



Contract code

SU194000CO2024090

Subject of the contract or need of the contracting authority

Atomic Layer Deposition System for the deposition of thin film layers for selective contacts.

The specifications detailed in this document are neither exhaustive nor limiting, so any other element that the company deems appropriate must be included and specified in the submitted offer. The required system must allow the deposition of atomically thin film layers (such as ZnO, ZnSnO, ZnMgO, Cu₂O...) to be used as selective contacts in photovoltaic/optoelectronic devices. Such a system is based on a vacuum chamber compatible with the preparation of oxides, and should have the following specifications:

General specifications:

- System compatible with substrates up to 200 mm in diameter.
- System compatible with substrate thicknesses up to 3-4 mm.
- Computer (optional) with control software (mandatory) to visualize the system status, process, and to program recipes.
- The system must have at least 4 interchangeable precursor lines (solid, liquid, or gas).
- The system must be able to work at a pressure of the order of the mTorr range (in the reactor chamber) using an appropriate pump.
- The system must include a chemical grade mechanical pump with gas connections for gas ballast and oil case purge. The pump must work with fomblin oil.
- The system must have an insulation cover onto the reactor chamber.
- The temperature of the reactor chamber, the precursor cylinders and the lines between the precursors and the chamber must be controlled independently one from another and programmable via software recipes.
- The system must include safety systems for overpressure, excess temperature, among others, all controlled by continuous self-diagnosis. In the event of an incident or malfunction, the safety system must shut off all heaters and close all valves automatically, indicating the issue to the user.
- The system must have a heated exhausted to avoid precursor accumulation and a particle/gas trap to protect the vacuum pump.

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Precursor specifications:

- The system must include at least the water cylinder and a high temperature (at least 220 °C) capable cylinder.
- Precursor cylinders must have a capacity of 50-200 mL to reduce operation cost and reduce upfront investment when implementing new precursors.
- The system must be compatible with commercial precursors.
- Precursor cylinders must be interchangeable by the user without special tools and within a time frame of less than 15 minutes.
- Valves must be controllable via software and offering an opening time of 10 ms or less.
- The system must be capable of extending the residence time of a single pulse precursor in the reaction chamber.
- The heating system for the different precursors (except for the water line) must be controllable through the recipe, ranging from ambient temperature to at least 180°C.
- At least 3 precursors heaters or heating jackets must be included.
- The system must be prepared for expansion, both in terms of the number of lines (minimum up to 6) and other options, such as real-time deposited thickness measurement systems (ellipsometry for example).

Software specifications:

- The software must be able to control the temperature and provide real-time temperature readings.
- The software must display real-time rolling pressure during recipe execution.
- The software must automatically record system configuration data, as well as temperature and pressure, throughout the entire execution of the recipe.
- The substrate temperature must be controllable via software within a temperature range from ambient temperature up to 300°C.

Installation, support, maintenance and documentation :

- The supplier must provide hardware and software support.
- Manuals will be delivered at least in English.
- Optional installation of the system and user training (in-person or telematic).
- Basic set of spare parts.
- The system must be provided with operating, service & maintenance and technical manuals with full diagrams and drawings /soft and hard copies.

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Compulsory general technical requirements of the provision and/or performance criteria or functional requirements of the provision

- Delivering to university lab (Barcelona) and shipping must be included. Optional installation and training will be evaluated (UPC will provide the power, working gases and facilities required for the installation).
- Warranty: 12 months
- Maximum delivery time: 6 months after contract signature.

The possibility of offering two different quotations with inclusion of extra elements (based on the specific list of evaluated criteria) is given to allow the providers to improve the specifications of the offered systems.

Maximum price: 170.000,00 €

Person in charge of the contract,

Marcel Placidi

Barcelona, at the date of the signature

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