

**TECHNICAL SPECIFICATIONS-CUM-COMPLIANCE TABLE FOR
2D-DIGITAL IMAGE CORRELATION (DIC) SYSTEM**

For

The Department of Civil Engineering, IIT Madras, Chennai

NOTE: For each specification, please enter “Yes” or “No” in the second column of this table. **If a cell in the second column is left blank, then it will be assumed that the quotation does not comply with the respective specification/requirement.** Provide catalogues, data sheets and/or other documentation to support the compliance of your equipment to the given specifications.

Specifications	Yes / No	Remarks
1 General		
The DIC system is expected to include components for image acquisition and processing such as <ul style="list-style-type: none"> • Hardware (camera) to capture images • Accessories to station and connect camera to computer • Software to capture and process images System should possess the following specifications or better.		
Hardware (Camera, etc.) and Image Acquisition (IA) Software		
1.1 Image capture rate: 1 to 10 frames per second (for short duration tests)		
1.2 Image capture rate: 1 to 10 frames per hour (for long duration tests)		
1.3 Adaptive image capture rates given as input during the course of a test		
1.4 Programmable multiple image capture rates given as input before the initiation of a test		
1.5 Camera resolution: > 10 megapixels		
1.6 Area of interest: 1 m × 1 m (maximum) 0.01 m × 0.05 m (minimum)		
1.7 Set of lenses should suitably cover the area of interest <i>Specify the type of lens mount in the Remarks cell</i>		
1.8 Lenses should suitably cover the area of interest <i>Specify the range of focal length available in the Remarks cell</i>		
1.9 Lenses should suitably cover the area of interest <i>Specify the range of distance of camera station from specimen surface in the Remarks cell</i>		
1.10 LED light source should have ≥ 3000 Lux		
1.11 Camera should function continuously with a relatively high image capture rate (but, without getting heated or damaged) for at least 5 hours		
1.12 Camera should function continuously with a relatively low image capturing rate (but, without getting heated or damaged) for at least 5 days		

1.13 To save power, the Complimentary Metal Oxide Sensor (CMOS) is preferred to Charge-Coupled Device Sensor (CCDS) <i>Specify the sensor quoted in the Remarks cell</i>		
1.14 Provision of filters/polarizers for noise reduction <i>Specify the technology quoted in the Remarks cell</i>		
1.15 Speckle kit with advanced features (e.g., air-brush) <i>Specify the features in the Remarks cell</i>		
1.16 Non-metallic, telescopic tripod with 3-way leveling utilities		
Features of 2D-Digital Image Correlation (2D-DIC) Software		
1.17 Ability to record displacement and calculate strain		
1.18 Ability to analyze images captured by an external source (different camera/laboratory), and not necessarily from the connected hardware alone		
1.19 Provision to trigger connected cameras and the loading machine (UTM) simultaneously, ensuring synchronization		
1.20 Provision to sync, calibrate and stitch 2D-images captured through multiple cameras focusing on different parts of a single specimen (in the same plane)		
1.21 Ability to perform incremental DIC calculations		
1.22 Output data file formats: .mat, .csv, .xlsx, ascii & .txt <i>Specify unsupported file formats in the Remarks cell</i>		
1.23 Ability to assess the sharpness and lighting of the image and the size and contrast of speckles		
1.24 User-interface should have the feature to select multiple points on the screen/image and get their individual strain evolution		
1.25 Online Help files within the Graphical User Interface (GUI)		
1.26 Auto-correlation options to select DIC parameters (subset, step size, strain window size, etc.) <i>Specify the range (minimum and maximum) of the mentioned variables in the Remarks cell</i>		
1.27 Other key features of the software algorithms that can be demonstrated before the purchase <i>Specify these in the Remarks cell</i>		

Features with Combination of All the Hardware and Software		
1.28 Automatic recording of images in both Image Acquisition software and hardware on commencement		
1.29 Ability to provide a suitable pre-defined file name pattern like 'ABCDEF' (e.g., ABCDEF_1.XYZ, ABCDEF_3.XYZ, ABCDEF_3.XYZ, and so on.). Should be able to change the 'ABCDEF' to any other sample identification naming pattern		
1.30 Ability to measure a minimum of 15 microstrains for the given area of interest		
1.31 A desktop computer compatible with the hardware and software <i>List the key features of the computer in Remarks cell</i>		
1.32 Calibration tools/systems		
1.33 Three software licenses to work on different computers and necessary USB dongles		
1.34 Facilitating the continued use of software through free additional licenses, USB dongles or other means, if an existing dongle and/or login credentials are lost accidentally		
Experience, Installation & Training		
1.35 The original equipment manufacturer (OEM) should have least 5 years of experience in the field of optical non-contact strain measuring systems		
1.36 Similar equipment should have been supplied and commissioned satisfactorily. Provide a list of IITs/government agencies, where similar equipment was supplied with their email and phone contact details such that the details can be verified. Please provide the relevant purchase orders also.		
1.37 Free installation and commissioning of DIC system at IIT Madras		
1.38 Free hands-on training on the installation, operation, testing, data acquisition, maintenance and emergency management of the equipment for minimum two users, for a period of at least two full working days at IIT Madras		
1.39 Technical support to clarify queries from IIT Madras on subsequent usage of the system		
1.40 As part of technical evaluation process, a full-fledged demonstration at IIT Madras on the installation, image acquisition, and DIC analysis on at least one specimen each of concrete, steel and composite materials may be required. Please indicate whether this would be possible. <i>Specify all what can be demonstrated in the Remarks cell</i>		

TERMS AND CONDITIONS

1. Provide separate quotations for systems with
 - (a) One camera and necessary accessories.
 - (b) Two cameras and necessary accessories (to view two regions on the same face of a specimen).
 - (c) Two cameras and necessary accessories (to view opposite faces of a specimen).
2. Provide quotation for additional software licenses (in case of lost dongle, credentials etc.).
3. The quoted price should be inclusive of all taxes/freight/installation charges etc.
4. The quote should be prepared based on 5% GST considering Educational Institute/Research purpose.
5. Customs/Excise Duty exempted price should also be quoted.
6. The quotation should have at least three months validity.
7. Brand name of the equipment should be mentioned and brochure to be enclosed.
8. Warranty conditions, details of the nearest servicing centers, user reference, necessary supporting catalogues and demonstration should be provided.
9. The right to accept or reject quotes without assigning any reason rests entirely with the undersigned.
10. Authorized dealer certificate should be attached with tender.
11. If the date of receipt and opening of quotation is declared a holiday, the next working day shall be the last day for the purpose.
12. The item mentioned in the tender is for research purpose. The details furnished by the vendor should match with the specifications. However, minor variations from the specification if acceptable by the evaluation committee, will be considered.
13. A 2-bid evaluation system will be followed. Separate sealed envelopes with technical bid and financial bid should be submitted.