TECHNOLOGY DEVELOPMENT

Plasma Expertise to provide a comprehensive technology development solution.

PyroGenesis is proud to have a team with one of the largest plasma expertise in the world. Working out from our Montreal-based manufacturing facility, our team offers innovative approaches to solve your problems in the most economical way possible. PyroGenesis’ technology development services can be classified into 2 main categories:

- Process Development Services
- Custom Plasma Reactors

INDUSTRY SECTORS:
- Mining & Metallurgy
- Defence
- Environment
- Oil & Gas
- Advanced Materials

CAPABILITIES:
- Process Design & simulation
- Proof of concept testing
- 3D Modeling
- Custom Fabrication
- Pilot testing

If you have a technology development project, please contact us and we will be pleased to evaluate how we can help.

For more information, please contact:

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PyroGenesis has been mandated by HPQ Silicon Resources to develop a technology to produce silicon metal directly from quartz. PyroGenesis developed the PUREVAP™ process to transform quartz into a solar grade silicon metal, in one-step, creating a simple, clean, and cheap alternate to conventional technologies.

**EXAMPLE OF A PROJECT: PUREVAP™ WITH HPQ SILICON RESOURCES**

**PROJECT MILESTONES TO DATE:**

- Transformed low purity quartz (97.5%) into high purity silicon
- Produced 4N (99.99%) silicon from low purity quartz
- Removed aluminum, boron, calcium & phosphorous with consistently high efficiencies (between 67% and 97%)
- Quantity produced per batch during testing phase increased from less than 0.1 g to 8.8 g; nearly a hundredfold increase
- Reached 4N+ purity level of Silicon Metal (99.99+% Si) using 98.14% SiO$_2$ by adding a solid purifying agent into the feedstock

<table>
<thead>
<tr>
<th></th>
<th>Capacity (MT)</th>
<th>Capital Cost (USD)</th>
<th>Spot Price (USD/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional Technology</td>
<td>~ 20,000</td>
<td>&gt; $1.5G</td>
<td>~ 17</td>
</tr>
<tr>
<td>PUREVAP™</td>
<td>~ $38-75M</td>
<td>~ $38-75M</td>
<td>~ 2</td>
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**CONTACT US TO DISCUSS YOUR PLASMA BASED PROJECT.**

*PyroGenesis Canada Inc. is a world-renowned high-tech company operating in the field of high temperature processing of materials and waste, which counts the US Navy and the US Air Force amongst its discerning client base.*

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