



## TECHNICAL SUITABILITY STATEMENT

We hereby declare that we can provide the equipment with the required technical suitability in line with all the technical requirements included in the tender documentation.

### TECHNICAL CHARACTERISTICS:

#### general characteristics:

- Electron beam evaporator; versatile, research grade machine
- Multiple sources
- Easy access, easy loading and easy maintenance
- Upgradable
- Applications: Lift off, nanolithography, microfabrication

#### system requirements:

- required base vacuum (mbar):  $\underline{\quad} 10^{-7}$  mbar range  $\underline{\quad}$  (better than  $10^{-6}$  mbar; high vacuum)
- materials to be evaporated: Au, Al, Pd, Pt, Ni, Cr, Ti, Nb, Ta, Mo, Si
- sequential deposition of different metals in a same vacuum process
- metal film thickness:  $\underline{\quad} 1 \text{ nm} - 200 \text{ nm} \underline{\quad}$  (1 nm – 200 nm)
- deposition rate:  $\underline{\quad} 2.5 \text{ \AA} / \text{s} \underline{\quad}$  (2.5 Å /s)
- thickness uniformity:  $\underline{\quad} \ll 4\% \underline{\quad}$  (5 %)

#### chamber:

- vacuum grade stainless steel or aluminum
- viewport with mirrors for visual control (*comment from PLASSYS: replaced by specific viewport with protective film and polarizing filter*)
- deposition shields for easy system cleaning

#### vacuum:

- turbo pump:  $\underline{\quad} 1300 \text{ L/S range} \underline{\quad}$  (medium size ~700L/s preferred; pump time of few hours acceptable)
- pre-pump
- vacuum gauge

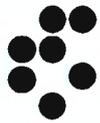
#### system:

- manual operation and control is acceptable
- thickness/Rate "controller" with recipe storage, end of process by setting thickness
- quartz crystal sensor for thickness and rate control
- source shutter for starting/stopping deposition
- power supply, control cabinet

#### evaporation source:

- e-beam power:  $\underline{\quad} 6 \text{ kW} \underline{\quad}$  (6kW or more)
- multiple pocket source:  $\underline{\quad} 4 \text{ or } 6 \underline{\quad}$  (4 pockets)
- pocket size:  $\underline{\quad} 4 \times 8 \text{ cc or } 6 \times 4 \text{ cc} \underline{\quad}$  (3cc or 4cc) (*comment from PLASSYS: end user can choose between both when ordering the system*)
- deflection of electron beam:  $\underline{\quad} 270^\circ \underline{\quad}$  (270°)
- ebeam sweep unit
- manual pocket changing

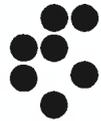
#### substrate stage:



- minimum stage size: \_\_\_\_\_ 2" wafer or up to 9 x 10x10mm<sup>2</sup> samples \_\_\_\_\_ (2" wafer or up to 9 x 10x10mm<sup>2</sup> samples; custom holders, clips, to easy mount 2" wafer or smaller pieces)
- maximum sample temperature for lift-off applications: \_\_\_\_\_ below 40°C confirmed for aluminium \_\_\_\_\_ (limited to 40°C; for any metal, including Mo, Ta...) *(comment from PLASSYS: possible but not guarantee for thick layers of refractory materials. An active cooling of the substrate is provided to limit the thermal load from the source)*
- sufficient working distance between source and samples: \_\_\_\_\_ 40 cm range \_\_\_\_\_ (at least 35cm, configured for lift-off applications)

## OTHER REQUIREMENTS:

- The equipment must be CE compatible
- Documentation and manuals must be included
- Price must include delivery charges, installation or system startup and training at the customer's location for at least 2 days; offer should include all costs connected with traveling and accommodation
- demonstration of successful lift-off: \_\_\_\_\_ of 50nm thick Au film at 50nm pattern resolution \_\_\_\_\_ (of 50nm thick Au film at 50nm pattern resolution)
- demonstration: \_\_\_\_\_ << 4% \_\_\_\_\_ (of 5% uniformity using one material)
- dimension and weight limits: width \_\_\_\_\_ below 1.4 m except electrical cabinet \_\_\_\_\_ (1.4m max), height \_\_\_\_\_ 2 m max \_\_\_\_\_ (2m max), weight \_\_\_\_\_ 500kg max except electrical cabinet \_\_\_\_\_ (500kg max)
- possibility of upgrade with ion source gun and joint vacuum chamber. *(comment from PLASSYS: not proposed)*
- Test reports to demonstrate vacuum and substrate heating. No oxidation should be present at interfaces.
  - Deposition of 50 nm Si on ~5 nm Ti buffer layer on provided substrate.
  - 50 nm Al on ~5 nm Au/Pd buffer layer on provided substrate.
- service response time must be available within \_\_\_\_\_ 2 days \_\_\_\_\_ (7 max) days after notification of a malfunction
- remote help by phone or electronic mail
- Warranty and Out-of-warranty support:
  - Warranty: \_\_\_\_\_ 2 years \_\_\_\_\_ (at least 2 year)
  - After expiration of the limited warranty the provider must provide Out-of-warranty support: \_\_\_\_\_ 10 years \_\_\_\_\_ (for at least 10 years after the purchase date)
  - A replacement parts and services for all the items in this tender, and the customer shall pay for all the expenses and charges associated with out-of-warranty services. No used or rebuilt systems accepted.
- **upgrade options**
  - The offer should include the following upgrade options:
  - load lock pre-chamber for fast loading/unloading the samples, compatible with CF40 feedthrough for vacuum transfer  YES/ NO *(comment from PLASSYS: Optional load-lock chamber but not with a CF40 feedthrough)*
  - substrate stage tilt/rotation  YES/ NO *(comment from PLASSYS: partially compliant > rotation is already included but not the tilt of the substrate)*
  - substrate stage heating/cooling  YES/ NO *(comment from PLASSYS: partially compliant > water cooling is already included, heating would require a large redesign of the stage that could be quoted later)*



This statement is an integral part of, and an annex to, the application to the public tender for the supply of »**SUPPLY OF A E-BEAM EVAPORATOR**«.

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The bidder:

Marolles en Hurepoix

May 20th 2019

(place, date)

(signature of the representative)

**The contracting authority's note:**

The applicant must specify the characteristic of the offered goods and write them down on a blank space and submit the suitable prospect documents or the confirmations from the producer of the goods to prove its statements and mark in these prospects the fulfilment of each characteristic.

