

Moving forward with Trebor on their 100M mask agreement, ZEN achieves positive initial phase 2 cytotoxicity results

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[ZEN Graphene Solutions Ltd.](#) (TSXV: ZEN) ('ZEN') continues to innovate and rapidly progress. Initially a graphite junior, then a graphene producer, then a co-producer of graphene-silver materials for COVID-19 protection (masks, gloves etc), and now a potential graphene-based biocidal product developer. It has been an incredible past 9 months for ZEN Graphene Solutions as shown on the chart below. The upward move started after mid-2020 and after ZEN gained a Letter of Intent (LOI) for their [COVID-19 virucidal graphene-based composite ink](#) for face masks and other protective clothing. It is not at all surprising that ZEN was [recently named](#) in the TSX Venture top 50.

Below I take a look at the latest developments with this most exciting company.

ZEN Graphene Solutions stock price has surged on the back of tremendous company news and progress the past 9 months



[Source](#)

ZEN [describes themselves](#) as:

“A next gen nanomaterials company developing graphene-based technology that helps protect people, the environment and makes existing products better. ZEN is currently focused on

commercializing a **patent-pending graphene-based coating with 99% biocidal activity, including against COVID-19** and the potential to use this graphene compound as a **pharmaceutical product against infectious disease.**“

Dr. Francis Dubé, ZEN Executive Chairman, [stated](#):

“The company continues to make positive progress towards our patent-pending, biocidal compound being considered as a pharmaceutical agent. Health safety evaluation in preclinical models is the most important consideration at this stage – and with the high dose (1,000 mg/kg) in this study being 20,000 times higher than the Minimum Inhibitory Concentration from the Mount Sinai study – we are incredibly encouraged. We will continue to move this new potential therapeutic towards Phase 1 human trials as quickly as possible pending the final report from Nucro-Technics.”

A translation of the above is that thus far ZEN’s graphene based graphene-silver product is proving to be extremely safe, but there is still a way to go. We already know from previous studies that the product is [99.9% effective](#) against aerobic bacteria (gram-positive and gram-negative), fungal and viral activity, including COVID-19.

Greg Fenton, ZEN CEO, [commented](#):

“This broad-spectrum compound is a novel solution that could have an impact on infectious disease management. It has the potential to act as a targeted treatment for multi-drug resistant organisms (MDR) as well. As in previously released results on the effectiveness of a similar compound against COVID-19, this graphene-based treatment could be against viral infections. We will be exploring its use not only in the fight against the current global pandemic, but also against numerous other pathogens....Based on this breakthrough and an urgent need

for such treatments, we will seek immediate collaborations with potential pharmaceutical partners to optimize the delivery mechanisms to target infections in general and especially those common in the respiratory tract.”

ZEN’s graphene products have enormous potential applications from fighting pathogens to air and water filtration to better batteries and many more



Source: [ZEN’s corporate presentation](#)

ZEN’s latest successes

- Jan. 13, 2021 – ZEN [reported](#) positive news on the use of their graphene-silver coating for masks. Filter material flow rates and pressure drop were not affected by the application of the coating and treated mask material achieved excellent dispersion and coverage. ZEN stated: “Both findings help validate that ZEN’s coating does not inhibit breathability in polypropylene mask material or flow rates in air filtration media.” This is another significant step towards successful adoption and commercialization of ZEN’s graphene-silver coating. Recall that ZEN previously announced a contract in Canada to supply their graphene-silver coating to TreborRx (‘Trebor’) for [100 million masks.](#)
- Jan. 18, 2021 – ZEN’s [announced](#) that they had reached an agreement with Trebor for the application of their coating on nitrile gloves sourced or produced by Trebor. ZEN will provide Trebor with a distribution agreement for Canada, the USA and Mexico (Territory). Trebor agrees to use the coating on all gloves sold and will pay ZEN a royalty per glove coated, with a minimum first year guarantee of 100 million gloves. George Irwin, Trebor CEO, [commented](#), “We

are excited to bring another game changer to the PPE Industry. We believe Zen's biocidal coating on gloves gives front line responders and health care associates in all medical and non-medical situations additional protection for both the patient and health care worker. This coating can be used on gloves in food processing and agriculture as well. Trebor and Zen have a unique relationship with the goal of making safer PPE. Trebor looks forward to supplying the biocidal gloves within the 1st half of 2021."

Next steps for ZEN

ZEN's engineering company will design and source the equipment for the production of the proprietary graphene-silver formula on an industrial scale. The equipment will be assembled and installed in ZEN's new industrial facility in Guelph, Ontario. We will also need to wait to see what happens with Trebor's application for an amendment to Health Canada to include ZEN's coating on their already approved masks. There will also be further results and trials for ZEN's biocidal product for human use.

Closing remarks

ZEN Graphene Solutions currently has a market cap of C\$242 million. The Company has had a stunning past year and management is to be congratulated. Further upside remains should they achieve commercialization success in either of their current main projects (graphene-silver coating for personal protective equipment and successful trials and approval of their biocidal agent).

This is an amazing story from an amazing company. Stay tuned in 2021.

- [Dr Dube & Greg Fenton on ZEN's potential graphene-based antibiotic, antiviral & antifungal compound \(video\)](#)

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

A graphene based virucidal ink face mask and line of clothing that does more than protect – it intends to kill COVID-19

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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.