Date: 11 June 2026
To: All Potential Bidders
Subject: Addendum No. 1 | Q&A
Bid: **#26-010 Thermal Evaporation Thin Film Deposition System.**

---

1. **Reference:** High-vacuum pumping shall be provided by turbomolecular, cryogenic, or comparable high-vacuum pump technology with pumping speed of at least 500 L/s or equivalent performance for the chamber volume.

   Q: Please specify the time required from 1 atmosphere to 1x10E-6 Torr for the given turbopump size and chamber volume. For example, one can use Turbo pump of size 450L/s and smaller size of volume of the chamber (by 10%) provided source to substrate distance is still 12 inches.

   A High-vacuum pump size, chamber volume, and pump-down time:

   The specification does not require a fixed pump-down time from atmosphere to 1×10^{-6} Torr. The vendor should provide the expected pump-down time for the proposed chamber volume, pumping configuration, and clean/dry chamber condition. As a practical performance expectation, a pump-down time on the order of approximately 60–90 minutes to reach 1×10^{-6} Torr under normal clean and dry operating conditions would be acceptable. Equivalent or better performance may also be considered, provided the system meets the required base pressure, chamber geometry, source-to-substrate distance, deposition uniformity, and process requirements.

2. **Reference**: System must include a deposition controller or software capable of closed-loop or feedback-based rate/thickness control using the installed thickness sensor.

   Q: Is it okay to have only rate and thickness control performance on using deposition controller?

   A Deposition controller and rate/thickness control:

   Yes, it is acceptable for the deposition controller to provide rate and thickness control using the installed thickness sensor, provided that the system supports closed-loop or feedback-based control of deposition rate and final film thickness. The controller should use the quartz crystal microbalance/thickness sensor signal to monitor real-time deposition rate and accumulated thickness and to regulate the evaporation source output and shutter operation as appropriate for the installed source configuration. The system should be capable of reproducible thin-film deposition with user-defined target thickness and deposition rate settings.

3. **Reference:** The control system must provide automated or recipe-based control of major system functions, including pumps, valves, shutters, deposition source status, and substrate motion, where applicable.

   Q: Please clarify details of "deposition source status".

   A Meaning of "deposition source status":

   "Deposition source status" refers to the operating condition and readiness information for the installed evaporation source or sources. This may include, as applicable to the proposed system design:

   - Source power status, such as ON/OFF or standby condition
   - Source output level, such as current, voltage, or power
   - Source selection, if multiple sources are installed
   - Shutter status associated with the source
   - Interlock or fault status related to the source
   - Whether the source is ready, active, ramping, depositing, or stopped
   - The intent is that the user can verify the operational condition of the evaporation source during system setup, deposition, and shutdown.

4. **Reference:** Software must allow display of vacuum status, deposition status, thickness/rate data, and system alarms or status messages.

   Q. Please clarify in detail the meaning of "deposition status".

   A "Deposition status" refers to the real-time process information displayed during a deposition run. This may include, as applicable:

   - Whether the system is idle, pumping down, ready for deposition, ramping source power, depositing, holding, cooling, completed, aborted, or in alarm condition
   - Current deposition rate
   - Accumulated film thickness
   - Target thickness
   - Active source and active shutter condition
   - Process step or recipe step, if recipe-based operation is provided
   - Any relevant alarms, interlocks, or status messages affecting deposition
   - The intent is that the operator can monitor the progress and condition of the deposition

5. We would like some more details on the "mask holder" requirement. A multi-sample holder, clip holder, mask holder, or equivalent fixturing must be included with the quoted system for small substrates and patterned contact deposition.

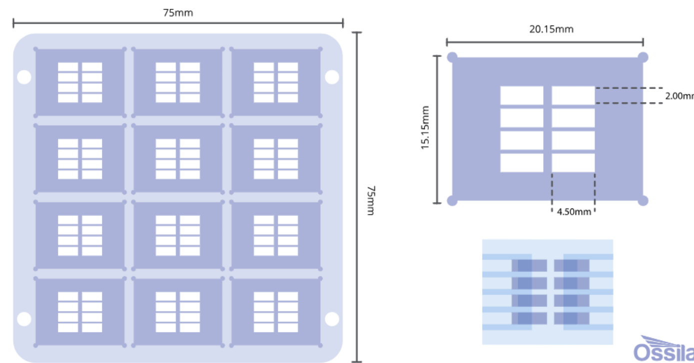
A We already have an existing commercially purchased multi-electrode shadow mask from Ossila, along with patterned ITO- and FTO-coated glass substrates that we plan to use for thermal evaporation of metal contacts.

Our requirement is for the thermal evaporator system to include a suitable universal substrate/mask mounting fixture. The fixture should allow us to securely mount and align our existing shadow mask with different substrates during patterned metal deposition. I have attached two images for clarification:

1. The existing Ossila multi-electrode shadow mask that we already have:

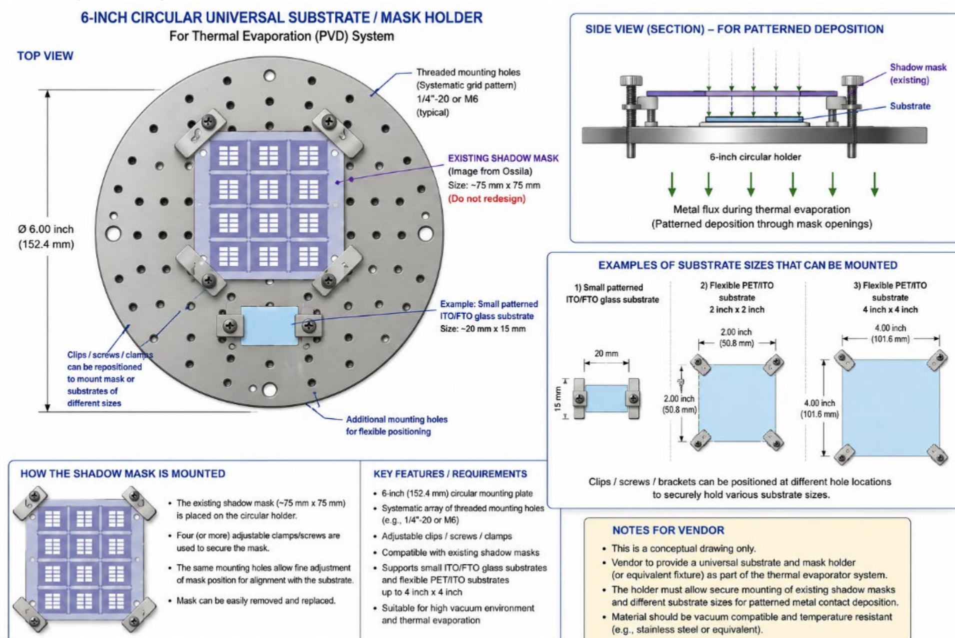
Multi-Electrode Mask

Ossila's multi-electrode mask has been designed to obtain the most amount of pixels from a single substrate. Using our multi-electrode mask, it is possible to define 8 x 4mm^2 devices. In addition, by placing the electrodes in the middle of the substrate edge defects from solution processing of films can be eliminated improving the reliability of devices across a substrate. By using a multi-electrode structure, device statistics are significantly improved -- allowing you to feel confident in the results you are obtaining from thin film device fabrications. The deposition pattern overlaid onto our S211 substrate is shown to the right.



schematic drawing of our multi electrode mask

2. A conceptual drawing showing the type of universal circular substrate/mask holder we are requesting:



Ideally, the holder would be a circular mounting plate, approximately 6 inches in diameter, with a systematic array of threaded holes or mounting points. This would allow clips, screws, clamps, or brackets to be repositioned for different substrate sizes and for holding the shadow mask.