14 June, 2017 PH/SMI/168/2017-18

Tender Notification for the Procurement of Two Identical 'KrF Excimer Laser and Associated Accessories'

(Last Date for submission of tenders: 3rd July, 2017)

Kindly send your best quotation for **two identical KrF excimer lasers** and accessories with the following technical specifications on C.I.P. Bangalore basis. Your quotation should clearly indicate the terms of delivery, delivery schedule, estimated delivery date, and payment terms. Each tender should be submitted in two separate sealed envelopes - one containing the technical bid and the other containing the commercial bid, both of which should reach us, duly signed on or before 17:00 hours on 3rd July, 2017.

The bids for both systems should be addressed to:

The Chairman,
Department of Physics
Indian Institute of Science (IISc)
Bengaluru, India - 560012

One set (technical + commercial) of sealed bids should be sent to:

Prof. P. S. Anil Kumar
Professor
Department of Physics
Indian Institute of Science (IISc)
Bengaluru, India - 560012.
Ph: +91-80-2293 2632
Email: anil@physics.iisc.ernet.in

Another set (technical + commercial) of sealed bids should be sent to:

Dr. Srimanta Middey
Assistant Professor
Department of Physics
Indian Institute of Science (IISc)
Bengaluru, India - 560012.
Ph: +91-80-2293 2861
Email: smiddey@physics.iisc.ernet.in

Please enclose a compliance statement along with the technical bid.

Technical Specifications for Excimer Laser and Associated Accessories

1. *KrF Excimer Laser*

1.1. The laser wavelength should be 248 nm.

1.2. The maximum laser pulse energy should at the least be 400 mJ per pulse. The maximum pulse energy for the laser being quoted should not exceed 400 mJ per pulse by more than 10%.

1.3. The maximum average output power of the laser beam should at the least be 8 W. The maximum average output power of the laser beam should not exceed 8 W by more than 10%.

1.4. A maximum pulse repetition rate of at the least 20 Hz should be possible. The pulse repetition rate should be continuously variable from 1 Hz to 20 Hz.

1.5. The average pulse duration should not exceed 20 nanoseconds.

1.6. Pulse to pulse energy variation should be less than 1%

1.7. The output laser beam dimensions should be approximately 25×10 mm^2

1.8. Laser beam divergence should be $\leq 3 \times 1$ mrad^2

1.9. Laser beam pointing stability (1 sigma) should be ≤ 50 µrad

1.10. The laser should be capable of operating with a single-phase 230 V power supply.

1.11. The laser tube should be air-cooled. Water-cooled systems will not be considered.

1.12. KrF gas mixture lifetime (50% drop of maximum energy) should be clearly mentioned. This lifetime should be at least 8 million shots from one fill of KrF mixture. If the laser is not used after a refill, it should take atleast 18 days for the energy to be half of the maximum energy.

1.13. The laser system should have an integrated energy monitor for stabilized operation

1.14. There should be an integrated oil free vacuum pump (used to evacuate the laser tube before a gas fill).

1.15. The system should come with an inbuilt halogen filter.

1.16. Laser tube and other components should be designed to minimize the effects of halogen corrosion and contamination to ensure long gas life times.

1.17. Laser should be operable in constant energy and constant voltage modes.

1.18. The laser system should be controllable through a handheld keypad. It should be possible to control any action of the laser and to fill in process gas using the handheld keypad. The handheld keypad should be supplied along with the laser system.

1.19. The system should also have a suitable communications interface such as RS232 and be controllable via a software interface on a computer.

1.20. It should be possible to externally trigger the laser system with a TTL pulse and it should be possible to set the laser system to accept an internal or an external trigger (such as from a computer software).

1.21. The laser should have an integrated electrostatic gas filter for filtering particles in process gases.

2. *Other Requirements*

2.1. The system should have a modular design for easy service ability and troubleshooting. Components should be easily accessible for maintenance as and when needed.

2.2. The system should incorporate necessary safety interlocks to permit safe operation of the equipment. Details of safety interlocks should be clearly mentioned in the technical bid.

2.3. All utilities for installation of the system (space, support table, electrical power etc.) should be clearly stated in the technical bid.

2.4. If an order is placed, the Manufacturer or Indian representative should install and commission the system at purchaser's laboratory and demonstrate satisfactory performance. The Indian representative should have well proven service capability on similar systems.

2.5. All the technical literature/catalogues of various sub-systems must accompany the quotation. All documents should be in English. If an order is placed, the Manufacturer should supply all documents including complete system description, operation and service manuals, and full description of hardware and software used.

2.6. Equipment should be guaranteed for trouble free performance at the purchaser's laboratory at least for a period of two years from the date of commissioning of the equipment.

2.7. A list of at least 5 references in India, where similar systems have been installed in the recent 3 years, must be provided.

2.8. The Manufacturer/Indian representative should have 2 or more factory-trained engineers for after sales support and maintenance of the system. The training certificates of the trained engineer should accompany the bid.

3. *Gases and regulators required for the laser*

3.1. A 49-liter gas cylinder with KrF gas premix (6900 liters at normal Temperature and Pressure (NTP)) suitable for the laser should be quoted.

3.2. A suitable 316 stainless steel gas regulator for the premix cylinder should also be quoted.

3.3. A 50-liter helium gas cylinder (9100 liters helium at NTP, purity 99.999%) with a suitable 316 stainless steel regulator should be provided.

3.4. The purity of the gas mix and helium gas should be clearly mentioned.

3.5. The regulators should be for high purity gas and suitable for corrosive gas.

3.6. The manufacturer of the gas regulator, if being provided by a third party supplier should be clearly mentioned.

4. *Accessories*

4.1. An external energy meter to measure output laser energy and power should be provided. The external energy meter should meet the following specifications:

4.1.1. The energy meter should have a suitable display unit such as backlight LCD display.

4.1.2. The energy meter should enable statistical analysis such as measuring mean, maximum, minimum, and standard deviations of output parameters such as energy and power.

4.1.3. The energy meter should come with a rechargeable battery & AC power adaptor.

4.1.4. The energy meter should have a USB interface for connecting to a computer.

4.1.5. The energy sensor in the meter should enable the measurement of energy over the range of 1 mJ to 1 J measurement with an average power measurement of at the least 35 W.

4.1.6. The energy sensor diameter should be approximately 50 mm.

4.1.7. The damage threshold should be > 500 mJ/cm^2.

4.2. The prices for consumables such as halogen filter, O-rings and spare parts such as varistors, trigger board, rear mirror, output coupler, etc., should be quoted.

4.3. The bidder should also quote the price for 4 pairs of suitable laser goggles for working with 248 nm wavelength laser light.

Yours Sincerely,

Prof. P. S. Anil Kumar
Professor
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