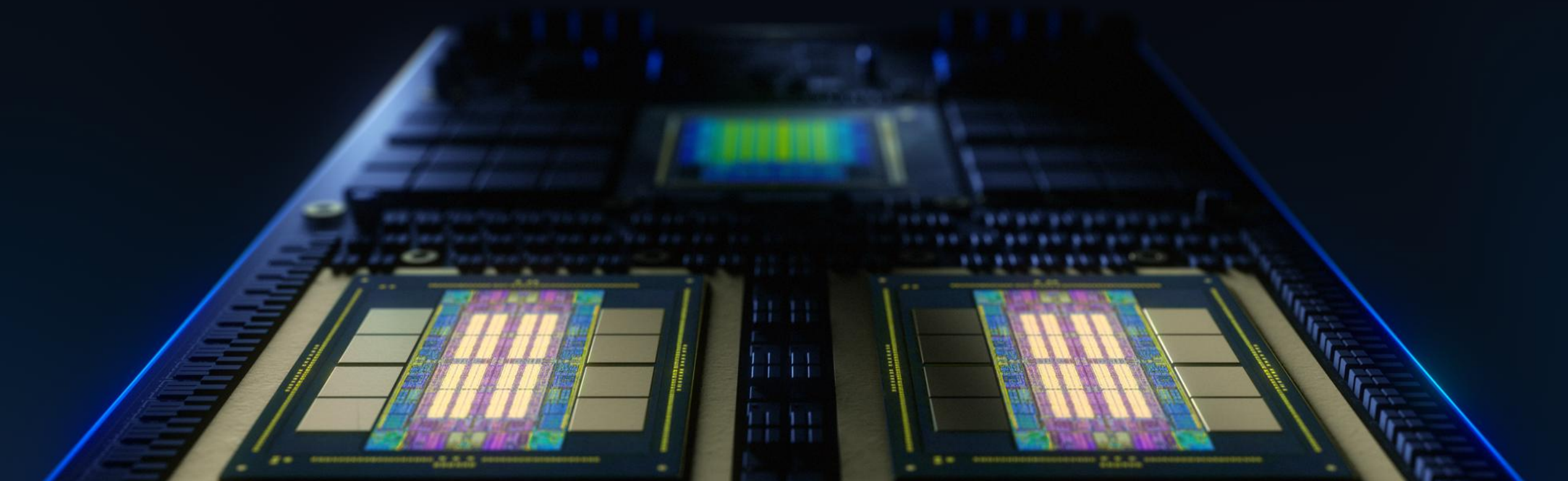
Alpha HPA

ULTRA-HIGH PURITY ALUMINA FOR SEMICONDUCTOR AND AI INFRASTRUCTURE

AGM Presentation



CAUTIONARY STATEMENT

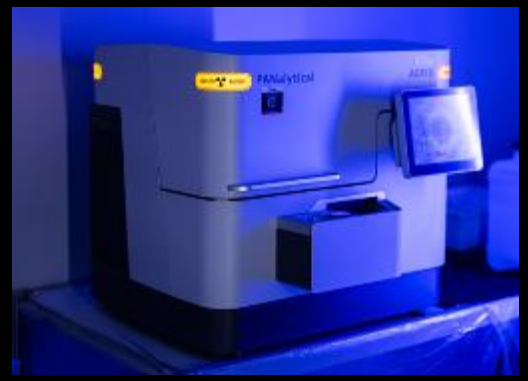
The Definitive Feasibility Study (DFS) referred to in this Presentation was undertaken in 2023 and 2024 to assess the technical and financial viability of the HPA First project. The DFS is based on the material assumptions including the availability of funding and the pricing received for Alpha's products. The HPA First Project, Stage 2 financials were re-baselined in January 2026.

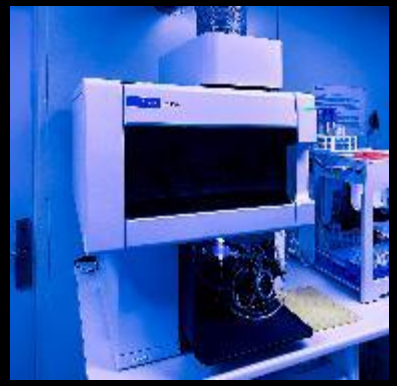
While the Company considers all of the material assumptions in the 2024 DFS and the January 2026 re-baseline to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the outcomes indicated will be achieved. To achieve the range of outcomes indicated in the 2024 DFS and the 2026 re-baseline, additional funding may be required. Investors should note that there is no certainty that the Company will be able to raise the amount of funding when needed. It is also possible that such funding may only be available on terms that may be dilutive to or otherwise affect the value of the Company's existing shares. It is also possible that the Company could pursue other 'value realisation' strategies such as a sale, partial sale or joint venture of the HPA First project. If it does, this could materially reduce the Company's proportionate ownership of the HPA First project. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the 2024 DFS or the 2026 re-baseline.

FORWARD LOOKING STATEMENTS

This presentation contains certain forward-looking statements with respect to the 2024 DFS, the 2026 re-baseline, financial conditions, results of operations, and business of the Company and certain plans and objectives of the management of the Company that are based on the Company's assumptions, expectations, estimates and projections as of the date on which the statements were made. Generally, forward-looking statements can be identified by the use of forward-looking terminology such as 'outlook', 'anticipate', 'project', 'target', 'likely',' believe', 'estimate', 'expect', 'intend', 'may', 'would', 'could', 'should', 'scheduled', 'will', 'plan', 'forecast', 'evolve' and similar expressions. These forward-looking statements involve known and unknown risks, uncertainties and other factors which are subject to change without notice and may involve significant elements of subjective judgement and assumptions as to future events which may or may not occur. Forward-looking statements are provided as a general guide only and there can be no assurance that actual outcomes will not differ materially from these statements. Neither the Company, nor any other person, give any representation, warranty, assurance or guarantee that the occurrence of the events expressed or implied in any forward-looking statement will actually occur.

In particular, those forward-looking statements are subject to significant uncertainties and contingencies, many of which are outside the control of the Company. A number of important factors could cause actual results or performance to differ materially from the forward looking statements. Although the Company attempts and has attempted to identify factors that would cause actual actions, events or results to differ materially from those disclosed in forward looking statements, there may be other factors that could cause actual results, performance, achievements or events not to be as anticipated, estimated or intended, and many events are beyond the reasonable control of the Company. Investors should consider the forward looking statements in light of those disclosures and are cautioned not to place undue reliance on forward looking statements. The Company disclaims any intent or obligations to update or revise any forward-looking statements, whether as a result of new information, estimates, or opinions, future events or results or otherwise, unless required to do so by law.





2026 HIGHLIGHTS

Alpha HPA

A YEAR OF MAJOR PROGRESS

STAGE 2 CONSTRUCTION ADVANCES	**60%** COMPLETE
PRODUCT MARKETING GROWING STRONGLY	**+13,800** TONNES UNDER LOI
STAGE 1 FACILITY OVERSUBSCRIBED	**~4X** FOR HPA AND ATH
COMMENCEMENT OF GOVT DEBT DRAWDOWN	EFA FUNDING UNDER DRAW TARGETING NAIF Q1 CY27

ABOUT ALPHA HPA

LEADING SPECIALTY MATERIALS MANUFACTURER OF ULTRA-HIGH PURITY ALUMINAS (“HPA”) AND RELATED PRODUCTS PRIMARILY FOR ADVANCED SEMICONDUCTOR APPLICATIONS

- Operating the Stage One Facility and constructing the world’s largest High Purity Alumina materials facility as Stage Two
- Established and growing as a critical supplier to the semiconductor sector, currently supporting memory and logic chips for Artificial Intelligence
- Proven technology advantage positions Alpha as the only known manufacturer to meet critical product specifications for heat dissipation and low radiation for advanced semiconductor packaging
- Comprehensive support by Federal and State critical minerals initiatives

ULTRA-HIGH PURITY
+
ULTRA-HIGH VALUE MATERIALS
+
HIGH MARGIN

COMPELLING ECONOMICS

OUR TECHNOLOGY ADVANTAGE



DEVELOPING THE WORLD’S LARGEST, SINGLE-SITE HIGH PURITY ALUMINA MATERIALS FACILITY IN GLADSTONE, QUEENSLAND

MANUFACTURING FACILITIES

NOVEMBER 2025



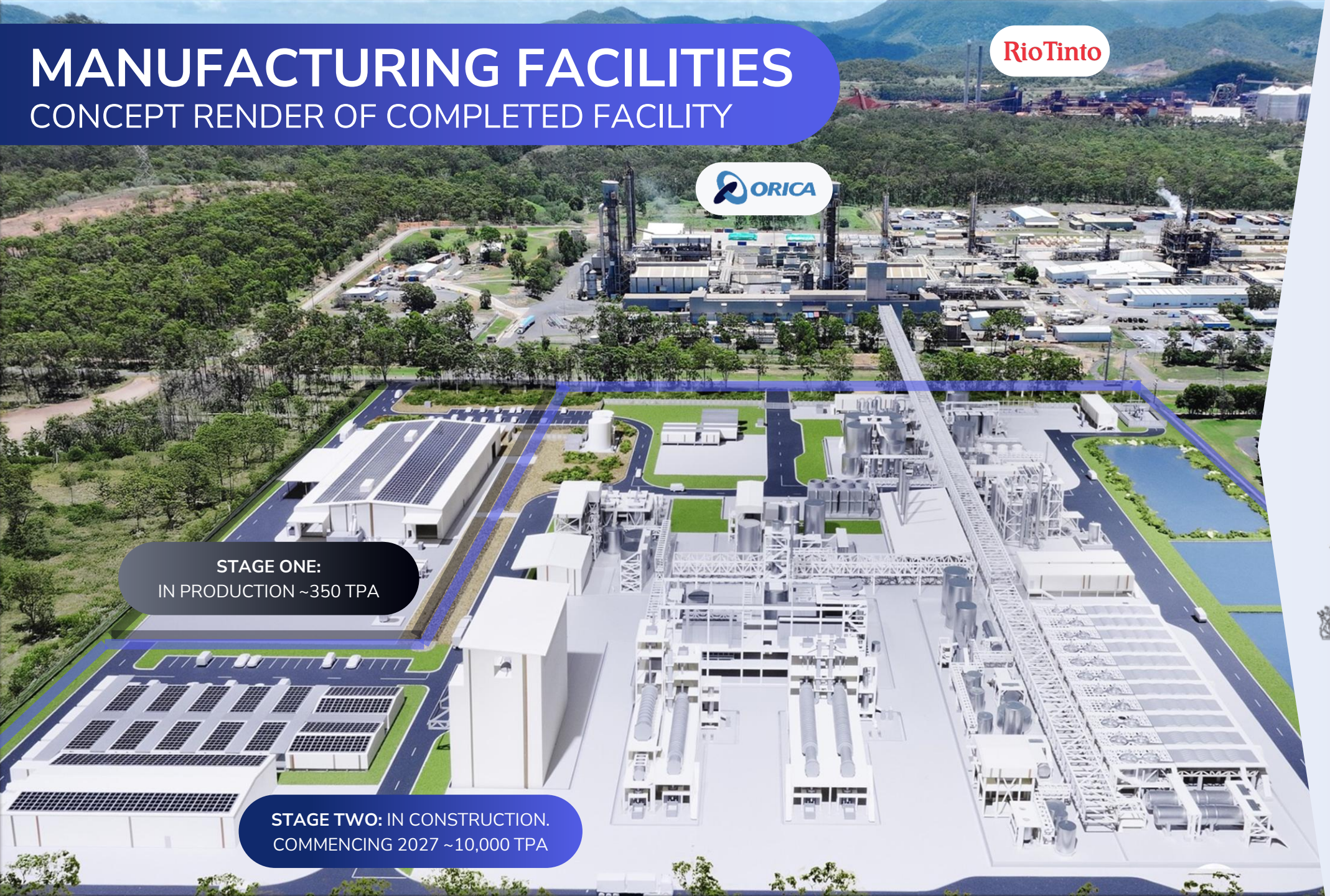
MANUFACTURING FACILITIES

NOVEMBER 2026



MANUFACTURING FACILITIES

CONCEPT RENDER OF COMPLETED FACILITY



STRONG GOVERNMENT BACKING AND SUPPORT

National Reconstruction Fund Corporation	A$75M EQUITY to 6.9% holding
NAIF / export finance australia	A$320M PROJECT LOAN A$80M COST OVERRUN[1]
QIC	A$30M ROYALTY INVESTMENT[2]
Australian Government	A$45M GRANT[3]
Queensland Government	A$22M GRANT[4]

[1] EFA drawdown commenced per announcement dated 2 November 2026.
[2] Fully drawn.
[3] As per announcement dated 16 March 2022
[4] As per announcement dated 5 April 2023

STAGE TWO FACILITY: NOVEMBER 2026









AlphaHPA

STAGE TWO FACILITY: NOVEMBER 2026









AlphaHPA

STAGE TWO FACILITY: NOVEMBER 2026



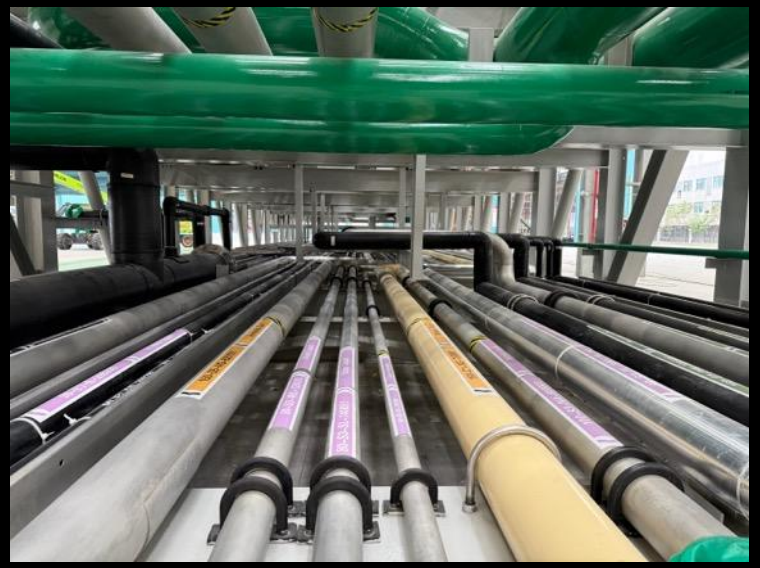






STAGE TWO FACILITY: PIPE RACKS OFFSITE ASSEMBLY











STAGE ONE FACILITY









STAGE ONE FACILITY











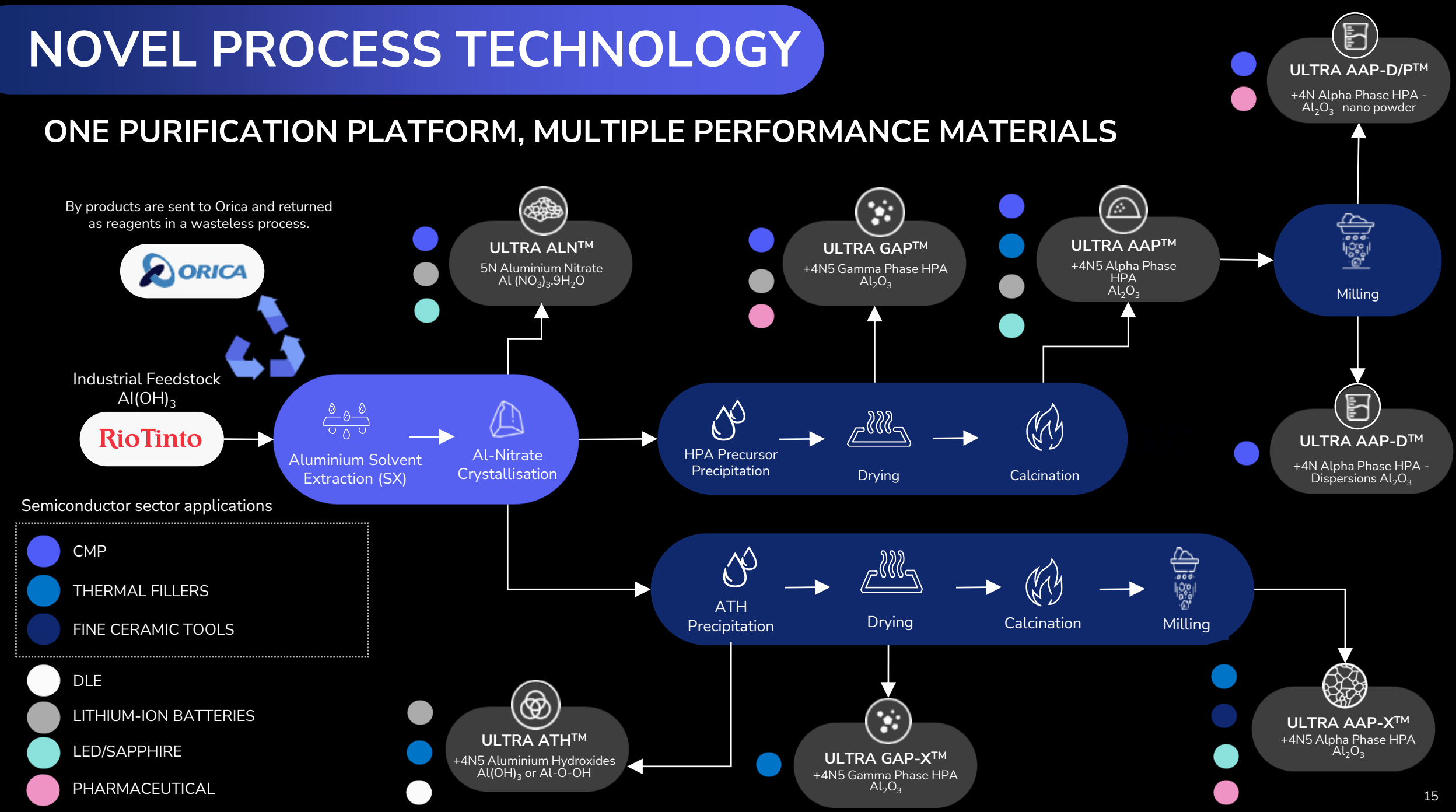






NOVEL PROCESS TECHNOLOGY

ONE PURIFICATION PLATFORM, MULTIPLE PERFORMANCE MATERIALS

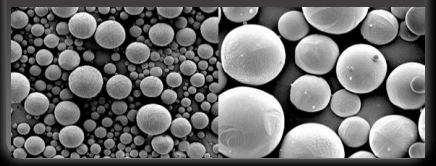


SEMICONDUCTOR SUPPLY CHAIN POSITION

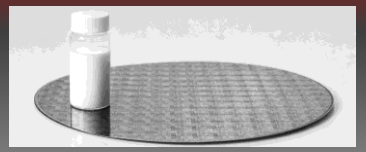
HP aluminium based materials

Alpha HPA

Spherical alumina manufacturers



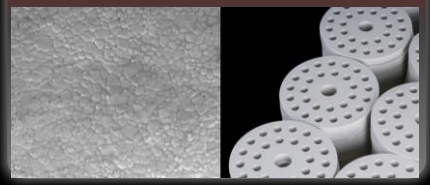
CMP Slurry Makers



Thermal spray coating manufacturers



Ceramic component manufacturers



Semiconductor packaging manufacturers



RESONAC Chemistry for Change

Shin-Etsu

SUMITOMO BAKELITE CO., LTD.

SAMSUNG

NAGASE Delivering next.

KCC

Semiconductor Fabrication Equipment Manufacturers



Lam RESEARCH

APPLIED MATERIALS

ASML

TEL TOKYO ELECTRON

Global Semiconductor IDMs* & Foundries



*IDM = Integrated Device Manufacturer

tsmc

intel

SAMSUNG

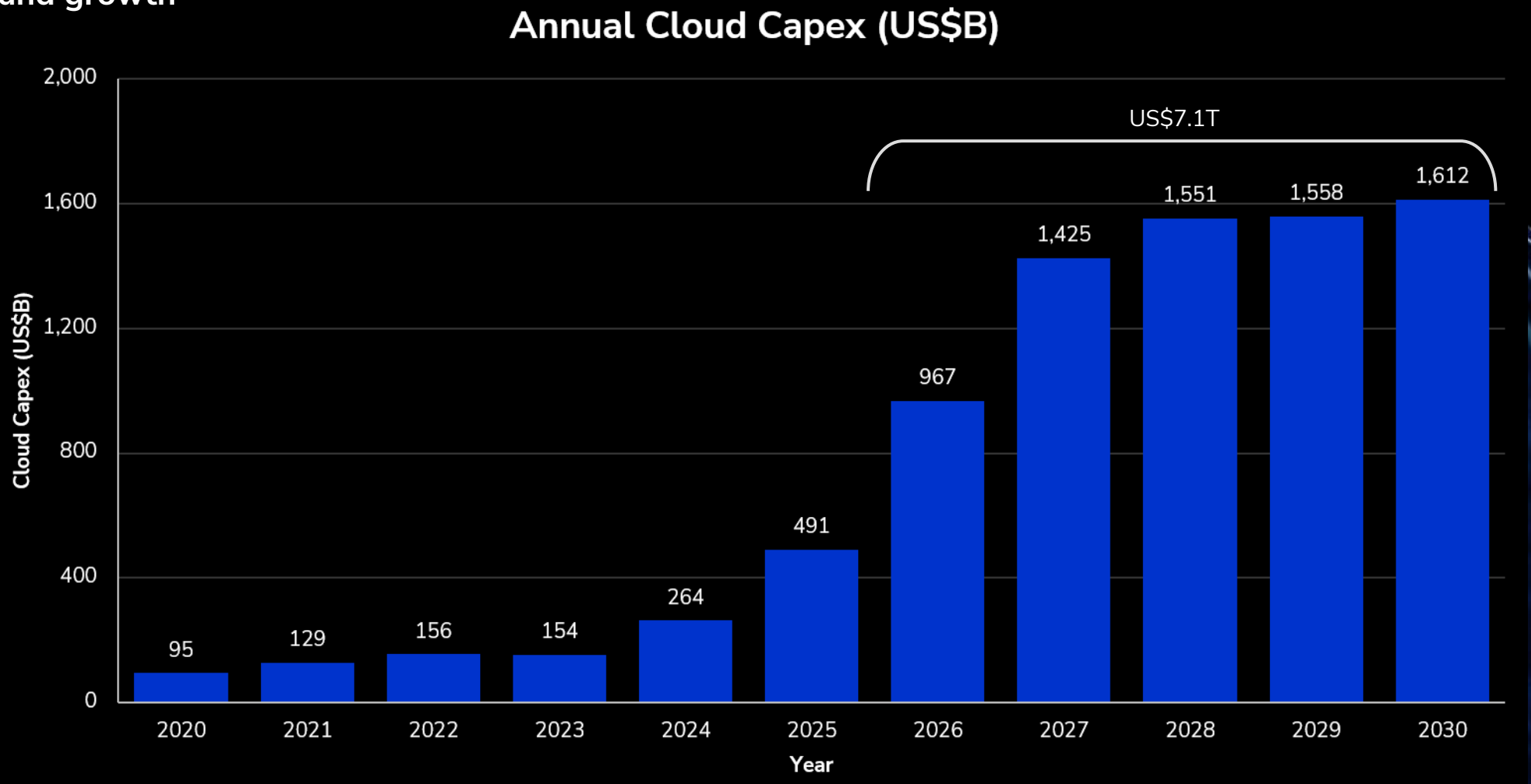
SK hynix

micron

GLOBAL SIGNIFICANCE OF THE SEMICONDUCTOR BOOM

Alpha HPA

Surging AI adoption driving demand across the semiconductor sector – with compute and data driving majority of the scale and growth



Source: JP Morgan capex dataset accounts for several cloud/neocloud operators including: Amazon, Google, Microsoft, Meta, Oracle, CoreWeave, Nebius, IREN, and SpaceX; All forward estimates are based on median consensus estimates.

Source: J.P. Morgan Cloud Capex Dataset, Bloomberg Finance L.P.

SOLVING THE MATERIAL PROBLEM

AI AND OTHER TECHNOLOGIES ARE PUSHING MATERIALS INTO HARDER OPERATING CONDITIONS

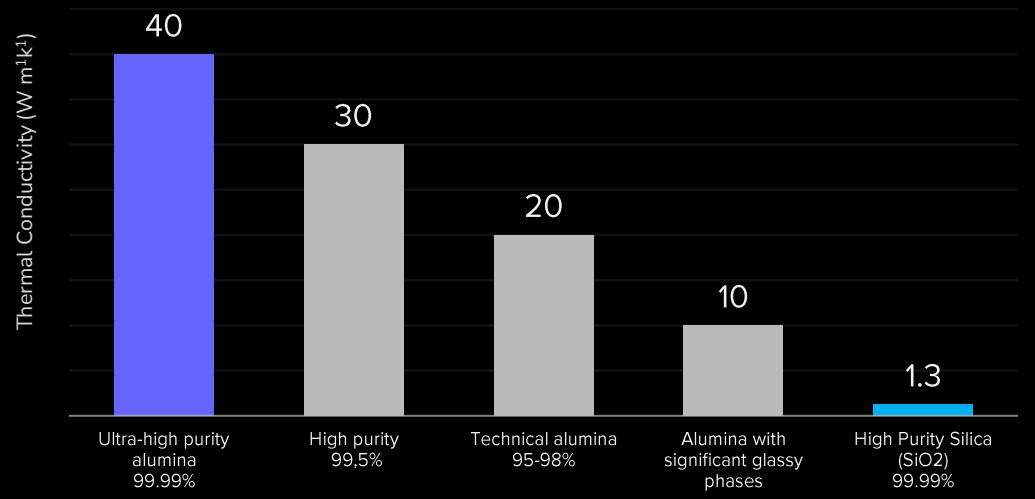
1 THE SWITCH TO HPA TO MANAGE DATA CENTRE COOLING

- Silica has long been used for thermal fillers in chip packaging. HPA is now emerging as the preferred material, offering superior heat dissipation and mechanical reliability for advanced semiconductors
- Chips are hitting thermal limits – materials must carry more heat out of the package
- HPA enabling higher computing output per kilowatt of energy at data centre level
- HPA vs silica: ~2–3× higher thermal conductivity for heat dissipation → ~4–5 °C cooler chips per accelerator
- Fleet impact scales to ~20–30 TWh/year energy savings by 2030 with full-stack adoption

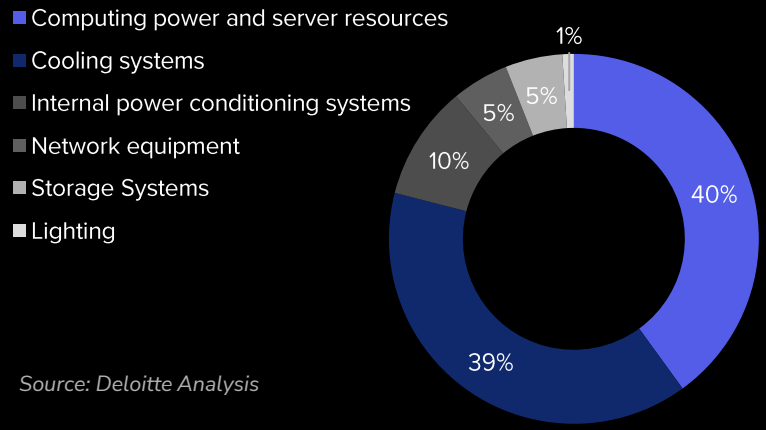
"There is growing industry attention on new packaging materials to unlock much-needed thermal efficiency in the next wave of AI hardware. Interest in High Purity Alumina (HPA) is growing due to its rare combination of thermal conductivity, electrical insulation, and mechanical compatibility"

Source: UBS – "Cooler Chips – Dec 2025"

HIGH PURITY ALUMINA IS >30x MORE EFFECTIVE AT DISSIPATING HEAT THAN SILICA. HIGH PURITY IS CRITICAL FOR HIGHEST THERMAL CONDUCTIVITY



Source: UBS – "Cooler Chips – Dec 2025"



COMPUTING POWER AND COOLING SYSTEMS DRIVE MUCH OF THE CONSUMPTION IN AI DATA CENTRES

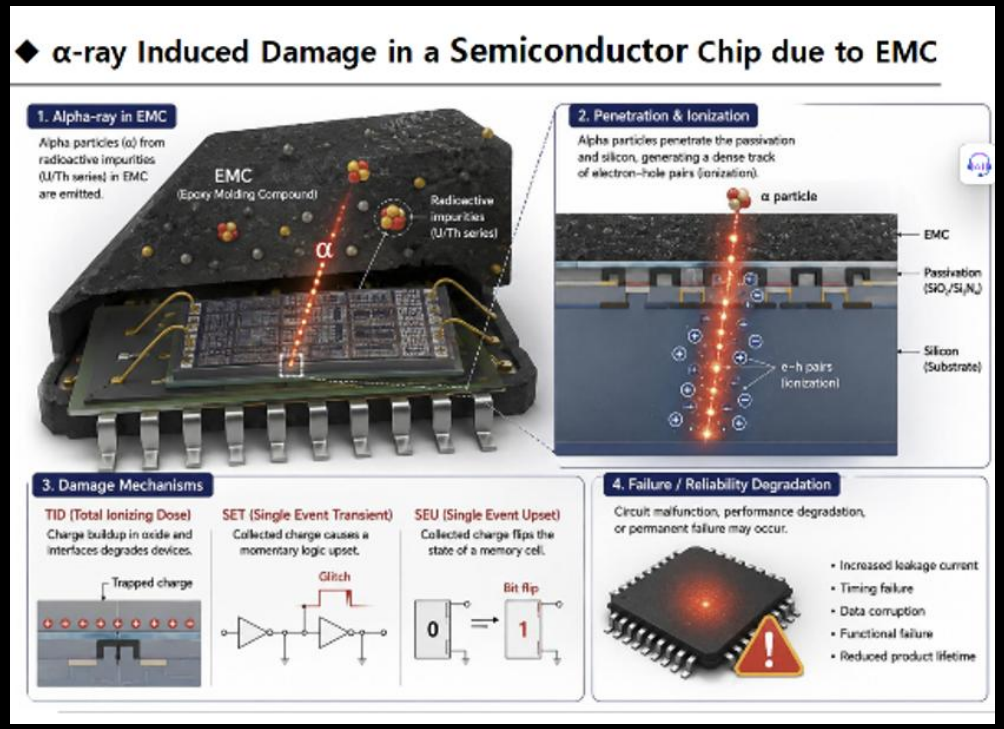
Source: Deloitte Analysis

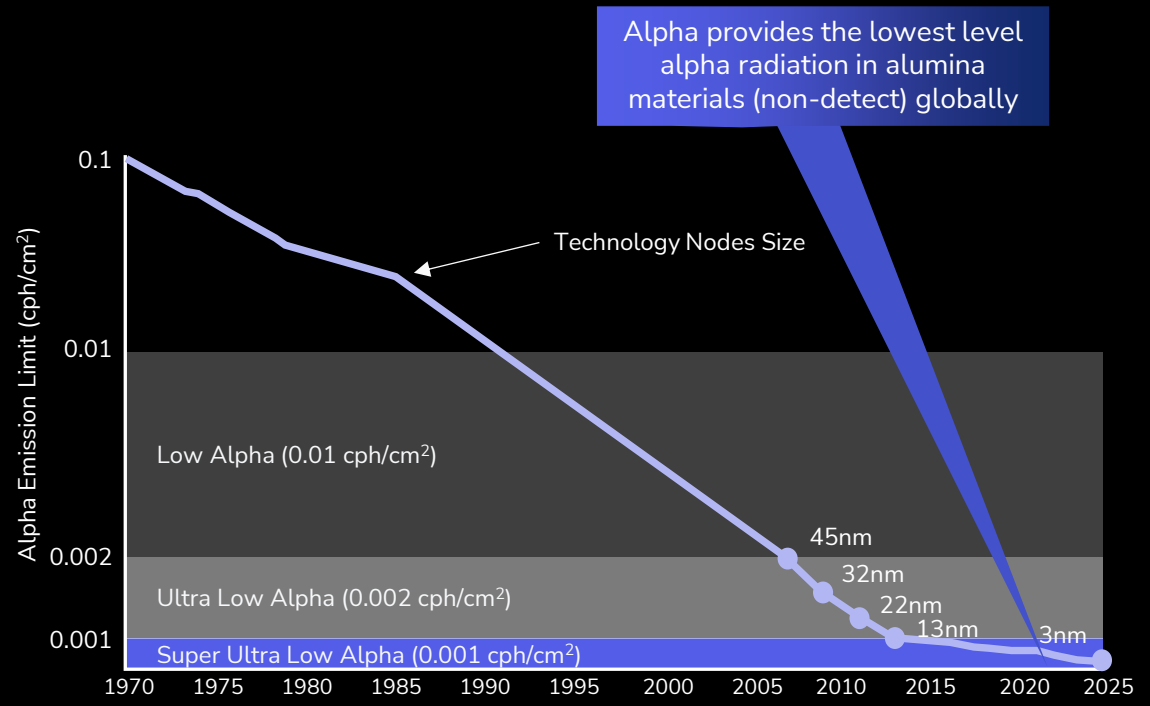
THE MATERIAL PROBLEM

AI AND OTHER TECHNOLOGIES ARE PUSHING MATERIALS INTO HARDER OPERATING CONDITIONS

2 HPA FILLERS REQUIRE ‘ZERO ALPHA’ SPECIFICATION

- As semiconductor nodes continue to reduce, ‘low-alpha’ emission alumina materials are becoming critical
- Increasingly adopted for thermal fillers and for ‘wafer adjacent’ ceramic parts in manufacturing equipment
- Emission of alpha radiation particles cause ‘bit-flips’ and soft errors
- Unique purification process removes all detectable levels of Uranium and Thorium
- Alpha HPA’s materials meet non-detect levels of alpha-radiation

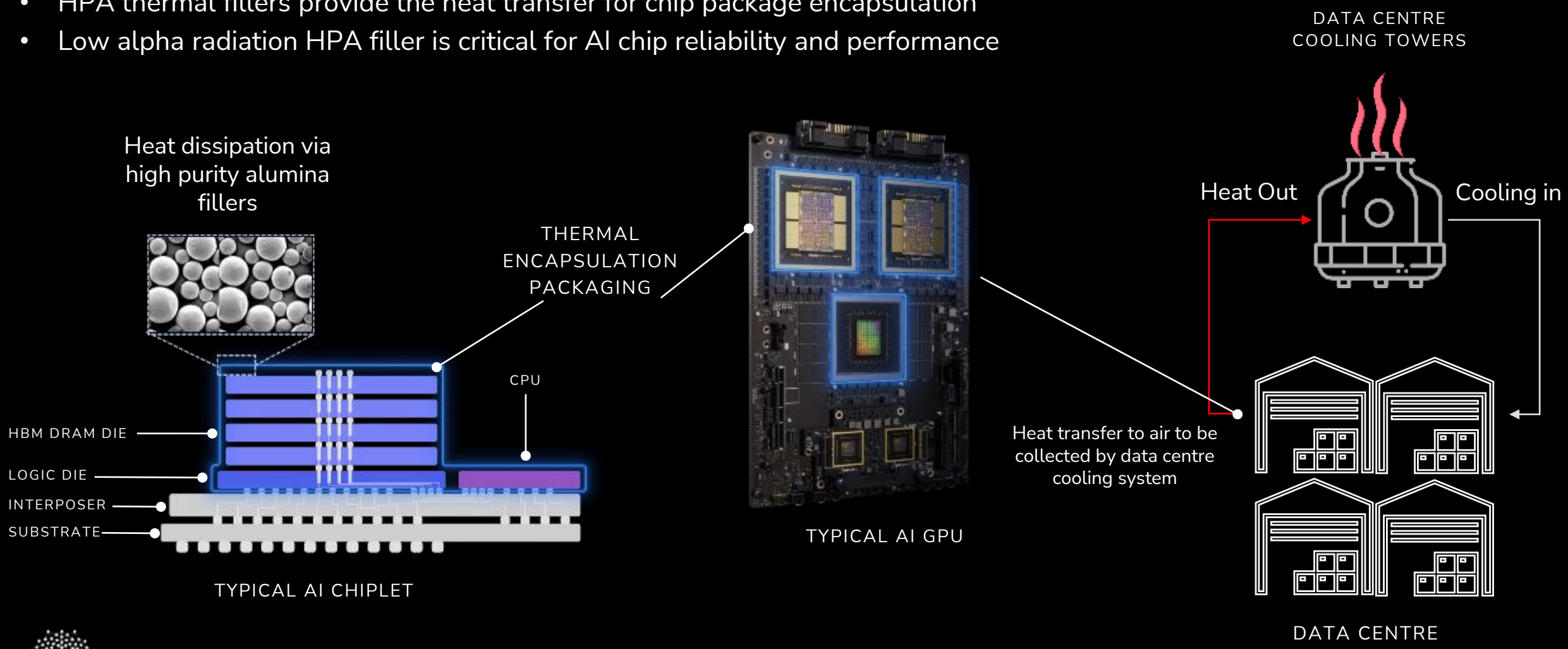




Source: Honeywell Advanced Materials

‘LOW ALPHA’ HPA FILLERS: THE FRONT LINE OF HEAT MANAGEMENT

- HPA thermal fillers provide the heat transfer for chip package encapsulation
- Low alpha radiation HPA filler is critical for AI chip reliability and performance



Schematic of AI Graphics Process Unit
HPA use case based on confirmed end use for Alpha’s material

AlphaHPA

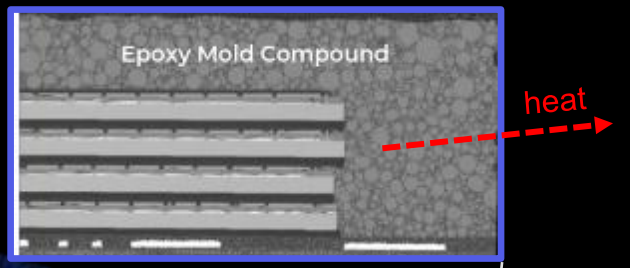
HPA ADOPTION IN AI ACCELERATOR PACKAGING

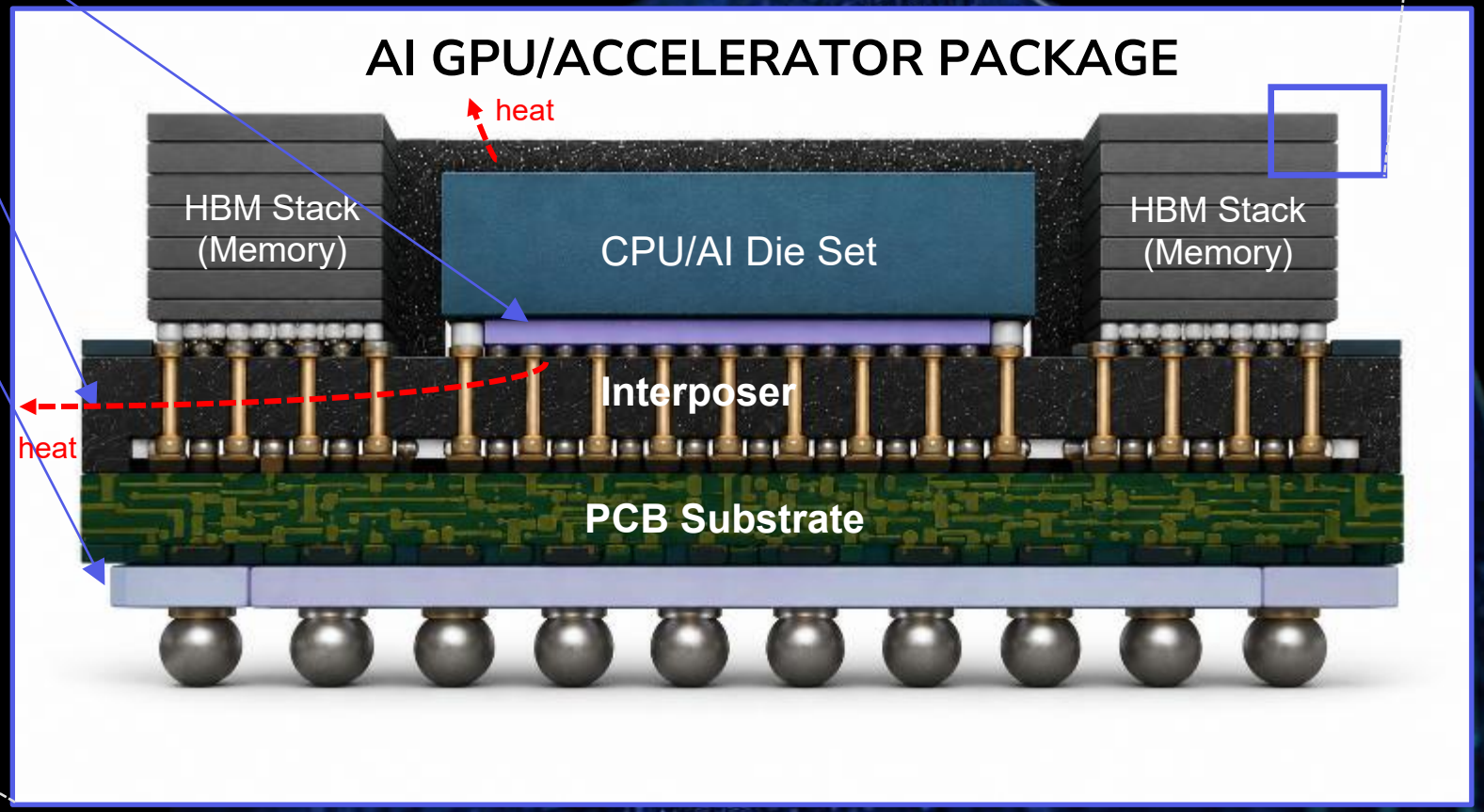
Spherical HPA for Die-Attach Film (DAF):
Adoption to spherical, 'low-alpha' HPA underway
A4N Products: AAP, ATH, GAP-X

Interposer:
Selected transitioning to low-alpha HPA for heat dissipation
A4N Products: AAP, AAP-X

Base Plate
Sintered alumina – transitioning to low alpha HPA
A4N Products: AAP, AAP-X

Spherical HPA for thermal fillers in EMC
90% ceramic filler
Adoption to spherical, 'low-alpha' HPA underway
A4N Products: AAP, ATH, GAP-X





AI Accelerator example:

NVIDIA Blackwell GPU

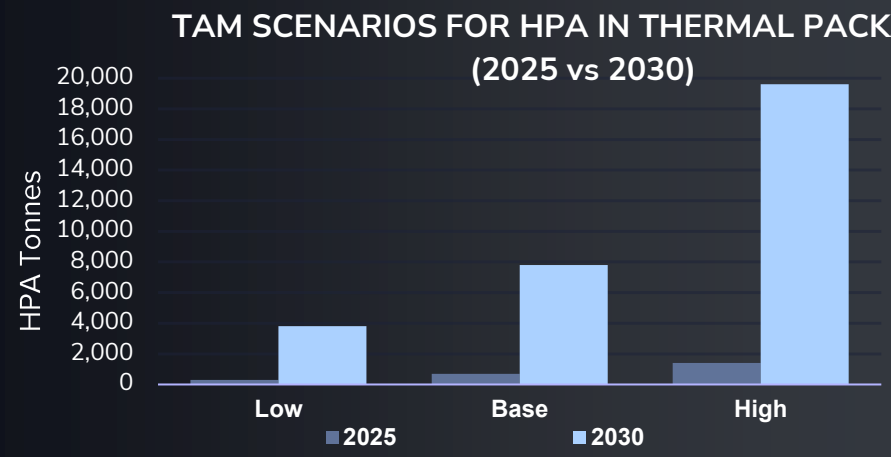


HPA IN THERMAL FILLERS: MARKET OUTLOOK

Strong forecast demand - directly correlated to AI/Data Centre CapEx deployment

1 UBS RESEARCH FORECASTS SIGNIFICANT UPSIDE FOR HPA IN THERMAL PACKAGING ACROSS MULTIPLE MATERIALS AND APPLICATIONS

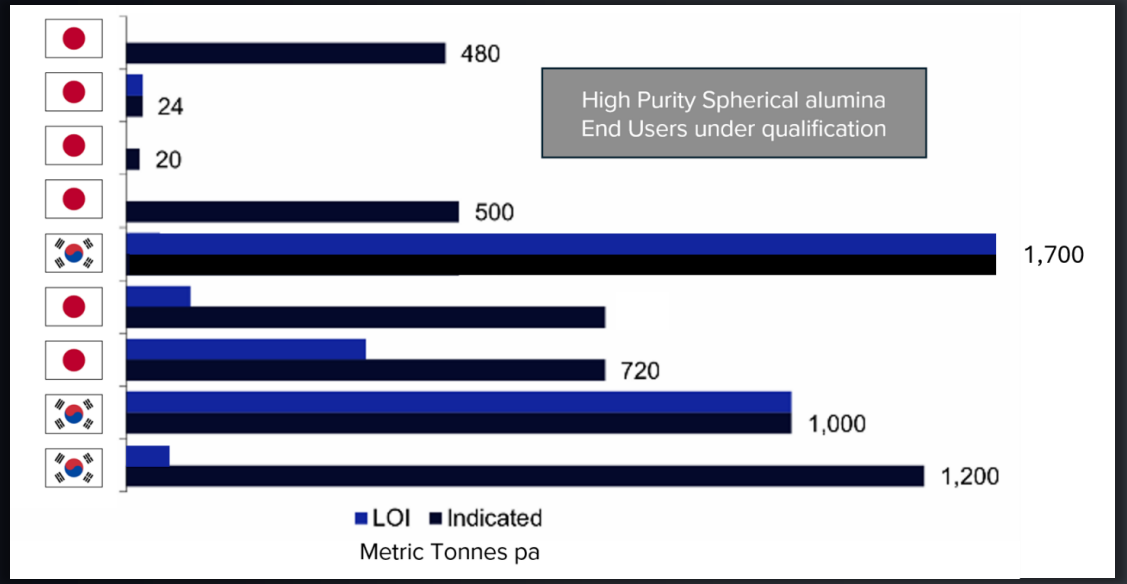
- Base Case: ~8,000 tonnes by 2030
- High Case: >18,000 tonnes by 2030 (includes underfills, EMCs, die-attach, gap fillers, thermal pads, ceramic packaging compounds)



Source: UBS Research – "Cooler Chips – Dec 2025"

2 ALPHA MARKET INTELLIGENCE MATCHING 3RD PARTY MARKET ASSESSMENT

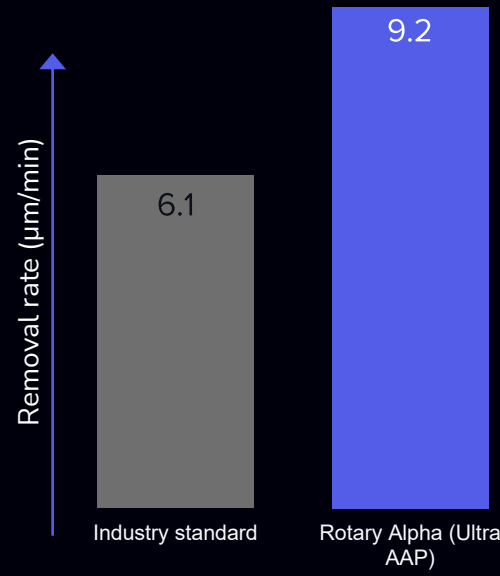
- Confirmed demand of at least 6,300 tonnes pa from direct end-users under qualification or LOI



Source: Alpha HPA Market Intelligence

OUTPERFORMANCE IN CMP

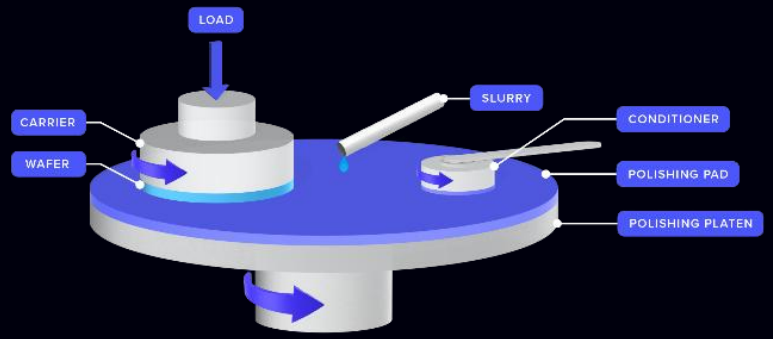
- CMP (Chemical Mechanical Planarisation) is essential for precision wafer polishing in advanced semiconductor manufacturing
- Alpha's process delivers a novel HPA particle that can deliver up to 50% higher removal rates and superior selectivity on hard substrates (Si-umC, Hard Carbon Masks, GaN, BN, AlN, Packaging, Sapphire)



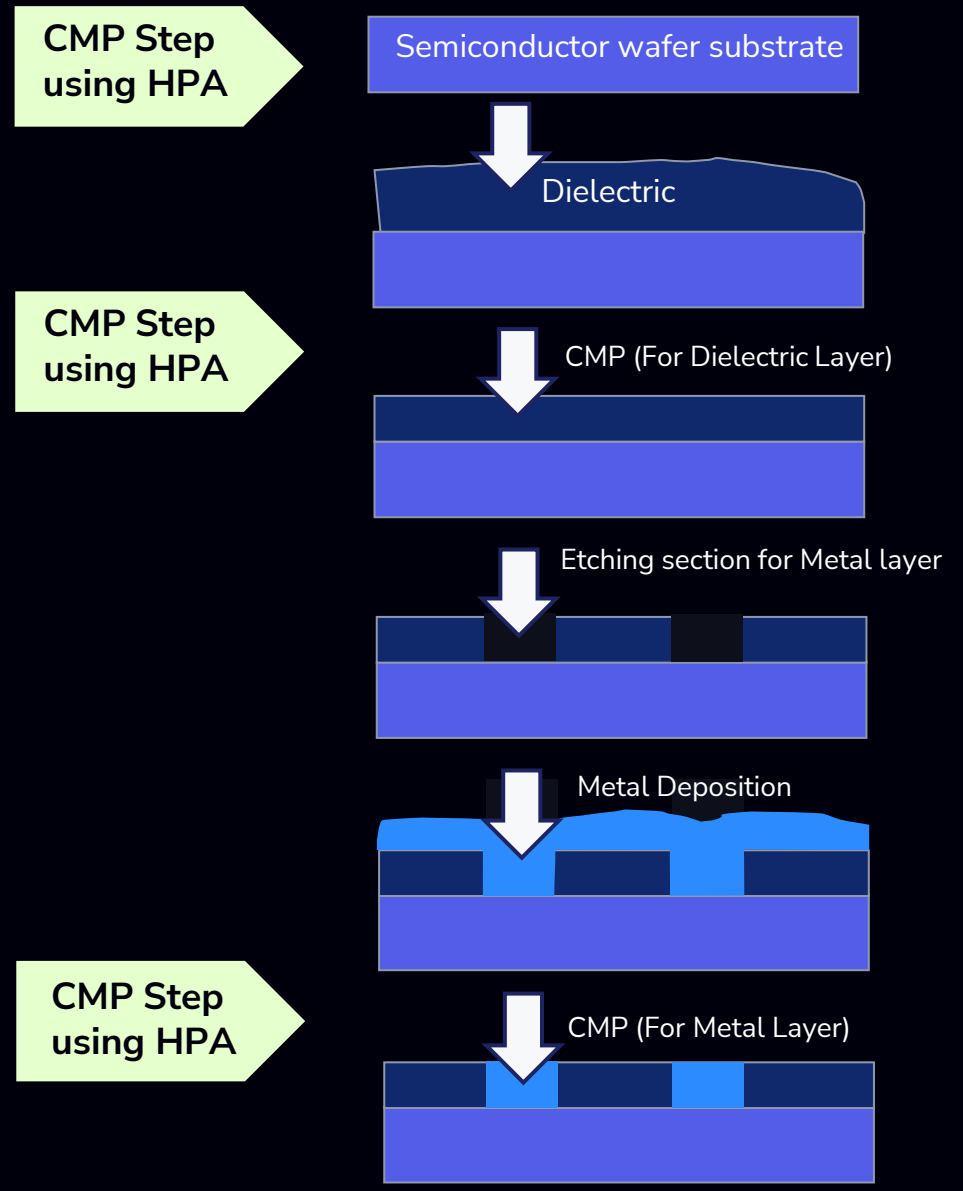
50% higher removal rate performance using Alpha's novel HPA particle:

Si-C wafer substrate

Source: Alpha



PROFILE SCHEMATIC OF CMP STEPS IN SEMICONDUCTOR MANUFACTURING



Each semiconductor wafer requires an average 25-25 CMP steps

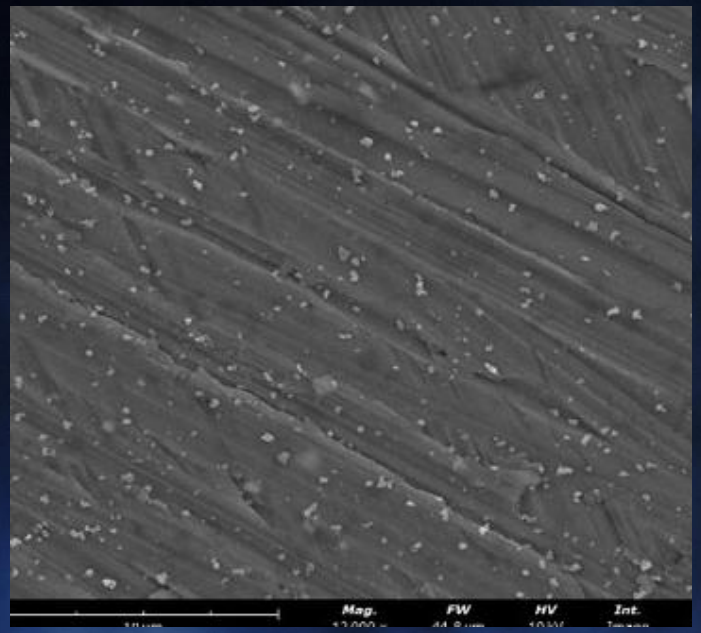
ULTRA AAP-D ™
High Purity nano-alumina Dispersions

- Product Code: **Ultra AAP-D**
- High purity alpha-phase alumina dispersion
- Custom d50: 90 – 200nm

- Typical Purity: +99.99% Al_2O_3
- Supplied as DI water dispersion 10 - 20wt% solids



Netzsch – Zeta 10 system in operation at Stage 1



SEM - alumina solids



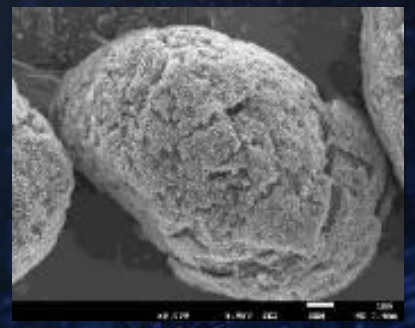
5N AL-NITRATE UNLOCKS Li-B SAFETY TECHNOLOGY

- Alpha HPA is the first commercial scale manufacturer of 5N purity Al-Nitrate
- Unlocks dormant Li-ion battery safety technology – anode and cell case coatings
- Technical approval from a global, Tier #1 Li-B anode OEM after +24 months test work
- Coated synthetic anode material, coated using Alpha's Al-Nitrate delivers proven capacitance, thermal stability (safety) and charging benefits
- Letter of Intent for up to 5,000tpa Al-Nitrate

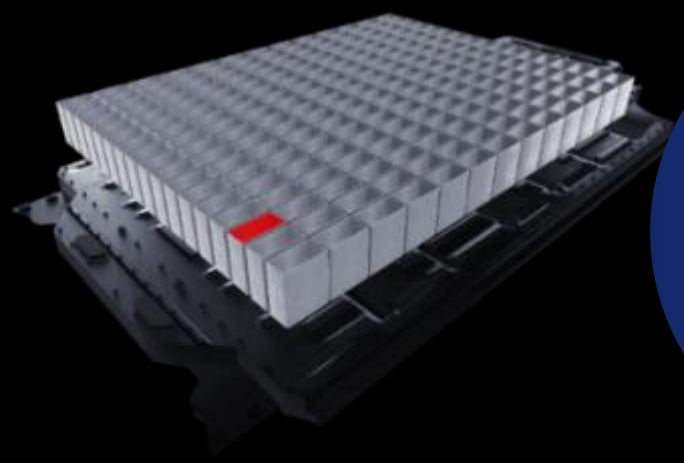
PARTICLE COATING
Alpha UltraCoat



UNCOATED
Raw, uncoated graphite AAM particles.



COATED
Ultra fine (Al-oxide coated AAM particles).



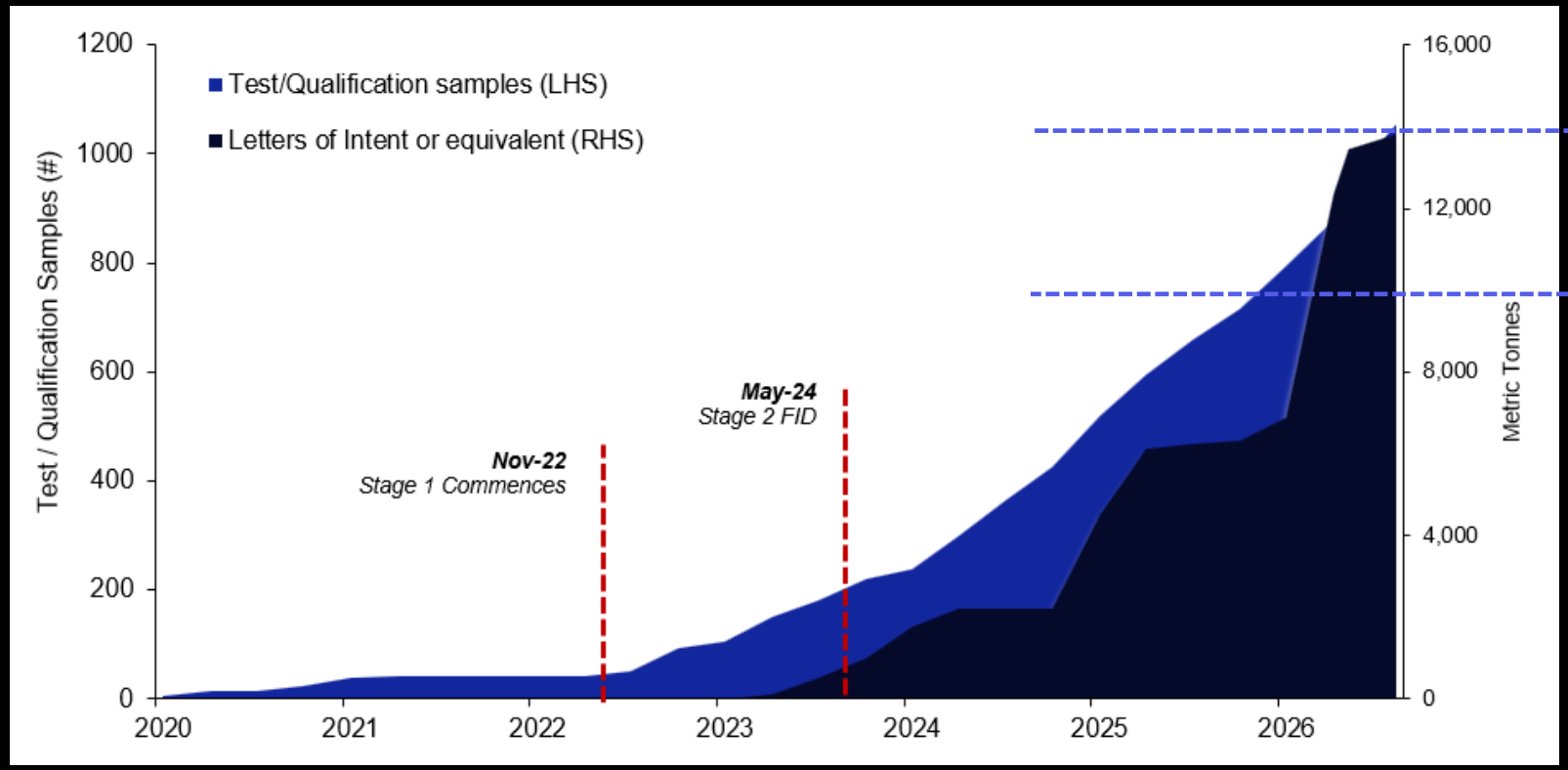
Up to 100% reduction in thermal runaway with Al-Nitrate based coating on cell casing and/or anode materials



On 14 April 2025 the China Ministry of Industry and Information Technology (MIIT) introduced a rigorous new set of technical standards for the batteries in electric vehicles

STAGE 2 +1.3x OVERSUBSCRIBED
DOMINATED BY SEMICONDUCTOR DEMAND

- Product Test samples (which include sales) >800 since Jan 2024 and >1,000 total
- Ongoing qualification with >100 end-users
- Velocity of test sample number and total volume still building
- **<u>Test sampling activity has proven a reliable leading indicator to LOI coverage</u>**
- Recent LOIs include:
  - For up to 1,700 metric tonnes pa of ATH and HPA – South Korean ceramics company in HBM supply chain
  - For up to 5,000 metric tonnes pa for Lithium Ion Battery application



LOI COVERAGE
13,830tpa

STAGE 2 CAPACITY
10,430tpa

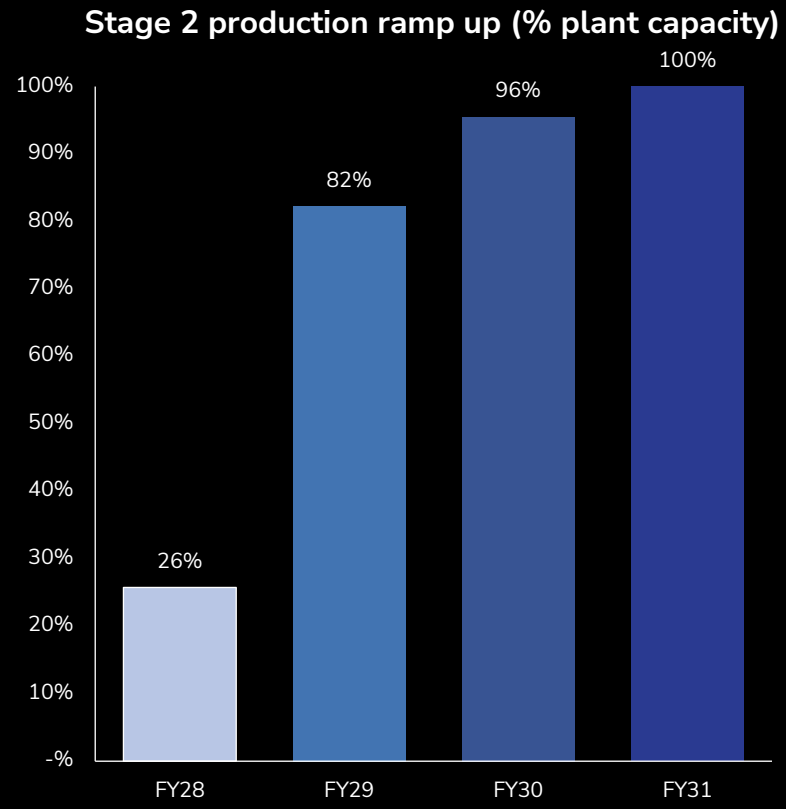
STAGE 2 : PROJECT METRICS

Strong margins (~73%) with some pricing upside as markets mature

- Some upside in FY28 ramp up
- Feed on second half CY27
- >80% of product expected to enter semiconductor supply chain

	$US (M)[1]	$A (M)[1]
Key Project Metrics at 100% production	**Steady State FY31 (Nominal)**	**Steady State FY31 (Nominal)**
Annual Revenue	282.0[1]	402.8[1]
Annual Operating Costs	(76.3)	(109.1)
EBITDA (Less Payroll Tax & Royalty)	**202.0**	**288.6**
Unit Cash Cost ($/kg of aluminium product)	(7.30)	(10.50)
Weighted Average Product Price ($/kg)	27.0	38.6
CapEx (including contingency)[2]	489.5	699.2
Production Volume (mt)	10,430	10,430

2026 CapEx Contingency = A$53m[2]



[1] October 2025 real product prices taken as basis for calculating nominal FY31 revenue forecast
[2] Exchange rate of $A:$US = 0.7

Alpha **SAPPHIRE**

- Phase A production - supplying good clarity and higher yield boules for C plane wafers for GaN semis and boules for an optics customer
- Supplied ~1,000kgs of sapphire boules to an optics customer

GaN-on-Sapphire requires wide-format (8”), C-plane wafers

- Ideally suited to Alpha’s investment in next generation wide-format growth technology
- Qualification is continuing with a total of 310 wafers supplied to a global tier-1 semiconductor OEM
  - YTD 2026 - 200 wafers delivered, double and single sided polished wafers
- Working through qualification of an additional wafering partner.





Complete C-Axis sapphire boule and wafer

Alpha HPA

THANK YOU

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