



**NATIONAL CENTER FOR COMBUSTION RESEARCH  
AND DEVELOPMENT (NCCRD)  
INDIAN INSTITUTE OF TECHNOLOGY MADRAS  
CHENNAI – 600036, INDIA**

**Ref. No. ICS/11-12/013/DSTX/TSUN**

**Date: 29 June 2016**

**Due date: 20 July 2016**

**Item name: DOUBLE SHUTTER CCD CAMERA (2 nos.)**

1. Quotations are invited in a **two bid system** for the items shown overleaf (in Annexure I). The offers / bids should be submitted as Technical bid and Financial bid. The Technical bid should consist of all technical details / specifications only. The Financial bid should indicate item-wise price for each item and it should contain all Commercial Terms and Conditions including Taxes, transportation, packing & forwarding, installation, guarantee, payment terms, pricing terms etc. The Technical bid and Financial bid should be put in separate covers and sealed. Both the sealed covers should be put in a bigger cover. The Tender for supply of “ \_\_\_\_\_ ” should be written on the left side of the Outer bigger cover and sealed.
2. The quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
3. The total cost of the equipment in terms of CIP Chennai should be clearly mentioned.
4. Terms of warranty and guarantee should be explicitly mentioned.
5. Packing and delivery charges, customs and clearance duty should be clearly stated.
6. Goods shall not be supplied without an official supply order.
7. Local firms : Quotations should be for free delivery to this institute. If quotations for ex-godown delivery charges should be indicated separately.
8. Firms outside Chennai: Quotations should be for F.O.R. Chennai. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If ex-godown, packing, forwarding and freight charges must be indicated.
9. The rate of sales / general taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for sales / general taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have Concessional Sales Tax (CST) applicable to non-government educational institutions run with no profit motive for which a concession sales tax certificate will be issued at the time of final settlement of the bill.
10. Payment : Specify the mode of payment and if advanced payment has to be made. Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.
11. IIT Madras is exempt from payment of excise duty and is eligible for concessional rate of customs duty. Necessary certificate will be issued on demand.
12. IIT 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.
13. The sealed quotation may be sent to

**Prof. S. R. Chakravarthy**

**NCCRD Office**

**No. 201, Rarefied Gas Dynamics Lab (Behind Aerospace Engineering Dept.)**

**Chennai – 600036, Ph. (O) +91-44-22575025**



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**Annexure I**

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**Technical specifications of Double Shutter CCD Camera (2 nos.)**

**Camera requirements: 2 units of a compact CCD camera for studies on sprays**

- Compact camera: frontal dimension: 50 mm x 50 mm or less
- Weight: <400 g
- Sensor type: Monochrome CCD / ICCD
- Resolution: not less than 1280 x 1024
- Maximum Quantum efficiency: Not less than 60%
- Pixel size: not less than 6 micro meter
- Interframing time between two frames: 1 micro second or less
- Minimum exposure time: 1 micro second or less
- Binning: 2x2 or higher
- Frames per second: not less than 5 fps at full resolution
- Dynamic range: 14 bit
- Full well capacity: Not less than 15000 e-
- Non linearity: less than 1%
- Noise: less than 10 e-
- Spectral range: 300 nm to 1000 nm
- Mount type: F mount (in case of C/CS mount cameras, an F mount adapter should be included)
- Control: Manual and external trigger through TTL signal or RS 232 interface
- Data interface: USB or Gigabit Ethernet or Camera Link
- Operating temperature: up to 40 degrees C ambient temperature
- Power requirements: should be able to work with 220 V AC power supply
- Warranty for 1 year
- Software for acquiring images should be included
- The camera should be compatible for control through the LabView software (drivers should be included)
- Trigger cable should be included

**Accessories**

- Frame grabber card (if applicable)
- 100 mm macro lens from reputed manufacturer



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Each quotation of camera should also include a catalogue, containing technical specification of the camera offered and also a list of existing customers in India, failing which the offer is liable to be rejected. Also, include an offer to extend warranty to 2 and 3 years.

**Contact details for technical clarifications:**

**Prof. T.N.C. Anand, Mechanical Engineering, IIT Madras.**

**Email id: [anand@iitm.ac.in](mailto:anand@iitm.ac.in)**