

CHAPTER - 4

ELIGIBILITY CONDITIONS, SPECIFICATIONS AND ALLIED TECHNICAL DETAILS

Minimum Eligibility Criteria for Participation in Tender

Vendor must have installed a minimum of three high speed equivalent cameras in any national laboratories (DRDO/CSIR/DST, etc.) or central-funded teaching and research institutes (IITs/IISc/NITs, etc.) in India within the last five financial years or latest

(Note: Firms not meeting the minimum eligibility conditions will not be considered for technical evaluation.)

Technical Specification for High-speed camera

Minimum technical specifications required for one unit of High-speed camera:

Sl. No.	Parameters as notified in the tender	Revised SERC Requirements after PBC
1.	Sensor type	Minimum requirement: Back side illuminated (BSI) CMOS
2.	Sensor resolution	≥ 1.0 Mega pixel
3.	Frames per Second	≥ 15,000 frames per second @ 1 Mega pixel ≥ 4,00,000 frames per second @ 256X128 (Or its equivalent Megapixels)
4.	Memory (In built memory)	≥ 64 GB
5.	Non-Volatile Media Slots	Supporting secondary data offload from primary storage to removable, non-volatile media to enable untethered, standalone operation File Transfer speed ≥ 800 MB/s Storage capacity ≥ 1 TB
6.	Record Time @ maximum frame rate with storage	Calculations shall be specified by the Vendor
7.	Pixel Size	≥ 18 µm
8.	Colour Scheme	Mono
9.	Bit Depth	≥ 12-bit

10.	Exposure time	$\leq 1.1 \mu\text{Sec}$
11.	Operating Temperature	0 to 50 °C
12.	Particle Image Velocimetry (PIV)	The camera shall feature a hardware-enabled PIV/frame-straddling mode, capable of capturing multiple discrete exposures per external trigger pulse to support future upgrades for PIV measurements. Furthermore, the camera shall provide hardware signal output ports (e.g., Frame Sync / Fsync) to control and synchronize external devices such as lasers.
13.	Acceptable Interface	Ethernet/HDMI (supply of 10 Gb/sec or higher highspeed Ethernet cable)
14.	Triggering camera	Bayonet Neill–Concelman (BNC) – trigger and software trigger
15.	Power Supply	Necessary power, PC connection/data transfer cable and BNC cable
16.	Software	• Software Control & Installation: The software shall provide full control of all camera operations and calibration routines, and shall feature a simple, user-friendly installation process. • Automatic Tracking & Motion Analysis: The software shall feature built-in automatic two-point or multi-point tracking capabilities with simultaneous real-time motion analysis. • Data Acquisition & Analysis: The software shall integrate data acquisition, post-processing of results (including projectile velocity, angle, and displacement measurements), and advanced image processing tools (such as crop, resample, tone curves, and filtering).
17.	Weight	$\leq 5 \text{ Kgs}$
18.	Lens	lens's focal length: 100 mm macro lens, aperture range: f/2.8 to f/3.2
19.	Lens mount	Interchangeable F mount and C mount
20.	On camera control	The camera shall feature a video output interface (such as HDMI or 3G-SDI) to connect an external monitor for real-time display of live images and operational parameters. Furthermore, the camera shall include integrated physical

		controls (buttons or knobs) to perform basic operations directly on the unit while viewing the external monitor. These operations include triggering, frame rate selection, resolution adjustment, exposure time configuration, Extreme Dynamic Range (EDR), ISO control, and event playback.
21.	Carry Case	Carry case with the wheels for camera
22.	Tripod	3-way Head, 10Kg payload with the minimum height of 170cm. (1 for camera, 2 for lighting)
23.	Lighting	Flicker free light with the minimum 12K Lumen- 2No's with the tripod support system.
24.	Laptop	Minimum of Intel core ultra 9 or latest processor, 1 TB SSD, 32 GB RAM DDR5, Intel or NVIDIA 8 GB Graphics or higher, MS Office, Window 11 pro OS. (Pre-installed - camera software)
25.	Calibration	Calibration plates suitable for identification of 1mm - 30 mm particle size.
26.	On-site installation	On-site installation and demonstration of the high-speed camera at CSIR-SERC, Chennai, is mandatory.
27.	On-site warranty	3 years from the date of installation
28.	Eligibility criteria	Vendor must have installed a minimum of three high speed equivalent cameras in any national laboratories (DRDO/CSIR/DST, etc.) or central-funded teaching and research institutes (IIT/IISc/NITs, etc.) in India within the last five financial years or latest.
29.	Hands on Training	Hands on training (operation & maintenance) is required for CISR-SERC scientists and technicians for minimum of 3 days to be conducted after installation of product
30.	General requirements	Bidders may visit SERC beforehand to understand the site requirements