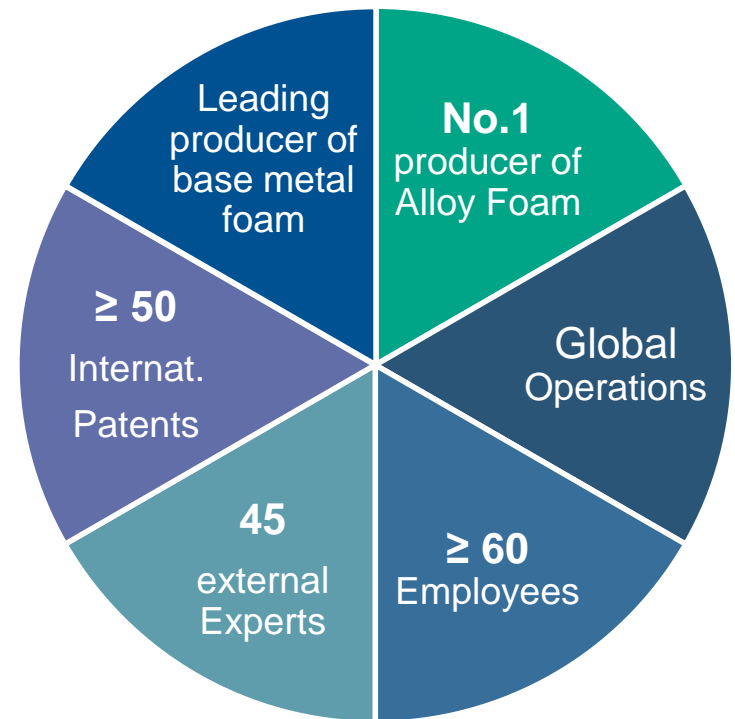


Powder-metallurgical process upscaling at Alantum

Elyntegration Workshop Dresen, 19.09.2018

A leader, an enabler, an innovator

- **Alantum is the only manufacturer of alloy foam operating on commercial scale**
- **Owned by Korean industry leaders in non-ferrous metal refining: Korea Zinc Corporation, Korea Nickel Corporation, Young Poong Corporation**





Germany Munich

- Alantum Europe GmbH**
- Marketing & Sales
 - R&D
 - Chemical Process Technology
 - Energy Storage and Conversion

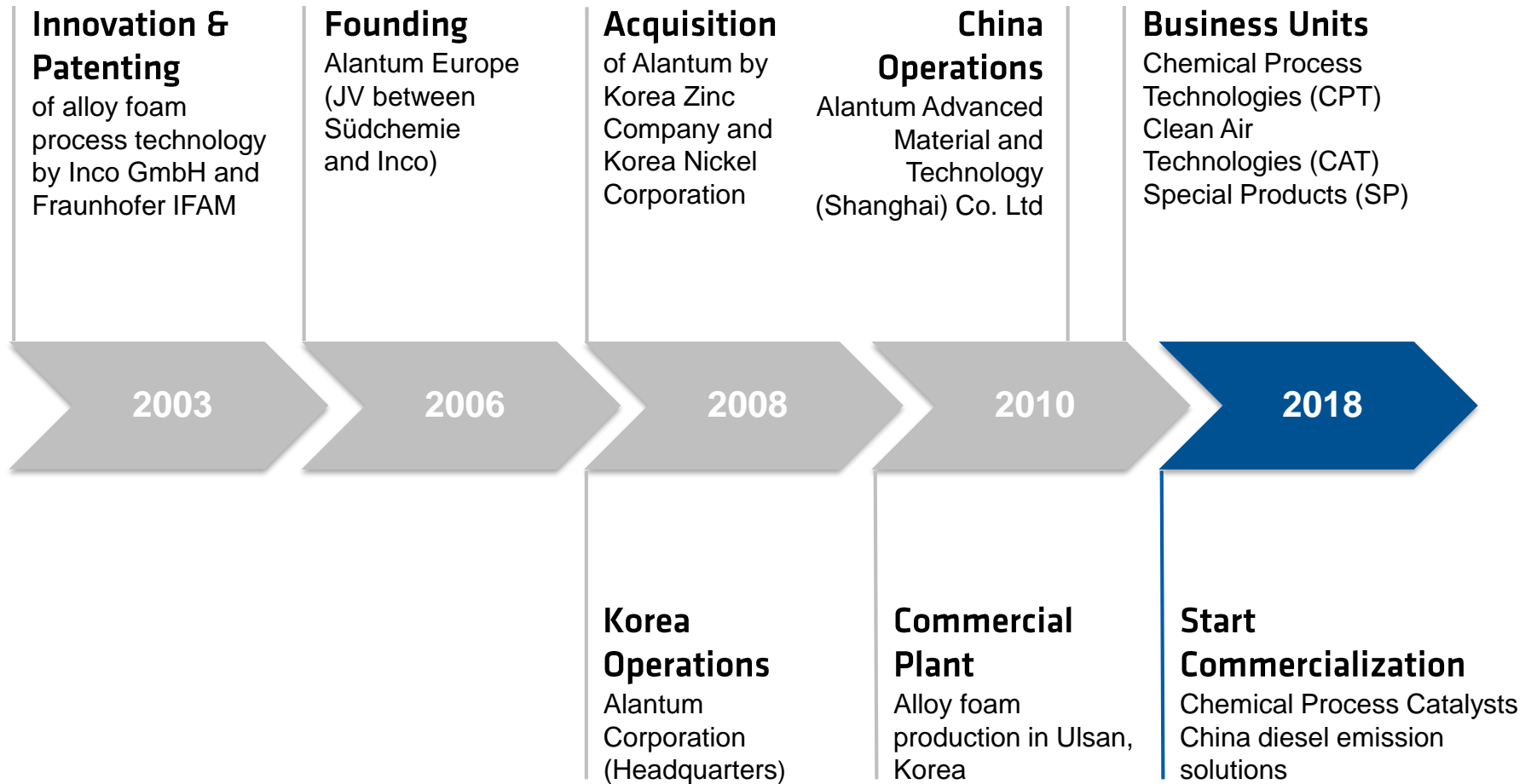
China Shanghai

- Alantum Advanced Material Technology CO. LTD**
- Marketing & Sales
 - Automotive
 - Production

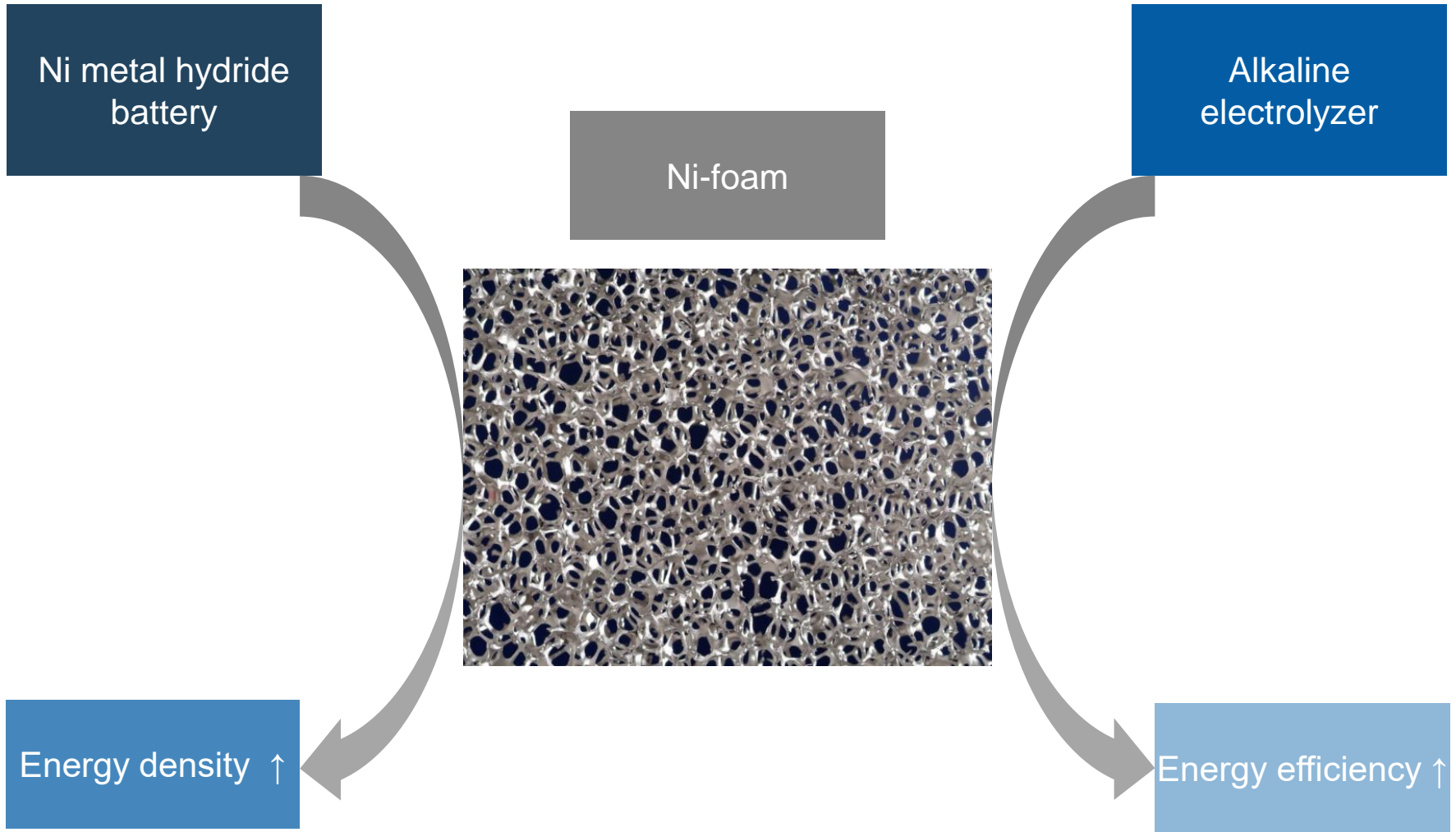
Korea Seoul, Ulsan

- Alantum Corporation (HQ)**
- Marketing & Sales
 - R&D
 - Special Products
 - Production





Analogous Technology Development

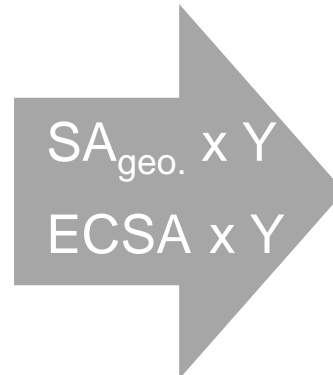


SOA Ni-Sheet



- Geo. surface area: Low
- Porosity: Low
- ECSA: Low

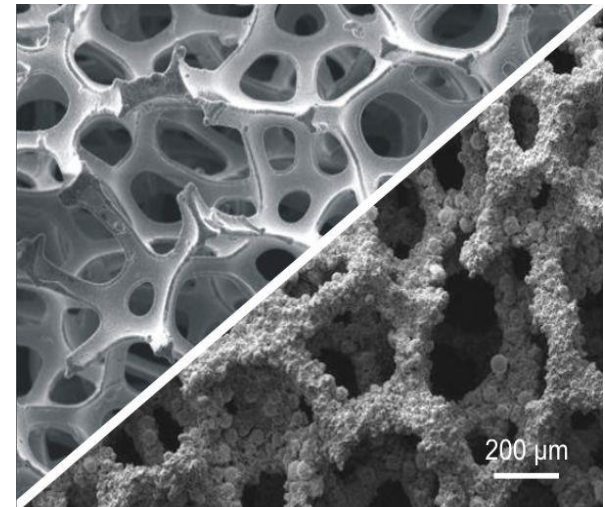
Surface Modification



Surface Chemistry Modification

- Powder metallurgy
- Coating
- Sintering
- Alloy formation

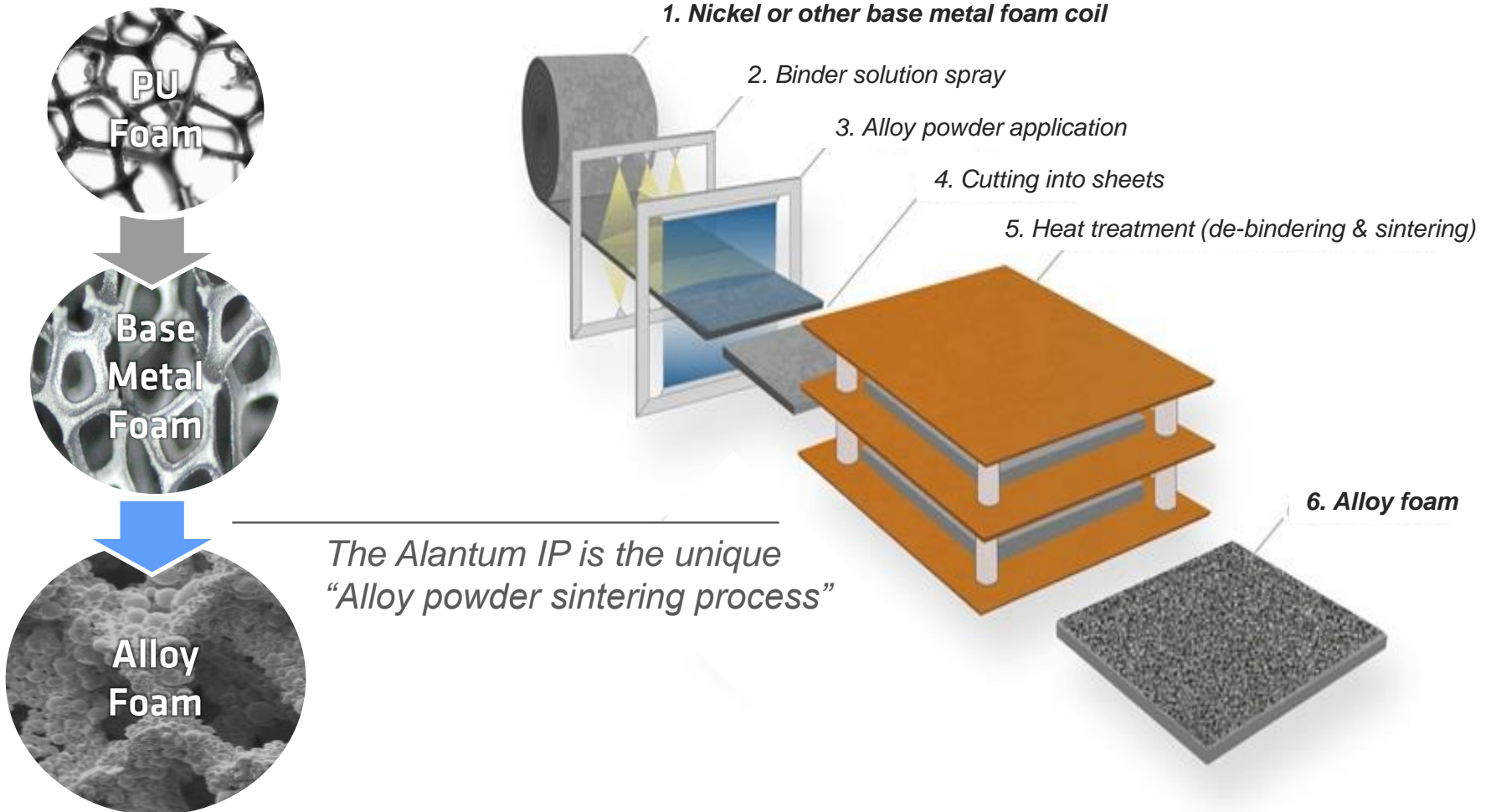
Structured Ni-Foam



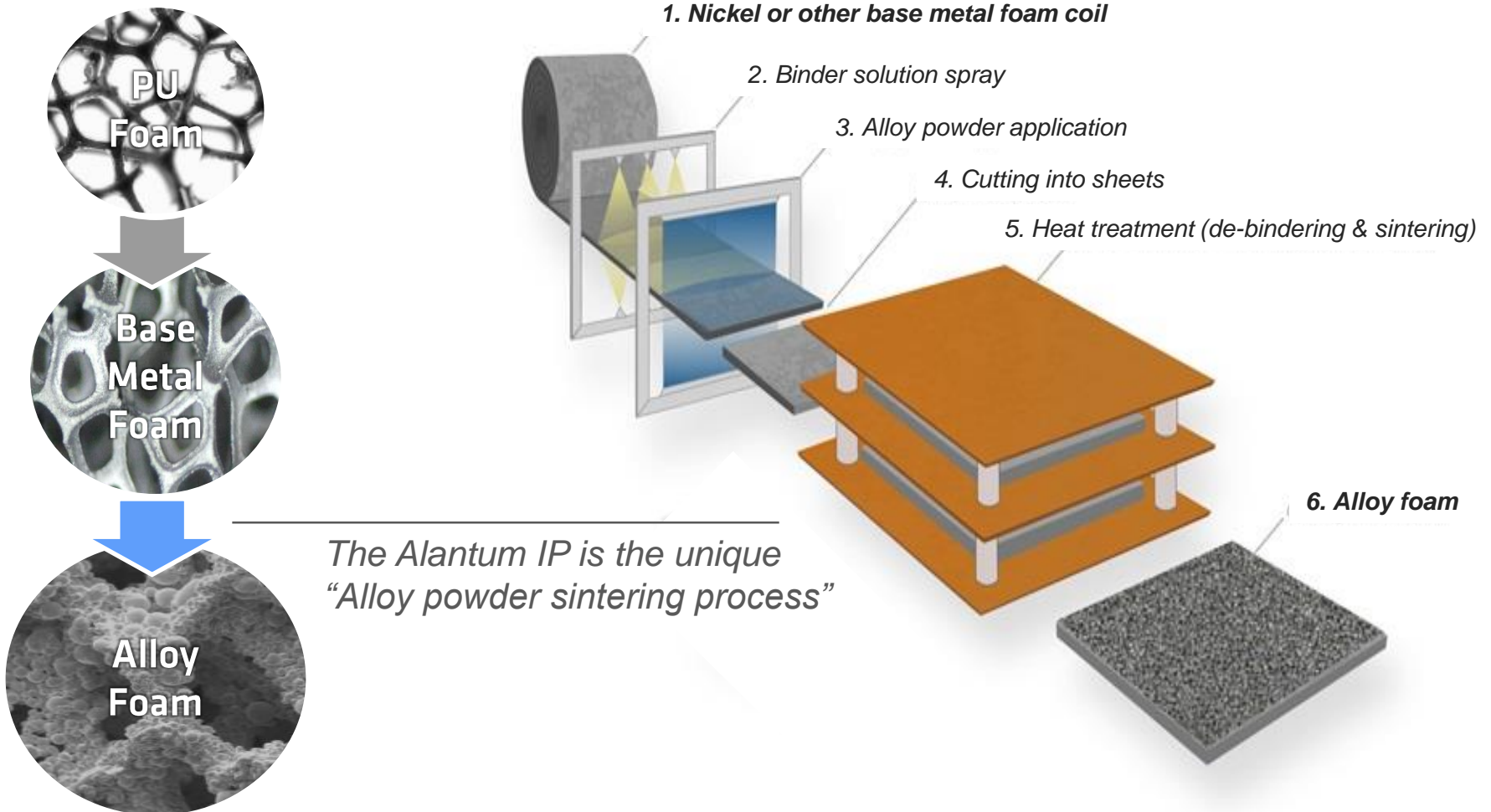
- Geo. surface area: High
- Porosity: High
- ECSA: High

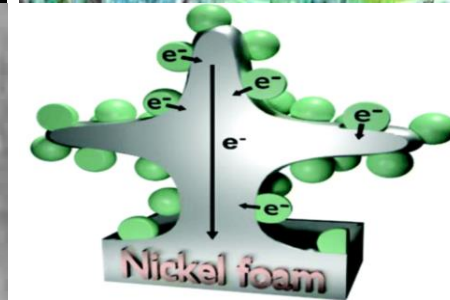
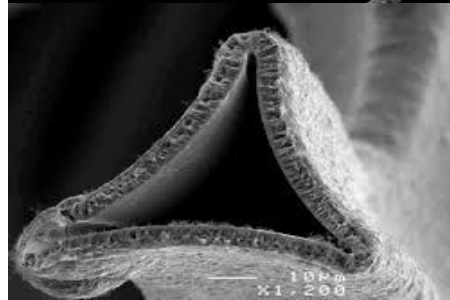
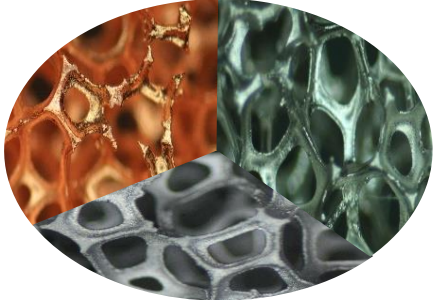
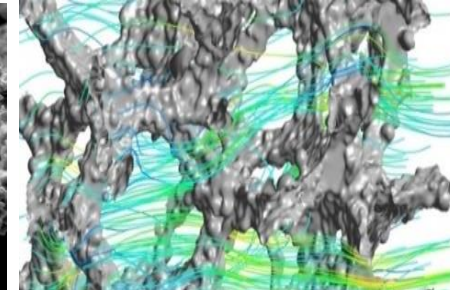
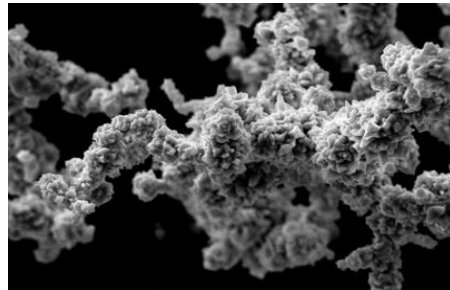
► Increase efficiency of electrolysis

Patented Alloy Foam Production Process



Patented Alloy Foam Production Process





Structure:

- Composition
- Pore size
- Porosity
- Surface area
- Size/shape

Active Material:

- Alloy/NM Foam
- Coating
- Powdering
- Layer thickness
- Particle distribution

Features:

- Large surface area
- Access to act. sites
- Mass/heat transfer
- Small weight
- Durable/flexible

Chemical Process Technologies



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