

## TECHNICAL SPECIFICATIONS AND OTHER ALLIED REQUIREMENTS

PUR/71/FOUNDRY/AP/E/2022-23

Sl.	Specifications	Quantity
01	<b>SUPPLY, INSTALLATION, COMMISSIONING AND TRAINING FOR OPTICAL BLUE LIGHT SCANNING SYSTEM</b> (Details are as per ANNEXURE-I)	1 Set

### 1. QUALIFICATION CRITERIA

- 1.1 As mentioned in ANNEXURE-I

### 2. DELIVERY, INSTALLATION, COMMISSIONING & TRAINING

- 2.1. The delivery, installation, commissioning and training are to be completed within 150 days from the date of issue of Purchase Order. The installation & Commissioning shall be carried out by your expert- engineers of supplier/Manufacture. During installation & Commissioning necessary training on operation and maintenance of the goods/system shall be imparted to relevant Scientist/Engineers/Technicians.

### 3. WARRANTY

- 3.1 1 Year after successful installation, commissioning and training.

### 4. BID SECURING DECLARATION FORM

- 4.1 Vendor should provide BID Securing Declaration form as per given format in the Tender Documents.

### 5. PERFORMANCE SECURITY

- 5.1 Performance Security @3% of invoice value will be provided by the supplier within 21 days from the date of issue of Purchase Order.

### 6. Manufacturer Authorisation Form

- 6.1 MAF will be provided by the Non OEM supplier

### 7. MAKE IN INDIA LOCAL CONTENT

- 7.1 Make in India Local Content self-declaration Certificate with proper value addition (in percentage) will be furnished by the supplier as per format uploaded with Tender Documents.

**ANNEXURE 1- OPTICAL BLUE LIGHT SCANNING SYSTEM**

**Application:** Observation, inspection & measurement of features in test samples with intricate shapes and sizes. System should facilitate observation of objects with the accuracy levels as mentioned in this annexure. It must be equipped with professional tools & software for fast & Reliable imaging, image processing & measurements. Should be capable for inspection with the CAD model in-situ with the test sample.

System should be from OEM or authorized dealers with experience in the field of scanning, measurements for a decade or more. Complete system should be from single manufacturer and the manufacturer must have a valid ISO 9001 certificate. For every numerical point the bidder must have to write the exact value of their system; Words such as "Complied", "Agreed", "Accepted", "As per norms" will not be allowed. In case of multiple choices a "Yes" or "No" approach is acceptable.

S.No.	Description	Specifications	Bidder's Specification
1	Resolution	Double Camera & Projector Based System with <b>12 Megapixels</b> CMOS Camera (each) or better	
2	Light Source	Optical Blue LED light based 3D Scanning system.	
3	Stand Alone Structured System	System should be stand alone and mounted on a studio stand. Should not be handheld type, arm type or connected to any optical/laser tracker system.	
4	Acquisition Time	Should be 2 seconds or better	
5	Fields of View (FoV)/Measuring Volume (MV)	1) FoV/MV 1 (X × Y, mm <sup>2</sup> ) - (70-80) × (50-60)	
		2) FoV/MV 2 (X × Y, mm <sup>2</sup> ) - (350 - 425) × (250 - 325)	
		System should be capable to handle/accept different optional lenses for adapting different FOV/MV	
		No manual setting of focus is needed, either at projector or at camera.	
6	System Accuracy		
	FoV/MV 1	a. Probing Error Form - 0.006 mm or lower	
		b. Probing Error Size - 0.006 mm or lower	
		c. Sphere Spacing Error - 0.006 mm or lower	
	FoV/MV 2	a. Probing Error Form - 0.015 mm or lower	
		b. Probing Error Size - 0.020 mm or lower	
		c. Sphere Spacing Error - 0.025 mm or lower	
7	Measurement Rate	1,20,00,000 measures or points /image or better	
8	Data Transmission	Data Transmission between sensor and data acquisition system should be through a port of suitable speed	
9	LED Bulb Life	Minimum 10,000 hours or better	
10	Calibration	Certified calibration plates covering all measurement volumes to be supplied	
11	Mounting and Handling System	Transport box and casing to be supplied	
		Supplied Mounting and Handling system of the Sensor could be handled by a single person.	
		High quality height adjustable Studio stand with manual tilt axis for quick and easy manual sensor positioning. The studio stand should be equipped with high-quality and smooth-running wheels for maximum maneuverability.	
12	Sensor Cable	Atleast 10 meter long	
13	Rotary Table	One Automatic rotary table with load capacity of 20 kg or higher	
		One Manual rotary table with load capacity of 100 kg or higher	
14	Guided Pointers	The system should be equipped with guided pointers for visualizing the optimum measuring distance.	
15	Stand-off Distance	Upto 1000 mm	
16	Operating Conditions	The instrument should be capable of operating at 10 to 40°C temperature and Relative humidity 55% or less with no condensation.	
17	Merging Scanned Data	Should have the ability to merge scanned data using different methods	



18	GD & T Analysis	All GD & T measurements as per ISO and ASME (User selectable)	
20	Datum Creation	Should facilitate datum creation and local coordinate system	
21	3D Analysis	Tolerance and deviation Computations	
22	2D Analysis	Tolerance and deviation Computations for sections and surfaces	
23	Report Format	Should be capable of Report generation and Graphics feedback	
24	Import CAD Data Formats	STEP, Parasolid, IGES & NX	
25	Import of point clouds and polygons	OBJ, ASC, TXT, STL, PLY	
26	Export of point clouds and polygons	ACS, POL, STL, TXT/DXF	
27	3D Comparison	3D comparison with CAD/Mesh to generate color report.	
28	After Sales Support	All kind of After Sales support including Repairs, Calibration, Spares, etc should be locally available in India & OEM Authorization letter for the same should be provided.	
29	Auto Exposure	Automatic monitoring of calibration, transformation, movement and positioning for each single measurement	
30	CAD Alignment	The software shall have all the latest CAD based alignment features like automatic pre-alignment against CAD, alignment using 3-2-1, Best Fit with Tolerance, RPS, Plane-Line-Point, local best fit, etc. Tolerance definition on the CAD data should be possible.	
31	Draft Angle Analysis	Draft angle analysis in colour	
32	Gap & Flush Analysis	The software should be capable of evaluating flush & gap between mating parts & curve based analysis should be possible. Character line, bending distance, radius analysis, hemmed edge analysis, trim line & spring back analysis should be possible.	
33	Golden Mesh Feature	Software feature to determine the best part out of 'n' number of components inspected shall be available.	
34	Material Thickness Analysis	Full-surface computation of material thickness based on polygon meshes	
35	Multi-Part Analysis	Management of several individual part evaluations in one common project	
36	Onsite Calibration	Incase of requirement, VDI 2634 – Part 3 Calibration & accuracy certification in future at CSIR-CMERI	
37	Parametric Inspection	Software should be capable of parametric inspection with storage of creation sequence of the results with possibility to alter them without the need to redo the complete inspection.	
38	Surface Defect Analysis	Surface defect analysis to determine surface quality of sheet metal and plastic shall be possible in the inspection software.	
39	Blade Module	Software should come along with a Blade/ Aerofoil Inspection Module	
40	Simultaneous Scanning and Inspection	The system should be able to scan and inspect simultaneously. No need to keep scanner idle for inspection and report generation.	
		Software should be parametric and should be capable of 3D data acquisition, processing and 3D as well as 2D colour comparison.	
		The software shall provide online display of sensor position and live image mapping	
		Automatic transformation by measurement data by reference points or best fit of surface	
		Mesh editing by filling holes, smooth, thinning, repairing etc.	
		Facility of Augmented view for inspection report	
		Complete geometric measurement such as point, line, circle, slot, rectangle, vector, plane, cylinder, sphere, cone etc	
		Fitting elements feature (maximum inscribed and minimum circumscribed elements, Gaussian and Chebyshev methods) should be possible	
		Tracing and evaluation of curvatures and character lines	
		Silhouette section facility for 2D inspection	

41	Other Features of the Software	Multisections (axis parallel, radial, along curves and in viewing direction)	
		Cylindrical /conical base section and unroll section	
		Distance measurement using virtual caliper shall be possible. Software shall be capable to calculate curve length.	
		The measuring software shall provide complete set of indirect measurement for intersection, distance, angle, symmetry etc. Volume & Surface area evaluations should be possible in inspection software.	
		Curve base analysis like flush and gap, curvature etc	
		Evaluation of GD&T according to DIN ISO 1101 and ASME Y14.5 should be possible in software. All parameters like- flatness, Theoretically Exact Dimension (TED) Pattern, cylindricity, concentricity, roundness, run-out, total run-out should be evaluated by the software.	
		The software shall provide polygonization of random point clouds into polygon meshes.	
		Multiple alignment with hierarchical order in same project should be possible.	
		Tracing and evaluation of curvatures and character lines	
		Complete traceability of constructions and evaluations	
		This software shall be able to construct equidistant multiple points on areas or along edges. It should be capable to evaluate collective sections like axis parallel, radial and along curves. Intersection, projection, perpendicular dropping and averaging of features shall be possible.	
		The software should be capable of scanning complex projects like virtual assembly of different mating parts to determine the interference between different child parts during assembly & online positioning of component in nominal or in an assembly position.	
		Measuring principle feature should be available in software for repetitive dimensional checking. It should be possible to create a custom measuring principle as per user specification and store it for future use.	
		Report module shall consist of customized templates with logos and text boxes and master page concept for uniform report styles. It shall be possible to export report as CSV table/PDF and PNG/Jpeg/Tiff format.	
		Analysis of material allowance control shall be available in the software.	
42	Qualification Criteria	One button solution which updates all report for next same part.	
		Software should be certified by PTB/NIST or both	
42	Qualification Criteria	The supplier should have supplied similar systems of 8 Megapixel or higher to at least 3 premier government organisations in last 5 Years	
43	Warranty	System should be provided with comprehensive warranty of 12 months	
44	Support	After warranty the bidder must provide the necessary after sales support for smooth operation of the system for 5 years or more	
45	Installation & Training	Installation to be done by a qualified engineer of the bidder at CSIR-CMERI, Durgapur On-site hands-on training for at least 3 working days covering all aspects of equipment, operation and maintenance within two weeks of installation	
46	Computing Platform	<b>Workstation for data acquisition and analysis should be supplied</b> Intel Core i9/ Xeon (latest series), NVIDIA Graphics (8 GB or more), Windows® 11, Display LED 30 inch or more with QHD resolution from reputed manufacturer, 64 GB DDR4 ECC Memory, 512 GB SSD (Boot), 4TB HDD (RAID 5) or higher, 3-year manufacturer's warranty.	