

	<b>INDIAN INSTITUTE OF TECHNOLOGY MADRAS</b> <b>Chennai 600 036</b>	 <b>RWTUV</b>
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Prof. Anand T N C  
Project Coordinator

Ref: MEC/ATNC/01/2020  
Dated: 12.06.2020

Limited Tender No: MEC/ATNC/01/2020

**Due Date: 02.07.2020, 5:00pm**

**Pre-Bid meeting: - Not required.**

**Technical Bid opening meeting on Due Date: 03.07.2020, 4:00pm**

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of **“High Speed Camera with Bayer Filter”** conforming to the specifications given in **(Annexure-I)**.

#### **Terms and Conditions of Limited Tender**

**1. Preparation of Bids:** - The Limited tenders should be submitted under **Two bid system** (i.e.) Technical- and -Financial bid.

**2. Delivery of the tender:** - The tender shall be sent to the below-mentioned addresses either by post or by courier (duly sealed and super scribed on the envelope with the reference No and due date) so as to reach the following address before the due date and time specified in our Schedule:

**Prof. Anand T N C,  
Department of Mechanical Engineering  
IIT Madras  
Chennai - 600 036**

**3. Price:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to **Department of Mechanical Engineering**.

a. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for concessional GST and relevant certificate will be issued.

b. In case of import supply, the price should be quoted without custom duty. IIT Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty (not exceeding 5%) and the price should be quoted on EX-WORKS and CIP (stating the Cost, Insurance, Freight separately) and indicating the mode of shipment.

**4. Terms of Delivery:** - The item should be supplied to our Departments as per Purchase Order. In case of import supply, the item should be delivered at the cost of the supplier to our Institution. The Installation/Commissioning should be completed as specified in our important conditions.

**5. Catalogue:** Original catalogue (not any photocopy) of the quoted model duly signed must accompany the quotation in the Technical bid

**6. Late offer:** - The offers received after the due date and time will not be considered

**7. Payment:** - No Advance payment will be made for Indigenous purchase. However, 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved. In case of import supplies the payment will be made only through 100% Letter of Credit i.e. (90% payment will be released against shipping documents and 10% after successful installation wherever the installation is being done).

**8. Advance Payment:** - No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Vendor has to submit a Bank Guarantee from a Nationalized Bank of India equal to the amount of advance payment.

- 9. On-site Installation:** - The equipment or machinery has to be installed or commissioned by the successful bidder within number of days (as prescribed by PI's) from the date of receipt of the item at site of IIT Madras.
- 10. Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment.
- 11. Validity:** Validity of Quotation not less than 60 days from the due date of tender
- 12. Technical Bid Opening:** The technical bid will be opened on **03.07.2020 4:00pm** at the Department of Mechanical Engineering, IIT Madras and the **financial bids** of those tenders who are technically qualified will be opened at a **later date under intimation to them**.
- 13. Performance Security:-**The successful bidder should submit Performance Security for an amount of 5% of the value of the contract/supply within 21 days from the issue of work/purchase order. The Performance Security should be furnished in the form of an Account Payee DD / FD Receipt from the commercial bank (or) Bank Guarantee from any nationalized bank in India.
- 14. Accept /Reject:** IIT Madras reserves the full right to accept / reject any tender at stage without assigning any reason.
- 15. Settlement of Disputes:** Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.
- 16. Risk Purchase Clause:** - In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
- 17. Unsolicited offers:** “This notice is being published **for information only** and is not an open invitation to quote in this limited tender. Participation in this tender is by invitation only and is limited to the selected registered suppliers. Unsolicited offers are liable to be ignored. However, suppliers who desire to participate in such tenders in future may apply for registration as per procedure.” The Website for Registration of vendors is <http://web.iitm.ac.in/supplier/> and the mail address for queries is “[workflow@rt.iitm.ac.in](mailto:workflow@rt.iitm.ac.in)”.

Yours sincerely,

**Prof. Anand T N C,  
Department of Mechanical Engineering  
IIT Madras  
Chennai - 600 036**

## **Specifications for High Speed Camera with Bayer Filter**

**Camerarequirements:1unitsofacompact,sensitive,color,CMOShighspeedcamerafors**  
**studiesonsprayswith3-colorstructuredillumination**

- 1) Compact camera: frontal dimension: 150 mm x 150 mm or less
- 2) Weight: < 2 kg
- 3) Sensor type: CMOS with Bayer Filter
- 4) Resolution: not less than 1000 x 1000 pixels
- 5) Maximum Quantum efficiency: Not less than 45 %
- 6) Light sensitivity: ISO rating of 15000 or higher in color as per ISO 12232
- 7) Internal memory: 8 GB or higher
- 8) Minimum frame rate at full resolution: 2000 fps
- 9) Pixel size: 20  $\mu\text{m}$  or higher
- 10) Minimum exposure time: global exposure time of 1.5  $\mu\text{s}$  or lower at full resolution
- 11) Binning: 2 x 2 or higher
- 12) Dynamic range: 12 bit per color, or higher
- 13) Spectral range: 400 nm to 675 nm or wider
- 14) Mount type: F mount (in case of C/CS mount cameras, an F mount adapter should be included)
- 15) Control: Manually through software, and external trigger through TTL signal via BNC cables
- 16) Data interface: Gigabit Ethernet or Camera Link
- 17) Operating temperature: 15 to 40 degrees C ambient temperature or wider
- 18) Power requirements: should be able to work with 220 V AC power supply
- 19) Software for acquiring images should be included
- 20) The camera should be compatible for control through the LabView software (drivers should be included)
- 21) Warranty for 1 year
- 22) Transit/storage case should be provided
- 23) Image formats: TIFF, RAW
- 24) Maximum framing rate: >50,000 fps
- 25) Bayer filter characteristics required:
  - Blue:
    - Minimum relative spectral response  $\geq$  40 % at wavelengths between 450 to 460 nm (preferably at 457 nm)
    - Maximum relative spectral response of  $\leq$  15 % at 530 to 540 nm
    - Maximum relative spectral response of  $\leq$  5 % at 630 to 640 nm
  - Green:
    - Minimum relative spectral response of  $\geq$  60 % at wavelengths between 530 to 540 nm (preferably at 532 nm)
    - Maximum relative spectral response of  $\leq$  15 % at 450 to 460 nm
    - Maximum relative spectral response of  $\leq$  15 % at 630 to 640 nm
  - Red:
    - Minimum relative spectral response of  $\geq$  80 % at wavelengths between 630 to 640 nm (preferably at 639 nm)
    - Maximum relative spectral response of  $\leq$  5 % at 450 to 460 nm
    - Maximum relative spectral response of  $\leq$  15 % at 530 to 540 nm

- 26)** Vendor should mention maximum/minimum relative spectral response values for the ranges mentioned in point 22, for the camera quoted in a tabular form, as below:

<b>Blue channel</b>	<b>% Value</b>
Minimum relative spectral response between 450 and 460 nm	
Maximum relative spectral response between 530 and 540 nm	
Maximum relative spectral response between 630 and 640 nm	

<b>Green channel</b>	<b>% Value</b>
Maximum relative spectral response between 450 and 460 nm	
Minimum relative spectral response between 530 and 540 nm	
Maximum relative spectral response between 630 and 640 nm	

<b>Red channel</b>	<b>% Value</b>
Maximum relative spectral response between 450 and 460 nm	
Maximum relative spectral response between 530 and 540 nm	
Minimum relative spectral response between 630 and 640 nm	

- 27)** Quantum efficiency values at 447 nm, 457 nm, 532 nm, and 639 nm, for the blue, green, and red channels should be tabulated by the OEM on their letterhead if these data are not usually a part of the standard catalog. These should be tabulated as below:

<b>Blue channel</b>	<b>% Value</b>
Quantum efficiency at 447 nm	
Quantum efficiency at 457 nm	
Quantum efficiency at 532 nm	
Quantum efficiency at 639 nm	

<b>Green channel</b>	<b>% Value</b>
Quantum efficiency at 447 nm	
Quantum efficiency at 457 nm	
Quantum efficiency at 532 nm	
Quantum efficiency at 639 nm	

<b>Red channel</b>	<b>% Value</b>
Quantum efficiency at 447 nm	
Quantum efficiency at 457 nm	
Quantum efficiency at 532 nm	
Quantum efficiency at 639 nm	

**28)** Each quotation of camera should also include a catalog, containing technical specification of the camera offered and also a list of existing customers in India for the color or equivalent mono-chrome model, failing which the offer is liable to be rejected.

### **Optional items**

- a) Option for 1  $\mu$ s exposure time at full resolution if available
- b) Extended warranty of 2 years (after standard warranty period of one year)
- c) Extended warranty of 3 years (after standard warranty period of one year)
- d) Option for 16 GB memory
- e) Heavy duty tripod
- f) 105 mm f/2.8 Macro lens