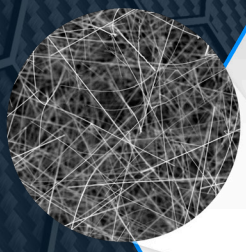
CVD Equipment Corporation

Chemical Vapor Deposition Equipment for Coating Powders

Ideal for Battery Nanomaterial Development

Coating & Infiltrating Powders with High Performance Nanomaterials & Thin Films



Silicon

State-of-the-Art CVD PowderCoat 300™

- **R&D Systems for Uniform Coating & Infiltration**
- **Functionalize substrate surfaces with silicon, carbon, metals, oxides etc. for enhanced performance**
- **Rotary Reactor with Tumbler Design**

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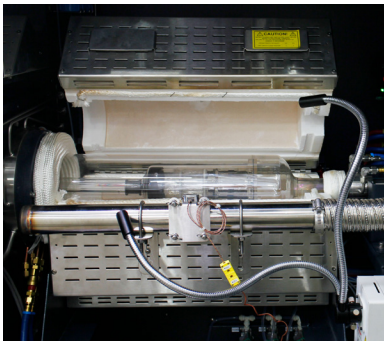
PowderCoat 300™ - Chemical Vapor Deposition System

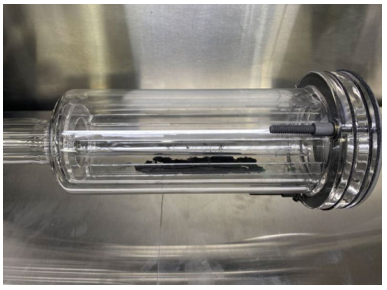
The PowderCoat 300™ is a Chemical Vapor Deposition and Infiltration System designed to process powder materials for high technology applications including EV battery manufacturing. Precursor gases react to form a coating onto powder substrates. Source gases are supplied through a gas management system to the inlet of a heated chamber. Thermodynamics and kinetics drive both precursor reaction and decomposition. A three-zone furnace with resistive heating can maintain process temperatures up to 1100°C. The chamber has a rotating barrel that mixes the powder during processing. Ramp up and ramp down rates are achieved by real time PID precision control. Our robust process control system maintains temperatures within half a degree as well as the pressure within +/- 1% of set point throughout deposition runs. Controlled and rapid cool-down features result in consistent processing and reduced cycle time.

CVD technology makes it possible to deposit a wide variety of materials, including silicon, silicon nanowires, carbon, metals, oxides, etc. onto powder substrates to functionalize the surface for enhanced performance. In addition, continuous coatings can be attained on substrates with irregular surfaces. Depending upon the process, particle size can vary from sub-micron to hundreds of microns, and the coating thickness can be a few nanometers to tens of microns.

Features and Options

- Powder Infiltration & Uniform Coating
- Rotary Reactor
- Low Pressure CVD
- 3 Zone Resistance Furnace Heating Systems
- Customizable Chamber
- Rotating Tumbler for Uniform Mixing
- Robust Production System with Enhanced Process Controls
  - Temperature Control +/- 0.5°C
  - Pressure Control +/- 1%
- Rapid Cool Down
- Glovebox for Unloading Sample Under Inert Conditions
- Powered by CVD*WinPrC*™





Hazardous gas storage and delivery, process reactor, and exhaust treatment subsystems can be provided as a complete integrated solution. Each component of the system is taken from our expansive library of process equipment configurations.

Technical Data

Process chamber inner diameter	70 mm nominal
Process chamber length	40 mm nominal
Powder load	up to 100 cc
Rotating tumbler	programmable speed 0 - 50 RPM volume up to 350 cc
Resistive heating furnace	3 Zones
Working temperature	max 1100°C nominal
Working pressure	0.2-500 Torr

High-Touch Customer Service

CVDE has a customized approach to client support. We offer onsite presence, site survey, installation coordination and field acceptance. NRTL/CE Certification is available. Initial start-up support and on-site training, warranty response and remote capability through help desk support are all available through our tailored service plans. Support contracts can be customized for spares and consumables, preventative maintenance and site personnel.

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