Avimetal Inc.

Next Generation Green Mineral Processing

Dry Concentration · Cyanide-Free Leaching · Graphene Electrowinning · Plasma Metal Refining

The Challenge

Mining's Three Critical Problems

The global mining industry is under mounting pressure to reform its core processing methods. Water scarcity, toxic chemical use, and chronic metal loss are no longer acceptable trade-offs — regulators, investors, and communities are demanding change.

💧 Water Usage

Traditional mineral processing consumes billions of liters of water annually. Environmental damage and increasingly strict permitting restrictions are limiting mine development worldwide.

☠️ Toxic Chemicals

Cyanide and mercury contamination pose severe risks to ecosystems and human health. Regulatory pressure is intensifying across the U.S., Europe, and emerging markets.

📉 Low Recovery Rates

Conventional mills lose fine particles containing 30–50% of recoverable metals, leaving enormous value stranded in tailings and waste streams.

The Avimetal Solution

Avimetal has engineered a **complete, integrated green processing platform** that eliminates the fundamental flaws of conventional mining metallurgy. Five breakthrough technologies work in sequence to deliver superior recovery with zero wastewater and zero cyanide.

Micronization Milling

Ultra-fine particle liberation at 400–600 mesh

Dry Electrostatic Separation

Water-free triboelectric mineral concentration

NaCl Non-Cyanide Leaching

Chloride-based, non-toxic dissolution chemistry

Graphene Cyclone Electrowinning

High-speed, low-energy metal recovery

Plasma Metal Refining

Next-gen slag processing and precious metal recovery

Avimetal Processing Flow

The Avimetal platform is a fully closed-loop system designed to maximize metal recovery at every stage while eliminating wastewater discharge, toxic chemical use, and unnecessary energy consumption.

Key Advantage: Closed-loop architecture with minimal environmental footprint — no wastewater streams, no cyanide reagents, and significantly lower energy consumption than conventional circuits.

Technology Deep Dive

Micronization Milling

Avimetal's proprietary vortex micronization mill achieves particle sizes of **400–600 mesh** — far finer than conventional ball mills or Raymond mills — unlocking metal grains that traditional grinding simply cannot liberate.

- Higher metal liberation rates from complex ores
- Smaller plant footprint and modular scalability
- Measurably lower power consumption per tonne
- Proven to significantly increase gold recovery from refractory feeds

Traditional	Avimetal
Ball Mill / Raymond Mill — coarse output, high energy	Vortex Micronization — 400–600 mesh, lower energy

Dry Electrostatic Concentration

Avimetal's dry electrostatic separation system uses **triboelectric charging principles** to sort micron-level mineral particles without a single drop of water. This enables processing in arid regions, cold climates, and sites where water permitting is prohibitive.

Zero Water Required

Eliminates the need for tailings ponds, water treatment infrastructure, and discharge permitting entirely.

Low Operating Cost

Minimal consumables, reduced maintenance complexity, and lower energy draw versus wet gravity circuits.

Portable Modular Plant

Containerized and skid-mounted configurations allow rapid deployment to remote or developing project sites.

Technology Deep Dive

Cyanide-Free NaCl Leaching

Avimetal replaces conventional cyanide leach circuits with a **sodium chloride (NaCl) chloride leaching system** that dissolves gold and other precious metals faster, safer, and with far less regulatory exposure. Operating at **65–95°C** and acidic pH below 3, the system is particularly effective on refractory and complex ores where cyanide underperforms.

Non-Toxic Reagents

No cyanide, no mercury — eliminates the most significant environmental liability in gold processing.

Faster Dissolution Kinetics

Chloride chemistry achieves superior leach rates on fine particles compared to cyanide systems.

Regulatory Advantage

Qualifies for streamlined permitting in jurisdictions with strict cyanide bans or restrictions.

Technology Deep Dive

Graphene Cyclone Electrowinning

Avimetal's electrowinning system pairs **graphene-coated high-surface-area electrodes** with a cyclone mass-transfer design to achieve recovery speeds and energy efficiencies that conventional electrowinning cells cannot match. The result is a continuous, single-step solution treatment that dramatically reduces capex and opex.

↑3x

Recovery Speed

Graphene electrodes dramatically accelerate metal deposition versus conventional cathode materials.

↓40%

Energy Cost

Higher current efficiency means fewer kilowatt-hours per kilogram of metal recovered.

24/7

Continuous Ops

Cyclone architecture enables uninterrupted operation without batch processing downtime.

Technology Deep Dive

Plasma Metal Refining

Avimetal's plasma refining platform represents the frontier of metallurgical processing — applicable to primary ore concentrates, industrial slag, and precious metal waste streams. Two complementary systems address different metallurgical challenges.

Cold Plasma System

Deploys hydrogen radical reactions to remove surface impurities and oxide layers from metal concentrates with precision and minimal thermal damage.

Hot RF Plasma System

High-temperature radio-frequency plasma enables metal recovery from slag, gasification of carbonaceous material, and clean separation of mixed metal streams.

Applications: Slag processing · Precious metals recovery · Industrial waste recycling · Smelter byproduct treatment

Commercial Deployments

Avimetal's platform is not theoretical — it is **actively deployed across three continents**, validating the technology in diverse geological, regulatory, and operational environments.

🇰🇷 Korea — Unju Mine

Full-scale mineral processing system installation, demonstrating integrated platform performance in an operating mine environment.

🇵🇪 Peru — Picchu Rio Gold Project

Cyanide-free gold processing deployment targeting high-grade refractory ore bodies in the Peruvian highlands.

🇺🇸 USA — Coronet Metals

Strategic development project applying Avimetal's dry concentration and electrowinning systems to a North American base and precious metals operation.

Intellectual Property Portfolio

Avimetal's competitive moat is built on a **deep and defensible patent portfolio** spanning the full processing technology stack. With 101 patents prepared and 99 graphene-related patents pending, the company's IP position is designed to protect market leadership across multiple mineral processing verticals for decades.

Patents Prepared

Full portfolio covering core processing technologies across all five platform pillars.

Graphene Patents Pending

Industry-leading graphene electrode and electrowinning IP representing a significant technological barrier to competition.

Electrostatic Separation

Dry triboelectric and high-voltage separation systems

Graphene Electrowinning

Novel electrode materials, cell designs, and cyclone configurations

Plasma Metallurgy

Cold and hot RF plasma application methods for metal refining

Water Turbine Systems

Integrated energy recovery systems for process water circuits

Market Opportunity

$90+ Billion Addressable Market

The global mining processing equipment market exceeds **$90 billion** and is accelerating as environmental regulations tighten, water scarcity intensifies, and demand for critical minerals surges. Avimetal is positioned at the intersection of every major growth vector.

→ Tightening Environmental Regulation

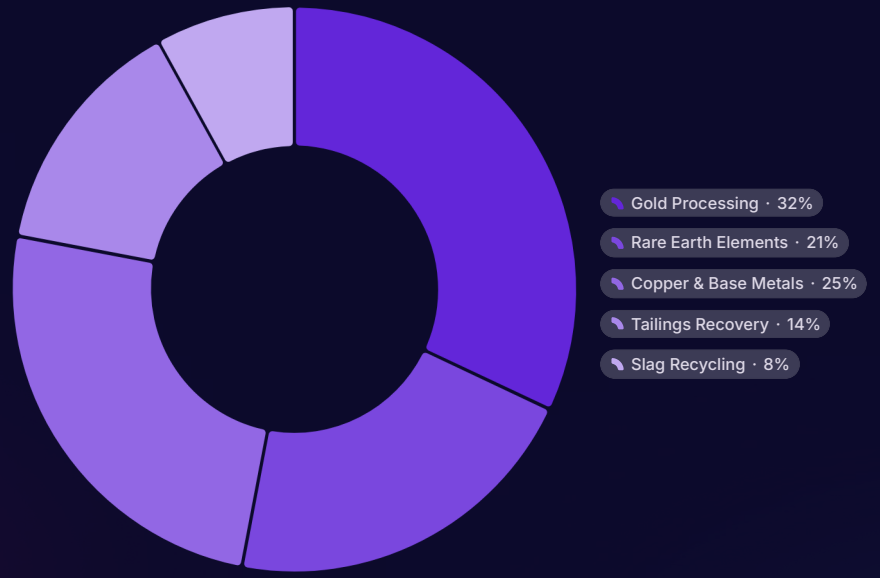
Cyanide bans and water discharge restrictions are forcing a global technology transition.

→ Critical Minerals Supercycle

EV batteries, semiconductors, and energy transition demand are driving unprecedented investment in new processing capacity.

→ Mine Tailings Recovery

Billions of tonnes of legacy tailings represent low-cost, high-value feedstock for Avimetal's platform.



Avimetal's platform serves all five major segments of the processing equipment market, with gold and base metals representing the largest near-term revenue opportunities.

Business Model

Four Diversified Revenue Streams

Avimetal's commercial model is designed to generate revenue across the full mining value chain — from initial equipment sales through long-term royalty-bearing licensing agreements and fully integrated EPC project delivery.

Equipment Sales

Direct sale of modular processing plants — micronization mills, electrostatic separators, electrowinning cells — to mining operators globally.

Technology Licensing

Fee-bearing licenses of Avimetal's patented processing methods to mining companies, OEMs, and national resource programs seeking clean processing solutions.

Processing Plant EPC

Full engineering, procurement, and construction delivery of complete processing facilities — turnkey solutions for greenfield and brownfield mining projects.

Metal Production Partnerships

Co-investment and revenue-sharing structures with mine operators and tailings owners, aligning Avimetal's success directly with metal production outcomes.

Leadership Team

Avimetal's management team combines deep expertise in aerospace engineering, metallurgical chemistry, environmental operations, and strategic advisory — providing the technical credibility and commercial experience to scale globally.

James Gim

Founder & CEO

Former Boeing Representative. Brings decades of precision engineering discipline, global commercial relationships, and technology commercialization expertise to Avimetal's leadership.

Richard Woodford

Chief Technology Officer

Chemistry & Metallurgy Expert. Leads all R&D, patent development, and processing technology deployment across Avimetal's five-technology platform.

Dan Swanny

Strategic Advisor

Former VP at Waste Management. Provides critical guidance on environmental compliance, waste stream monetization, and large-scale operational scaling.

Douglas Ashworth

Strategic Advisor

Chairman of PRG Group. Brings international investment networks, board governance expertise, and strategic partnership development capabilities to the company.

Investment Opportunity

Deploy Eco-Friendly Mineral Processing Worldwide

Avimetal is actively seeking **strategic partners and investors** to accelerate the global deployment of its green processing platform. The company targets four high-value expansion vectors where capital can generate both strong financial returns and measurable environmental impact.

🌍 Global Licensing

Expand the Avimetal IP licensing program to mining jurisdictions worldwide, generating recurring royalty revenue with minimal additional capital deployment.

🏗️ Modular Processing Plants

Fund the manufacture and deployment of containerized processing units for immediate revenue generation at operating mines and tailings facilities.

🔬 Rare Earth Processing

Apply Avimetal's platform to the rapidly growing critical minerals sector — a strategic priority for governments and technology manufacturers globally.

♻️ Mining Waste Recovery

Unlock the multi-trillion-dollar opportunity in legacy tailings and slag through Avimetal's high-recovery, low-cost processing systems.

The bottom line: Avimetal offers investors exposure to a defensible, patent-protected technology platform addressing three of mining's most urgent structural challenges — at a moment when the window for market leadership is wide open.