

## Technical specification for Excimer laser for Pulsed Laser Deposition

Sl. No.	Description
1	<b><u>Pulsed Excimer laser</u></b>
	a) Laser Wavelength: 248 nm
	b) Pulse Energy: 400 mJ per pulse. It should not exceed per pulse by more than 10%.
	c) Average Power: 8W or more. It should not exceed by more than 10%.
	d) Pulse rep. rate: 20 Hz and it should be continuously variable
	e) Pulse duration: 20 ns or better.
	f) Pulse to Pulse stability: $\pm 1\%$ or better.
	g) Minimum Beam Dimension (V $\times$ H): $\sim 10 \times 10 \text{ mm}^2$
	h) Maximum Beam divergence: $3 \times 1 \text{ mrad}^2$
	i) Laser Beam Pointing Stability: 50 $\mu\text{rad}$ or better
	j) Cooling: Air-cooled only.
	k) Laser Tube: Metal Ceramic technology.
	l) The system should be operated at constant energy and constant voltage modes.
	m) Single Phase Operation, 220V/50Hz
n) Gas life time should be $\geq 10$ million shots from one @ KrF gas mixture	
2	<b>The other requirements:</b>
	a) Electrostatic gas filter for internal gas purification system for extended operation of laser gas
	b) Integrated Oil free Vacuum pump and inbuilt Halogen filter
	c) An Integrated Energy monitor for stabilized operation
	d) Magnetic Assist Protection for Optimized discharge and long lifetime of Thyatron.
	e) Thyatron lifetime: 1 billion shots.
	f) KrF gas mixture lifetime (50% drop of maximum energy) should be clearly mentioned in the quotation. This lifetime should be at least 7million shots

	<p>from one fill of KrF gas mixtures. If the laser is not used after a refill, it should take at least 18 days for the energy to be half of the maximum energy</p>
	<p>g) The laser system should be controlled through a handheld keypad which can be used to control any action of the laser and fill in procedure of the gases in the laser. The handheld keypad should be supplied along with the laser system</p>
	<p>h) An external electrical trigger facility with TTL pulse and synchronous output in internal trigger operation.</p>
	<p>i) The laser system should be controlled through a remote control and should have RS 232/GPIB/USB interface to control through computer.</p>
	<p>j) Window cleaning Interval ~100 million shots.</p>
	<p>k) External energy meter:   Display Unit: Large backlight LCD display, USB interface, Digital reading display, Statistical Analysis (Mean, Max, Min, Std deviation), Rechargeable battery &amp; AC power adaptor.   Energy Sensor: specifically, suitable for Excimer Lasers</p>
	<p>l) Laser Safety Goggles suitable for above required laser: 4 numbers.</p>
	<p>m) Mirror: 2 numbers of Suprasil Quartz mirror with minimum of 38 diameter × 5 mm thickness. Reflectivity should be more than 99.5% at 248 nm and AOI 45 degree of arc.</p>
	<p>n) Plano-Convex lens: 1 number of antireflections coated Fused Silica UV grade lens with the dimensions of diameter (50.8-0.2) mm and edge thickness 3mm. Focal length at 248 nm should be 50 cm.</p>
3	<p><b>Gases for operation</b></p>
	<p>a) All gases (premix configuration in ~49 liter cylinder) required for the operation should be quoted together with gas regulators for the proposed system</p>
	<p>b) Supplier should clearly indicate the purity and quantity of each type of gas.</p>
	<p>c) The regulator should for high purity gas and suitable for corrosive gas.</p>
	<p>d) Supplier will be responsible for getting all clearance from Department of Explosive for import of gases &amp; cylinders.</p>
4	<p><b>List of Optional Items: Spare Parts</b></p>
	<p>a) Halogen filter</p>
	<p>b) Varistors</p>

	c) Fibre optic repair kit
	d) Rear mirror
	e) Output coupler
5	<b>Other Requirements :</b>
	a. The system should incorporate necessary safety interlock to permit safe operation of the equipment.
	b. All utilities for installation of the system should be clearly stated.
	c. The Manufacturer/Indian representative should undertake to install and commission the system at the purchaser's laboratory in the event of an order and demonstrate satisfactory performance. The installation and commissioning should be provided by the Manufacturer or their Indian representative. The Indian representative should have well proven service capability on similar system.
	d. All the technical literature/catalogues of various sub-system in English must accompany the quotation. In the event of an order, the manufacturer should undertake to supply all the documents including complete system description, operation and service manuals and full description of hardware and software used. Hard copy of all manuals including operations, maintenance and service manual along with circuit diagram of main equipment and all its accessories should be provided.
	e. Warranty: The Warranty on the complete system should be for 3 years. The equipment should be guaranteed for trouble free performance at the purchaser's laboratory for the period of 3 years or more from the date of commissioning of the equipment.
	f. The system quoted should be a standard model available in the market and not a customized one. The datasheet of the proposed system should be available on the manufacturer's website
	g. Output energy and energy stability needs to be demonstrated at the time of installation. Test report must be supplied along with the laser system.
	h. Company should have minimum 5 nos. of supply reference of the similar system installed in India in last 3 year. The detail Indian User reference list should be provided with contact details etc. The Company should provide 5 satisfactory certificates from the users in India.
	i. The company must have a Local Trained Service engineer to provide after-sales support. Certificates of the trained engineer should be included with the quotation.