

Department of Civil Engineering

Technical Specifications for Aggregate Imaging Measurement System

General Specifications

The Aggregate Imaging Measurement System must be capable of evaluating the particle size distribution and morphological/shape characteristics such as angularity, sphericity, flatness, flakiness, and elongation of both coarse aggregates (37.5 mm to 4.75 mm size range) and fine aggregates (4.75 mm to 0.075 mm size range), used for constructions of buildings, pavements (both bituminous and concrete) and any other infrastructure construction.

Technical Requirements for Aggregate Imaging Measurement System

- 1) The equipment must be capable of measuring the particle size distribution and morphological properties of aggregates in the range of 37.5 mm to 0.075 mm
- 2) The equipment must be capable of measuring the coarse aggregates (37.5 mm down and 4.75 mm retain) particle size distribution, angularity, surface texture, sphericity, flatness, and elongation
- 3) The equipment must be capable of characterizing the fine aggregates (4.75 mm down and 0.075 mm retain), particle size distribution, angularity, and 2D form
- 4) The equipment must be capable of characterizing an aggregate's performance in degradation tests such as the Los Angeles Abrasion test, Micro-Deval test, etc.

Power Supply

The instrument should be able to run in 220-240V, 50 Hz AC with a single-phase power supply.

Data Acquisition System

The instrument shall be fully automatic and must have an inbuilt Image Acquisition System and software, to automatically quantify and display the aggregates size and shape properties.

Accessories

The equipment should be supplied with all the accessories for evaluating the size and morphological properties of aggregates (both coarse and fine aggregates), including the following:

- i) High-definition camera for image acquisition
- ii) Aggregate tray package for all the aggregate sizes (31.5 – 0.075 mm)
- iii) Computer (preferably a laptop) etc. with preloaded software to ensure compatibility.

Any other optional accessories suitable for aggregate imaging measurement system may also be quoted. However, the purchase of the same will be solely depending on the availability of the funds.

Others

All the safety-related concerns must be stated, and details of functional access provided for safety-related problems should be mentioned in detail.

GENERAL TERMS AND CONDITIONS

- The supplier/vendor must be an original equipment manufacturer or the sole authorized agent/dealer/seller of the item.
- The system should be delivered within 14-16 weeks from the opening of the letter of credit or issue of the purchase order, whichever is later.
- Costs and related information should be given only in the financial bid.
- The cost should include 24 months warranty of the overall system and CIF up to Chennai.
- The warranty shall commence only from the date of equipment installation at IITM.
- Prices quoted should be valid for at least 90 days.
- Item-wise break up of cost should be provided in the commercial bid for different items.
- IIT Madras reserves the right to exclude some items from the purchase.
- The payment conditions consist of 90% LC at site and 10% after installation and satisfactory training.
- The system should be installed and commissioned with no additional cost.
- Training at IIT Madras should be provided with no additional cost.
- Two copies of the system manual should be provided in CD form.

Technical Bid should comprise of the following:

- Detailed Technical brochure
- Detailed technical write up explaining how each of the Technical Specifications are complied with
- The list of multiple Institutions/R&D units/Industry where similar installations have been supplied in India/abroad including contact details (name of the person in-charge, email, and phone number) is to be provided
- The vendor should guarantee round the clock technical support not only during the warranty period but even beyond through an annual maintenance contract. Demonstration of having provided such satisfactory technical support to customers shall be enclosed with the technical bid.

**TECHNICAL SPECIFICATIONS-CUM-COMPLIANCE TABLE FOR
AGGREGATE IMAGING MEASUREMENT SYSTEM**

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.

1 General	Yes / No	Remarks
<p>The Aggregate Imaging Measurement System must be capable of evaluating the particle size distribution and morphological/shape characteristics such as angularity, sphericity, flatness, flakiness, and elongation of both coarse aggregates (37.5 mm to 4.75 mm size range) and fine aggregates (4.75 mm to 0.075 mm size range), used for constructions of buildings, pavements (both bituminous and concrete) and any other infrastructure construction.</p> <p>The instrument should have the following characteristics or better and should satisfy and demonstrate the performance criteria given in Section 2, and Section 3.</p>		
2 Technical Requirements for Aggregate Imaging Measurement System		
2.1 The equipment must be capable of measuring the morphological properties of aggregates in the range of 37.5 mm to 0.075 mm.		
2.2 The equipment must be capable of measuring the coarse aggregates (37.5 mm down and 4.75 mm retain) particle size distribution, angularity, surface texture, sphericity, flatness, and elongation.		
2.3 The equipment must be capable of characterizing the fine aggregates (4.75 mm down and 0.075 mm retain), particle size distribution, angularity, and 2D form.		
2.4 The equipment must be capable of characterizing an aggregate’s performance in degradation tests such as the Los Angeles Abrasion test, Micro-Deval test, etc.		
3 Data Acquisition System		
The instrument shall be fully automatic and must have an inbuilt Image Acquisition System and software, to		

automatically quantify and display the aggregate's size and shape properties.		
4 Power Supply		
The instrument should be able to run in 220-240V, 50 Hz AC with a single-phase power supply.		
5 Accessories		
5.1 The equipment should be supplied with all the accessories for evaluating the size and morphological properties of aggregates (both coarse and fine aggregates), including the following: <ul style="list-style-type: none"> i) High-definition camera for image acquisition ii) Aggregate tray package for all the aggregate sizes (31.5 – 0.075 mm) iii) Computer (preferably a laptop) etc. 		
6 Manufacturer Experience, Installation & Training		
6.1 Provide a list of multiple Institutions/R&D units/Industry where similar installations have been supplied in India/abroad including contact details (name of the person in-charge, email, and phone number)		
6.2 Hands-on training on the testing, data acquisition and basic maintenance of the equipment should be provided for a period of at least two full working days at IIT Madras, Chennai		
6.3 The manufacturer must have a well-qualified technical support team		