

Beam shaper for ultrafast laser

Bids are entitled for the supply installation and commissioning of beam shaper. The proposed item to be purchased should be compatible with the ultrafast laser given in tar ensure A

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| 1.0 | Required output beam characteristics | |
| 1(a) | Output shape parameters | |
| 1.1 | Type | Free space collimated |
| 1.2 | Target/ Feature Dimension | 0.06 mm to 3.0 mm |
| 1.3 | Target Shape/Geometry (s) | Please specify if available all (circular, square and line) |
| 1.4 | Dimension in the processing plane | 2 to 4 mm |
| 1.5 | Beam quality | Diffraction limited |
| 1.6 | Spatial mode | Square or circular flat top |
| 1.7 | Total losses | < 10 % |
| 1(b) | Laser environment | |
| 1.1 | Ambient temperature | Constant value, set between 18 and 25°C |
| 1.2 | Temperature stability | ± 1,5 °C |
| 1.3 | Humidity | < 50% @ 25°C |
| 1.4 | Vibrations | Optical table or stable bench |
| 1.5 | Electricity | 110-250V AC 50 Hz, < 16 A@220V |
| 2 | Application requirements | |
| 2.1 | Micro drilling of high aspect ratio holes on thick materials such as Ti6al4V and Nickel alloys with zero conicity (taper angle) , Circularity error < 5 µm | |
| 2.2 | Shaped micro holes with an acute angle of 15 to 30° | |
| 2.3 | Surface texturing | |
| 3.0 | Quotation must include Installation, Commissioning and integration with the existing system and Annual Maintenance for 3 years | |
| 4.0 | It should be compatible with the existing system shown in Appendix A | |

Other Requirements

1. Quotations with the complete solution for the above requirement will only be accepted.
2. I.I.T. Madras has the right to accept the whole or any part of the tender or portion of the quantity offered or reject it in full without assigning any reason (Quote items separately)
3. Quotations for a prototype machine will not be accepted.
4. Test certificates for all the stages confirming the specifications from OEM are required with shipping/freight documents.
5. Suppliers to provide training for programming, operation and maintenance at IIT Madras at free of cost.
6. All necessary safety regulations should be followed.

7. The complete system and its associated hardware/should have a standard warranty of 3 years from the date of installation, commissioning and acceptance of the system at IIT madras. Suppler modification (s)/software upgrades shall be intimated and the same will be made available free of cost during the warranty period.
8. All technical literature/catalogues and drawings of various systems should accompany the quotation. All the documents should be in English.
9. Installation and commissioning should be provided by the supplier. The Indian agent should have well proven service capability on similar systems with factory trained service engineers available in India. Details of their engineers expertise should be enclosed along with the offer and will be a key factor in the decision making.
10. The system should have compatibility with Indian environment conditions (for better power/energy stability)
11. Supply detail similar items to other IIT's /NIT's/ Universities should be provided.
- 12. The last date for receipt of the quotation is .**

Appendix A

| S. No. | Specifications | Details |
|------------|---|--|
| 1.0 | Details of Existing Laser Features | |
| 1(a) | Laser input characteristics | |
| 1.1. | Type | High power ultrafast fiber laser (Yb) |
| 1.2 | Model | SATSUMA HP2 |
| 1.3 | Principle | M/s. AMPLITUDE SYSTEMS, FRANCE |
| 1.4 | Wavelength | 1030 nm |
| 1.5 | Lenses for beam delivery | Silicon Carbide Mirrors |
| 1.6 | Average power | Up to 20W |
| 1.7 | Pulse energy range (minimum) | Up to 40 μ J |
| 1.8 | Repetition rate (minimum) | 2 kHz to 2 MHz |
| 1.9 | Pulse width/Pulse duration | 300fs to 10 ps |
| 1.10 | Traverse mode | TEM00 |
| 1.11 | Beam quality, M^2 | <1.2 |
| 1.12 | Energy stability | <1% RMS |
| 1.13 | Pulse to pulse energy variation | <1% |
| 1.14 | Beam diameter | 3 ± 0.5 mm |
| 1.15 | Beam divergence | 0.5-0.6 milli radians |
| 1.16 | Operation | Computer control and full automation |
| 1.17 | Cooling System | Close loop Air Cooled |
| 1.18 | Machine Capability | Minimum spot/feature size 60 μ m |
| 1(b) | Galvo scanner and Laser Head | |
| 1.1 | Model | LS Scan - XY 20 (LS View) |
| 1.2 | Scanner aperture (input/output) | 5 / 20 mm |
| 1.3 | F Theta lens | F-Theta lens focuses the beam on a flat field |
| | Make | Linos F-theta Ronar |
| | Model: | 4401:288:000:20 |
| 1.4 | TELECENTRIC F-THETA LENS | Addition to focalize the laser beam on flat field, the Telecentric F-Theta objectives allows |

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| | | to conserve the same angle of attack for any points on this field |
| 1.5 | Labjack near Galvo Scanner | Utilizes a dual-pantograph design which offers excellent rigidity |