# Canaccord Genuity Growth Conference

August 2024

IperionX Limited
NASDAQ and ASX: IPX

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**Competent Persons Statements**
The information in this document that relates to Exploration Results and Mineral Resources is extracted from IperionX's ASX Announcement dated October 6, 2021 ("Original ASX Announcement") which is available to view at IperionX's website at www.iperionx.com.

The Company confirms that a) it is not aware of any new information or data that materially affects the information included in the Original ASX Announcement; b) all material assumptions and technical parameters underpinning the Mineral Resource Estimate included in the Original ASX Announcement continue to apply and have not materially changed; and c) the form and context in which the relevant Competent Persons' findings are presented in this report have not been materially changed from the Original ASX Announcement.

IPERIONX LIMITED
ABN 84 618 935 372

# Our plan is to re-shore a low cost, sustainable, U.S. titanium supply chain

1. Titanium supply chain is currently high cost, environmentally unsustainable and dominated by China and Russia
2. IperionX offers an end-to-end, cheaper and cleaner solution via innovative technologies
3. Our technologies have been proven with over 18+ months of industrialized pilot scale production in Utah
4. Large scale production begins in Virginia during 2024 with 100% titanium metal scrap feedstock
5. Future backward integration using up-graded minerals from Titan Projects' critical titanium mineral resources
6. Longer-term ambitions to disrupt the US$300+ billion stainless steel and aluminum markets
7. Led by an experienced management team, with strong support from Tier-1 investors

# Titanium has superior material properties that are prized across advanced industries

### High strength-to-weight ratio
Titanium alloys can have a far higher strength-to-weight ratio than aluminum and magnesium alloys

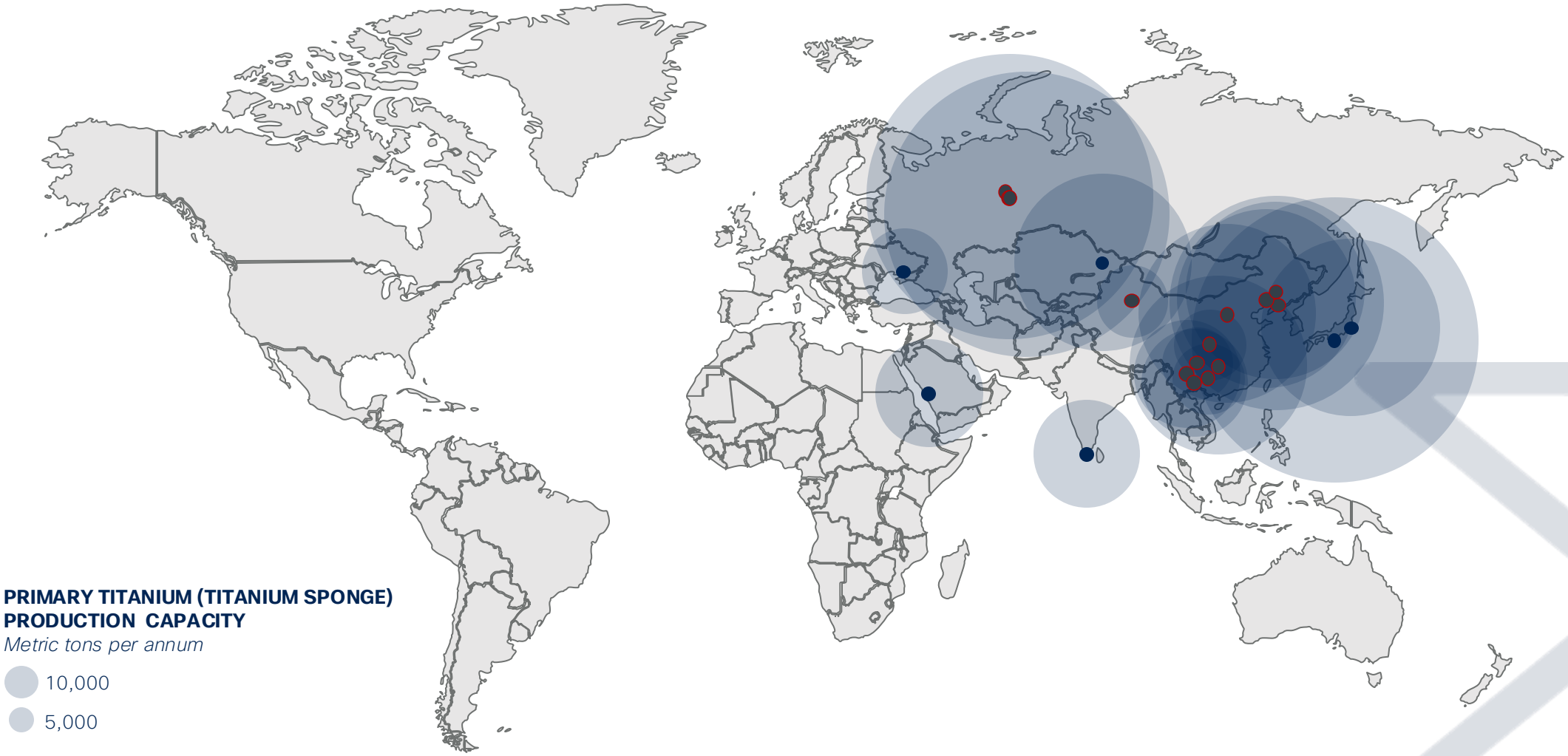
### 45% lighter than steel
Titanium alloys can be 3-5x stronger than stainless steel

### Superior corrosion resistance
Durable, long-life products that don't need paint

**Lockheed Martin F-35 Lightning II**
*~20% titanium by weight*


**Consumer Electronics**
*Titanium used in frames and enclosures*

# China and Russia control ~70% of the global titanium supply chain




Source: U.S. Geological Survey. Locations shown are approximate. Primary global titanium supply chain.

# Current production of titanium is complex, high cost and unsustainable

- High temperature (1,300°C), highly corrosive chlorination, reduction and distillation process to form titanium metal sponge
- High temperature (1,850°C) multi-vacuum melting processes to form 6-11t ingots
- 5-15% typical yield from ingot to final titanium metal part
- High-energy, high-carbon, and unsustainable titanium supply chain

# IperionX's simple, low waste, vertically integrated solution

## Current Industry

***Up to 10 forging / rolling steps***

Feedstock → Chlorination → Reduction & Distillation → Vacuum Arc Remelting → Forging → Rolling → Machining → Products





| Titanium Minerals | Titanium Sponge | Titanium Ingot | Titanium Mill Products | Titanium Products |
|---|---|---|---|---|
| | (<95% yield) [1] | (<85% yield)[2] | (~50-75% yield)[2,3,4,5] | (~5-15% yield) [2,3,4] |

IPERIONX

Feedstock → IPX HAMR Process → IPX HSPT Process → Machining → Products






| Titanium Scrap and / or Minerals | Titanium Powder | Titanium Mill Products or Near Net shapes | Titanium Products |
|---|---|---|---|
| | (~85-95% yield) | (~85% yield) | (~50-80% yield) |

IperionX yield figures will vary depending on final products and consolidation routes shown. Titanium Powder yield varies depending on scrap vs. mineral source.

1. Based on implied yield losses from TiCl4 to Sponge in Nagesh et. Al. 2004: "Mechanism of Titanium Sponge Formation in the Kroll Reduction Reactor"; 2. Oak Ridge National Laboratory (ORNL) 2012 Report: "Near Net Shape Manufacturing off New, Low Cost Titanium Powders for Industry"; 3. Boeing, ORNL, APCI 2012 Report for DoE: "Near-Net Shape Fabrication using Low-Cost Titanium Alloy Powders"; 4. RAND Corporation 2009 Report: "Titanium Industrial Base, Price Trend, and Technology Initiatives"; 5. Dept. of Energy 2008 Report "FY 2008 Progress Report for Lightweighting Materials – 4. Automotive Metals – Titanium"

# A Step Change in the Titanium Supply Chain

| | Current Industry | IPERIONX |
|---|---|---|
| $TiO_2$ Reduction Process | **Kroll** ($Cl_2$ gas, 1,300°C) | **HAMR** (<700°C) |
| Titanium Refining | **VAR** (1,850°C) | |
| Titanium Forging | **Traditional Hot Working** (Open or close die forging + Rolling or Extrusion) | **HSPT** (Sintering process) |
| Semi-finished Products | **Mill Products** (Bars, Sheet, Wire etc.) | **Near Net Shapes** or **Mill Products** |
| High quality microstructure | **Yes** | **Yes** |
| Final part machining requirements | **High** | **Low** |
| Yield to final parts | **5-15%** | **50-85%** |
| Carbon emissions (Scope 1 & 2)[1] | **High** | **Zero** |
| Energy consumption | **High** | **Low** |

1. IperionX carbon emissions based upon use of renewable power

# We have successfully proven large scale titanium production

- 18+ months of titanium production from our industrial pilot facility
- Multiple large scale hot-test runs at ~60x the production capacity of our industrial pilot facility
- Production results exceeded industry standards
- Off-the-shelf, low cost and scalable technology
- Furnace installed at Virginia and first production run complete

# Our high-performance titanium products have secured the interest of leading potential customers

VEGAS FASTENER MANUFACTURING

*Industrial Fasteners*

LOCKHEED MARTIN

*Aerospace and Defense*

CANYON

*Bicycles and E-mobility*

United Stars, Inc.

*Industrial Gears*

GKN AEROSPACE

*Aerospace and Defense*

RICHEMONT

*Consumer and Luxury Goods*

CARVER PUMP™

*Naval and Defense*

1. Richemont: See ASX announcements dated August 20, 2022 and November 17, 2022 for details; AFRL: See ASX announcement dated January 18, 2023 for details; Carver Pump and NAVSEA (US Navy):See ASX announcement dated February 6, 2023 for details; U.S. Navy's Naval Air Systems Command: See ASX announcement dated February 3, 2022 for details; SLM: See ASX announcement dated March 14, 2023 for details; Canyon: See ASX announcement dated March 29, 2023 for details; Ford: See ASX Announcement dated June 13 2023 for details; Lockheed Martin: See ASX Announcement dated July 18 2023 for details; GKN Aerospace: See ASX announcement dated October 2, 2023

# We are now scaling to commercial production at our Virginia Titanium Manufacturing Campus


***Titanium Production Facility***
***"TPF / 1080 Building"***

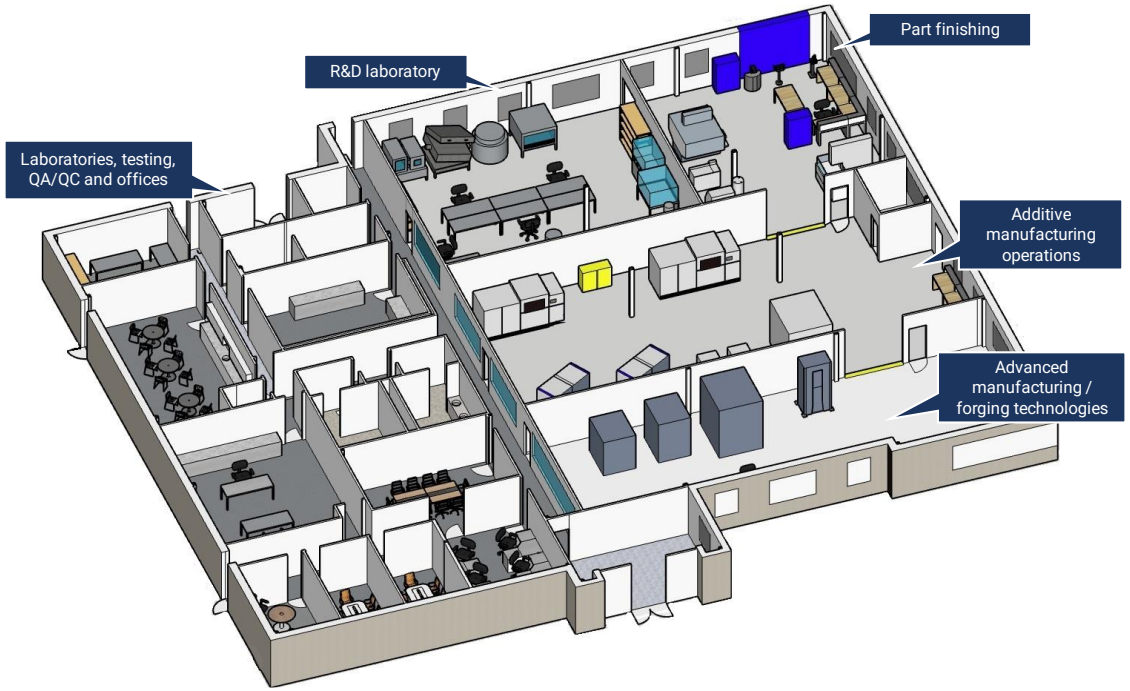
*"Refining" of titanium scrap into high-quality titanium metal powders*

***Advanced Manufacturing Center***
***"AMC / 1092 Building"***

*"Forging" and "printing" of titanium metal powders into high-quality titanium metal products*

# Titanium Production Facility – furnace installed, with first titanium production run complete

- **Increasing titanium production capacity by +60x**
  Scaling from ~2 tpa to 125+ tpa of titanium powder
- **Phased, low capital intensity production growth**
  Multiple pathways to scale in a modular, low cost approach
- **Production growth drives lower operating costs**
  Pathway to lower costs below cost of traditional ingot manufacturing
- **Multiple U.S. Government funding opportunities**
  U.S. government funding options include grants and equipment finance


# Advanced Manufacturing Center - first titanium products produced, scaling in Q3 2024

**Advanced manufacturing of high-strength titanium products**
Semi-finished titanium products, near-net shape forged titanium components and high-value titanium products using additive manufacturing

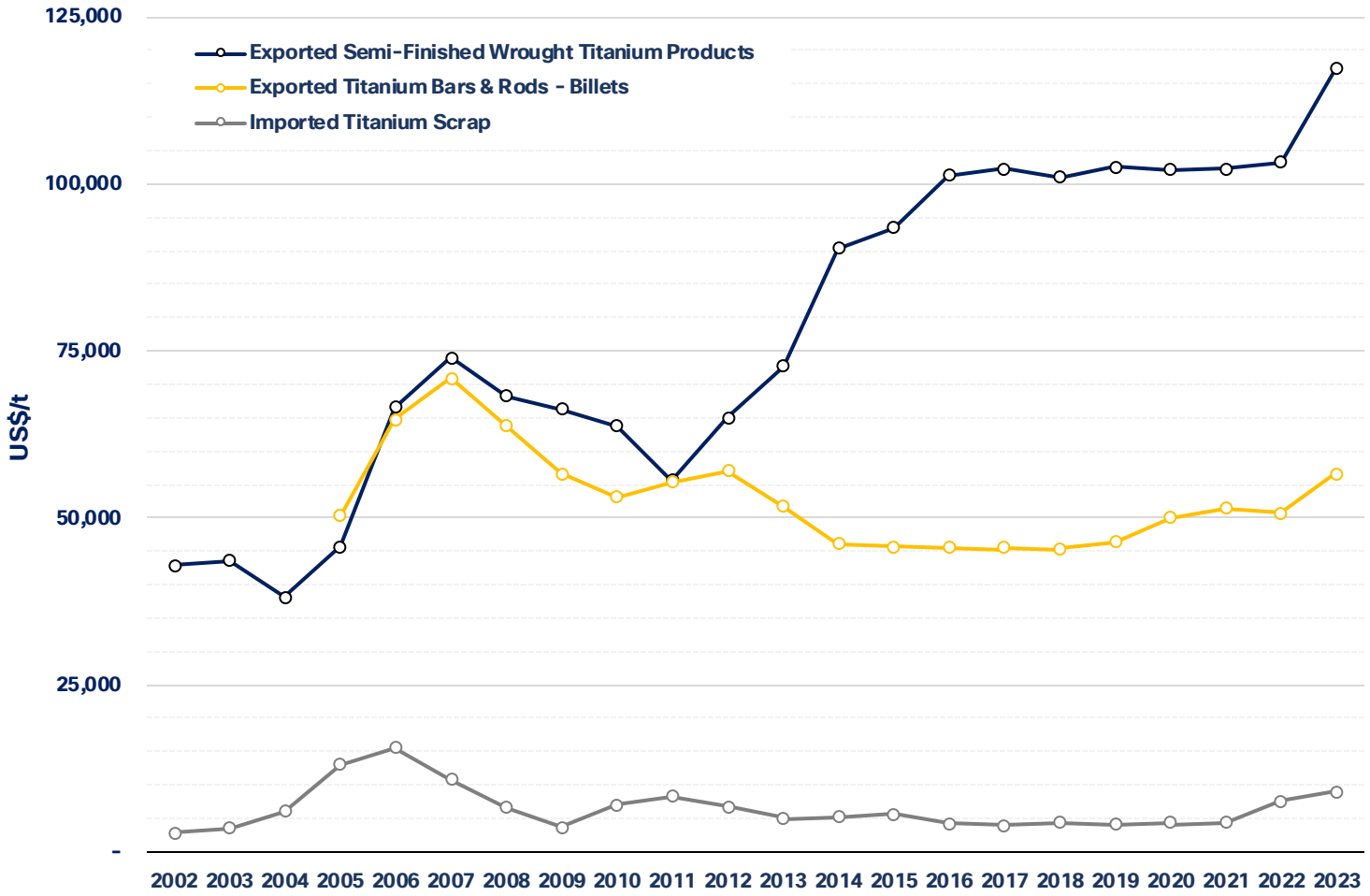
**Manufacturing high-performance titanium product range**
Sustainable competitive advantage captures value uplift from manufacturing high-performance titanium products

**Advanced center for titanium research and development**
Commercial development of titanium alloys, powder metallurgy and manufacturing technologies


# Titan Project underpins a low-cost, end-to-end U.S. titanium supply chain solution

- The fully permitted Titan Project in Tennessee is one of the largest titanium mineral resources in North America
- Titan Project combined with our titanium technologies to deliver an end-to-end solution for the U.S. titanium supply chain
- Titan Project is a leading U.S. resource of critical titanium, zircon and rare earth minerals
- Further technical studies will be advanced once third-party funding opportunities – including U.S. Government funding applications and multiple strategic customer negotiations – are successfully completed

# The U.S. titanium supply chain is fragmented, high risk, and vulnerable to supply shocks




- **~US$117,000 per tonne pricing on ~US$1.1bn** of U.S. exported semi-finished titanium products in 2023
- **~US$57,000 per tonne pricing on ~US$0.5bn** of U.S. exported bar and rod / billet titanium products in 2023
- **Supply constrained, rising price environment** with the average price of exported semi-finished titanium products rising 14% in 2023, reflecting:
  - Supply shocks from Russia's invasion of Ukraine
  - Raw material price increases and disruptions
  - Increasing demand for titanium

Source: USITC DataWeb

# Led by a highly experienced senior leadership team

**Anastasios “Taso” Arima**
**Co-founder, MD and CEO**
Successful founder of multiple billion-dollar companies, including most recently Piedmont Lithium (Nasdaq: PLL)

**Todd Hannigan**
**Executive Chairman**
25+ years of global experience in natural resources as company founder, CEO, private capital investor, and non-executive director

**Toby Symonds**
**President, Chief Strategy Officer**
30+ years in capital markets, founder of two asset management firms

**Scott Sparks**
**Chief Operating Officer**
30+ years in engineering, construction and management

**Jeanne McMullin**
**Chief Legal Officer**
25+ years in corporate law, previously CLO of start-up tech PE firm

**Marcela Castro**
**Chief Financial Officer**
25+ years of financial leadership experience across multiple industries

**Dominic Allen**
**Chief Commercial Officer**
15+ years commercial experience across the metals and minerals sector

## Independent Board Members

**Lorraine Martin**
**Audit Committee Member**
**ESG Committee Member**

35+yrs senior aerospace exec. at Lockheed Martin, CEO National Safety Council, Board Member; Kennametal

**Beverly Wyse**
**Audit Committee Member**
**Rem. Committee Member**
**ESG Committee Member**

30+yrs senior aerospace exec. at Boeing, Board Member; Heroux-Devtek

**Melissa Waller**
**ESG Committee Chair**
**Rem. Committee Member**

30+yrs senior finance exec. President of the AIF Institute

**Vaughn Taylor**
**Audit Committee Chair**
**Rem. Committee Chair**

20+yrs senior investment executive, Ex CIO of AMB Capital Partners, Board member global organizations

# High value catalysts are imminent

**Secure strategic partners for our titanium metal products**

- ☑ Test powders and/or prototype parts with prospective customers
- ☑ Secured prospective customer and government validation
- ☑ Secure additional customers across core industry sectors

**Scale up production of titanium powder and products**

- ☑ Titanium Production Facility (expansion to 1,000+tpa) CAPEX and OPEX
- ☑ Large scale furnace hot test and powder production run
- ☑ Complete final engineering for Titanium Production Facility
- ☑ Commence equipment installation at Titanium Production Facility
- ☑ Commission HAMR furnace at Titanium Production Facility
- ☑ Produce titanium components at Advanced Manufacturing Center

**Progress Titan Project to be construction ready**

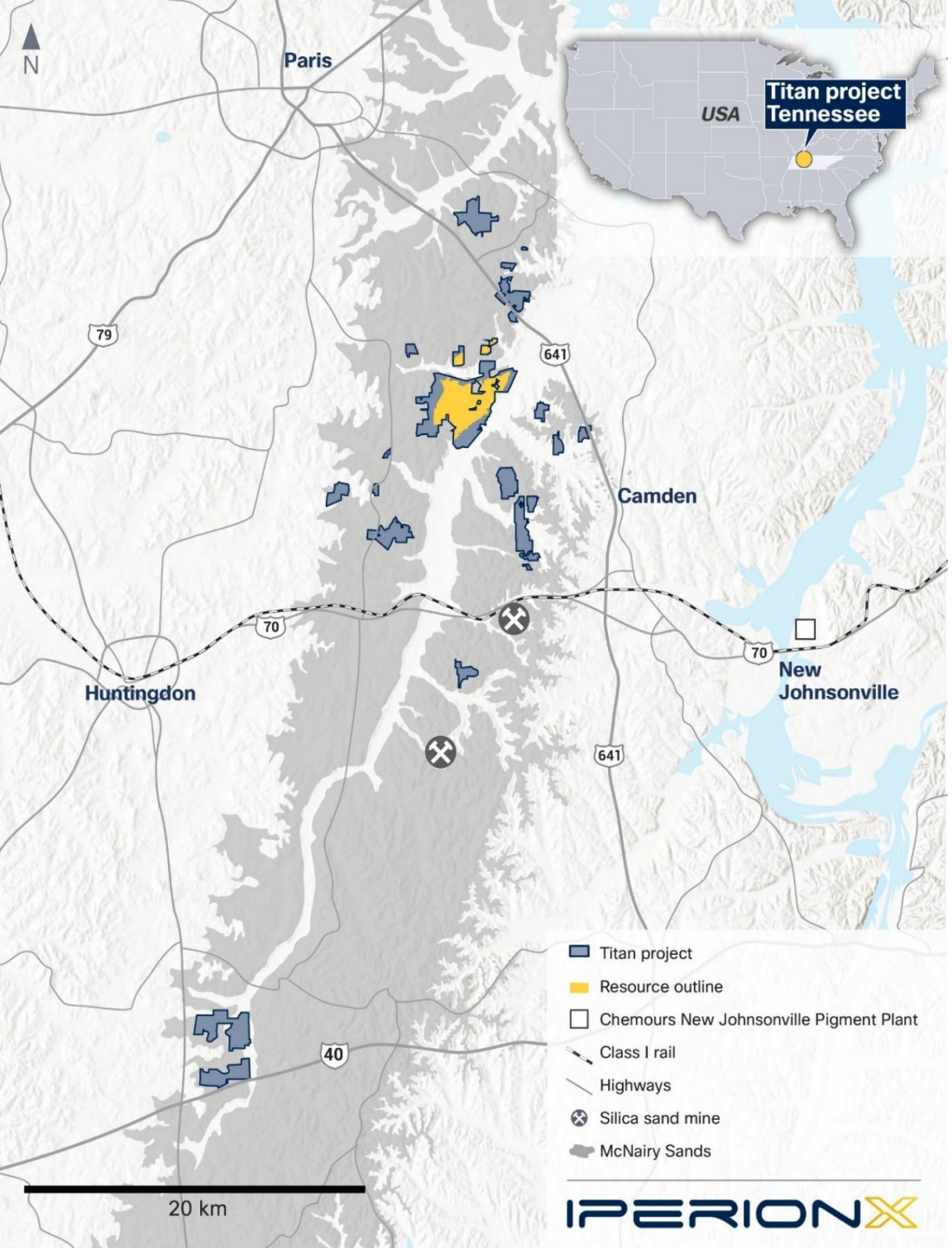
- ☑ Definition of largest known titanium mineral resource in U.S.[1]
- ☑ Scoping Study / Initial Assessment completed
- ☑ State Mine and NPDES permit
- ☑ PFS and / or FS, critical minerals sales contracts and FID

## Corporate Overview (NASDAQ / ASX Ticker Symbol: IPX)


| | |
|---|---|
| **Ordinary Shares / ADR's (1:10) Outstanding** | **260.9 million / 26.1 million** |
| **Market Capitalization (9-August-2024)** | **~US$360 million** |
| **Cash (30-Jun-2024, pro-forma)** | **~US$38 million** |
| **Fidelity Management and Research (FMR)** | **~10%** |
| **Fidelity International (FIL)** | **~7%** |
| **Insider/management Ownership** | **~30%** |

1. JORC and SK-1300 code compliant

# Supporting Information




# Titan Project is a very large potential source of U.S. titanium minerals

- Titanium, zircon and rare earth critical minerals
- Geological target is the McNairy Sand, a massive mineral formation that extends across West Tennessee
- Existing mineral resource estimate covers only a small portion of the secured landholdings
- Potential for new resource discoveries within land controlled by IperionX
- Opportunities to add new land holdings to further increase the resource base

| JORC Mineral Resource[1] | | | | | Total Critical Mineral Assemblage | | | |
|---|---|---|---|---|---|---|---|---|
| **Titan Project** | **Cut-off** | **Tonnes** | **TCM %** | **TCM** | **Zircon** | **Rutile** | **Ilmenite** | **REE** |
| | *(TCM %)* | *(Mt)* | *(%)* | *(Mt)* | *(%)* | *(%)* | *(%)* | *(%)* |
| Indicated | 0.4 | 241 | 2.2 | 5.3 | 11.3 | 9.3 | 39.7 | 2.1 |
| Inferred | 0.4 | 190 | 2.2 | 4.2 | 11.7 | 9.7 | 41.2 | 2.2 |
| **Total Mineral Resource** | **0.4** | **431** | **2.2** | **9.5** | **11.5** | **9.5** | **40.3** | **2.1** |
| ***Including High Grade Core*** | ***2.0*** | ***195*** | ***3.7*** | ***7.1*** | ***12.1*** | ***9.9*** | ***42*** | ***2.3*** |

1. See ASX announcement dated October 6, 2021 for details

# IperionX's Green Rutile™ technology could add significant value to the Titan Project

- IperionX's patented low-carbon "Green Rutile™" mineral enrichment technology can upgrade lower-grade ilmenite titanium minerals into a high-grade, higher-value titanium 'synthetic rutile' product
- Green Rutile™ has been successfully proven at a bench scale, with pilot scale production design now underway for completion in 2024
- Green Rutile™ process could also unlock value with potential critical co-products such as LFP battery feedstock or high-purity iron powder
- Low-carbon Green Rutile™ product has been successfully tested by potential customers in Japan and the U.S.
- IperionX plans to integrate Green Rutile™ enrichment plant options into the Titan Project's PFS and / or Feasibility Study, to potentially add significant value to the Titan Project's final economics

# Titan Project Technical Studies

- **IperionX has now completed key long lead assessments for the Titan Project PFS and / or Feasibility Study, including metallurgical test work and permits**

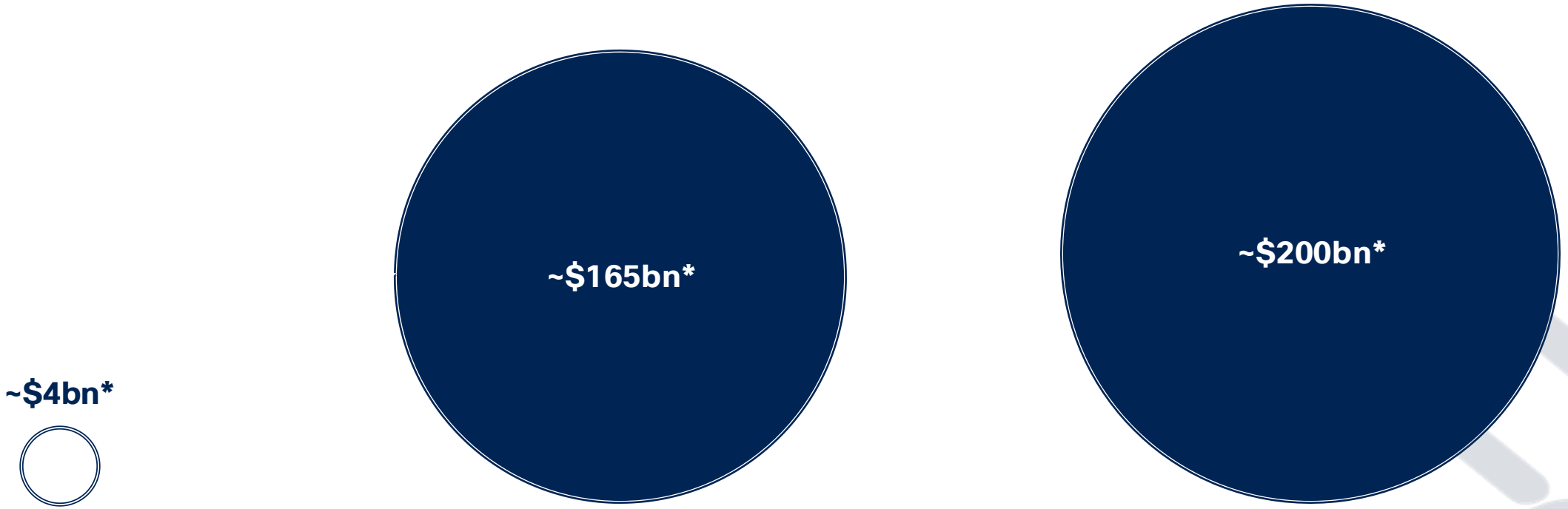
- ***Titan Project technical studies (PFS and / or Feasibility Study) are anticipated to be advanced and completed following the culmination of the below activities, which may conclude in late 2024:***

  - *Completion of Green Rutile™ pilot process design studies, for full integration into the final Titan Project PFS and / or Feasibility Study*

  - *Potential U.S. Government funding opportunities, including a recently submitted application to co-fund the Titan Project PFS and / or Feasibility Study, and co-fund the scale-up of IperionX's mineral enrichment technologies and the Virginia Titanium Manufacturing Campus*

  - *Potential funding and product offtake options from strategic investors, including Japanese companies, that are moving towards advanced stages of negotiations*

# In the long term, the total addressable market is the global lightweight structural metals market



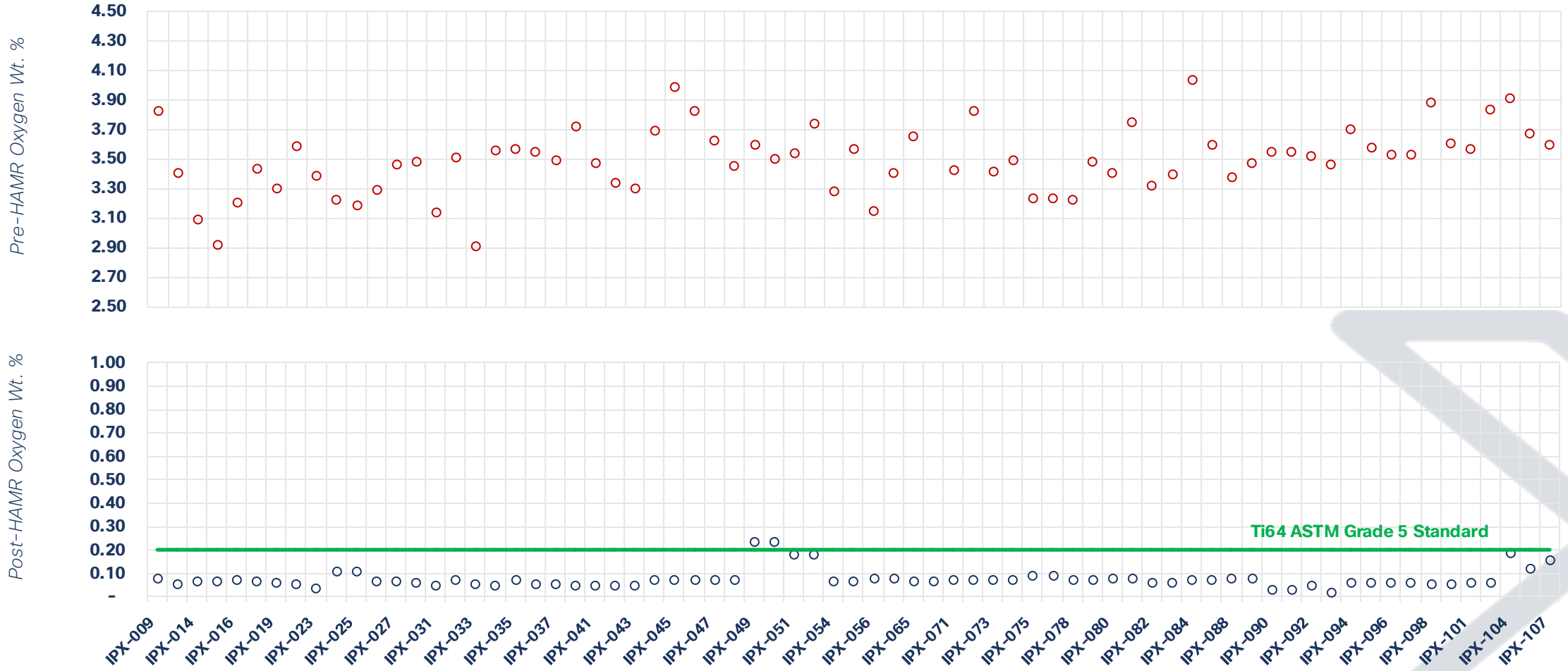

**Titanium Market[1]** | **Aluminum Market[2]** | **Stainless Steel Market[3]**

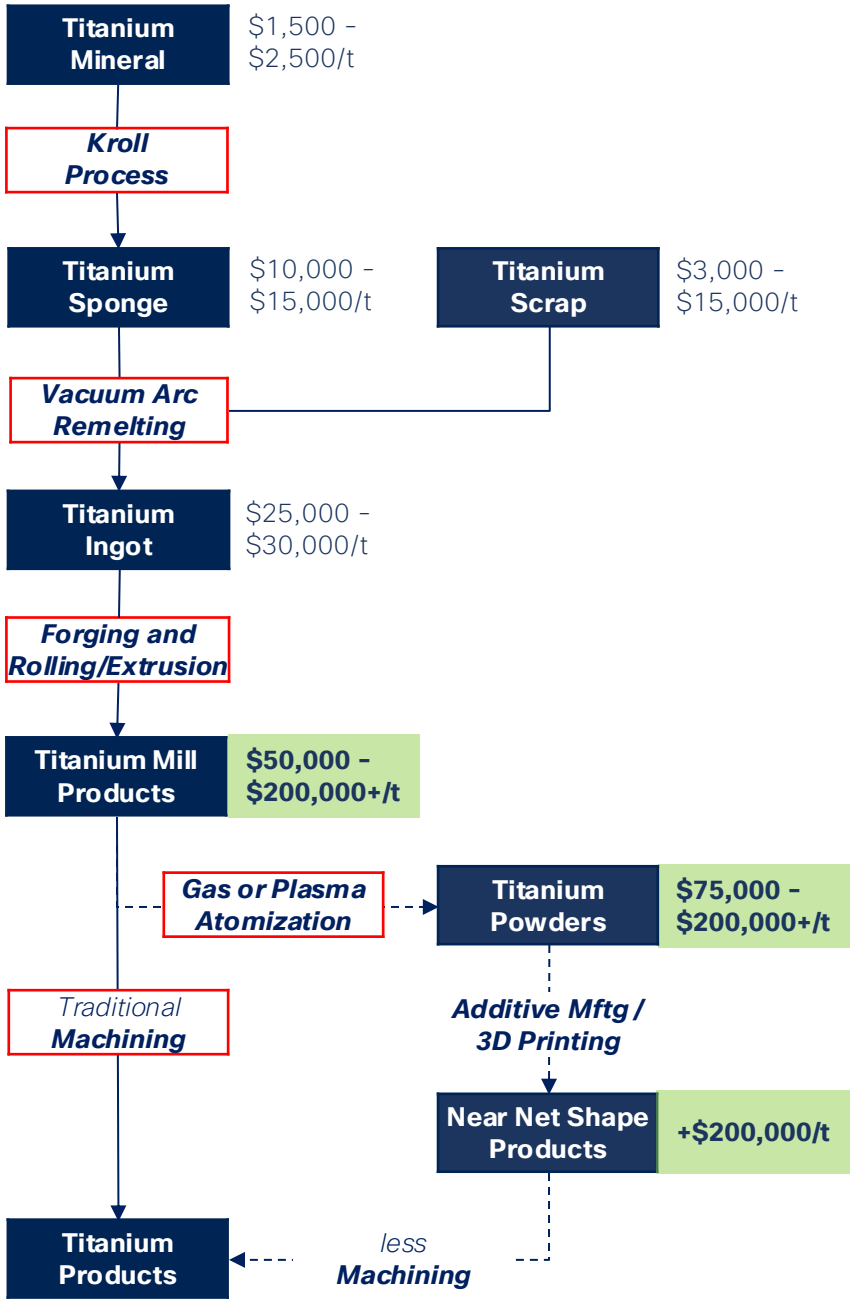
* Estimated Global Market Summary in USD. TAM market sizes are built up using 2022 material pricing

1. Sources: Roskill, Argus Metals. 2019 titanium melt products production of ~283kt at Q4-2022 Rotterdam Ti64 pricing of ~$16/kg. Note: Titanium market size uses 2019 volumes as base year, due to the Ukraine-Russia conflict.
2. Sources: Jefferies Equity Research, LME. Harbor Aluminum. 2021 global aluminum demand of ~67Mt at Q4-2022 pricing of ~$2.4/kg.
3. Sources: International Stainless Steel Forum, MEPS, 2021 global stainless steel melt shop production of ~56Mt at Q4-2022 304 Coil pricing of ~$3.6/kg.

# We have been producing high-quality titanium with our award-winning technologies for over 18 months

***Consistent and repeatable process achieving high quality standard***






# Titanium production is complex, high cost and unsustainable

## Kroll Process

- High temperature (1,300C°) batch process that requires high-quality titanium mineral feedstocks
- Uses chlorine gas and coke to produce titanium tetrachloride ($TiCl_4$) + carbon emissions
- $TiCl_4$ reduced by molten magnesium metal and the $MgCl_2$ is distilled under high temperature

## Vacuum Arc Remelting

- High temperature process (1,850C°) with titanium sponge mixed with low oxygen titanium scrap and alloying elements, welded into an electrode and then melted under a vacuum
- Process repeated 2-3x times to ensure homogenous product
- Ingot weights of 6-11 tons required to underpin economics

## Forging and Rolling / Extrusion

- 6-11 metric ton ingot is broken down into billets (or slabs) via high temperature forging
- Billets are then heated and rolled ot extruded into plate, sheet, bar, wire etc.
- Multiple reheats required with each reheat step requiring grinding of the Ti-O "alpha case" layer
- Mill product yields are low e.g. **55-60% yield** from ingot to 0.2" inch plate

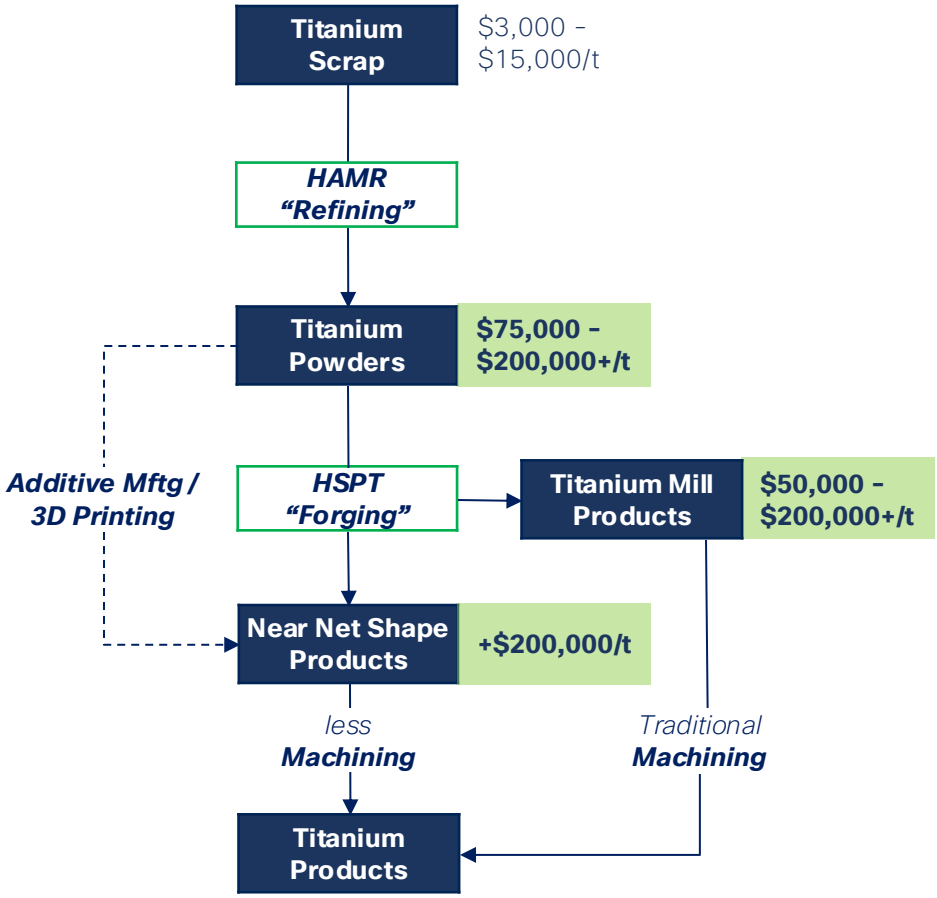
## Traditional Machining

- Mill products often require machining to final titanium metal product resulting in high scrap generation vs resultant product (i.e., the "Buy-to-Fly" ratio)
- Buy-to-fly ratios often lead to **<10% yield** - ~13:1 buy-to-fly ratio for watch cases from titanium bar are common

## Gas or Plasma Atomization

- High temperature process where high quality bar or wire is atomized in an inert atmosphere into spherical powders
- Wide range of sizes produced with **<50% yields** of "in-spec" powders

# Our titanium technologies can deliver low-cost, high-strength and sustainable titanium production




## HAMR "refining" technology

- Hydrogen Assisted Metallothermic Reduction (HAMR) process is based on a scientific breakthrough by Dr Zak Fang, Professor of Metallurgical Engineering at the University of Utah
- HAMR works by destabilizing the titanium-oxygen bonds and allowing for a simple reduction process – similar to iron ore to iron
- HAMR process is a low temperature (<800°C) fast (<6 hours) batch process and results in high quality titanium metal powders – potential conversion to an even faster continuous process
- The result is an efficient, scalable process that avoids both Kroll and ingot melting and is <50% energy requirements of the current supply chain with zero Scope 1 and 2 carbon emissions

## HSPT "forging" technology

- Hydrogen Sintering and Phase Transformation (HSPT) is a non-melt sintering technology that results in ultrafine grain micro structured titanium metal products
- The HSPT products have "forged" or wrought like properties typically seen only with traditional forged titanium mill products
- Combined with low-cost metal powders, HSPT avoids the multiple high-cost forging steps, with the associated yield losses, to manufacture high performance titanium mill products
- HSPT can deliver "forged" near-net shape products to greatly reduce machining and final costs for titanium metal products

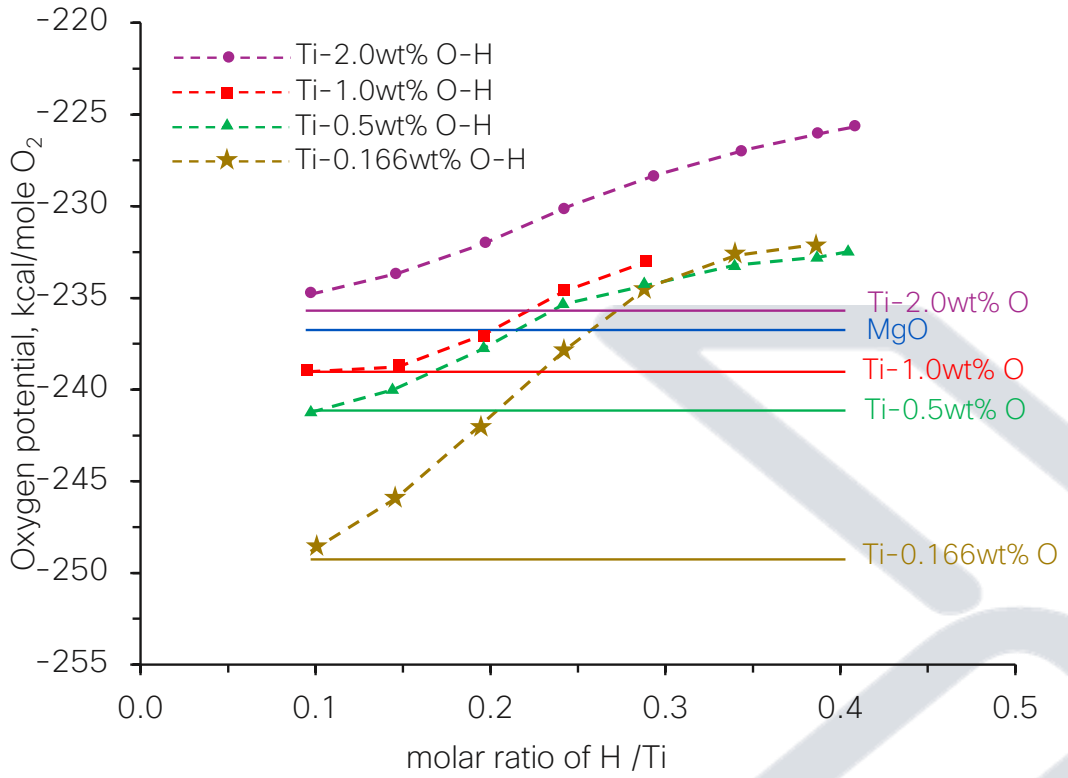
*IperionX holds exclusive rights over the HAMR and HSPT technologies.

# HAMR: The breakthrough science of a revolutionary technology

- Most common metals can be reduced to metal from oxides by carbon (or hydrogen) – this is not the case for Titanium Dioxide ($TiO_2$) because of the stability of the Ti-O bonds
- William Kroll invented a process to overcome this challenge and it relies on chlorination of $TiO_2$ in a carbothermal reaction to create $TiCl_4$, which is then reduced by molten magnesium in a vacuum and distilled to produce titanium sponge
- Titanium sponge is then vacuum melted multiple times to create a titanium ingot which is then hot worked into mill products
- HAMR reduces $TiO_2$ with magnesium under a hydrogen atmosphere, with hydrogen destabilizing the Ti-O bonds
- This principle can also be used to de-oxygenate recycled titanium scrap, as the most difficult impurity to "remove" is the oxygen on the surfaces – especially with machining titanium scrap
- **HAMR revolutionizes the ability to manufacture high quality titanium metal and alloys from both titanium mineral or scrap**

**Hydrogen's effect on the Ti-O bonds**

Ti-O bonds at various weight percent (solid lines) vs. Ti-O-H bonds destabilized at various weight percent (dashed lines) @ 700 C°

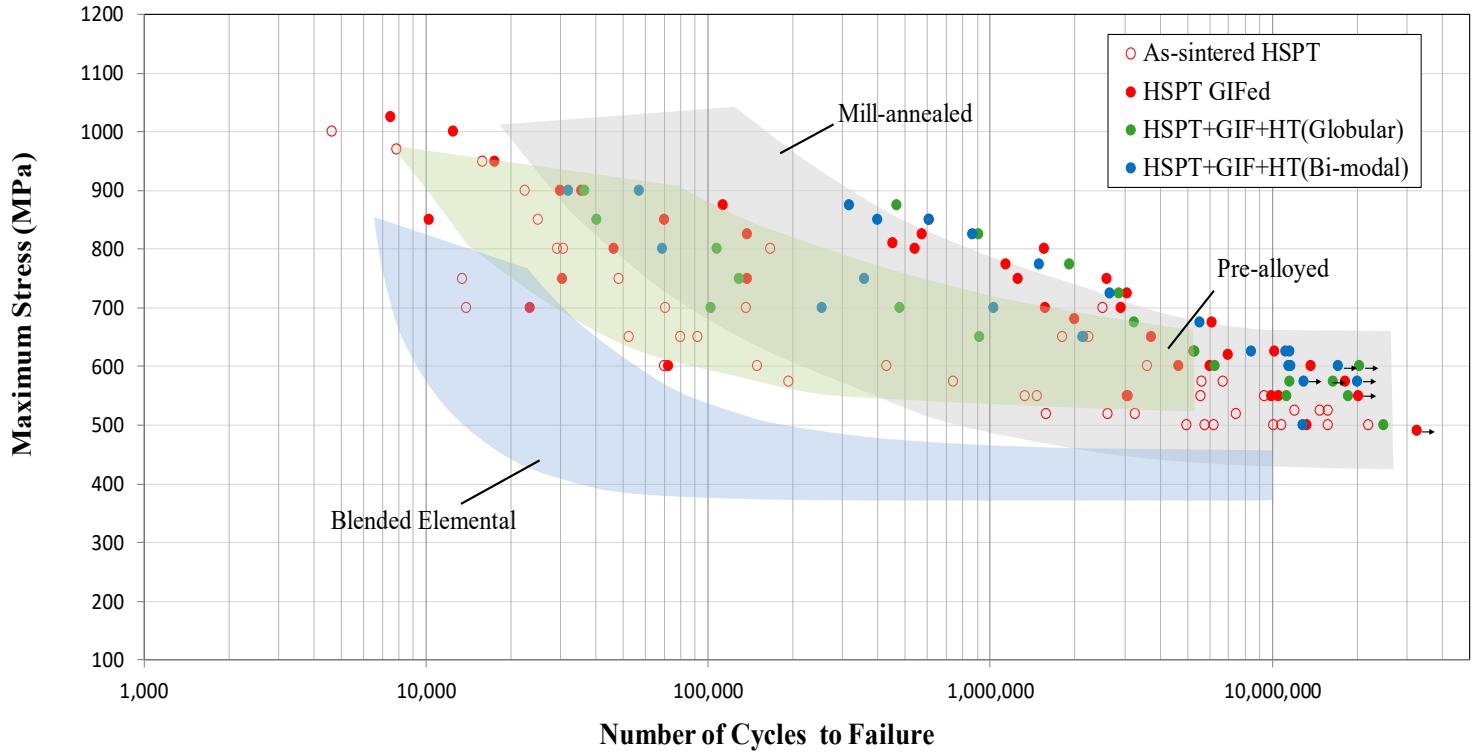



* IperionX holds an exclusive option to acquire the HAMR technology and other associated technologies

1. Dr Fang's history: https://powder.metallurgy.utah.edu/research/hamr.php
2. Original HAMR discovery article "*A novel chemical pathway for energy efficient production of Ti metal from upgraded titanium slag*": https://www.sciencedirect.com/science/article/abs/pii/S1385894715015016

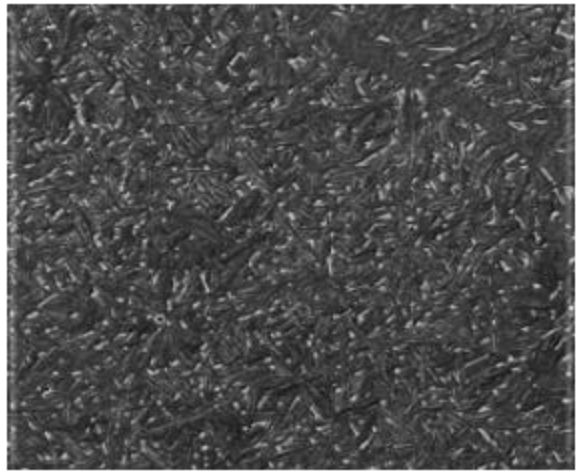
# HSPT: ‘Forged’ titanium, without the high-cost forging process

- Our patented HSPT technology unlocks a superior powder metallurgy pathway to manufacture ‘forged quality’ near-net shape titanium parts and components
- HSPT delivers mechanical performance properties with traditional forging processes, but avoids the high-cost and high-emissions associated with them
- The process can use angular HAMR titanium powder as the powder metallurgy feedstock
- **HAMR with HSPT provides a superior manufacturing solution for low-cost, sustainable and high-quality titanium parts for demanding applications**




HSPT = Hydrogen sintering and Phase Transformation; GIF = Gaseous Isostatic Forging; HT = Heat Treatment

**HSPT as-sintered microstructure**



**Vacuum as-sintered microstructure**