, 2020. Some of the announcement highlights are shown below:

- ZEN’s Virucidal ink is [99% effective](#) against the **COVID-19 virus**.
- ZEN’s [Virucidal ink was still 99% effective](#) a minimum of 35 days after application to N95 mask material.
- ZEN is now developing plans to expedite commercialization of this product, pending regulatory approval.
- [ZEN has filed a provisional patent](#) for this graphene-based virucidal product.....
- Very significant virucidal activity was recorded and reported, achieving 99% inactivation of the virus for both samples in 3 separate tests each and verified through a second round of testing...”

But back to the latest potentially game changing news for ZEN of the LOI for a minimum of 100 million masks/filters from Trebor. An order of this size for a relatively small company like ZEN is highly significant. Greg Fenton, ZEN’s Chief Strategy Officer,

[commented](#) (Nov. 9, 2020):

**“This is a historic day for ZEN. The signing of this significant commercial agreement is a watershed moment for our organization. Moreover, it is an honour for ZEN to partner with a Canadian company like Trebor and develop a 100% Canadian solution in the fight against the COVID-19 pandemic. The innovation of the Trebor Pro+ Respirator Mask will set a new standard in the mask industry and, combined with our viricidal coating, will bring a new level of safety for our front-line workers....”**

Trebor’s CEO George Irwin agreed [stating](#): “This is truly a game changer in the PPE space....”



### **PR0+ Respirator Mask**

It looks like the market also agrees with ZEN, up [358%](#) over the past 1 year, and up 293% since I wrote “[ZEN Graphene Solutions moves towards commercialization of virus-killing mask](#)” back on September 8, 2020.

**ZEN Graphene Solutions stock price is up 358% over the past 1 year, and up 293% since September 8, 2020**



### [Source](#)

What we know so far is that ZEN and Trebor have signed a LOI and that Trebor is a Canadian personal protective equipment mask manufacturer with an initial production facility located in Collingwood, Ontario, Canada. The announcement on the binding LOI includes several key points:

1. Initial first year production is planned to use ZEN’s

patent pending graphene based viricidal coating for a **minimum of 100 million masks/filters.**

2. Pricing of these mask/filters being variable based on a number of factors.
3. This initial minimum order is for the first year and is **subject to Health Canada approvals.**
4. ZEN's viricidal coating will be used on Trebor's patent pending Pro+ Respirator Mask (Pro+) N95 mask and also on their 3-ply surgical mask.

For now, we can only speculate on what the commercial terms would be and what other agreements may follow. What we do know is that the global market demand for face masks is enormous, certainly in the billions. Some have even called the face mask [‘the world’s most valuable commodity’](#). It is estimated that production of the highly protective [N95 face masks in the United States](#) alone will increase to 180 million units per month by the end/winter months of 2020.

**Demand for face masks is only increasing as global new COVID-19 cases continue to accelerate higher**



#### [Source](#)

Under a Biden presidency it looks highly probable that face masks will be viewed more positively than what happened under Trump. Back in June 2020, CNN [quoted](#): “Biden says he would make wearing face masks mandatory for Americans amid coronavirus pandemic.” This week Biden has announced a new [COVID-19 taskforce](#) to begin work immediately and continue after he is sworn in as president on January 20.

Global daily new cases of COVID-19 have been accelerating and are now averaging a **staggering 600,000 new cases per day**, for a

total of [over 52 million cases now globally](#).

All of this should lead to very strong demand for face masks in the year ahead.

Beyond COVID-19 ZEN has many other potential areas and deals to commercialize their graphene. Some recent deals include a collaboration agreement on [Carbon Aerogels with German Aerospace Centre](#) and a partnership with [the Royal Canadian Navy](#) and Evercloak to test Graphene Oxide Dehumidification Membrane Technology.

To meet all this new demand ZEN has had to [double their lab space](#) starting January 1, 2020 and [announced](#) this week that ZEN will lease a 25,680 square feet space in Guelph, Ontario to become ZEN's new manufacturing facility and corporate headquarters. ZEN [stated](#): "The company expects to begin initial production in Q4 2020 for incorporation into masks, other PPE and for HVAC filters and prefilters."

## **A summary of ZEN Graphene Solutions**



[Source](#)

## **Closing remarks**

ZEN Graphene Solution's management is doing a tremendous job. Pivoting in 2020 to produce a viricidal graphene coating was a genius move. Of course COVID-19 will come and eventually go, but demand for industry leading graphene products looks set to boom this decade as the world learns more about the wonders of graphene.

ZEN Graphene Solutions has a market cap of C\$139M and right now appears to have the world at their feet.

*Disclosure: The author is long ZEN Graphene Solutions Ltd. (TSXV: ZEN).*

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

written by InvestorNews | December 29, 2020

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](#)

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## **Dr. Francis Dube on the advancement of mask technologies and ZEN's graphene based virucidal ink with 99% efficacy**

written by InvestorNews | December 29, 2020

InvestorIntel's Tracy Weslosky speaks with Dr. Francis Dube, CEO and Director of [ZEN Graphene Solutions Ltd.](#) (TSXV: ZEN), about ZEN's novel graphene based virucidal ink. "We have come up with a coating that can be applied to masks and filter membranes to deactivate the COVID-19 virus," Dr. Dube told InvestorIntel. "It has been proven at plus 99% efficacy through Western University's ImPaKT facility which is a Biosafety Level 3 lab."

In an InvestorIntel interview that can also be viewed on our [InvestorIntel YouTube channel](#), Dr. Dube went on to say, while the current mask technologies are only meant to filter out particles, masks sprayed with ZEN's graphene-based virucidal ink



remains 99% effective in killing COVID-19 virus even after 35 days.

To watch the full interview, [click here](#)

To learn more about ZEN Graphene Solutions Ltd., [click here](#)

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## **ZEN Graphene Solutions moves towards commercialization of virus-killing mask**

written by InvestorNews | December 29, 2020

**ZEN is collaborating with partners to develop virucidal face masks and PPE**

Back in May 2020 InvestorIntel [wrote](#) about the very exciting development of masks and other personal protective equipment (PPE) that not only protect the wearer, **but actually kill viruses on contact**. to help . Since then the development of a “graphene virucidal ink face mask” and PPE has been progressing nicely in the fight against COVID-19.

In late July 2020 [ZEN Graphene Solutions Ltd.](#) (TSXV: ZEN) (“ZEN”) [reported](#) that research teams at a number of personal protective equipment (PPE) manufacturers are collaborating with ZEN to incorporate ZEN’s virus-killing graphene ink into commercial products, including masks, gloves, gowns and other

clothing. This follows ZEN's promising testing results from the University of Western Ontario's ImPaKT Facility, biosafety Level 3 lab.

ZEN has synthesized a 'silver nanoparticles functionalized graphene oxide ink' that has been documented by previous researchers to kill earlier versions of coronavirus. Silver is well known to be a potential virucidal agent.



***Photo: iStock***

In July ZEN reported in a [news release](#) that the company "continues to optimize its proprietary formulation for dosage and delivery mechanism for highest antiviral impact. **The next phase of testing is currently underway** at the ImPaKT Facility and includes a preferred mask fabric, from one of our collaborators, coated in ZEN's virucidal ink exposed to and tested against the COVID-19 virus."

Dr. Francis Dubé, CEO of ZEN, [commented](#) that "Based on results so far and our discussions with the team at Western, we are quickly moving to integrate our material into commercial products with partners who wish to increase the level of COVID-19 protection their products currently offer."

Given the world needs at least [3.5b](#) N95 face masks to fight COVID-19, the potential demand for ZEN's graphene based virucidal ink face mask could be enormous. If the new virucidal mask captured just 10% market share of the 3.5 billion masks needed that would mean manufacturing and selling ~350 million masks. Or even if just made mandatory for health care workers globally, the market would be very large, as there is an estimated [59 million health care workers worldwide](#). Each health care worker would need a number of masks per year. The revenue opportunities could be enormous if ZEN's graphene based

virucidal ink is licensed on a per unit basis. Added to this would be the potential for use in other PPE. For a small company such as ZEN the potential revenue upside could be highly significant.

Tests are still underway to improve and prove the effectiveness of the virucidal masks, but CEO Dubé's public comments about integrating ZEN's material into commercial products with partners indicates a positive outcome is looking increasingly possible.

Last week ZEN [announced](#) that it will "report shortly on significant progress being made in multiple programs, one of which has resulted in the preparation of a patent filing that is central to ZEN's business plan." Zen also announced receiving **significant funding grants**: "two NSERC Alliance COVID-19 project grants, a Mitacs Elevate Postdoctoral Fellowship grant, and two Mitacs Accelerate grants for a total of \$355,000 to its university collaborators," which increased ZEN's total research and development budget for the next 12 months to over \$1.4M.

## **Graphene's potential**

Graphene is a new wonder material with incredible potential to be commercialized in a huge number of products. These are as diverse as graphene coatings that can greatly improve corrosion resistance, increase strength, reduce friction and can be hydrophobic reducing ice formation (aerospace and aircraft industries). As a diesel/jet fuel additive it can improve fuel economy and reduces greenhouse emissions. It is also useful in electromagnetic shielding and electrostatic dissipation, desalinization membranes and low-energy dehumidification, heavy metal scavenging and removing industrial contamination, photovoltaics, displays & biomedical applications using graphene quantum dots, [virucidal inks](#), as a material enhancement

(clothes, tire strengthener, concrete additive), hydrogen storage and production, and advanced batteries. Samsung is developing an [advanced graphene phone battery](#). Graphene is super lightweight and also strengthens aluminum, rubber, plastics and other materials, making its list of applications almost endless.

**The graphene market is forecast to grow at a 39-45% CAGR this decade**



[Source](#): Company presentation

### **Closing remarks**

In addition to its advanced application projects, **ZEN owns a graphite mine** and has commenced small scale graphene [production from their facility](#) in Canada, and has numerous other [potential uses](#) to commercialize their graphene product. At the current market cap of just C\$31m the stock is not yet pricing in any chance of significant success in the virucidal mask and PPE market, or in the larger graphene market. This is good news for investors looking for underappreciated and early stage stocks. If ZEN is able to successfully commercialize its viricudal mask/PPE or other graphene products, it would be a game-changer.

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## **A graphene based virucidal ink face mask and line of clothing**

# that does more than protect – it intends to kill COVID-19

written by InvestorNews | December 29, 2020

The face mask sector is hot right now. Even [China can't make enough face masks](#) to meet their own demand. As countries begin to ease the COVID-19 (coronavirus) lockdowns literally billions of people will require face masks. Many airlines are already [making face masks mandatory](#), and this could soon spread to other forms of mass transport.

Even better than standard face masks are new high tech face masks designed to kill the virus, using antiviral nano-particles embedded inside the protective material.

Two companies are combining their expertise to produce new high tech face masks and other protective clothing that they hope will kill the virus. They are [ZEN Graphene Solutions Ltd.](#) (TSXV: ZEN) and Graphene Composites Ltd. (GC). They have teamed up to develop [a COVID-19 virucidal graphene-based composite ink](#) for face masks and other protective clothing.

An agent that kills viruses, a virucidal ink that can be embedded into all types of personal protective equipment (PPE) could have immense benefits for the world right now. Imagine owning a mask that not only blocks the virus but can kill it. The medical world will love it, as it will give them the much needed protection they deserve, as they battle on the front lines of this severe pandemic that has now infected over 3.7 million people, killing [~258,360](#).

## The plan

ZEN has synthesized a 'silver nanoparticles functionalized

graphene oxide ink' that has been documented by previous researchers to kill earlier versions of coronavirus. Silver is well known to be a potential virucidal agent. Testing will be conducted at Western University's ImPaKT Facility Biosafety Level 3 lab in Ontario, Canada.

Once testing is completed (and assuming successful), the virucidal graphene ink would then be incorporated into fabrics to be included into masks and filters designed by GC.

The CEO of ZEN, Francis Dubé, [stated](#):

*"We are pleased to be collaborating with GC and be on the forefront of a new innovative technology that could contribute to combating the deadly COVID-19 virus. The development of this potential COVID-19 virucidal graphene ink is coming at a crucial time to provide effective PPE supplies for the safety of frontline workers and hospital staff."*

The CEO of GC, Sandy Chen, [stated](#):

*"Combining the deep nanomaterials expertise of GC and ZEN with a truly collaborative approach has enabled us to do a year's worth of R&D in a matter of weeks. Quickly developing and deploying our virucidal/germicidal ink would make a significant difference in slowing the rate of infection – thus saving many lives."*

## **Competitors**

Given the newness of the COVID-19 pandemic there is so far little competition when it comes to virucidal protective clothing using graphene. One Israeli company is [reportedly](#) using a virucidal embedded into masks that consists of zinc oxide and copper oxide nano-particles.

**ZEN's graphene has a huge range of potential uses**

ZEN is already making [great progress in the production of graphene](#) with a huge range of [potential uses](#) such as: Tyre strengthener, aluminum/rubber/plastics enhancer, a cement additive/enhancer, diesel and jet fuel additive, graphene batteries, graphene based clothing and so on.

### **ZEN has unique graphite from which they make graphene**

ZEN Graphene Solutions also have their own unique source of graphite at their Albany Graphite Project, which is highly suitable for graphene production. The unique Albany Graphite Project provides the Company with a potential competitive advantage in the graphene market as independent labs in Japan, UK, Israel, USA and Canada have demonstrated that ZEN's Albany Pure™ Graphite is an ideal precursor material which easily converts to graphene, using a variety of mechanical, chemical and electrochemical methods.

### **ZEN's new graphene research and development facility at Guelph, Ontario, Canada**

ZEN has recently opened their new graphene research and small scale [production facility](#) in Canada, with a goal of scaling up graphene production to meet consumer demand. Graphene product sales were launched in early March 2020. The research and engineering team will also be developing and testing custom functionalized graphene formulations as requested by industrial collaborators for product performance enhancement.



### **[Source](#)**

### **Closing remarks**

ZEN is one of the most innovative companies out there, with a focus on using graphene to disrupt and improve various

industries. Their latest collaboration with Graphene Composites Ltd. is most exciting, as virucidal protective clothing can be a game changer right now in the fight against COVID-19.

Furthermore ZEN already has their own high quality Albany graphite source, and has started scaling up graphene production at their facility in Ontario Canada. This makes them a vertically integrated growing graphene producer, all for a market cap of just C\$32 million.