

BERNEX

CHEMICAL VAPOR ALUMINIZING EQUIPMENT

The Bernex™ CVA ALUVAP systems are a further development of the Bernex CVD platform, dedicated to the diffusion of aluminum. CVA is highly suited for superalloy components like hot-section turbine blades of aircraft engines and land-based gas turbines, which are subject to hot corrosion.



The CVA vacuum process uses gaseous precursors and provides very accurate control of diffusion depth and thickness over all inner and outer surfaces of the parts, irrespective of their geometrical complexity.

The design of the Bernex™ CVA system allows for the control of high and low diffusion activity as well as co-diffusion of elements such as silicon, chromium, zirconium, hafnium or cobalt, and a post-diffusion heat treatment process within the same process cycle.

Advantages:

- Active gas flow that reaches internal cooling channels
- Controlled high and low activity processes
- Dual reactor design for high capacity

In contrast to the conventional pack, out of pack, above the pack and slurry processes, CVA does not clog internal channels and leaves no byproducts on the surfaces. Therefore, post-process cleaning of the components is not needed. CVA is environmentally friendly and leaves no residues.

TECHNICAL DATA BERNEX™ CVA ALUVAP

BERNEX™ CVA

Models	ALUVAP 440BL	ALUVAP 190BL
Reactor dimensions (mm)	800 x 1800	530 x 1600
Max. load weight (kg)	400	400
Power requirement (kVA)	170	100
Heating zones	3	5
Deposition temp	900–1150 °C	900–1050 °C
Coatings	Aluminum diffusion coatings	
Applications	Hot-section turbine blades	

Modular Design

Bernex™ CVA equipment has a modular design to satisfy user-specific demands. The available modules can be added to new equipment and retrofitted onto existing systems.

- External aluminum chlorinator for low activity processes
- Internal aluminum chlorinator for high activity processes
- Chromium module
- Cobalt module
- Silicon module
- Hf, Zr chlorinator module
- Exhaust neutralization system
- Gas purification system
- Special fixtures for particular applications

The turn-key Bernex™ CVA ALUVAP systems are delivered with the most advanced process know-how and recipes, ready to use on high-temperature industrial and aero gas turbine components.

Included processes:

- High and low activity aluminizing process
- Aluminum co-deposition process (Cr, Co, Si, Hf, Zr)
- Post-diffusion heat treatment process

