



## PyroGenesis Provides Corporate Update to 3D Printing Powders Business Line

July 18, 2022

### **Production milestones reached and new markets eyed as global metal powder demand increases.**

MONTREAL, July 18, 2022 (GLOBE NEWSWIRE) -- PyroGenesis Canada Inc. (<http://pyrogenesis.com>) (TSX: PYR) (NASDAQ: PYR) (FRA: 8PY), a high-tech company (hereinafter referred to as the "Company" or "PyroGenesis"), that designs, develops, manufactures and commercializes advanced plasma processes, high quality plasma atomized metal powder for 3D printing, and sustainable solutions which are geared to reduce greenhouse gases (GHG), is pleased to provide today an update on its high quality plasma-atomized metal powders (for 3D printing) business line.

"Over the past three years, PyroGenesis completed a series of intricate production steps as it readied the NexGen Plasma Atomization system. This has resulted in the most recent milestone, where the Company announced that it had moved from sample production to commercial size batch production," said Mr. P. Peter Pascali, CEO and Chair of PyroGenesis. "With the ability to now produce titanium powder by the tonne, the Company is now in a position where it can provide additional perspective on status, and next steps, for both existing and developing opportunities."

### **NexGen Plasma Atomization System**

PyroGenesis previously announced the filing of a provisional patent for a revolutionary plasma atomized metal powder production process ("NexGen Plasma Atomization"), for use in 3D printing by additive manufacturers. This process was a significant departure from conventional plasma atomization – a technology the Company also invented and coined the term for, and which is still considered the gold standard for the production of metal powder. The provisional patent targets higher production rates, narrower particle size distribution ("PSD"), and has the additional advantage of being able to shift the bulk PSD into a more desirable distribution. These advantages enable the Company to produce for the Additive Manufacturing ("AM") industry, a very targeted powder, with little to no waste, at higher volumes and lower cost.

As the inventor of plasma atomization and a global leader in plasma research and commercialization for heavy industry, PyroGenesis is dedicated to continuous improvement and innovation for commercialization, with a goal to shatter all published plasma atomization system production rates and pricing levels.

### Aubert & Duval Agreement

#### *Status of Partnership Agreement*

PyroGenesis has a technical and commercial partnership agreement with Aubert & Duval, a world leader in industrializing high-performance steel, super alloy, aluminum and titanium alloys. Founded in 1907, Aubert & Duval – a division of the French multinational mining and metallurgy company; ERAMET – is both the world's second-largest producer of high-power press-forged parts and a recognized supplier of fine metallic powders for additive manufacturing in demanding markets such as aerospace, energy, medical, defense and automotive

This agreement, in place since 2019, pairs PyroGenesis with a partner that has a history of supporting their customers in AM, from the development of product to mass production. The agreement established the framework within which Aubert & Duval and PyroGenesis would work together during the period wherein PyroGenesis developed their NexGen technology. It also provided Aubert & Duval with exclusive rights to market PyroGenesis plasma-atomized titanium powders in Europe, while at the same time agreeing to buy titanium powder exclusively from PyroGenesis

#### *Next Step: Distribution Agreements*

With NexGen now producing titanium powder, and with powder shipments now commenced for distribution to companies worldwide for qualification, discussions are now under way between the parties for full distribution agreements. Steps under discussion include, but are not limited to, distribution planning, order planning, and logistics. The Company hopes to provide more information on these developments in the very near future.

### Top Tier Aerospace Company

PyroGenesis also has an agreement with a tier one North American global aerospace company (the "Client"), for qualification of the Company's titanium metal powder.

Under this agreement, the Client has been performing an in-depth qualification process – a procedure typically required before a company can become an approved supplier. The process was established to, amongst other things, evaluate the Company's manufacturing methods, test samples of powder for batch-to-batch consistency, and determine various mechanical and chemical properties. Subsequently, larger volumes of powder will be used to print test coupons to further evaluate mechanical and chemical properties.

Upon passing all steps, including acceptance tests, the Company's process will be locked down specifically for each client, with no additional modifications permitted. Upon successful completion of the testing, PyroGenesis would expect to receive formal acceptance as an approved supplier.

#### *Status of Qualification Agreement*

The formal and methodical process with this top tier aerospace company is on track and is nearing conclusion.

Recently, the Client provided verbal approval of "work instructions" – the procedures given to the Company's factory operators, which serves as the de facto facility operational manual for the Client's specific operating standards and expectations.

Next steps include the final assessment and approval of various non-manufacturing processes, for aspects such as quoting, handling, storing, shipping, logistics, etc. As the Company has already achieved ISO 9001:2008 and AS9100D certification, it is confident that these processes will meet

the Client's standard, after which the last step is for final small samples to be produced under the final locked-down process state. Once the final sample powder is analyzed, the Client will provide a memo that the Company's titanium metal powder is approved for use upon which the Company will inform investors.

The Company anticipates achieving final approval during Q4 of this year, 2022.

## **New Developments**

### Commencement of Inventory Production

The Company is now announcing its intention to start producing stock inventory of titanium metal powder – a pre-made bulk supply of powder for storage as inventory, in readiness for orders from Aubert & Duval and other entities.

### Asian Market Expansion

In the past, the Company has announced delivery of preliminary metal powder samples to a client in Asia. During the NexGen development process, while the industry awaited announcement of the Company's production milestones, various parties indicated interest in PyroGenesis' metal powder for the Asian market.

As a result, discussions are now underway with a major distributor of metal powder to establish distribution rights for the Asian market – a market with a very large automobile and aerospace presence.

The Company will provide more information on this development as it progresses.

### ISO 13485 Certification

In addition to being ISO 9001:2008 and AS9100D certified, the Company will also pursue ISO 13485:2016 certification. ISO 13485:2016 specifies requirements for a quality management system where an organization needs to demonstrate its ability to provide medical devices and related services that consistently meet customer and applicable regulatory requirements. Once obtained, the Company's market will expand to include medical device makers.

### Introduction of New Metal Powder: Aluminum Alloys

Today the company is also announcing its intention to produce additional powder materials for its plasma-atomized metal powder business line, with the first being aluminum alloy powder.

This development comes as a result of being approached repeatedly by tier one global automakers, who have requested aluminum alloy powders made with plasma atomization – specifically from the alloy known as AlSi10Mg. This alloy is traditionally used as a casting alloy, due to its high corrosion resistance, low density and light weight, and high mechanical strength of the final components, while at the same time, offering particular suitability for thin-walled components and parts with complex geometries.

This is a medium-term goal for the company and will require an additional stand-alone production system to (i) prevent cross-contamination, (ii) allow for individualized research and development, and (iii) facilitate the large scale and volume of production that is anticipated as a result of previous requests, and today's announcements.

The Company will provide more information on this development at a later date.

### Development of European Manufacturing Facility

In anticipation of the expected growth of the European market, and the expected introduction – based on significant recent commercial inquiries – of new markets in nearby regions, the Company is pursuing a strategy to build and operate a metal powder manufacturing facility in Europe.

To that end, the Company is examining cost-positive geographies, fleshing out preliminary infrastructure development plans, and exploring various avenues and potential approaches. All efforts are being conducted with the full knowledge and participation of our current European commercial partner Aubert & Duval, whose reputation and experience in the region will afford the Company unique advantages during all phases of this process.

The Company will provide more information on this development at a later date.

"As we have stated in the past, given the sheer size of this market and our unique manufacturing process – which improves exponentially on the world's existing leading metal powder production process (which we invented 25 years ago) – we expect to capture a significant share of the overall titanium powder market," said Mr. Massimo Dattilo, VP, PyroGenesis Additive. "With our NexGen system reaching the commercial scale production milestones of the past month, combined with the attention that these achievements have attracted worldwide, we are even more convinced that not only has the Company's systematic and painstaking approach been the correct path, but that this strategy will result in unique additional opportunities. As a result, we are continuing to announce new products, new markets, and additional manufacturing avenues as indicated above, all with the goal to help additive manufacturers improve their processes & margins, by offering the highest quality metal powders at the lowest cost."

According to Grand View Research, the global 3D printing market was valued at USD \$13.84 billion in 2021 and is expected to grow at a compound annual growth rate of 20.8% from 2022 to 2030<sup>1</sup>.

## **About PyroGenesis Canada Inc.**

PyroGenesis Canada Inc., a high-tech company, is a leader in the design, development, manufacture and commercialization of advanced plasma processes and sustainable solutions which reduce greenhouse gases (GHG) and are economically attractive alternatives to conventional "dirty" processes. PyroGenesis has created proprietary, patented and advanced plasma technologies that are being vetted and adopted by multiple multibillion dollar industry leaders in four massive markets: iron ore pelletization, aluminum, waste management, and additive manufacturing. With a team of experienced engineers, scientists and technicians working out of its Montreal office, and its 3,800 m<sup>2</sup> and 2,940 m<sup>2</sup> manufacturing facilities, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. The operations are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. For more information, please visit: [www.pyrogenesis.com](http://www.pyrogenesis.com).

*This press release contains certain forward-looking statements, including, without limitation, statements containing the words "may", "plan", "will", "estimate", "continue", "anticipate", "intend", "expect", "in the process" and other similar expressions which constitute "forward-looking information" within the meaning of applicable securities laws. Forward-looking statements reflect the Company's current expectation and assumptions and are subject to a number of risks and uncertainties that could cause actual results to differ materially from those anticipated. These forward-looking statements involve risks and uncertainties including, but not limited to, our expectations regarding the acceptance of our products by the market, our strategy to develop new products and enhance the capabilities of existing products, our strategy with respect to research and development, the impact of competitive products and pricing, new product development, and uncertainties related to the regulatory approval process. Such statements reflect the current views of the Company with respect to future events and are subject to certain risks and uncertainties and other risks detailed from time-to-time in the Company's ongoing filings with the securities regulatory authorities, which filings can be found at <https://www.sedar.com/> or at <https://www.sec.gov/>. Actual results, events, and performance may differ materially. Readers are cautioned not to place undue reliance on these forward-looking statements. The Company undertakes no obligation to publicly update or revise any forward-looking statements either as a result of new information, future events or otherwise, except as required by applicable securities laws. Neither the Toronto Stock Exchange, its Regulation Services Provider (as that term is defined in the policies of the Toronto Stock Exchange) nor the NASDAQ Stock Market, LLC accepts responsibility for the adequacy or accuracy of this press release.*

SOURCE PyroGenesis Canada Inc.

**For further information please contact:**

Rodayna Kafal, Vice President Investor Relations and Strategic Business Development

Phone: (514) 937-0002, E-mail: [ir@pyrogenesis.com](mailto:ir@pyrogenesis.com)

RELATED LINK: <http://www.pyrogenesis.com/>

<sup>1</sup> [3D Printing Market Size & Share Report, 2022-2030 \(grandviewresearch.com\)](https://www.grandviewresearch.com/press-release/new-global-3d-printing-market-size-share-report-2022-2030)