

ASX ANNOUNCEMENT  
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## **Volt Achieves Technical Milestone in Ultra-High Purity Graphite Bench-Scale Trials**

Volt Resources Limited (**ASX:VRC**) ("**Volt**" or "**the Company**") is pleased to announce a significant technical milestone, successfully and repeatably producing **Ultra-High Purity Graphite (UHPG)** with **99.96 – 99.98% purity** using our proprietary HF-free chemical purification process in bench-scale trials.

This achievement validates Volt's patent-pending **HF-free purification technology** as a safer and cost-efficient alternative to conventional methods.

This milestone marks a critical advancement, supporting Volt's staged pathway toward potential U.S. production of high and ultra-high purity, battery-grade graphite at the proposed **Alabama Graphite Refinery**. Stage 1 of the Refinery is focussed on producing 99.5% high purity graphite (HPG) allowing for the modular addition of a UHPG circuit as a second stage for the long term production of both HPG and UHPG.

### **Prashant Chintawar, Volt's Chief Executive Officer, commented:**

"Achieving greater than 99.95% purity consistently using a safe, HF-free process, highlights Volt's innovation and technical capability. This result represents a significant step toward building a sustainable U.S. based graphite supply chain and reinforces our position as an emerging leader in advanced materials."

### **Key Highlights**

- **Recent graphite purities of 99.96–99.98% repeatability demonstrated** using **Volt's HF-free purification process** at Zavalievsky Graphite (ZG);
- **About 95% average yield** from -100 mesh ZG feed;
- **Low-to-moderate temperature**, water-based chemistry supports safer operations and simpler permitting pathways.

**Following further test-work, proceed with pilot-scale design, plant construction and operation**, supporting Volt's U.S. downstream high purity production strategy.

## Background

Ultra-High Purity Graphite (99.95%) is a key component of several demanding and rapidly growing battery applications, such as anode active material and cathode conductivity booster for **lithium-ion batteries**, which are powering today's **EVs, and Battery Energy Storage Systems (BESS)**. The purity of the graphite directly impacts the battery's performance including its capacity and lifespan.

In addition, 99.95% and higher purity graphite is used in:

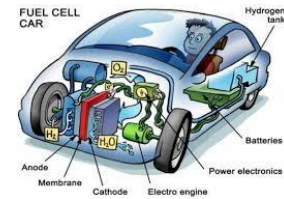
- **Alkaline batteries**
- High end **industrial lubricants**
- **Fuel cells** (bipolar plates and gas diffusion layers)
- **Electronic devices** (thermal sink to efficiently spread and dissipate heat)
- **Nuclear reactors** (as a neutron moderator and structural material)
- **Semiconductor wafer processing** (crucibles, susceptors, wafer carriers)



**Alkaline Batteries**



**Industrial Lubricants**



**Fuel Cells**



**Nuclear Reactors**



**Semiconductors**



**Electric Vehicles (EV)**

**Figure 1: Industrial Applications of  $\geq 99.95\%$  Purity Graphite**

These are **high value applications** that represent future markets for Volt's product roadmap.

## Industry Context

Traditional UHPG production methods rely on **thermal purification** or **hydrofluoric acid (HF) purification**, both with clear drawbacks. Thermal purification requires extremely high temperatures and capital-intensive equipment, while HF-based processes pose significant safety and environmental risks. The table below provides a summary of key industry techniques used for graphite refining including key advantages and disadvantages.

Graphite refining remains the **"Achilles' heel"** of the graphite industry.

TECHNIQUE	GRAPHITE PRODUCT PURITY (%)	ADVANTAGES	DISADVANTAGES
<b>Chemical via HF</b>	98 – 99.99	<ul style="list-style-type: none"> <li>• Low energy consumption</li> <li>• Low production cost</li> <li>• Modest capital costs</li> </ul>	<ul style="list-style-type: none"> <li>• Waste chemicals</li> <li>• Toxic chemicals (potentially e.g. hydrofluoric acid)</li> </ul>
<b>Thermal</b>	98 – 99.995	<ul style="list-style-type: none"> <li>• Extremely high purity yields</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive capital costs</li> <li>• Toxic gases</li> <li>• Large scale infrastructure required</li> <li>• High electricity usage</li> </ul>
<b>Chlorination Roasting</b>	98 – 99.95	<ul style="list-style-type: none"> <li>• Lower temperatures (than thermal)</li> </ul>	<ul style="list-style-type: none"> <li>• Destructive nature of chlorine to equipment and environment</li> <li>• Toxic gases used and produced</li> </ul>
<b>Microwave</b>	98 – 99.99	<ul style="list-style-type: none"> <li>• Rapid/selective heating</li> <li>• Environmentally sustainable</li> <li>• Fast on/off switching</li> </ul>	<ul style="list-style-type: none"> <li>• Emits toxic gases</li> <li>• Lower purity yields</li> </ul>

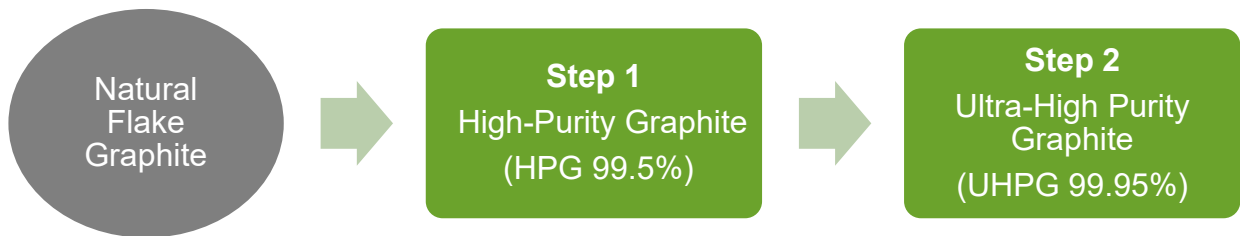
**Table 1: Summary of Natural Graphite Purification Techniques**

\*Reference: Future Battery Industries, CRC Project Report, University of Melbourne and CSIRO

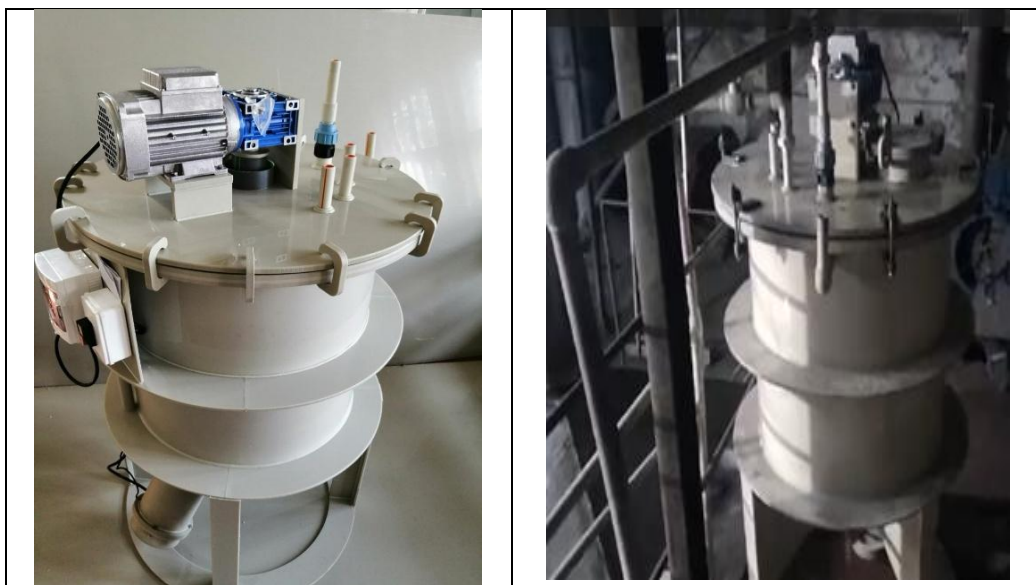
## Volt's High Purity Graphite Production Process

Volt's proprietary process addresses cost, safety, and permitting challenges through a **two-step approach**:

1. **HPG Production (99.5%):** Upgrading natural graphite concentrate (~95%) to High-Purity Graphite (HPG 99.5%) using Volt's proven process in commercial operation at ZG.
2. **UHPG Production (99.95%):** Refining HPG to 99.95% purity using Volt's proprietary **HF-free process**, supported by a U.S. provisional patent 63/696,244 titled "*Low-Cost HF-Free Purification to Produce Battery Grade Graphite.*"



In January 2025, a small-scale reactor was commissioned at Zavalievsky Graphite's processing facility for UHPG trials, as shown below<sup>1</sup>. This reactor provides better control on reagent addition, reaction time, process safety, and provides design data needed for the next step of industrialization.



**Figure 2: Small-Scale Reactor Commissioned at Zavalievsky Graphite for UHPG**

<sup>1</sup> Refer to ASX Announcement: 20 Jan 2025 "Additional Graphite orders secured from Zavalievsky Graphite, Partner graphite evaluation progress, and commencement of UHPG Graphite trials".

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## Key Technical Results

- **Typical Batch Size:** 22.7 kg graphite input to the reactor or smaller scale (<1 kg) bench top studies of about 99.5% purity
- **Number of Batches Produced:** over 20
- **Feed Composition:** Zavalievsky Graphite (-100 mesh)
- **Average Production Yield:** ~95%
- **Recent Measured Purities:** 99.96%, 99.97%, 99.97%, 99.97%, 99.98% over last five batches. Graphite was analysed for carbon content via Loss on Ignition (LOI) analysis.

Process operates at **low to moderate temperature** with water-based chemistry.

Purity consistency is influenced by:

- Magnetic separation efficiency (before and after reaction)
- Wash cycle effectiveness
- Ratio of proprietary salt to graphite

The reproducibility of **99.95% purity UHPG** confirms the **technical viability** of Volt's technology and process and supports advancement to pilot-scale production.

## Commercial Relevance

This milestone is a step toward producing **high-value graphite**. Demonstrating reproducible **99.96% – 99.98% purity** using a low cost, HF-free process confirms commercial potential.

This milestone positions Volt to:

- Supply **sustainable, battery-grade graphite** for EV and BESS markets.
- Qualify for **premium applications** in semiconductors, fuel cells, and advanced energy systems.
- Progress toward **customer qualification programs** and pilot-scale production.

## Forward Plan and Next Steps

Volt's next phase of technical and commercial development activities will focus on:

- Conducting **feed flexibility testing** with third-party graphite sources
- **Trialling larger flake graphite** (+80, +100 mesh)
- **Process optimization to reduce reagent costs**
- **Pilot-scale UHPG facility** design, construction, and commissioning
- Expanding **customer sampling and evaluation** programs

-ENDS-

**This announcement was authorised for release by the Board of Volt Resources Limited.**

**For further information, please email [contact@voltresources.com](mailto:contact@voltresources.com)**

### **About Volt Resources Limited**

Volt Resources Limited ("Volt") is a critical minerals and advanced materials company listed on the Australian Stock Exchange under the ASX code VRC. We are an established graphite producer and advanced materials developer.

In 2021, Volt acquired a 70% interest in each of the companies comprising the ZG Group, namely - Zavalievsky Graphite LLC (processing plant buildings, processing plant, mining equipment, power sub-station, and distribution), Stone Found LLC (crushed rock operations), and Graphite Invest LLC (holds a 79% interest in PJC Zavalievsky Graphite Kombinat – mine, land, main administration office building. It is this entity that holds the 636 hectares of freehold land on which the Zavalievsky mine, and other related buildings and facilities are located)<sup>2</sup>.

Volt holds two licence applications that are prospective for lithium-borate mineralisation. The licence applications are located in Serbia and are west and south-west of the Serbian capital, Belgrade<sup>3</sup>.

Volt is progressing the development of its large wholly owned Bunyu Graphite Project in Tanzania, as well as gold exploration in Guinea leveraging the Company's existing extensive networks in Africa.

The Bunyu Graphite Project in southeast Tanzania is ideally located near critical infrastructure with sealed roads running through the project area and ready access to the deep-water port of Mtwara 140km from the Project. In 2018, Volt reported the completion of the Feasibility Study ("FS") into the Stage 1 development of the Bunyu Graphite Project followed by a Feasibility Study Update published in August 2023. The Stage 1 development is based on a mining and processing plant annual throughput rate of 400,000 tonnes of ore to produce on average 24,780 tpa of graphite products. A key objective of the Stage 1 development is to establish infrastructure and market position in support of the development of the significantly larger Stage 2 expansion project at Bunyu<sup>4</sup>.

The Guinea Gold Projects comprise three projects in Guinea, West Africa having a total area of 348 km<sup>2</sup>. The Projects are located in the prolific Siguiri Basin which forms part of the richly mineralised West African Birimian Gold Belt.

Volt's wholly owned US subsidiary, Volt Energy Materials LLC, is headquartered in Alabama Entrepreneurship Institute at University of Alabama, Tuscaloosa, Alabama. and is focussed on the downstream graphite business including the high purity graphite processing technology. In June 2025 a Graphite Refinery Scoping Study confirmed strong project economics based on a staged development of refinery capacity. The Company is proceeding with plans for pilot plant trials,

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<sup>2</sup> Refer to Volt's ASX announcement titled "Volt to Acquire European Graphite Business Following Completion of Due Diligence" dated 14 May 2021.

<sup>3</sup> Refer to Volt's ASX announcement titled "Strategic European Lithium Acquisition – Jadar North" dated 18 November 2021.

<sup>4</sup> Refer to Volt's ASX announcement titled "Feasibility Study Update for Bunyu Graphite Project Stage 1, Tanzania Delivers Significantly Improved Economics" dated 14 August 2023.

engaging with potential offtake partners, exploring government facilitation, and considering funding options as it moves forward with project development<sup>5</sup>.

Information in this report that relates to the production target of the Bunyu Graphite Project was released to the ASX on 14 August 2023 and is available to view on [www.asx.com.au](http://www.asx.com.au). Volt Resources Limited confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement, and that all material assumptions underpinning the production target continue to apply and have not materially changed.

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<sup>5</sup> Refer to ASX announcement dated 17 June 2025 titled “Alabama Graphite Refinery Scoping Study Confirms Strong Project Economics”.