PROMETHEUS™

Scalable Fluidized Bed Reactor

PALD Line

Powder - Research/Pilot

PROMETHEUS is Forge Nano's flagship powder atomic layer deposition tool built to bridge lab innovation with commercial validation. PROMETHEUS is designed to be modular with interchangeable reactor vessels to assist in solution scaling. The fluidized bed model provides high precursor usage and additional fluidization and mixing parameters to fine tune the deposition, making it perfect for mechanistic studies and process scaling.

1000 mL

max batch size

Up to 10

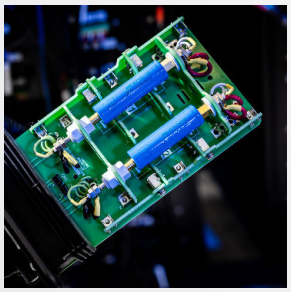
precursor & gas lines

5 reactor sizes

for process scaling & flexibility

Industries & Applications

Batteries



Stabilizing coatings for cathodes and anode powders

Additive Manufacturing

Oxidation control and improved binding for Ti, Al, Cu and other metals

Catalysis

Enhanced catalyst selectivity and sintering resistance

Pharmaceuticals

Improved flowability, shelf life and binder formulations

FORGE NANO

Global HQ:
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PROMETHEUS™ PALD Line

Specifications & Options

Standard Specifications	
Batch Size	Standard Vessel: 10-150 mL fill size
Process Temperature	Up to 400 °C
Main Dimensions (LxWxH)	91 x 32 x 78 in
Precursor & Gas Lines	2 High Vapor Pressure included, Up to 8 additional lines
Power Requirements	200 – 240 V, 1Φ, 50/60 Hz
Included Hardware	Roots Style Vacuum Pump Integrated Quadrupole Mass Spectrometer (QMS)

Options & Upgrades

- Up to 2 additional HVP precursor lines
- Up to 4 LVP precursor lines
- Ozone Generator
- Jet Assist Fluidization Aid
- H2/NH3 Gas Lines
- Additional Reactor Vessels (5 sizes ranging from 0.5 mL to 1000 mL)
- Glass Reactor Kit for Fluidization Viewing

References & Case Studies

UNI FREIBURG

IMTEK - Department of Microsystems Engineering

Pt/C catalysts synthesized in a commercial particle atomic layer deposition system enabling improved durability in fuel cells

Using the Forge Nano Prometheus fluidized bed reactor, the team showed:

- A method for synthesizing narrow distributions of highly dispersed Pt particles
- 64% more electrochemically active surface sites due to high dispersion of Pt nanoparticles
- 34% improved cell performance retention compared to commercially available catalysts after 30,000 accelerated stress test cycles

Read the full paper!

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