

प्रक्रम एवं गुणता नियंत्रण प्रभाग / PROCESS AND QUALITY CONTROL DIVISION
मानवोचित एवं उत्पाद आश्वासन ग्रुप /HUMAN RATING & PRODUCT ASSURANCE GROUP
वांतरिक्ष ऑर्डनेंस एन्टिटी/AERO SPACE ORDNANCE ENTITY
विक्रम साराभाई अंतरिक्ष केंद्र/VIKRAM SARABHAI SPACE CENTRE

Annexure A

Technical Specification for Multi unit Automatic Hardness Tester with multi indentors

Sl. No.	Parameters	Finalized spec
I	Multi unit automatic hardness tester with multi indentors	
1.	General Description	Bench top type multi unit automatic hardness tester. Automatic support for the housing of four units fitted with automatic sample lifting system. At a time 4 units (Sh.A, Micro Sh.A, Sh.D, IRHD) shall be installed and test shall be performed by rotating the support.
2.	Unit control	Automatic hardness units shall be controlled by electronic console and software.
3.	Control Console	Colour Touch screen display for the control of automatic hardness unit which permits the selection of hardness unit (Type of indenter), perform automatic multiple test in different point of the same sample, set the number of tests to be performed automatically and the rotation angle between one test and the next one, Set hardness test time, Display the test result at the end of the test time. Start and stop the automatic execution of the test.
4.	Operating Software in English along with data acquisition system	System should be loaded with latest licensed full data acquisition software which permits: Execution of a customer defined number of tests in different point of the sample with customer defined test time. Analysis of hardness relaxation curve. Statistical analysis of results The software shall be compatible with latest OS. Software shall permit all the activities mentioned in the control console. Compatible latest desktop/ Laptop for fast data acquisition and processing (Make: HCL/Dell/HP) with laser jet printer & latest operating system is also under suppliers scope. 8GB RAM minimum, 1TB HDD. Dual LAN card for connecting instrument and other to Local area net work
5.	Sample holder with automatic rotation	Sample holder with motor controlled rotation. The device has to be installed on the machine and permits to perform automatic multiple test in different points of the same sample.
6.	Magnifying lens	Magnifying glass with metal frame. Scratch-proof and solvent-resistant lens with magnification of five times. Lens diameter should be minimum 75mm with enlarged

		magnification area with a diameter of 20mm.
7.	Dimension of the test specimen	The machine shall be capable to hold the specimen of thickness 1.5mm and above to perform hardness measurement.
8.	Power supply	230 V +/-10%, 50-60 Hz, single phase
II	SHORE A MEASURING HEAD & ACCESSORIES.	
1.	General Description	Shore A testing unit conforming to ASTM D2240 standard to be installed on the multi unit tester.
2.	Range	0 to 100 Sh.A
3.	Resolution	0.01 Sh.A
4.	Accuracy	± 1 Sh.A
5.	Calibration of equipment	The instrument shall be supplied with calibration certificate conforming to ASTM D2240 with traceability. The certificate includes follows: Calibration of the force applied by the spring vs indentation Calibration of the hardness reading vs indentation Calibration of the test time.
6.	Standard blocks	5 nos of rubber samples shall be supplied for verification of Shore A tester with standard hardness values of 20-90 Sh.A. The samples should be supplied with Calibration certificate and traceability. Single identification label & Wooden protection box
7.	Range of application	Suitable for hardness measuring on flat and curved surfaced specimens with diameter ≥35 mm and thickness ≥6 mm prescribed under standards.
III	MICRO SHORE A MEASURING HEAD & ACCESSORIES.	
1.	General Description	Micro Shore A (Shore AM) testing unit conforming to ISO 48-4, ASTM D2240 standard to be installed on the multi unit tester.
2.	Range	0 to 100 Micro Sh.A
3.	Resolution	0.01 Micro Sh.A
4.	Accuracy	± 1 Micro Sh.A
5.	Calibration of equipment	The instrument shall be supplied with calibration certificate conforming to ISO 48-4 and ASTM D2240 standard with traceability. The certificate includes follows. Calibration of the force applied by the spring vs indentation Calibration of the hardness reading vs indentation Calibration of the test time.
6.	Standard blocks	5 nos of rubber samples shall be supplied for verification of Micro Shore A tester with standard hardness values of 20-90 Micro Sh.A. The samples should be supplied with Calibration certificate and traceability. Single identification label Wooden protection box

7.	Range of application	Suitable for hardness measuring on flat and curved surfaced specimens with diameter $\geq 1.5\text{mm}$ and thickness $\geq 1.5\text{mm}$ prescribed under standards.
IV	O RING HOLDING DEVICE	
1.	General Description	This centering device should allows to quickly carry out hardness test of O rings with cross section diameter between 1.5mm to 11mm.
2.	Oring dimension to be tested	Device should be capable of holding Oring with outer diameter of 5mm to 200 mm and Oring cut pieces of minimum 10mm length.
3.	Fixing mechanism	<p>The device has to be applied to the standard plate of the instrument through magnetic fixing which allows rapid installation and removal</p> <p>The adjustment wheel allows you to set the distance between the cylinders according to the cross section diameter of the Oring.</p> <p>The fixing clip for the correct positioning of curved pieces.</p> <p>The integrated extension plate should allow large pieces of O ring up to 200mm ID.</p>
IV	SHORE D MEASURING HEAD & ACCESSORIES.	
1.	General Description	Shore D testing unit conforming to ASTM D 2240 standard to be installed on the multi unit tester.
2.	Range	0 to 100 Sh.D
3.	Resolution	0.01 Sh.D
4.	Accuracy	± 1 Sh.D
5.	Calibration of equipment	<p>The instrument shall be supplied with calibration certificate with traceability. The certificate includes follows.</p> <p>Calibration of the force applied by the spring vs indentation</p> <p>Calibration of the hardness reading vs indentation</p> <p>Calibration of the test time.</p>
6.	Standard blocks	<p>Samples required for verifying minimum 5 measurements with standard hardness values of 20-90 Sh.D.</p> <p>The samples should be supplied with</p> <p>Calibration certificate and traceability.</p> <p>Single identification label</p> <p>Wooden protection box</p>
7.	Range of application	Suitable for hardness measuring on flat and curved surfaced specimens with diameter ≥ 35 mm and thickness ≥ 6 mm prescribed under standards.
V	Others	
1	Supply package shall include	<p>Life time licensed software with data acquisition unit and laser printer</p> <p>Wheel mounted steel/wooden table with bottom shelf/drawers for accommodating the machine, data acquisition unit (PC) and printer.</p>

		Free technical support & yearly calibration during warranty Required number of Anti-vibration mounts to be provided
TERMS AND CONDITIONS		
Breakup cost of each item should be provided along with the quote.		
1.	Installation, Commissioning, Demonstration and Testing at our site	
1.1	System has to be commissioned, calibrated and demonstrated with all features at user's site. Environmental conditions at installation site are as follows: Power: 230 V $\pm 10\%$, 50 Hz, single phase Humidity: 50-90% relative humidity. Ambient temperature: 20 to 35°C.	
1.2	Detailed operational and service manuals in English including essential circuit diagrams for all systems and subsystems are to be provided.	
1.3	Training for 2 persons on the operation & day-to-day maintenance of all the systems and features has to be provided at user's site.	
1.4	Pre-installation site requirement like electrical. shall be provided in the quotation.	
1.5	Supplier shall carry out the calibration of all the transducers and sensors traceable to national or international standards and due certificate has to be provided.	
2.	AMC Support and spares and after sales service.	
2.1	Supplier shall provide Warranty for all the systems and sub systems at least 36 months from the date of commissioning and acceptance.	
2.2	AMC & calibration for 3 years after the warranty period shall be quoted separately	
2.3	Spares for the trouble free operation for a minimum of three years after the warranty period shall be provided.	
2.4	List and cost of essential spares during AMC has to be submitted along with quote.	
2.5	Guaranteed after sale service for a minimum of 10 years should be committed.	
2.6	Party shall have a strong service back-up in India with technically competent service engineers trained and certified by the factory. Proof of evidence has to be provided in the quotation.	
2.7	Time required attending ON CALL basis service is to be mentioned.	
3.	Others	
3.1	Detailed compliance matrix of our specifications and supplier specifications item by item has to be filled and provided along with the quotation.	
3.2	The instrument and accessories must be designed with all necessary safety interlocks and earthing for operators' safety.	
3.3	Machine maintenance kit with all necessary tools has to be supplied free of cost.	
3.4	Any software used for the system has to be supplied to VSSC in installable CD media, so that the software can be reinstalled at VSSC in case of a system crash. If the software is upgraded within 5 years from installation the same shall be done free of cost.	
3.5	List of similar systems supplied in India with complete contact details of the user like full postal address, Phone number and e-mail ID has to be provided along with the quotation. Non compliance to this condition may lead to rejection of the offer.	
3.6	Indian agents submitting the quotation on behalf of foreign suppliers must submit the authorization letter to submit the quotation, after sales service, maintenance and repair.	

3.7	Party shall submit technical brochures, catalogues for all the subsystems proposed (including bought out items, if any) with full features and capabilities.
3.8	The equipment shall be provided with a warranty certificate and calibration certificate with traceability.