Minimum Technical Requirements for an Electron-beam Deposition Retrofit Kit,

The following is a list of technical specifications required for minimum operation of the requested custom Electron-beam deposition kit:

1. The Electron-beam deposition kit shall be designed to fit inside the existing vacuum sputtering chamber in Building 3, Rm. 242, without having to modify or replace the existing vacuum chamber.
2. The Electron-beam deposition kit shall comprise of a compact 3KW e-beam source with four independent sources of material (known as pockets). The overall dimensions of the e-beam source shall not exceed 3" wide by 6.5" deep by 2.5" high. Each pocket shall provide a volume for evaporating material equal or greater than 2 cubic centimeters.
3. The e-beam source shall provide the capability of accessing each of the pockets for deposition without breaking vacuum by rotating the pockets exposed to the e-beam source. Rotation shall be provided by manual operation via a rotary feedthrough.
4. The Electron-beam deposition kit shall include a power supply with filament transformer rated at a power equal or greater than 3KW to operate the e-beam source. Power supply shall comprise of a digital display with graphic user interface and programmable power level and arc recovery. Cables to connect the power supply to the e-beam source shall be included.
5. The Electron-beam deposition kit shall include a programmable controller to sweep the e-beam over the entire pocket containing material to achieve uniform heating for controlled material evaporation. Controller shall be capable of storing user-defined sweep patterns.
6. The Electron-beam deposition kit shall include a computer-controlled thin film deposition thickness controller to monitor film growth rate, thickness and temperature during deposition and control operation of e-beam power supply.
7. The Electron-beam deposition kit shall include a single quartz crystal sensor head with embedded thermocouple. Quartz crystal sensor shall be mounted on a 2.75" CF flange.
8. The Electron-beam deposition kit shall include a 8" dia. CF vacuum flange with a rotary magnetic fluid sealed feedthrough for switching the pockets on the e-beam source, multiple electrical feedthroughs to control the e-beam source and two water feedthroughs to provide cooling for the e-beam source. The 8" dia. CF flange shall also include required mounting hardware to support e-beam source inside vacuum chamber.
9. The Electron-beam deposition kit shall include high voltage vacuum feedthrough rated to 10 KV mounted on a separate 2.75" CF flange.
10. Up to two days of on-site support to install and test the Electron-beam deposition kit shall be provided.

The above minimum technical requirements for this custom Electron-beam deposition kit designed to fit inside the existing sputtering chamber in Building 3, Rm. 242 shall be fulfilled in order to fabricate thin films of dielectric materials for optical multilayer stacks under development in Code 6364. The electron-beam kit designed by All Scientific, LLC of Gaithersburg, MD provides the best match to the above minimum technical requirements. A quote from All Scientific is enclosed for reference.

If there are any questions related to this purchase requisition, please contact Alberto Piqué at 767-5653.