

HPQ Silicon Resources: Analysis Confirms Purity as High as 99.97%, Process Demonstrates Significant Capacity to Remove Impurities

29.09.2016 | [Marketwired](#)

Including Boron, Pathways to Higher Purity Being Implemented in New Testing Program

MONTREAL, Sept. 29, 2016) - [HPQ Silicon Resources Inc](#) ("HPQ") (TSX VENTURE:HPQ) (FRANKFURT:UGE) (OTC PINK:URAGD) is pleased to inform its shareholders that it has received from PyroGenesis Canada Inc ("PyroGenesis") a report summarizing the results from the 15 tests that made up the "Phase 1 - Proof of Concept Metallurgical Tests Program", completed between March 29th, 2016 and July 22th 2016. *The results demonstrate the PUREVAP[®] QRR concept of combining different known steps into a one step process has now been validated by the results from the Phase 1 proof of concept metallurgical testing program.* The report includes data and analysis from all tests completed by:

- PyroGenesis Canada Inc., the world leader in the design, development, manufacture and commercialization of advanced plasma processes;
- INRS - ETE, (*Institut National de la Recherche Scientifique, Eau Terre Environnement*) Quartz, Carbon and Silicon Purity tests completed during the year;
- Evans Analytical Group, ("EAG" of Liverpool, NY, USA) - Glow Discharge Mass Spectrometry ("GDMS") and;
- Centre de Caractérisation Microscopique des Matériaux (CM²), located at the École Polytechnique de Montréal - Scanning Electron Microscope with X-ray microanalysis (SEM-EDS).

Bernard Tourillon, Chairman and CEO of HPQ-Silicon stated, *"To say that we are thrilled with the final results from our Phase 1 testing program is an understatement. We have officially achieved almost 4N material purity and, more importantly, now have the data necessary to implement the pathway to higher purity levels, right up to Solar Grade Silicon Metal. We are especially pleased with the fact the PUREVAP[™] Quartz Reduction Reactor exceeded our expectations by producing 99.97% purity material on the first attempt, as well as impressing us with its' significant removal of impurities including Boron. This latter point is of great importance to the industry and demonstrates the capability of the PUREVAP process."*

GENERAL SUMMARY OF RESULTS AND MAJOR MILESTONES

PyroGenesis' Testing Program confirmed that the *PUREVAP[™] Quartz Reduction Reactor* ("QRR") is working as expected. Key milestones are being reached and the pathway to higher purity, up to Solar Grade Silicon Metal "SGSi", have been identified and are being implemented in the newly started Phase 2 test program (PR Dated September 1, 2016).

The key major milestones and results are as follows:

1. Analysis of silicon material created by the Purevap® Process, by third party independent laboratories, confirm that the process:
 1. Is capable of producing high purity Silicon Metal, (99.9+% Si) as shown by Scanning Electron Microscope (SEM) work done by the INRS¹ and at CM2²;
 2. Is capable of producing high purity material as shown by GDMS analyses completed by EAG, with results of up to 99.97% (3N+) purity achieved (Table 3 for complete results);
 3. Is capable of removing key impurities from the final product, notably Boron (B), the most difficult impurity to remove when making Solar Grade Silicon Metal. This is an important outcome, as the presence of Boron in SGSi negatively affects the conversion efficiency of solar grade cells;
 4. Can attain even higher purity levels in the current second phase of testing as planned process adjustments are tested and process improvements are implemented following receipt of the GDMS analysis result.
2. Achieving the significant removal of impurities is a major milestone as it validates the Company's claim that *PUREVAP™ QRR* can transform our Quartz (SiO₂) into Silicon Metal (Si), while removing impurities *in a single step*;
3. Progressive test work during the *PUREVAP™ QRR* Phase 1 program advanced the process from producing sporadic and thin layers of Silicon Metal (from either the tip of the electrode or the bottom of the crucible), to producing meaningful sizes of Pure Silicon Metal Nuggets, shown in Image 1, below. This is a major milestone for the following reasons:
 1. Analysis of nuggets is simpler and quicker, reducing turnaround times for the current, Phase 2 series of tests, thereby improving the information feedback loop needed by PyroGenesis and improving the chances of success;
 2. It will allow for the preparation of samples in sufficient quantity to be sent to potential end buyers.

To view Image 1, please visit the following link: http://media3.marketwire.com/docs/1070961_1.pdf

¹ Press release dated June 29, 2016

² From PyroGenesis Canada Inc Technical Memo: "TM-2016-756 - SEM/EDS analysis conducted at the CM2 "

"We are clearly breaking new ground in a very exciting industry where the initial results are very promising," said P. Peter Pascali, President and CEO of PyroGenesis. "Key milestones are being reached and the path towards higher purity levels is becoming ever clearer. We do not expect the future to be without its challenges, but so far we could not have hoped for better results than what we have produced."

RESULTS FROM EAG GDMS TESTS CONFIRMS NEAR COMPLETE IMPURITY REMOVAL BY THE *PUREVAP®* QUARTZ REDUCTION REACTOR ("QRR") FOR Al, B, Ca, AND P

As predicted by PyroGenesis Theoretical Model for the *PUREVAP™ QRR*, (March 3, 2016 Press Release), the test results clearly indicate that the process can successfully remove impurities from the material while transforming SiO₂ into Silicon Metal (Si) in one step.

- Impurity removal efficiencies for Al, Ca and P were consistently high, between 67 % and 97 % for test #6, #7, #9, #10 and #15.
- The most impressive results emanating from Phase 1 testing is the capability of the *PUREVAP™ QRR* to remove Boron (B) from the final material produced, with consistently high Boron removal ranging between 83 % and 98 % for test #6, #7, #9, #10 and #15.
 - Boron and Phosphorous (P) are the most challenging impurities to remove for the production solar grade silicon. Their removal is critical since elevated contents in silicon materials will negatively affect the conversion efficiency of solar grade cells, the maximum tolerance for B and P in Solar Grade Silicon Metal are respectively 0.3 ppm and 0.1 ppm;
 - Phase 1 test work achieved concentration level as low as 0.41 ppm for B and 0.31 ppm for P, a very encouraging result to be a focus of Phase 2 testing;

- Titanium (Ti) concentration increased during the tests, due to its very low partial pressure, and will be a focus of ongoing test work in Phase 2 *PUREVAP™ QRR* Metallurgical Test Program.

Table 1 – Impurity removal summary for all tests that successfully produced material³

Elem.	Impurity removal per test					
	#6	#7	#9	#10	#15	
Al	86	% 96	% 98	% 97	% 74	%
B	97	% 98	% 91	% 83	% 96	%
Ca	12	% 23	% 99	% 96	% 82	%
Fe	-208	% 61	% -214	% -148	% 7	%
P	94	% 97	% 67	% 78	% 92	%
Ti	-321	% -63	% -93	% -49	% -93	%

- The variability in the results obtained for Fe, which had some good removal efficiency in tests #7 and #15, but seem to show accumulation in tests #6, #9 and #10, is not perceived as an issue at this stage. Additional test will be needed to clarify this issue.

³ From PyroGenesis Canada Inc Technical Memo: "TM-2016-758 - Mass Balance on Impurities".

"Achieving significant removal of impurities is a major milestone on our road to transforming Quartz (SiO₂) into Silicon Metal (Si)," said P. Peter Pascali, President and CEO of PyroGenesis, "and it increases the probability that the *PUREVAP™ QRR* One Step process will eventually become the Gold Standard for the production of High Purity Silicon Metal."

PATHWAYS TO ATTAINING HIGHER PURITY

Having proven that the *PUREVAP™ QRR* can successfully remove impurities from the material while transforming SiO₂ into Silicon Metal (Si), the key objectives moving forward become improving the impurities removal capacity of the systems by:

1. Using the full energy potential of the plasma submerged arc in the Vacuum;
2. Testing additional *PUREVAP™ QRR* purification processes;
3. Using the data from the GDMS results to adjust operational characteristic of the systems.

The high level of sulphur in almost all the final product results from the relatively high sulphur content the Asbury 4055 carbon source, used as a catalyst in the process, and can be managed in subsequent testing.

Sulphur is theoretically an easy contaminant to remove. Assuming 100% removal of the Sulphur during the process this would imply that our first phase results, instead of obtaining purity result in a range from 99.88% up to 99.97(4), our first phase Purity results range could have been between 99.95% up to 99.991%.

⁴ Best results from EAG Laboratories GDMS Analytical Report

⁵ From PyroGenesis Canada Inc Technical Memo: "TM-2016-758 - Mass Balance on Impurities".

Table 2- present the complete Impurity removal information for the produced during test 15⁵

Test Results from First Nugget produced by the PureVap QVR system during test #15							
Elements	Impurities level of source materials					Impurity removal efficiencies	
	Martinville	SiO ₂	Carbon Source	TOTAL ¹			
(-)	(%)	(ppm) ²	(%)	(ppm) ³	In (ppm)	Out (ppm) ⁴	diff (%)
Al	0.002940	29.4	0.0178	178	71.8	19	74 %

B	0.003233	32.33	0.0000	0.35	23.2	1	96	%
Ca	0.001590	15.9	0.0052	52	26.1	4.7	82	%
Fe	0.002650	26.5	0.0138	138	58.4	54.5	7	%
P	0.001200	12	0.0003	3	9.5	0.73	92	%
S	0	0	0.0011	11	3.1	1,055	-	
Ti	0.000100	1	0.0005	5	2.0	3.9	-93	%

¹ Total mass for a fixed weight ratio of 2.5:1 SiO₂:C

² SiO₂ Data from INRS ETE (Press release March 3, 2016)

³ Carbon data from INRS ETE testing of Carbon source 4055 purchased from Asbury Carbon, a material with spec that mentions that the material may have up to 5,000 ppm of Sulphur.

⁴ EAG Laboratories GDMS Analytical Report, average of the ppm impurities from Si-Grains-1 and Si-Grains-2.

This table clearly demonstrates the effect of the carbon contamination by Sulphur from the Asbury 4055 carbon used. Of the total 1,138.83 ppm of impurities left in the material, 1,055 ppm (or 92%) came from Sulphur. Sulphur contamination can be readily resolved in the Phase 2 processes by using different source carbon material, or by adjusting the process.

Testing Methodology:

The SEM-EDX analysis were completed at both the INRS - ETE laboratory in Quebec City and the Centre de Caractérisation Microscopique des Matériaux (CM²), located at the École Polytechnique de Montréal.

The GLOW DISCHARGE MASS SPECTROMETRY (GDMS) completed by Evans Analytical Group, ("EAG" of Liverpool, NY, USA) - The chemical composition of inorganic solid samples is directly analyzed using glow discharge atomization / ionization sources combined with high mass resolution analyzers Glow Discharge Mass Spectrometry or GDMS.

Pierre Carabin, Eng., M. Eng., has reviewed and approved the technical content of this press release.

To view Image 2, please visit the following link: http://media3.marketwire.com/docs/1070961_2.pdf ⁶

RECAP OF KEY MILESTONES REACHED TO DATE

The Table below details some of the key information emanating from PyroGenesis 15 tests completed during the *PureVap QVR* Proof of Concept Metallurgical Program started on March 29th, 2016 and ended on July 22nd 2016.

⁶ Detection limit of the SEM-EDS apparatus is 99.9% purity

Table 3 - Summary of the test results conducted during the Proof of Concept testing phase

Test #	Date	Description	Result	SEM Analysis Confirms Reading of 100% Si (7)	Trace Metallic Impurities [ppm wt](8)	Implied Purity in %
1	16-03-29	First test hot test	No sample produced	N/A	N/A	N/A
2	16-04-07	Increased power input	Sample produced	N/A	N/A	N/A
3	16-04-08	Reduced heat losses	Test Failure	N/A	N/A	N/A
4	16-04-15	Changed electrode tip	Test Failure	N/A	N/A	N/A

5	16-04-20	New electrode sealing	Test Failure	N/A	N/A	N/A
6	16-05-09	New electrode design	Sample produced	YES	1,100.82	99.88
7	16-05-10	Additional Insulation	Sample produced	YES	763.02	99.92
8	16-05-13	Changed C particle size	Test Failure	N/A	N/A	N/A
9	16-05-13	Pre-dried carbon source	Sample produced	YES	271.85	99.97
10	16-05-25	Changed base design	Sample produced	YES	314.93	99.97
11	16-05-30	Changed base design	No sample produced	N/A	N/A	N/A
12	16-06-16	Smaller Quartz particle size	No sample produced	N/A	N/A	N/A
13	16-07-05	Mixture of quartz	Traces of metal produced	N/A	N/A	N/A
14	16-07-13	Reproduce previous test	Traces of metal produced	N/A	N/A	N/A
15	16-07-22	Improve heat losses	First Nugget Size Sample Produced	YES	909.04	99.91

⁷ Data from INRS for Test #6, 7, 9 and 10, and from PyroGenesis Canada Inc Technical Memo: "TM-2016-756 - SEM/EDS analysis conducted at the CM2 " for test #15.

⁸ Best results from EAG Laboratories GDMS Analytical Report

About HPQ Silicon

[HPQ Silicon Resources Inc.](#) is a TSX-V listed junior exploration company planning to become a vertically integrated and diversified High Value Silicon Metal (99.9+% Si), and Solar Grade Silicon Metal (99.9999% Si) producer.

Our business model is focused on developing a disruptive solar grade silicon metal manufacturing process (patent pending) that can generate high yield returns and significant free cash flow within a short time line.

Summary of Recent Rapid Progress in Producing High Purity Silicon

In September 2015, PyroGenesis announced that it had filed for a provisional patent for the PUREVAP[®] Quartz Reduction Reactor (QRR) process, which it noted was able to produce silicon in one step, at a lower cost, while generating less CO₂ emissions than current processes.

On April 19, 2016, PyroGenesis announced that early test results of the PUREVAP[®] QRR process have demonstrated that it can transform high purity quartz into silicon metal.

On June 29, 2016, HPQ Silicon announced that first pass analytical process confirms the ability of the PUREVAP[®] process to create high purity silicon metal exceeding 99.9%.

Samples from the first series of test have been sent to EAG, a specialized laboratory in the United States, to determine the precise purity levels of the Silicon Metal.

On August 2, 2016, HPQ Silicon announced that it had:

1. Acquired the intellectual property rights to the *PUREVAP*® process as it relates exclusively to the production of silicon metal from quartz. PyroGenesis retains a royalty-free, exclusive, irrevocable worldwide license to use the process for purposes other than the production of silicon metal from quartz.
2. Placed an order for the purchase a 200 metric ton/year *PUREVAP*® QRR pilot system to produce solar grade silicon metal from HPQ Silicon quartz.

The *PUREVAP*® QRR process's disruptive advantage is its one step direct transformation of Quartz into High Purity Silicon Metal Solar Grade Silicon Metal and/or Higher Purity product, thereby potentially allowing HPQ Silicon to manufacture high value material for the same operating cost presently being paid by traditional producers to make Metallurgical Grade Si (98.5% Si) using the traditional arc furnace approach.

*The results demonstrate the *PUREVAP*® QRR concept of combining different known steps into a one step process has now been validated by the results from the Phase 1 proof of concept metallurgical testing program*

High Purity Quartz Properties

HPQ Silicon is the largest holder of High Purity Quartz properties in Quebec, with over 3,500 Ha under claims. Despite the abundance of quartz, very few deposits are suitable for high purity applications. High Purity Quartz supplies are tightening, prices are rising, and exponential growth is forecast. Quartz from the Roncevaux property successfully passed rigorous testing protocols of a major silicon metal producer confirming that our material is highly suited for their silicon metal production.

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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 on-going filings with the securities 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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Die URL für diesen Artikel lautet:

<https://www.rohstoff-welt.de/news/244196--HPQ-Silicon-Resources--Analysis-Confirms-Purity-as-High-as-99.97Prozent-Process-Demonstrates-Significant-Ca>

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