



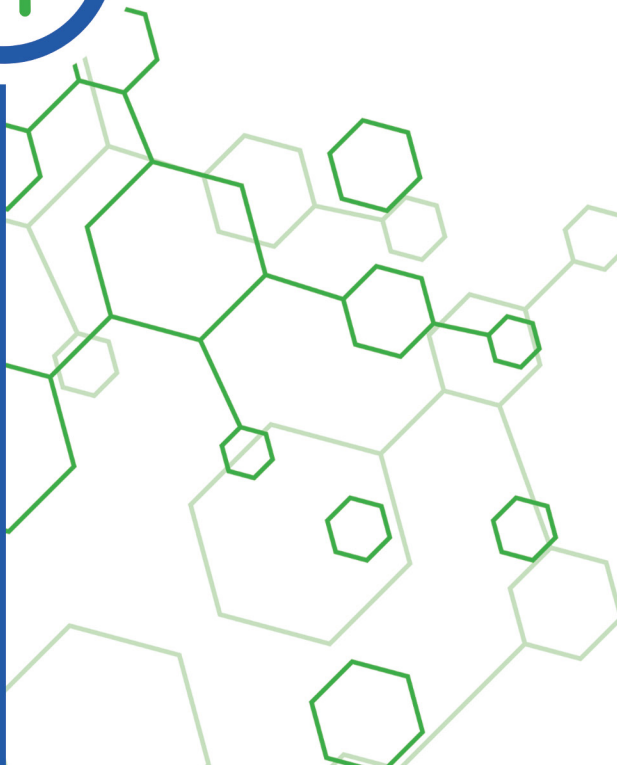
# HIGH-PRESSURE SLURRY ABLATION (HPSA)

Smarter Circuits. Better Recovery. Lower Cost.





**DISA Technologies** is transforming mineral processing with HPSA, our patented, chemical-free technology that uses particle-to-particle collisions to selectively liberate minerals. We deliver industrial-scale performance gains with a compact, modular system that bolts directly into existing concentrator circuits or standalone sites.



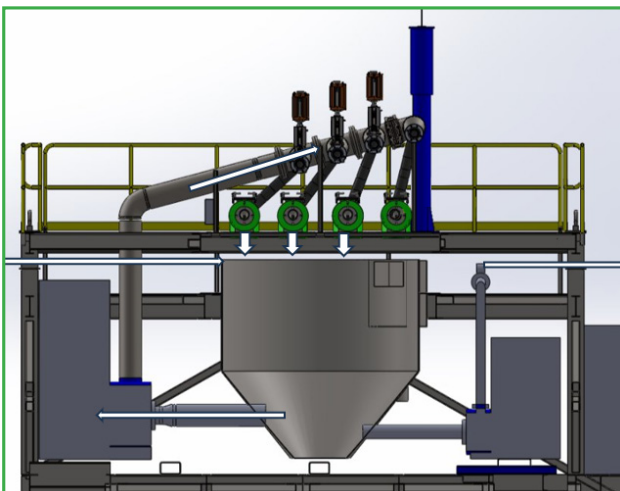
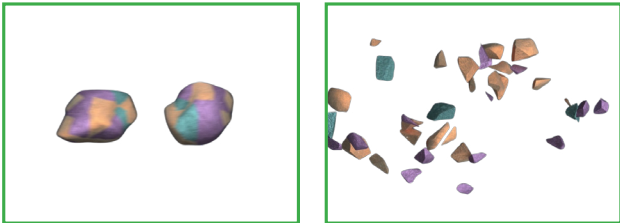
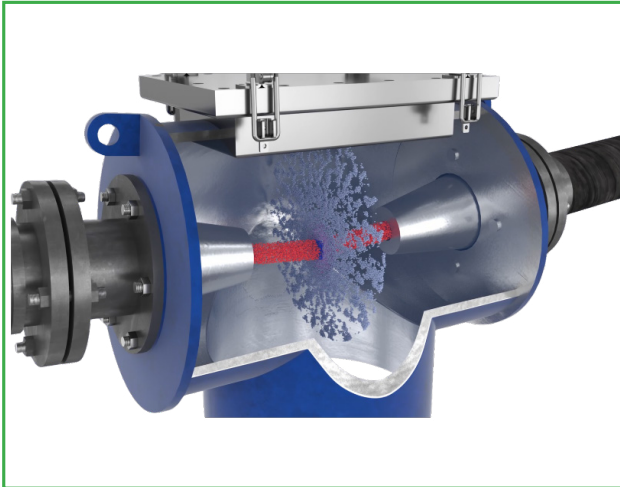
BUILT FOR  
**DEPLOYMENT**

PROVEN ACROSS  
**25+ ORE TYPES**

BACKED BY  
**15 PATENTS**



## HOW HPSA WORKS

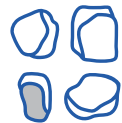


### Selective liberation

HPSA uses high-velocity slurry jets to generate particle-to-particle collisions that fracture ore along natural boundaries and ore hardness differences. The result is early-stage liberation of target minerals with significantly reduced fines.



**100% mechanical** process  
(no grinding media or chemical reagents)



**Liberates at coarser grind sizes**  
(reduces overgrinding and slimes)



**Selective breakage** based on Mohs hardness  
differentials and grain boundaries



**Produces cleaner size distributions**  
and higher downstream recoveries

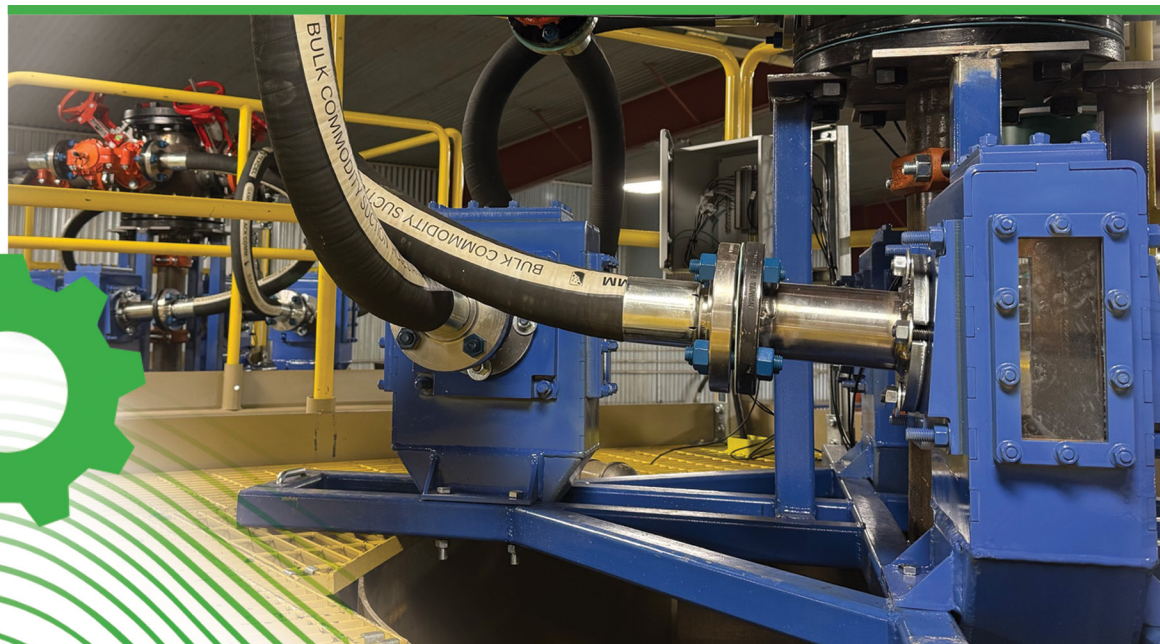


**Compatible** with flotation, leaching,  
sizing, or magnetic/gravity separation

## DESIGNED FOR MODERN CIRCUITS



HPSA modules bolt into new or existing concentrator circuits in weeks, not months. They increase revenue, reduce project CAPEX and cut OPEX without expanding your footprint. HPSA improves metal recovery from tailings and middlings streams, unlocking value from material previously considered waste. Modular design minimizes shutdown requirements and integrates seamlessly with mill automation systems for fast commissioning and reliable, continuous performance.







## Drop-in integration with measurable impact.

- ⬡ Boosts liberation and throughput = **Increased revenue and profit**
- ⬡ Reduces grinding = **Downstream OPEX savings**
- ⬡ Shrinks footprint = **Reduces CAPEX and environmental impact**
- ⬡ Simplified maintenance = **Higher uptime**
- ⬡ Flexible module designs = **Flexible modular designs 1 to 500 TPH units available**
- ⬡ Skid-mounted with all necessary components = **Short installation timelines and easy integration**
- ⬡ Short lead time (<6 months) = **Quick implementation and shorter project cycle**

## Installation to operation:

- ⬡ < 1 week for smaller units, < 2 weeks for larger units = **Fast return on investment**
- ⬡ Robust design with abrasive-resistant internals = **Long wear life and higher availability**



## DISA HPSA UNIT SIZING OVERVIEW

From pilot to production, installed in weeks not months.

Unit Type*	HPSA C-1	HPSA C-2	HPSA C-10	HPSA C-25	HPSA C-50	HPSA C-125	HPSA C-250	HPSA C-500
Capacity Up To (MTPH)	1	2	10	25	50	125	250	500
% Solids	45	45	45	45	45	45	45	45
Installed Power (Hp)	20	40	100	200	400	1000	2000	4000
Installed Power (kW)	15	30	75	160	300	800	1500	3000
Length (in)	96	96	270	240	300	420	420	480
Width (in)	48	48	96	108	108	180	360	360
Height (in)	84	96	180	180	265	290	300	300
Total Weight (lbs)	4,000	6,000	23,000	30,000	45,000	60,000	100,000	150,000

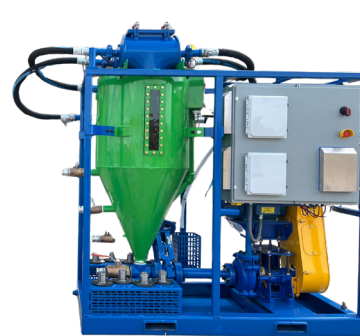
Field Pilot Units

\*Selected unit depends on individual material characteristics and testing performance



## | MODULAR BY DESIGN

Engineered as a fully modular system, HPSA adapts to a wide range of processing capacities and site conditions. Its architecture enables straightforward scaling: from pilot installations to full-capacity production. The configurable layout allows easy expansion, reconfiguration, and seamless integration with new or existing processing circuits. This modular approach delivers long-term flexibility without compromising performance.



1 TPH



2 TPH

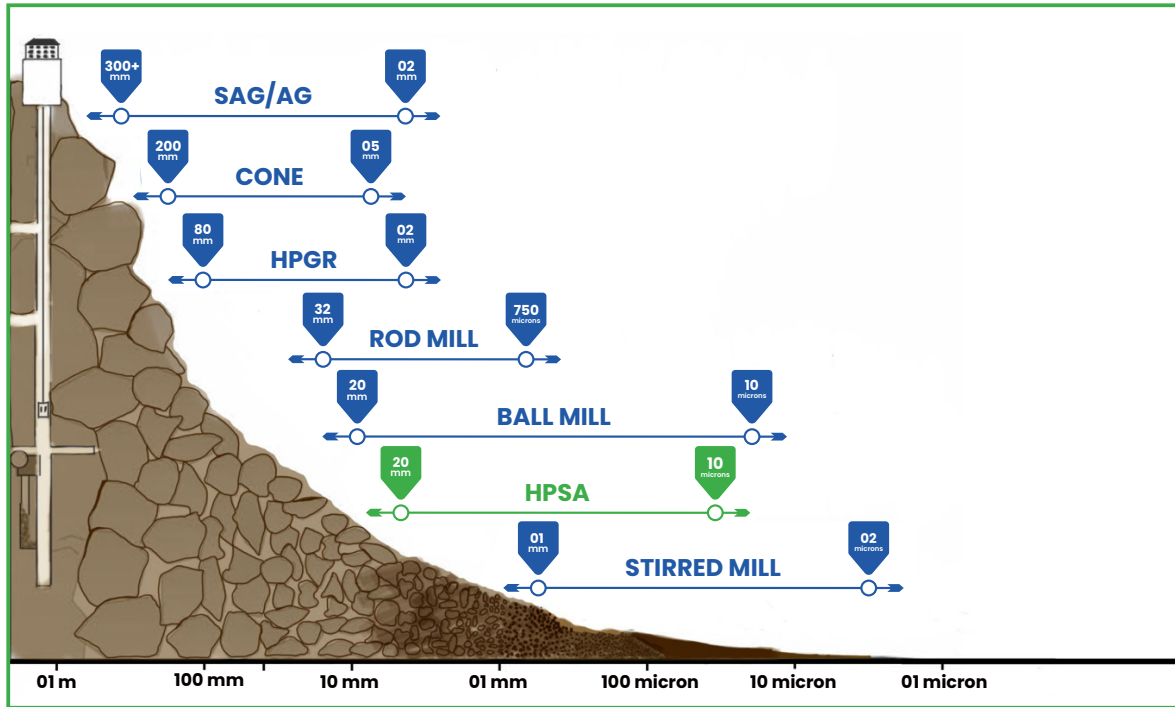


10 TPH

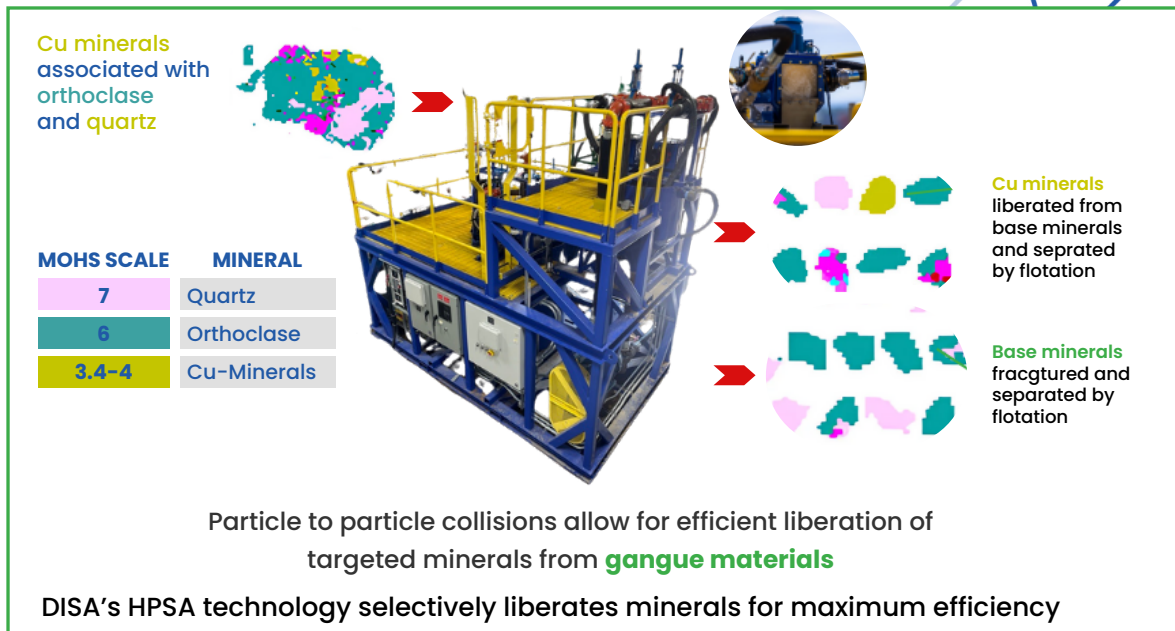


50 TPH

# COMPARATIVE SIZE REDUCTION CAPABILITIES OF MILLING TECHNOLOGIES



The result is lower costs, higher recoveries, and more sustainable, resilient operations.







## | PERFORMANCE ADVANTAGES

### Better results with less energy and wear.

Compared to ball, rod or tower mills and attrition scrubbers, HPSA reduces energy, lowers downstream processing and eliminates grinding media — all while boosting concentrate grades and recoveries at a coarser p80.

- ⬡ **Higher concentrate grades** and recoveries across sulfides, oxides, and industrial minerals
- ⬡ **No grinding media required** (removes steel cost, logistics, and contamination risk)
- ⬡ **Safer maintenance** — modular skids, fewer moving parts, no mill liners
- ⬡ **Rapid startup** and restart capability



## | FIELD PROVEN RESULTS

### Demonstrated performance across commodities.

From copper sulfides to REEs and industrial minerals, HPSA consistently improves grade and recovery while lowering operating costs. Case studies show added value at commercial scale, with rapid ROI.

**Copper Sulfides:** +13% concentrate grade, +22% recovery versus rod mill; improved flotation kinetics.

**Phosphate:** +15%  $P_2O_5$ , -50% MgO; \$26M/year added value at 250 TPH scale

**Gold Tailings:** +44% Au recovery; P80 reduced from 2,100  $\mu m$  > 150  $\mu m$

**Graphite:** +25% concentrate grade at coarser grind size; reduced downstream attrition milling

**Rare Earth Elements (REEs):** 95% TREE recovery; 42% less downstream processing volume

**Iron Ore:** Improved liberation of hematite at P80 300  $\mu m$ ; 18% higher Fe recovery in tests

**Nickel/Copper (sulfide):** +2% Ni recovery; cleaner separation of sulfides

**Molybdenum:** 25% higher Mo grade; better separation from gangue minerals

**Lithium:** 18% less fines and 19% increased recovery versus regrind mill





## | WHERE HPSA WORKS

### Versatile across ores and stages.

HPSA is proven on sulfides, oxides, industrial minerals, and tailings retreatment. Whether upstream, midstream, or downstream, it adds liberation where it matters most.

**Base Metals:** Copper, Nickel, Zinc, Molybdenum

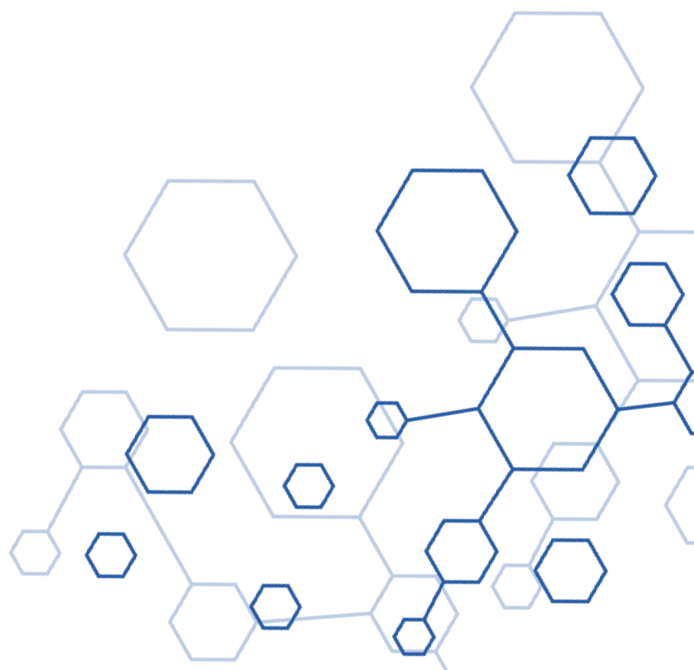
**Precious Metals:** Gold, Silver, PGM

**Battery & Critical Minerals:** Graphite, Lithium, REEs

**Bulk & Industrial Minerals:** Iron ore, Fluorspar, Filter sand, Chromite, SCM and Coal

**Fertilizers:** Phosphate, Potash

**Tailings:** All ore types





## | INTEGRATION FLEXIBILITY

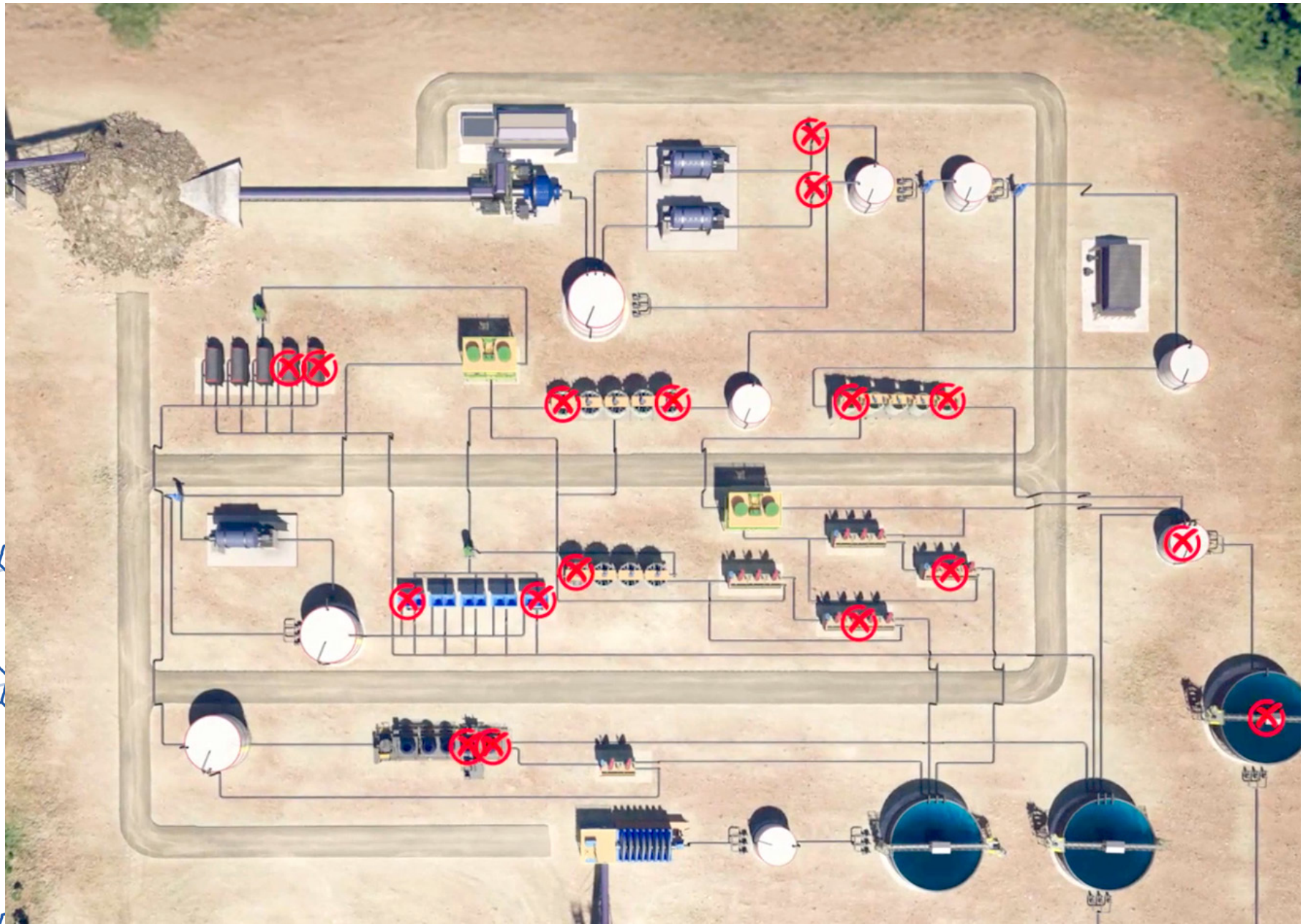
### Engineered for unmatched flowsheet adaptability.

HPSA can be deployed at nearly any point in the circuit to improve liberation, reduce energy use, or recover lost value. Its design enables integration as:

- ⬡ Its design enables integration as replaces or supplements ball, rod or tower mills and attrition scrubbers
- ⬡ Its design enables integration as liberation upgrade midstream, ahead of or between beneficiation stages
- ⬡ Its design enables integration as tailings retreatment / reprocessing
- ⬡ Its design enables integration as deployable in constrained sites where footprint and installation windows are limited





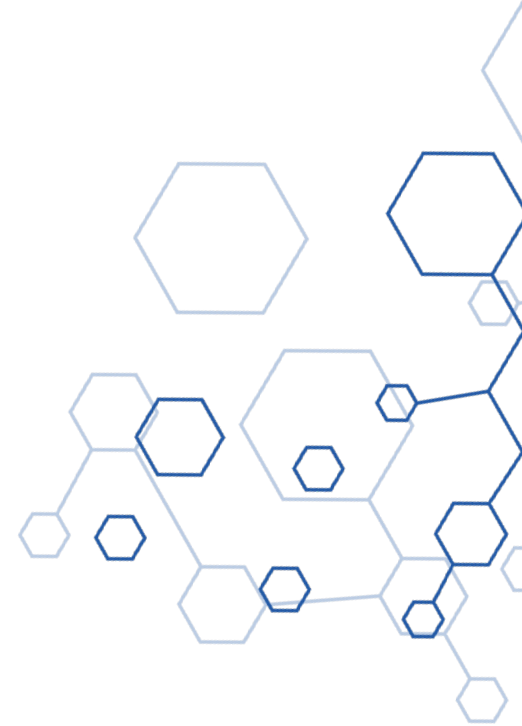


## | TESTING, SERVICE, & SUPPORT

### From lab to full-scale, backed globally.

DISA provides full-service support: laboratory characterization, pilot testing, flowsheet optimization, operator training, and lifecycle service. With more than 150 ore campaigns conducted, our technical teams deliver data-driven integration at speed.

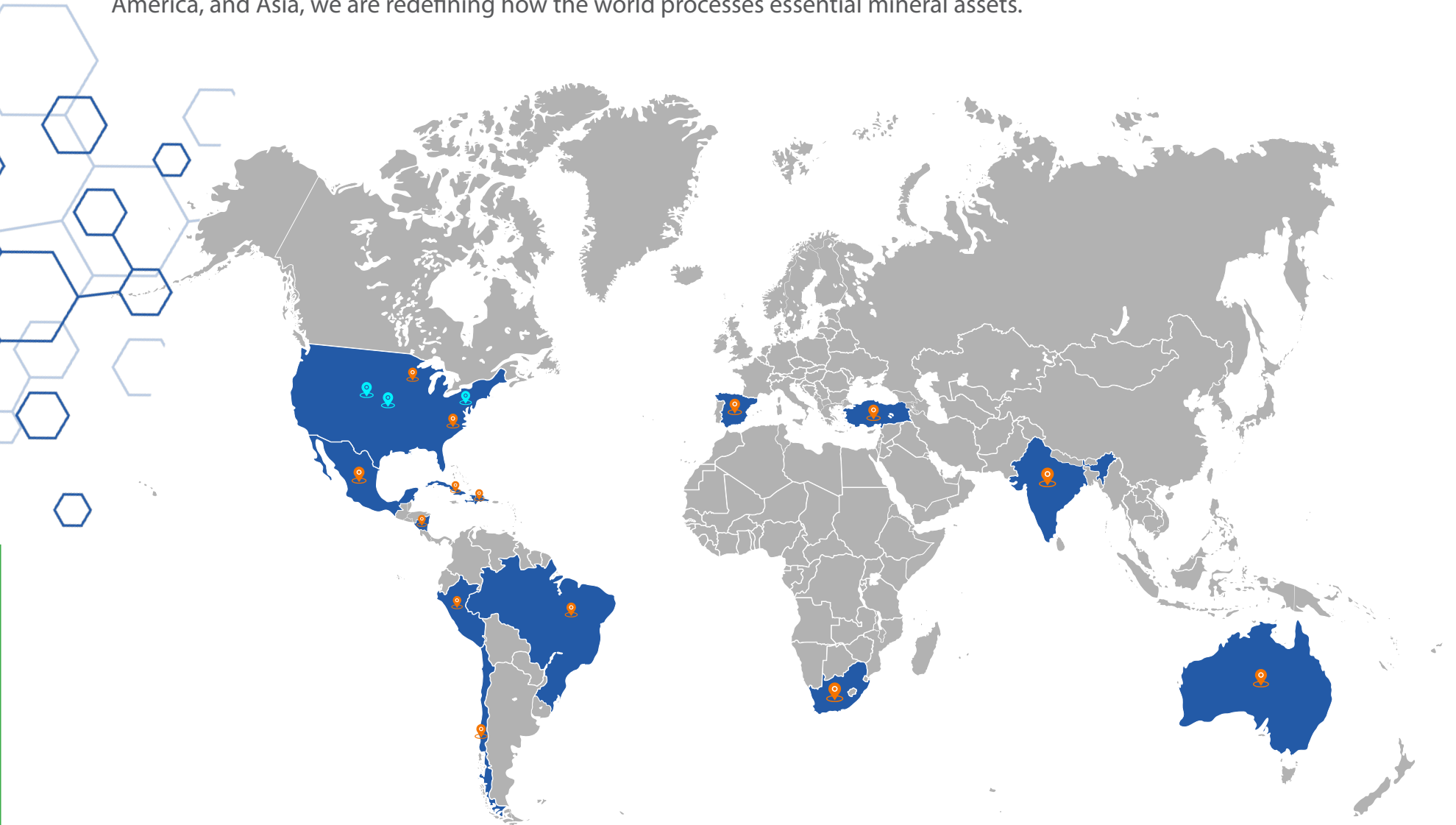
- ⬡ Laboratory testing and material characterization in Denver and Casper
- ⬡ Global fleet of mobile skid mounted pilot units for rapid, low-footprint onsite validation
- ⬡ 150+ ore campaigns conducted
- ⬡ Integration consulting and flowsheet optimization for new and existing circuits
- ⬡ Full lifecycle support: spare parts, preventive maintenance, and operator training
- ⬡ Backed by a global sales and technical support network



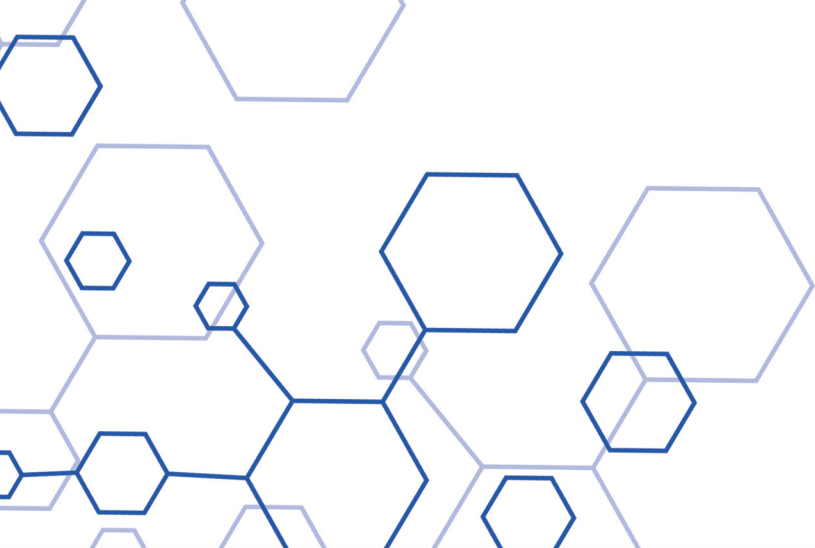


## | DISA TECHNOLOGIES

Founded in 2018 and headquartered in Casper, Wyoming, DISA Technologies is commercializing HPSA to modernize mineral recovery at scale. With 15 patents and systems operating across the U.S., South America, and Asia, we are redefining how the world processes essential mineral assets.







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