

ROUNDNESS TESTER - TECHNICAL SPECIFICATIONS COMPLIANCE MATRIX

S.NO.	SPECIFICATION	SPECIFICATION - VALUE	COMPLIANCE
1	Machine requirement 1	System shall be capable to measure, analyze and display all geometrical parameters like Roundness, Concentricity/Eccentricity, Flatness, Squareness, Parallelism, Vertical and Horizontal straightness, Cyclindricity, Runout, Partial arc etc.	
2	Machine requirement 2	Manual movement through joystick and fully automatic 'CNC' mode operation to be provided.	
3	Machine requirement 3	Automatic centering and leveling table with continuous spindle rotation shall be quoted	
4	Machine requirement 4	Equipment shall consists of sturdy base unit, high precision spindle and work table: with air bearing, motorized vertical column and radial straightness unit, measuring gauge capable of measuring Roundness, different types of styli, computer with colour monitor, printer and user friendly software packages for measuring all geometrical parameters.	
5	Component Diameter	Ø400mm or higher	
6	Measuring Diameter	Ø350mm or higher	
7	Component Weight	60kg or higher	
8	COLOUMN (Z-AXIS)	Details as below	
9	Material	Precision machined cast iron or suitable	
10	Height	900 mm or higher	
11	Vertical Straightness	0.2 micron over 100mm or better	
12	Vertical Axis to Spindle axis parallelism	2 Microns over 900mm or better	
13	Speed of traverse (measuring)	1 to 10 mm/s	
14	Vertical Positional resolution	10µm or better	
15	SPINDLE AND WORKTABLE	Details as below	
16	Worktable Diameter	Ø280mm minimum	
17	Spindle Construction	Ultra precision AirBearing/Mechanical Bearing	

18	Speed of rotation	0.6 to 10 RPM, bi-directional	
19	Radial error (height above table)	$\pm(0.04 \text{ micron} + 0.0005 \text{ micron/ mm})$ (height Above table) or better for standard stylus (100mm minimum)	
20	Radial Accuracy for stylus having more than 100mm length	To be Provided by the party	
21	Axial Error (radius from centre)	$\pm(0.04 \text{ micron} + 0.0005 \text{ micron/ mm})$ (radius from centre) or better for standard stylus (100mm minimum)	
22	Axial accuracy for stylus having more than 100mm length	To be Provided by the party	
23	Center and levelling Table control	Automatic	
24	Centering range	2mm or higher	
25	Levelling Range	$\pm 0.5^\circ$ or higher	
26	Internal bore reach	160 mm depth with standard stylus	
27	Maximum depth measurement	with probe extension upto 250 mm or 180mm with special stylus	
28	Horizontal Arm Axis	Details as below	
29	Horizontal arm	Radial Straightness Unit shall be provided	
30	Arm construction	Suitable thermally stable material having high structural rigidity	
31	Horizontal movement	200mm or nearest possible higher size	
32	Horizontal straightness	0.5 micron over 100mm or better	
33	Squareness to spindle axis	2 micron over 200mm or better	
34	Positional control	± 10 micron or better	
35	Horizontal arm Positional resolution	1 μ m or better	
36	Gauge (Probe)	Details as below	
37	Measuring range	± 1 mm minimum for 100mm length	
38	Resolution	0.03 μ m	
39	Gauge attitude/ Orientation	Manual / Automatic	

40	System measurement capabilities	Geometrical parameters like roundness, cylindricity, straightness, parallelism, Flatness, concentricity, eccentricity / co-axiality and run-out.	
41	Computer and software features 1	Provision for measurement, analysis and display of measured results, storage of datas and programmes.	
42	Computer and software features 2	Latest Software package for the measurement of all geometrical parameters like Roundness, Cylindricity, Vertical and Horizontal Straightness, Parallelism, Flatness (single or multiplane) Squareness, Concentricity, Eccentricity / Co-axiality, Run-out, etc.	
43	Computer and software features 3	'CNC' measurement and online programming facility to be provided.	
44	Computer and software features 4	Interrupted work piece measurement and unwanted data removal shall be possible automatically through software or manually using mouse on the screen.	
45	Computer and software features 5	Suitable latest version computer, with high resolution LED colour monitor (21" or more) and HP/ equivalent make laser colour printer preferably from local sources having advanced user friendly operating system shall be provided.	
46	Computer and software features 6	Uncertainties shall be in accordance with ISO guide to the expression of uncertainty in measurement (ISO GUM 1993) or equivalent	
47	Computer and software features 7	Machine errors quoted shall be as maximum permissible errors (MPE)	
48	Computer and software features 8	Filters like 2CR, gaussian and polar filters upto 1500 μ m including band pass filters shall be provided for the measurement of all geometrical	
49	Styli requirement 1	Different stylus combination/ accessories are to be quoted with individual price for measurement at various depth with Ruby/ Sapphire balls (detailed indicative sketches are attached as annexure-A)	
50	Styli requirement 2	Tip diameter ϕ 1.00mm, 100mm length Ruby ball	
51	Styli requirement 3	Tip diameter ϕ 2.00mm, 100mm length Sapphire ball	
52	Styli requirement 4	Tip diameter ϕ 4.00mm, 100mm length Ruby ball	
53	Styli requirement 5	Tip diameter ϕ 2.00mm, 150mm length Sapphire ball	

54	Styli requirement 6	Ruby Ball Recess stylus with ϕ 1mm Tip diameter; 100mm length	
55	Styli requirement 7	Ruby Ball Recess stylus with 2.00mm Tip diameter, 5mm shank clearance and 100mm length	
56	Styli requirement 8	Ruby Ball Recess stylus with Tip diameter 2.00mm, 30mm shank clearance and 100mm length	
57	Styli requirement 9	Reach Recess Ruby ball styli with Tip diameter 2mm, shank clearance 100mm and 100mm effective length.	
58	Styli requirement 10	Special Ruby ball with Recess stylus with 1.00mm Tip diameter, shank clearance 2.5mm and 100mm length having a relief of 30mm	
59	Styli requirement 11	The figures of probe arms and styli are indicative considering the applications. The size and shape of each probe arm and styli can be varied slightly from the indicative sketch without changing the tip configuration with respect to the available Probe arm and stylus configuration with each manufacturer.	
60	Styli requirement 12	The holding portion mechanism of stylus to the gauge/probe shall be as per the available configuration of each manufacture's gauge/probe	
61	Optional requirement 1	Tip diameter ϕ 0.50mm, 100mm length Ruby ball	
62	Optional requirement 2	Special Styli having diameter as small as 0.2 mm or wire stylus	
63	Optional requirement 3	Stylus having length of 300 mm with 2 mm Ruby ball or probe/gauge extensions having 200 mm length with 100 mm stylus.	
64	Optional requirement 4	Accessories like Chuck for holding cylindrical parts with dia. 5 to 50 mm, horizontal Test Glass, Bar Stylus shall be quoted.	
65	Optional requirement 5	Other calibration standards like precision test cylinder, glass flat 250mm dia, etc shall also be quoted.	