PyroGenesis Announces Completion of Ramp-Up Phase of 1st Plasma Atomization System

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MONTREAL, QUEBEC--(Marketwired - Oct. 23, 2017) - PyroGenesis Canada Inc. (http://pyrogenesis.com) (TSX VENTURE:PYR) (OTCQB:PYRNF), a high-tech company (the "Company" or "PyroGenesis") that designs, develops, manufactures and commercializes advanced plasma processes and plasma torch products, announces today that it has successfully completed the ramp-up phase of its first plasma atomization system.

During the ramp-up, the following were also achieved:

- Six (6) Non-Disclosure Agreements ("NDA") signed with distributors and 3D printer manufacturers
- Three (3) NDAs being negotiated with multinational aircraft engine manufacturers, at their request
- Exclusive distributorship under negotiation in Asia
- Received six (6) sample orders for metal powder, of which five (5) have been delivered to date
- Adjusted process for other metal powders (i.e. Inconel)
- Developed new, potentially game changing, intellectual property; Patent applications progressing as expected

Mr. P. Peter Pascali, President and CEO of PyroGenesis, provides an overview of today's announcement in the following Q&A format. The questions, for the most part, are derived from inquiries received from investors, analysts, and potential customers:

Q: You announce today that ramp-up is complete? What does that mean exactly?

A: It means that we are open for business. By announcing the end of ramp-up, the plasma atomization reactor is fully functional, and ready to operate 24/7. We have added a second shift in anticipation of large scale commercial orders. The feedback so far is that our powders are of exceptional quality and, given our capacity for innovation, we offer extremely competitive pricing. As previously noted, we are already in discussion with numerous players in the field.

Q. In terms of your sales strategy, do you plan on targeting metal 3D printer manufacturers, end users such as GE, distributors, or all the above?

A. As noted above, we have signed six (6) NDAs with both distributors and 3D printer manufacturers and three (3) NDAs are currently being negotiated with multinational aircraft engine manufacturers.

PyroGenesis' strategy in the beginning of 2016, when we first announced that we were reentering the business of producing the very same powders we once produced for ourselves and the biomedical industry, was simply to be a credible second supplier. It only made good business sense for companies to have a second supplier for a vital feedstock such as titanium powders, and we wanted to fill that role.

Approximately one year ago, GE announced its acquisition of Arcam and, by default, AP&C. This acquisition, in our opinion, effectively introduced a supply chain risk in Additive Manufacturing ("AM"), despite AP&C's willingness to still sell powders into the marketplace. We have found that end-users, and metal 3D printer manufacturers alike, want to make their supply chain more robust. We believe that as a result of GE's acquisition of Arcam/AP&C, we are seeing a particular interest from GE's competitors. We are in the process of negotiating at least three (3) NDAs with multinational aircraft engine manufacturers after having concluded at least another five (5) with metal 3D printer manufacturers. This activity, we believe, not only underscores, but validates our previously identified concerns regarding the supply chain.

So, with that as background, and to answer your question, we are positioning ourselves to be a dominant metal powder supplier to anyone in the industry with a need for small, spherical, uniform metal powders, of exceptional characteristics, whose particle size can be varied depending on the need.

Of interest, is that we are not so much targeting a specific group as we have been targeted by them. We currently have ongoing discussions with end users, distributors, and printer manufactures.

Q. What kind of feedback have you received from the sample powder orders you have shipped?

A. The feedback we have been getting since being on-line has all been positive and beyond what we anticipated. I cannot stress enough that we never expected to receive sample orders during ramp-up. The take away should not just be that we received these sample orders during ramp-up, but that we have also signed a number of NDAs with credible players.

To recap, PyroGenesis has received six (6) unique sample orders, including one sample order for both our Grade 23 and Grade 5 MIM cut. Of these sample orders, we have currently shipped five (5)*, and the majority of these only in the past two (2) months. To date, we have not had any negative feedback.*

Q. Do you plan on selling spot orders, or entering into a partnership / joint venture, or an exclusive sales agreement?

A. As discussed above, our original strategy was to sell spot orders, but given the strategic importance of GE's acquisition of Arcam, and the concerns it has created with respect to powder supply, we believe that the market is now more interested in long term arrangements such as partnerships, joint ventures, and exclusivity agreements as opposed to buying spot orders as needed.

Q. In your press release dated Sept 18, 2017, you mentioned that, "…to the best of our knowledge, we know of no other company that offers

commercial quantities of Ti-6Al-4V Grade 23 MIM cut...". Does this suggest there won't be a significant demand for MIM powder?

A. Absolutely not. It's quite the opposite in fact.

We see demand coming from two areas:

First, with respect to AM, the MIM cut powder is being considered as a feed to making parts in quantity; essentially targeting high volume rather than high value manufacturing. This is what Desktop Metal, Markforged, 3DEO and Digital Metal are doing. These companies have effectively gained prominence very recently.

Spherical Ti64 grade 23, and grade 5, MIM cut powder (i.e. less than 25 microns) is not easy to produce. Our ability to supply these powders in commercial quantities, which can be produced with little or no waste, is enabling the industry.

Second, beyond AM, specifically in metal injection molding, end users have traditionally been trading flowability for part density. With PyroGenesis' recent innovations, these end users can now have both flowability, with an extremely dense part, by sourcing PyroGenesis' MIM cut powder.

As you can see, PyroGenesis is in effect enabling two (2) markets with our new plasma-based atomization system; namely for Additive Manufacturing and Metal Injection Molding. As such, in conclusion, we expect the demand for our MIM powder to exceed our most aggressive forecast model. We believe we are uniquely positioned to become the largest supplier of MIM cut powders to this industry should the anticipated explosive demand be realized.

Q. So, bottom line, you envision high demand for your MIM cut powder?

A. Yes. As I said, we believe that as 3D printing evolves, and new printers are developed, there will be an increased demand for different metal powder particle size cuts. We believe that the growth in demand for MIM cut powders by companies such as DeskTop Metal, 3DEO, Markforged, and Digital Metal will continue to grow. Additionally, we also anticipate a portion of our MIM cut powders to be sold to Metal Injection Molding companies.

Our ability to produce very narrow size cuts in significant volumes, with little to no waste, will not only allow us to address an explosive demand for MIM cut, but for any particular particle range, thereby enabling metal printers to evolve unrestricted by supply constraints.

Q. How do you see the demand for the other size cuts of powder (i.e. SLS and EBM cuts) evolving? Are you concerned at all that other non-powder-bed AM methods, such as directed energy deposition, could become more widely adopted and impact the demand for powder feedstock?

A. Each AM method has its own targeted niche application. From SLS, to EBM, to Ink Jet, to Directed Energy Deposition, they each have targeted applications. EBM for example is excellent for, and quite widely adopted by, medical implants (such as hip joints). Each method offers a unique solution which can range from crude parts production that are large and require considerable post machining and processing, to repair parts, to others that are almost in their final form. Although AM has clear advantages over conventional manufacturing, we believe that it will remain a complimentary and parallel manufacturing method to conventional manufacturing. This being said, AM is finding considerable acceptance, and adoption, across many industries. As such, we see the AM method continuing to grow at current double-digit growth rates for the foreseeable future.

Furthermore, we are not concerned that other non-powder-bed AM methods, such as Directed Energy Deposition, could become more widely adopted and impact the demand for powder feedstock. Directed Energy Deposition is an excellent solution for producing large parts that are very crude in finish and require considerable post machining and processing. This solution could be a choice for certain applications; however, for certain other applications, that require intricate internal details, or an almost finished build (near net shape), this method falls short or simply cannot achieve the desired results. Directed Energy Deposition in fact is derived from the welding industry and has been around for a considerable amount of time. We see the growth in AM coming from "net shape parts", and in fact, are seeing a considerable amount of demand and growth coming from the finer size cut powders (exactly where we have been focusing in anticipation of this demand). More and more clients are requesting a high purity fine powder, and this is exactly where PyroGenesis' new plasma-based process excels.

Q. The market would like some clarification - how did PyroGenesis get into this business of producing and selling powders?

A. PyroGenesis originally invented Plasma Atomization to address an internal need for small spherical titanium powders which were required for a project we were working on for NATO, i.e. developing light weight armor. It was difficult to find small spherical titanium powders of the quality we needed, and when we did, they were very expensive. This was well before there was any significant demand for these powders by metal 3D printers.

To make a long story short, we invented Plasma Atomization (and actually coined the term in our original patent application) to make small spherical powders for ourselves, not realizing that these powders had a use in the biomedical industry. The biomedical industry liked how our powders flowed like water and compacted tightly. The industry immediately found a use for them in the production of titanium implants (ex. titanium knee and hip replacements). Our first commercial biomedical sale was to a company called Stryker Corporation (the relationship of which was transferred to AP&C, who we believe, can still count them as one of their important customers today).

When the program to develop lightweight armor came to an end, the biomedical industry would not take up all of our powder production, which is the reason PyroGenesis decided to get out of the business of powder production and, to this end, reached an arrangement wherein AP&C could continue the business subject to, amongst other things, a non-compete clause which ended in 2012. AP&C (a former division of Raymor Industries) sought creditor protection in 2009. When AP&C eventually came out of creditor protection, metal 3D printers started to have a need for the exact titanium powders that PyroGenesis' Plasma Atomization system produced, and which AP&C was trying to commercialize. Arcam AB, a manufacturer of metal 3D printers, became a client of AP&C and eventually bought AP&C in 2013. Since that time, Arcam has done an amazing job of industrializing the process and AP&C, under Arcam, has become one of the dominant suppliers of titanium powders to metal 3D printers.

Q. Will your newly developed ability to control particle size distributions allow you to significantly differentiate yourself from your competition in terms of price?

A. We believed that we could differentiate ourselves from our competition in terms of price, before our newly developed ability to control particle size distribution was a consideration; our recent developments only solidifies/amplifies this advantage.

Separately, PyroGenesis announces today that it has signed an agreement with Crescendo Communications, LLP ("Crescendo"), effective November 1, 2017, for certain capital market strategic advisory services, specifically, to increase the Company's market awareness amongst investors, with a particular emphasis on those in the United States (the "Agreement").

In consideration of the services to be provided, the Company has agreed to pay Crescendo a monthly retainer fee of $6,000, with the first two months due ($12,000) upon signing of the Agreement. The Company may terminate the Agreement with Crescendo, at any time after December 31, 2017, by providing thirty (30) days' written notice.

Crescendo does not have any interest, directly or indirectly, in the Company or its securities, or any right or intent to acquire such an interest.

"We are pleased to announce that we have selected Crescendo to help increase PyroGenesis' profile within the financial community as well as enhance the visibility of our product lines," said Mr. Pascali. "We believe Crescendo's methodologies fit well with the Company's strategy to increase awareness within the investment community."

In addition, and given the numerous inquiries on the topic, Mr. Pascali would like to take this opportunity to confirm that he has been a net buyer of PyroGenesis' shares over the past few months as reflected in his public filings. "I have been adding to my ownership of PyroGenesis over the past few months," said Mr. Pascali. "My intention is to continue to do so, as a net buyer, over the next few months as well."

Additional information on the Company is available on SEDAR at www.sedar.com.

About PyroGenesis Canada Inc.

PyroGenesis Canada Inc. is the world leader in the design, development, manufacture and commercialization of advanced plasma processes. PyroGenesis provides engineering and manufacturing expertise, cutting-edge contract research, as well as turnkey process equipment packages to the defense, metallurgical, mining, additive manufacturing (3D printing), oil & gas, and environmental industries. With a team of experienced engineers, scientists and technicians working out of our Montreal office and our 3,800 m^2 manufacturing facility, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. Its core competencies allow PyroGenesis to lead the way in providing innovative plasma torches, plasma waste processes, high-temperature metallurgical processes, and engineering services to the global marketplace. Its operations are ISO 9001:2008 certified, and have been ISO certified since 1997. PyroGenesis is a publicly-traded Canadian company on the TSX Venture Exchange (Ticker Symbol: PYR) and on the OTCQB Marketplace (Ticker Symbol: PYRNF). For more information, please visit 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 www.sedar.com, or at www.otcmarkets.com. 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.

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Contact Information:

Rodayna Kafal
VP, Investor Relations and Communications
(514) 937-0002
ir@pyrogenesis.com or rkafal@pyrogenesis.com