



HPQ SILICON *GEN3 PUREVAP™* QRR PILOT PLANT: DYNAMIC TEST SUCCESSFUL, MAJOR SCALING UP MILESTONES REACHED; PILOT PLANT READY TO PROCESS MATERIAL

MONTREAL, Canada, November 8th, 2022 — [HPQ Silicon Inc.](#) (“HPQ” or the “Company”) ([TSX-V: HPQ](#)) ([OTCQX: HPQFF](#)) ([FRA: O08](#)), an innovative silicon solutions and technology development company, would like to inform shareholders that technology provider [PyroGenesis Canada Inc.](#) ([TSX: PYR](#)) ([NASDAQ: PYR](#)) ([FRA: 8PY](#)), has informed HPQ that the *GEN3 PUREVAP™ Quartz Reduction Reactor (QRR)* dynamic test was successful and that the pilot plant is now ready to process material.

GEN3 QRR TESTING VALIDATES DESIGN PERFORMANCE AND SCALABILITY

The high-temperature dynamic blank test confirmed that the *GEN3 PUREVAP™ QRR* Pilot (the “Pilot Plant”) can operate, as expected, within important design parameters; over a long period of time.

This is a major milestone for this first-of-its-kind, state-of-the-art pilot plant prototype, and the team at PyroGenesis also achieved the largest single scaling up of the QRR required before moving to commercial production. The GEN3 Pilot Plant will produce approximately 2,500 times more product than GEN2. This major breakthrough increases the expectation that the next step of commercial scalability will be successful.

HPQ, with development partner PyroGenesis, is closer than ever to confirming the innovative approach to making high Purity Silicon using the QRR process will be a commercial success.

GEN3 QRR TESTING ALSO ACHIEVES SEVERAL MAJOR ENGINEERING MILESTONES

During the 72-hour dynamic blank test, all the key steps required to make Silicon were tested. The system not only validated its ability to operate under vacuum at a high temperature for the required time, but it also demonstrated the capability to maintain an inert state in the Pilot Plant furnace at even higher temperatures for the duration of the test.

The Pilot Plant design incorporates ideas and concepts first described in the provisional *PUREVAP™ QRR* patent applications filed in 2021 ([Sept. 4, 2021, release](#)) covering a new and novel process for continuous operations of a plasma arc furnace under vacuum.

“Reaching a vacuum, at high temperatures in the reactor and then maintaining it at an inert state at even higher temperatures; over multiple days was a complex undertaking,” said Mr. Bernard Tourillon, President and CEO of HPQ Silicon Inc. “There is no other way to say it; the results obtained during the 72-hour dynamic blank test are major engineering milestone and accomplishment for the PyroGenesis team.”

*“Advancing the *PUREVAP™* project to this stage has been one of the great achievements of the Company. From initial idea to lab tests, to design and build, and now with the successful operational testing of the pilot plant, our efforts to introduce plasma technology to the high-purity silicon industry is yet another example of how we are putting our scientific and engineering expertise to use in solving some of heavy industry’s most pressing issues,” said Mr. P. Peter Pascali, CEO and Chair of PyroGenesis. “As we have stated before, we firmly believe that the *PUREVAP™* process will prove to be a game changer in the production of a metal as strategically important to future energy goals as silicon. We are proud to be on this journey together with HPQ.”*

THE HIGH TEMPERATURE DYNAMIC BLANK TEST, THE FINAL REHEARSAL BEFORE MAKING SILICON

Before starting the high-temperature blank test, charcoal was loaded in the reactor to protect components in direct contact with the plasma arc. Furthermore, to shield the lining of the furnace from oxidation, (combustion of the charcoal), the system had to maintain an inert state during the duration of the test. Having any oxygen in the furnace would have combusted the charcoal and caused damage to the reactor.

Image 1 (L) below shows the intensity of the plasma arc ($> 2,000\text{ }^{\circ}\text{C}$) while image 1 (R) show the bottom of the furnace after the test still filled with un-combusted charcoal.



Image 1) (L) Plasma arc in reactor

Image 1) (R) Charcoal remaining at bottom of reactor after test

PILOT PLANT READY TO PROCESS MATERIAL

The next step in the process improvement tests and beyond include introducing a mixture of quartz (SiO_2) and reductant into QRR, as image 2 below demonstrates. The 72-hour test demonstrated that the system could operate under vacuum at a high temperature and then to maintain an inert state in the reactor, also that we are able to produce the key production parameters of Silicon. As a result, we are now ready to initiate the production of silicon by carbothermic reduction of quartz.

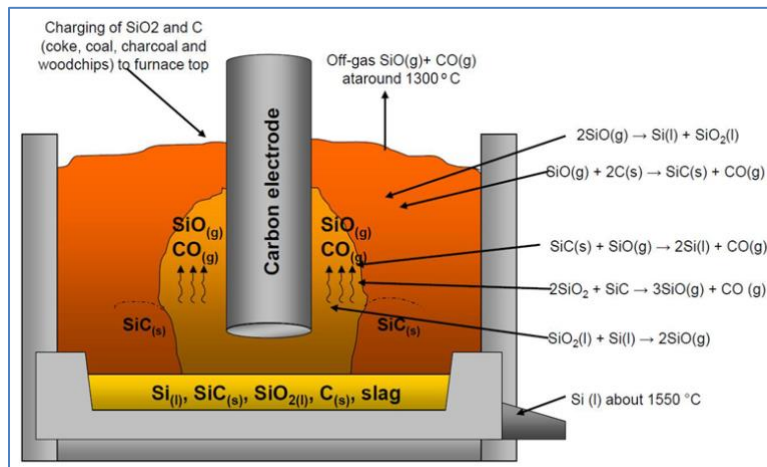


Image 2) The process to transform Quartz into Si



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 three 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 m² and 2,940 m² R&D and 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

About HPQ Silicon

[HPQ Silicon Inc. \(TSX-V: HPQ\)](#), is a Quebec-based innovative silicon solutions company that offers silica (SiO₂) and silicon (Si) based solutions and is developing a unique portfolio of high value-added silicon (Si) products sought after by battery and electric vehicle manufacturers, among other industries. On July 21, 2022, HPQ started trading as a Tier 1 Industrial Issuer on the TSX Venture Exchange.

Silicon (Si), also known as silicon metal, is one of today’s key strategic materials needed for the decarbonization of the economy and the Renewable Energy Revolution (“RER”). However, silicon does not exist in its pure state and must be extracted from quartz (SiO₂) in what has historically been a capital and energy-intensive process.

HPQ is the only company bringing to market a new process for manufacturing Silicon that is perfectly suited to the new demands and realities of today’s Silicon market. With ESG principles playing an active role in materials sourcing and with recent geopolitical unrest emphasizing the need for stable trade partners and supply security, global corporations are becoming more aware of the difficulties in securing the ESG-compliant Silicon needed to meet their renewable energy agenda.

The reality of chronic underinvestment in new technologies combined with the offshoring of Silicon production capacity, is creating massive opportunities for HPQ and the processes it is developing with [PyroGenesis Canada Inc.\(TSX: PYR\) \(NASDAQ: PYR\)](#):

1. the **PUREVAP™ “Quartz Reduction Reactors” (QRR)**, an innovative process (patent granted in the United States and pending in other jurisdictions), which will permit the one-step transformation of quartz (SiO₂) into high purity silicon (Si) at reduced costs, energy input, and carbon footprint that will propagate its considerable renewable energy potential.
2. Through its 100% owned subsidiary, HPQ NANO Silicon Powders Inc., the **PUREVAP™ Nano Silicon Reactor (NSiR)** is a new proprietary process that can use material produced by the QRR as feedstock, to make a wide range of nano/micro spherical powders and nanowires of different sizes.
3. Through its second 100% owned subsidiary, HPQ Silica POLVERE Inc., HPQ is developing a new plasma-based process that allows a direct Quartz to Fumed silica transformation, removing the usage of hazardous chemicals in the making of Fumed silica and eliminating the Hydrogen Chloride Gas (HCl) associated with its manufacturing.

HPQ is also a technology development company interested in developing hydrogen-based ventures, that could be complementary to the QRR efforts. Currently, HPQ is working with Novacium developing processes for making hydrogen via hydrolysis of silicon and other materials.



For more information, please visit [HPQ Silicon web site](#).

Disclaimers:

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 security's regulatory authorities, which filings can be found at www.sedar.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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Source: HPQ Silicon Inc.

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