



HPQ Silicon Secures Patent for Key Lithium-ion Battery Cathode Material

New Patent Expands HPQ's Portfolio in Lithium-ion Battery Material Manufacturing

Montreal, Canada, February 19th, 2025 — [HPQ Silicon Inc.](#) (“HPQ” or the “Company”) (TSX-V: [HPQ](#), OTCQB: [HPQFF](#), FRA: [O08](#)), today announced it has filed a **provisional patent** for an innovative **one-step manufacturing process** that produces **fumed alumina (Al₂O₃)** and **fumed titanium (TiO₂)**—two materials essential for the advancement of next-generation lithium-ion (Li-ion) battery cathodes ^[1].

This latest patent, based on **HPQ Silica Polvere Inc. (HSPI)** ^[2] **Fumed Silica Reactor (FSR)** technology, strengthens HPQ's position in battery material production by expanding its intellectual property (IP) beyond **silicon-based anodes** into **critical cathode materials**. The patented process enables a **cost-efficient, single-step alternative** to conventional multi-step and energy-intensive flame hydrolysis manufacturing methods, allowing HPQ to address scalability, environmental and cost challenges in the traditional fumed oxide materials market while being well-positioned to meet future demand from the battery supply chain.

“This patent is more than an expansion of our intellectual property—it represents a leap forward in how critical battery materials can be produced at scale,” said Bernard Tourillon, President and CEO of HPQ Silicon Inc. *“For too long, battery material production has been slowed by costly, multi-step processes. Our one-step approach simplifies manufacturing, reducing energy use and cost while making high-performance cathode materials more accessible.”*

Making a Strategic Expansion in Battery Materials

The demand for advanced cathode and anode materials continues to grow as battery manufacturers seek to improve energy density, cycle life, and cost efficiency. This **patent allows HPQ to broaden its offering** in both **anode and cathode material production**.

The company has already demonstrated **innovation in silicon anodes**, providing a viable high-capacity alternative to graphite, which dominates today's Li-ion battery anodes. Now, with this latest patent, HPQ is expanding its efforts into cathode materials, ensuring a more comprehensive approach to next-generation battery technologies.

Fumed Alumina and Fumed Titania: Market and Applications

Fumed alumina, a **US \$ 1.6 Billion market in 2023** projected to reach **US \$ 2.8 Billion by 2031** ^[3] and fumed titania, a **US \$ 1.2 billion in 2023** projected to reach **US \$ 1.8 billion by 2032** ^[4], materials used in the automobile sector, paints and coatings cosmetics and healthcare also play an increasingly critical role in the electrification of transportation, energy storage systems, and consumer electronics. These materials offer advantages in improving battery performance, particularly in stabilizing cathodes, enhancing energy density, and enabling longer cycle life.

Fumed alumina, known for its **high thermal stability** and **chemical resilience**, is particularly valuable in Li-ion batteries due to its ability to act as a **protective coating for cathode materials**. This helps prevent degradation during charging and discharging cycles, thereby extending the battery's lifespan. Additionally, its use in ceramic separators **improves safety and thermal stability**, which is crucial as battery systems become more powerful and energy dense ^[1].



On the other hand, Fumed titania, is gaining recognition for its **high conductivity and ability to enhance charge efficiency**. By incorporating fumed titania into cathode formulations, battery manufacturers can **achieve faster charging speeds** while maintaining a high level of **energy retention**. This is particularly advantageous for electric vehicles and grid-scale energy storage, where both charge time and battery longevity are key factors ^[1].

The **growing global demand** for high-performance lithium-ion batteries has created a market opportunity for these materials. As gigafactories scale up production and new battery chemistries emerge, the need for cost-effective and scalable material solutions is greater than ever. HPQ's patented process addresses this by providing an economically viable and energy-efficient method for **producing fumed alumina and fumed titania at scale**, making it an attractive solution for battery manufacturers worldwide.

Future-Ready Solution for Lithium-Ion Battery Manufacturing

HPQ's latest patent represents a step forward in the company's broader strategy to develop practical, scalable solutions for the battery industry. HPQ is expanding its capabilities and solidifying its position as both an IP holder and a supplier of next-generation battery materials by extending HSPI Fumed Silica Reactor technology to produce fumed alumina and fumed titania.

"This patent reflects our ongoing commitment to developing innovative manufacturing processes that address the real challenges of battery material production," added Mr. Tourillon. *"We are refining how silicon-based materials are produced for anodes, while also advancing the cathode side of the equation. This positions HPQ as an important contributor to the lithium-ion battery supply chain."*

Beyond anodes, HPQ's entry into cathode material production represents a natural expansion that aligns with the rapid growth of the Li-ion battery market. With electrification efforts accelerating worldwide, HPQ is well-positioned to provide scalable, cost-effective, and high-performance solutions for battery manufacturers.

REFERENCE SOURCES

- [1] Source to article explaining why [Metal oxides enhance the performance of li-ion batteries](#)
- [2] A wholly owned subsidiary of HPQ Silicon Inc. when technology supplier PyroGenesis announced its intention to exercise its option to acquire a 50% stake in HSPI in May 2024.
- [3] Link to [Fumed Alumina data source](#)
- [4] Link to [Fumed Titania data source](#)

About HPQ Silicon

HPQ activities are centred around the following five (5) pillars:

- 1) Becoming a green low-cost (Capex and Opex) manufacturer of Fumed Silica using the **FUMED SILICA REACTOR**, a proprietary technology owned by HPQ Silica Polvere Inc being developed for HSPI by PyroGenesis.
- 2) Becoming a producer of silicon-based anode materials for battery applications with the assistance of NOVACIUM SAS.



- 3) HPQ SILICON affiliate NOVACIUM SAS is developing a low carbon, chemical based on demand and high-pressure autonomous hydrogen production system.
- 4) HPQ SILICON affiliate NOVACIUM SAS is developing a new process to transform black aluminium dross into a valuable resource.
- 5) Becoming a zero CO₂ low-cost (Capex and Opex) producer of High Purity Silicon (2N+ to 4N) using our **PUREVAP™ “Quartz Reduction Reactors” (QRR)**, a proprietary technology owned by HPQ being developed for HPQ by PyroGenesis.

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

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Source: HPQ Silicon Inc.

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