SC OPTIMA

The SC Optima from Swiss Cluster represents the next generation of large batch systems for Atomic Layer Deposition (ALD). The SC Optima is carefully optimised to deliver high-quality and uniform coatings to all types of 3D objects in record time, streamlining every step of your door-to-door processes, from loading to unloading.

Experience a new level of precision and efficiency in 3D part coating with the new patent-pending chamber from Swiss Cluster. The innovative and scalable chamber has been optimally designed to adapt to your 3D parts and coating material to deliver exceptional coating homogeneity at unparalleled process speeds. Our single chamber approach makes it easy to load and unload 3D parts from the cleanroom, while the rest of the system is accessed from the grey room. This also allows for ultra-fast heating and cooling of both the chamber walls and the parts themselves. Moreover, these features combined with our flexible machine control and recipe creation software suite gives you complete control over the system and its automation.

The next era in production ALD processes for 3D objects starts with an optima design.

Technical Specifications

Chamber Dimensions	143 L – 1000 L 640x640x350 mm – 900x1600x700 mm
Loading	Front loading with guided cart Custom-made frames for 3D holders Cleanroom compatible
Process Temperatures	Up to 500°C
Precursors	Up to 8 gas sources with 6 individual inlets Ozone option
Standard Materials	Al_2O_3, ZnO, SiO_2, TiO_2, Y_2O_3, Nitrides Novel bubbler delivery system optimised for low vapour pressure precursors
Substrate Sizes	Multiple substrates or 3D objects of various shapes and sizes Dimensions of chamber and holder are optimally adapted to the parts and coating material

Swiss Cluster

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The SC Optima Series

Door-to-door process times with the standard volume of 143 L. Total duration 370 – 520 min.

1. **Loading-Closing Door**
   <5 min
2. **PumpDown/Heat-up of Chamber to 300°C from 25°C**
   30 min
3. **Bakeout of Parts to Reach ~300°C**
   120 – 180 min
4. **Process Time Al_2O_3 100 nm**
   120 – 180 min
5. **Cooldown of Chamber from 300°C to 150°C/Venting**
   90 – 120 min
6. **Open Door-Unloading**
   <5 min

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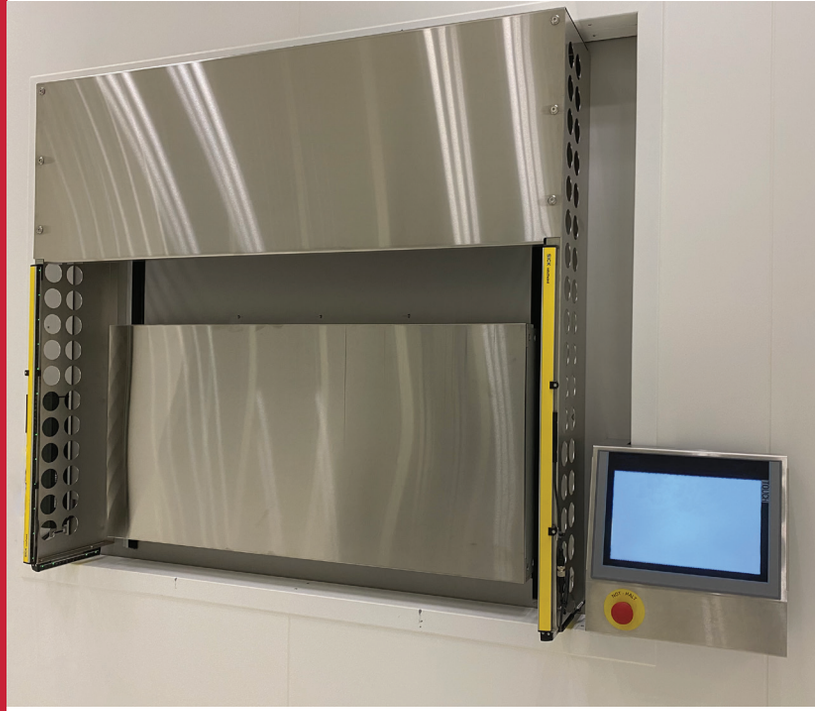

Advantages of the SC Optima in every step of the process

Effortless Front Loading and Unloading
The parts can be easily front loaded and unloaded using a guided cart system in a matter of minutes without any downtime. This front- loading approach further reduces the risk of particle generation towards the reaction chamber. The customised frame holders further ensure optimal part distribution and film homogeneity.

Ultra-Fast Heating and Cooling
Our new chamber design in the SC Optima provides ultra-fast heating and cooling. Within just 30 minutes, the chamber walls can reach 300°C, and loaded 3D parts within 3 hours. After the coating process is completed, our built-in cooling system can cool the chamber walls down to 150°C within only 2 hours. This provides unparalleled efficiency and speed in your production process.

Fast, Homogeneous, and Flexible Coating Process
Our pulsing and purging configurations can be optimised for each 3D part and coating material, resulting in optimised cycle times and homogeneous coating of parts, regardless of their geometrical shapes, aspect ratios, or surface areas. Furthermore, we can carefully design the chamber dimensions to accommodate large or many small to medium sized parts, maximising your throughput and film homogeneity.

Unparalleled System Control and Recipe Creation
Enjoy complete control over our system and unmatched flexibility in recipe creation for full automation.

We offer support at every stage of your production process, including optimised chamber dimensions and configuration, ideal frame holder selection, technical and scientific support to optimise process parameters to deposit a homogeneous and high-quality film.