



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai - 400076

After pre-bid meeting, Revised Technical Specification
for High-Speed Imaging Camera

This tender includes the purchase of a 'high-speed imaging system,' also known as 'high-speed camera system.' The desired specifications of each of the components are given below. Please note, all components are necessary unless "OPTIONAL" is specified against them. ***The camera will be used for the analysis of ultrafine gas bubbles dispersed in cutting fluid.***

Notes and essential terms for qualification:

1. The vendor should provide details of at least three customers (at least one from India in the past three years) where a similar system/equipment from the manufacturer has been working successfully. Wherever the system is being used, background checks may be done at the expense of the vendor.
2. The system should come with a **comprehensive warranty of 12 months** from the date of installation.
3. The price quote must include the price of software, accessories, packing, etc. Educational/research/academic discounts may be applied, if applicable. An authorization letter should be furnished along with the quotation.
4. A compliance statement should be enclosed with the quotation. Point by point list must be provided in the compliance statement to demonstrate that the requirements have been met.
5. Trained service engineers in India (preferably in Mumbai) should be available to resolve any technical problems.
6. The lead time for the delivery of the equipment should not be more than three months from the date of receipt of the purchase order.
7. The vendor should take total responsibility for installing/assembling the system and demonstrating the performance on-site. The installation should be done free of cost. Training to operate the instrument must be given to our research scholars at free of cost.

8. Before the purchase order, the technical specifications described below should be substantiated with certification. The inability to do so will lead to disqualification from the tender process.

9. Live demonstration is required for technical evaluation.

10. As and when the queries are raised against any technical point, it must be addressed promptly, positively within seven working *days*. In case, the response is not received within seven working days; the offer will be rejected on technical grounds.

11. Vendors are encouraged to highlight any other salient features or technical advantages of their product over the competitors.

Technical Specifications :

No	Parameter	Specifications
1	Resolution and Frame Rate	Minimum 1MP resolution (and minimum 800 pixel in each direction) at minimum 7500 fps frame rate
		Should reach minimum 60000 fps frame rate at 65536 pixels (256 x 256) resolution
		Higher frame rates at reduced resolution
		User should be able to select the frame rate and the resolution
2	Sensor	CMOS sensor
		Pixel size of 15 to 26 microns square
		Monochrome, Color mode [Optional]
		>= ISO 25000 in monochrome mode (ISO 12232 Ssat standard at gain 1)
		>= 12-bit depth
		Dark current <= 40e- at 20 ⁰ C
		Fill factor >= 55%
		Maximum quantum efficiency in the range of 550 nm - 650

		nm \geq 45%
		Sensor dynamic range \geq 50 dB
		Spectral response graph should be provided
3	Memory	Should have internal memory to record for at least 3 seconds at 7500 fps and 1MP resolution
		Continuous recording should be possible when connected to external memory
		Should have option of recording while downloading data
		Should have option of upgrading in future if required
4	Shutter Speed	< 1 microsecond (global electronic shutter) independent of frame rate
5	Triggering	Programmable trigger (start/end/center) with at least 100ns resolution
		Trigger from the software
		External hardware trigger
6	Connectivity	High-speed gigabit Ethernet for control and data
		Capability of synchronizing the camera with other cameras or external sources
7	Software	User-friendly, supported in standard OS (Windows/Linux)
		Should provide lifetime access to future upgrades at no additional cost
		Software must display all the basic imaging parameters
		Should help in focusing
		Image and video processing tools
		Frame synchronization
		Basic measurement tools and motion analysis
		Standard image formats such as TIFF, RAW, AVI, MOV
		Please mention compatibility with other software like MATLAB, LABVIEW

8	Lensing	C-mount adapter must be provided if the camera is F-mount
9	Power Requirements	100 - 240 V, 50 - 60 Hz AC
10	Weight	< 10 Kg with batteries
11	Operating Conditions	Up to 45 deg C at least, Maximum humidity higher than 80%, Camera should have active cooling
12	Warranty	Comprehensive warranty of 12 months from the date of installation.
13	Tripod	Professional heavy-duty tripod compatible with the camera
14	LED Lighting	White light LEDs > 12000 Lumen
15	Spare Parts/Upgrades	Please provide a list of spare parts or upgrades that are possible in future
		Spare parts must be available with the manufacturer at least for the next 10 years

Technical Evaluation Process :

The technical and commercial evaluation of the product will be carried out separately. The following details should be furnished along with the offer.

- a) Name of the company
- b) Address of the company
- c) Comprehensive Company Profile
- d) Specific company details
- e) Details of the service team to support the system offered by them
- f) Details of customers, to whom similar system, were supplied with in the country. Provide the list containing the name of the contact person, address and telephone number.

The offers will be evaluated based on the following :

- a) It will be a two-bid submission and technical and commercial bids will be submitted separately.
- b) Detailed technical submission by the vendor explicitly showing compliance with the specifications mentioned in the tender document.
- c) Prompt response to the technical queries raised by the user
- d) In case the response is not received against technical inquiry within seven working days, the offer will be treated as rejected on technical ground.
- e) A comprehensive technical presentation may be sought by the vendor's representative who can respond to queries on the floor or via teleconferencing.
- f) The purchaser reserves the right to visit the installation site for evaluation prior to the finalization of the order.
- g) Please quote a **comprehensive warranty of 12 months** from the date of installation.