

Technical Specification for Tender No. 2023-24/06 Released Government E - Marketing (GeM Portal)

1. Dielectric Strength Tester

Sl. No.	Specification	Range / Value
1	TYPES OF TESTS TO BE PERFORMED	To determine the dielectric breakdown voltage through the thickness of a Polymeric test specimen. It may also be used to determine dielectric breakdown voltage along the interface between a solid specimen in air and oil medium.
2	APPLICABLE STANDARD	Should be complied to ASTM D 149, IEC 60243, ISO 1235, BS 2782 Method 201, IS 2484,
3	Capacity	0-100 kV(Suitable for BDV up to 100 KV without external flashover). Mode of operation Fully automatic. Breakdown detection should perform in terms of both Voltage and Current.
4	Voltage Source	Suitable step-up Transformer supplied from a variable sinusoidal low-voltage source with Voltage capacities range 0 to 100 kV rms with ratio of crest to root-mean-square (rms) test voltage, equal to $\sqrt{2} \pm 5\%$ (1.34 to 1.48), with the test specimen in the circuit, at all voltages greater than 50 % of the breakdown voltage.
5	Display	Colour display with backlight. The test set should give all the test results with standard deviation, average of reading and a pass / fail message wherever necessary on LCD/LED screen, Instrument should have alphanumeric keypad to facilitate entry of test ID notes etc
6	Frequency	from 25 to 800 Hz
7	Voltage rise time & accuracy	Suitable as per Method A,B, & C of ASTM D 149 & other standard as mentioned.
8	Voltage rise time Resolution	0.1 kV/s

9	Test Vessels/Medium	Air & Oil medium. Suitable Oil media Tank in line with the requirement of Standard
10	Test Temperature range	Ambient to 100°C. Suitable heaters should be provided for heating oil bath. Test kit should have automatic oil temperature measurement facility with a temperature sensor resolution of 1°C or better.
11	Temperature resolution	1 °C or better
12	Power supply	Voltage - 85 to 265 VAC Frequency - 50/60 Hz
13	Interface	RS-232 interface , I/O port with safety interlock, USB Host Port for Data/Program storage
14	Protection provided to equipment	Dual safety micro switches on chamber cover. HV Chamber interlocking. Zero starts interlocking Test Kit Trip time should be less than 10 microsec. The HV switch OFF time (automatically) if an established arc of 4 mA occurs for 5 msec should be less than 10 μs.
15	Mandatory Items With the Machine	AC/DC Digital Voltage Meter: 50,100,150,200kV
		DC micro-ammeter
		Electrode set of Type 1 to Type 7 as per standard
		Vendors must have sufficient experience in supplying equipment to reputed organizations of Plastic/polymer Industries Magnetic bead stirrers

16	Additional Requirements - Special Features Needed	Sample cutter as per standard.
		A suitable Voltage calibrator meter should be provided along with equipment which should be oil free
17	Other Mandatory Items	While supplying the Machines, the supplier should also provide the following items apart from above:
		Hard copies of Operational & Service Manual-01Set.
		Traceable Calibration certificate ofequipment.
		External printer with USB interface and PCL3driver
		Machine should come with all other essential accessories & spares required for installation, commissioning&Operation

2. Lateral Spread of Flame		
Sl. No.	Specification	Range / Value
TYPES OF TESTS TO BE PERFORMED		The lateral flame spread test can be used as a measure of the ability of a product to inhibit the ignition of the substrate to which it is applied. The substrate, in a vertical orientation, is exposed to a known radiant heat source and the time to ignition measured.
APPLICABLE STANDARD		ISO 5658-2 Specified as per EN-45545-2
1	Tubular steel frame	This frame should consist of 40 mm X 40 mmsquare section steel tube and shall support theradiant panel with its centre 1200 mm abovefloor level.
2	Radiant Panel	It should made up of Porous refractory materialhaving dimension280 mm × 480 mm

3	Specimen Holder	<ul style="list-style-type: none"> • It should constructed from heat resistant steel. • Observation mark shall be field in an interval of 50 mm • The framework shall have two solids of stainless steel pipe with grove
4	Pilot Burner	The pilot burner Should be made of up a stainless-steel tubing approximately length of 200 mm long
5	Mirror	750 mm length and 120 mm width
6	Flux meter	Heat flux meter for measuringthe flux profile along the specimen should be supplied.
7	Calibration System	<p>The calibration system should consists of a calibration board and a heat fluxmeter.</p> <p>The calibration board shouldmanufacturedfrom a calciumsilicate-based board material andis provided with a series of holes which, whenthe calibration boards inserted into the testapparatus, positions the heat flux meter atprescribed calibration locations.</p>
8	Other Features	<ul style="list-style-type: none"> • High accuracy Mass flow controller is used for controlling the gas mixing. • Radiant panel gas control. • Safety gas controls and cut off circuitry. • Ignition system • Equipment should have all facility to complie the test procedure as per the standard ISO 5658-2.
9	Other Mandatory Items	<p>While supplying the Machines, the supplier should also provide the following items apart from above:</p> <ul style="list-style-type: none"> • Hard copies of Operational & Service Manual- 01 Set . • Calibration Certificate for requireded parameters with Traceability. • Machine should come with all other essential accessories,demo material for trial& spares required for installation, commissioning& Operation.

3. Radiant Panel

Sl. No.	Specification	Range / Value
TYPES OF TESTS TO BE PERFORMED		This test method is used to measure the critical radiant flux of horizontally-mounted floor covering systems exposed to a flaming ignition source in a graded radiant heat environment, within a test chamber. It can also be used to measure this same critical radiant flux for exposed attic floor cellulose insulation.
APPLICABLE STANDARD		ISO 9239-1 as per EN 45545
1	Test Chamber	Chamber should made up of fire-resistant (calcium silicate) body with fire resistance window glass.
2	Heat flux	10kW/m ² to 50 kW/m ²
Specimenholder:-		
3	Size	A specimen holder should heat-resistant L-profile stainless steel of (2.0 ± 0.1) mm thickness & size (1140 ± 10) mm by (325 ± 10) mm x (22 ± 2) mm
4	Gas-Fired Radiant Panel	A panel of porous refractory material radiant heat source area should be (300 ± 10) mm x (450 ± 10) mm

5	Maximum working temperature	up to 900 °C
6	Pilot Burner	ID 6 mm and OD 10 mm
7	Exhaust system Capacity	Should have capacity to Exhaust 39 m ³ /min at (25 °C , 1 bar) to 85 m ³ /min.
8	Smoke extraction rate	(2.5 ± 0.2)m/s
9	Radiation Pyrometer	Temperature range should 480 ° C to 530 ° C (black body temperature)&accuracy of ± 5 °C.
10	Heat Flux Meter	Having a range of 0 to 15 kW/m ² ± 0.2 kW/m ² (accuracy of ± 3 %).
11	Ignition system	high voltage electronic ignition

12	Other Features	Equipment should have all facility to comply the test procedure as per the standard ISO 9239-1
13	Other Mandatory Items	<p>While supplying the Machines, the supplier should also provide the following items apart from above:</p> <ul style="list-style-type: none"> • Hard copies of Operational & Service Manual- 01 Set . • Calibration Certificate for required parameters with Traceability. • Machine should come with all other essential accessories, demo material for trial & spares required for installation, commissioning & Operation.

4. Thermo Gravimetric Analyzer (TGA)

Sl. No.	Specification	Range / Value
1	Balance Sensitivity	0.1 µg or Better
2	Balance Measurement Range	Upto 1g or more
3	Weighing precision	0.01 % or better.
4	Signal Resolution	0.02 µg
5	Temperature Range	ambient or less to 1000°C or more
6	Temperature measurement accuracy	±0.5°C or better
7	Temperature Accuracy	±0.5°C or better
8	Dynamic Temperature Precision	±1°C or better

9	Isothermal Precision	±1°C or better
10	Heating rate	0.1°C/minute or lower to 100°C/minute
11	Cooling time	10 min or better, any cooling accessory required should be quoted
12	Differential Thermal Analyzer	Simultaneous measurement of TGA/DTA
13	Sample Pans	Platinum Pans 10 Nos., Alumina Pans – 10 Nos., Lid for Platinum Pans- 10 Nos., Lid for Alumina Pans- 10 Nos, Quartz Crucible 10 Nos. Aluminum Pans-500 Nos. with crimping machine (if necessary)
14	Capacity of Pan	The volume of the sample shall be 100µm or compatible with the equipment
15	Chiller	A suitable in built chiller with CE certification should be quoted.
16	Gas Flow Control	The system must include a software programmable mass flow controller (2 or more) for convenient & precise gas control and switching between gases (Inert & Air).
		The system should be able to perform under flowing inert and /or active gases, static as well as vacuum atmosphere. All vacuum accessories required should be quoted

17	Atmosphere	The system should also be suitable to perform adsorption studies of gases such as NH ₃ , CO, CO ₂ , H ₂ etc. from a 1 % or more mixture of these gases in an inert gas. The quoted MFC should be able to control the flow rate of such gases. All other accessories required to perform adsorption studies should be quoted.
18	High vacuum pump	Ultimate vacuum less than 10m bar or better.
19	Gas cylinder	High purity (99.999%) nitrogen, oxygen zero air gas cylinder (capacity 47litres) with double stage double meter gas regulator with stainless steel diaphragm and pressure gauge suitable for above cylinder should be quoted
20	Software	The latest Microsoft windows based user-friendly software should be supplied. The software should have the ability to data access, storage and analysis. The software should also have the ability to Plot thermal curves for TGA against time and or temperature. Calculate the derivative of TG data and plot DTG curves. Baseline correction, integration and prepare overlay of curves. Possibility of converting data into ASCII format and export the same for further manipulation.
21	Others	For the entire third party item being quoted the model and make should be specified in the quotation
		System should be supplied with latest branded PC and Printer.
		To supply necessary spares and accessories

22	Accessories to be quoted and supplied along with machine / equipment	<p>The following accessories should be quoted invariably</p> <ul style="list-style-type: none"> · Auto sampler with 10 sample position · Kinetics software, based on model – free is conversional method based algorithm
23	Calibration	<p>Calibration certificate to be produced wherever required traceable to NISTCRM (Nickel, Calcium Oxalate Monohydrate or equivalent) Standard weight of 1 mg & 100 mg (with certificate)</p>
24	Personal Computer (PC)	<p>A Personal Computer having latest configuration: i7 processor 10th generation, 16GB RAM, DVD - RW, 500 GB SSD, Windows 11 with lifetime licence, Latest Microsoft Office professional, 27" LCD display, Wi-Fi enabled or with better specifications. The scope of supply also includes a good (reputed make, please give the details) colour Laser jet Printer having a resolution of 1200 × 1200 dpi or better.</p> <p>All software shall be loaded into the hard disk with</p> <p>Appropriate partitions. All original CDs/DVDs must be provided.</p> <p>UPS (5 KVA) for 1 hour or higher power backup (2 years warranty on UPS and 2 years warranty on batteries).</p>
25	Terms & Conditions	<p>Manufacturer/Supplier should have sizable installations of same or better model worldwide and at least five in India which is education institutions/Research Testing centrally funded institution</p> <p>A Satisfactory Performance certificate from at least one Customer to be provided for eligibility. Bidder should submit complete contact details</p> <p>Service Support: reporting time within 48 hours after official request for service</p>

		Hard copies of operational & Service manual -01 set
26	Scope of supply	Complete list of items quoted are to be provided
27	Warranty	Minimum 2 years warranty must be provided
28	Training	Training on operation & maintenance of the equipment should be provided onsite
29	Installation & Commissioning	The Machine should come with all other essential accessories & spares required for installation, commissioning & operation

5. Automatic Hydraulic Compression Press

Sl. No.	Specification	Range / Value
1	Clamping force	30 Tons
2	Adjustable Daylight	Up to 300 mm
3		Vertical 4 column press with an integrated high pressure hydraulic system with a continuous closed loop control to maintain pressure accuracy within limits.
4	Patent size	350 x 350 mm
5	Working area	300 x 300 mm
6	Operating temperature	400 °C

7	Hydraulic pressure	350 – 400 bar
8	Heating / cooling system	- Platen cooling as per ASTM D-4703 Procedure for compression moulding of thermo plastic compounds. (Refer STD)
		- Inlet and outlet manifolds & valves for platens
		- Programmable temperature controllers with ramp capability
		- One digital temperature controller per platen
9	Control system	Programmable touch screen for clamp pressure, cure time and temperature per recipe
		Minimum 10 recipe storage capability
		Programmable in units of Kg, US Tons, Metric Tons & Pounds
		Two "anti-tie-down" close buttons for operator safety
		Interlocked safety enclosure with hinged door
		The control panel should be mounted to access electrical parts and hydraulic units for easy maintenance purpose

10	Calibration	Pressure calibration - traceable to NIST (10 point check), Calibration of platen temperature controls (10 point check), Temperature uniformity of platens, Platen parallelism
		The machine should be supplied with suitable compression Moulds as per below specification, material feeding-manually, compression release, ejection, curing time one cycle auto.
11	Spares Parts	Hydraulic Oil -As per requirements for Installation and operation of the Machine
		Electrical spares of a reputed brand – Cartridge Heaters 02 sets, temperature sensors-02 Sets, solenoid valve-01 No., MCB -01no., Power control Sensor (SSR) – 1 No.
12	Mould Material:	Stainless Steel or as mentioned in ASTM4703
13	Tile Mould	200x200mm thickness 3.2 mm
		200 mm x 200 mm each for 0.5 mm, 1.0mm, 1.5 mm, 2.0mm, and 4.0mm thickness sizes.
		100mm x 100 mm each for 0.5 mm, 1.0mm, 1.5 mm, 2.0mm, and 4.0mm thickness sizes.
14	Circular mould	Male-female type mould with opening tool. For preparing sheet of 120 mm diameter and 10 mm thickness as per ISO 16770
15	Specimen moulds	Cavities with specimen dimensions complying with ASTM above standards to be provided
		Hard copies of Operational & Service Manual 01 set

16	Mandatory Items	Basic Tool Kit box with all necessary Tools like spanner, Allen keys, scew driver set, etc ,
		Safety gloves & and goggles (each 2 sets) required for day-to-day activities during operation of the Machine
		The machine should come with all other essential accessories & spares required for installation, commissioning & Operation including Hydraulic Oil.
17	Warranty	2-Years

6. CNC Milling Machine			
Sl. No.	Specification	Unit	Range / Value
Make		Bidder to specify	
Model		Bidder to specify	
1	Axis Travel		
1.1	X-Axis	mm	800 - 850 mm (min)
1.2	Y-Axis	mm	500 – 550 mm (min)
1.3	Z-Axis	mm	500 - 550 mm (min)
2	Table		
2.1	Length	mm	1000 mm (min)
2.2	Width	mm	530 mm (min)
2.3	T-Slot Width	mm	18 mm or more
2.4	Number of Std T-Slots	(Nos)	4 or more
3	Feed		
3.1	Rapid Feed (X, Y,Z Axes)	m/min	30 or better

3.2	Max. Cutting Feed (X, Y,Z Axes)	m/min	10 or better
4	Spindle		
4.1	Rating	KW	Bidder to specify
4.2	Max. Speed	rpm	10000 or better
4.3	Taper		BT40
5	Accuracy		
5.1	Positioning	μm	10 or better
5.2	Repeatability	μm	5 or better
6	Automatic Tool Changer		
6.1	Magazine capacity	(Nos)	20 - 24 or better
6.2	Tool select by shortest & Random select		Bi-Directional
6.3	Max. tool diameter	(mm)	80 or better
7	Control System		
7.1	Controller	Fanuc/Siemens/Haas Latest with complete module	
7.2	Part Program Storage	(GB)	Capable to store large CAM programs for continuous running (Minimum 64 GB)
7.3	Programming Functions with editor	Complete Module with technical calculator for power and torque requirements , with dxf file import facility, 3D simulation	
8	Essential Accessories		
8.1	Servo stabilizer		
8.2	Ultra Isolation transformer	Bidder to specify and quote suitable for the machine and to be	

8.3	Air Compressor (3 hp) with drier and multi-dry filter	
8.4	Automatic centralized lubrication system	
8.5	Machine protection	<p>1. Monitoring vibration during machining to protect machine and spindle failure.</p> <p>2. User autorisation to the control system and the machine.</p> <p>3. Safety during power failure and Panel cooler for electrical cabinet.</p> <p>4. Door interlock for safety</p>
8.6	Operation hardware	Electronic handwheel, Flushing gun for internal cleaning & Coolant tank
8.7	Electrical Cabinet AC	Internal Drive cooling automatic 1 KW Compressor
8.8	Tool holding devices	<p>1. Bidder to specify and quote Set of suitable Cutting Tool holders</p> <p>2. ER 10 Extended collet chuck -1 No. ER 10 collets Dia 1.0 to Dia 10.0 in steps of 1mm - 1 each</p> <p>3. ER 25 collet chuck -1 No. ER 25 collets Dia 3 to Dia 14 in steps of 1mm - 1 each</p> <p>4. ER 32 collet chuck - 1 No. ER 32 collets Dia 10 to Dia 20 in steps of 1mm - 1 each</p> <p>5. ER 40 collet chuck -1 No. ER 40 collets Dia 20 to Dia 25 in steps of 1mm - 1 each</p> <p>6. ER 25 Tap collets with square drive for M6 to M10 taps- 1 each</p> <p>7. ER 32 Tap collet with square drive for M12 tap-1 each</p> <p>8. Side lock adaptors Dia 16, 20, 25 & 32 -1 each Keyless drill chuck 0-13 mm (with adapter) ER 40 Taper Shank adapter (Three Ranges), Holder (adapter) for 9.40 mm Face mill - I No Holder (adapter) for 80 mm Face mill - I No Holder (adapter) for 50 mm Bull - I No</p> <p>10. Tool locking device-1 No. Pull stud- 30 no's</p>
8.8	Precision Machine vice	4 Inch (02 nos)
8.9	Edge finder	Mechanical type
8.10	Clamping Kit	Clamp set (03 nos)
8.11	Others	RS 232 Ports with fabricated data cable (20 meters), USB ports

8.12	Software	CAM software with post processor suitable for the machine to be quoted separately and transfer media software for RS 232 connections with 05 years auto upgradable
9	Other accessories	<p>1. Computer: 31.5 Inch Full HD IPS Display, Intel Core i5 12th Gen, Windows 11 Home Desktop with license, (8GB, 1TB HDD, 256GB SSD, Intel)</p> <p>2. Printer: LaserJet A3 & A4 Monochrome All-in-One Printer with Networking</p> <p>3. Suitable table for equipment and computer to be provided</p> <p>4. Required Oil, Lubricant along with cutting oil to be provided</p> <p>Bidder to specify and quote if any other accessories are available /required for smooth running and better utilization of the machine.</p>
10	Terms & Conditions	<p>1. Manufacture/Supplier should have sizable installations of same or better model worldwide and at least Five in India which is education institutions centrally funded institution.</p> <p>2. A Satisfactory Performance certificate from three institutions for the same model equipment to be provided for eligibility.</p> <p>3. Bidder should submit complete contact details</p>
		The quoted machine should be recently manufactured with the latest technologies and should not be a absolute model in the market and has at least minimum 10 years residual market life.
		Equipment should be CE certified
		Authorization Letter from OEM
		List of clients along with contact details in last Eight years to be provided.
		Equipment should be robust and vibration free
11	Scope of supply	<p>1. Bidder should submit complete scope of supply (Machine, standard accessories, Optional accessories etc with make and model) in the technical bid with our price.</p>
		<p>2. Bidder should supply complete start up package necessary to prove the machine and provide training.</p>
12	INSTALLATION, COMMISSIONING AND TRAINING	

12.1	Installation and commissioning requirements	Bidder should state the space required and condition of floor and any other requirements for installation of the machine and equipments. State clearly the specifications of electrical requirement. Vendor should carry out installation and commissioning of the machine and its accessories on a turnkey basis.
12.2	Training and documentation	<p>Minimum of 3 days training on machine and 5 days training on software for five persons which includes basic & advanced level training. Training content and plan to be submitted. Training faculty must have adequate experience in this field.</p> <p>The vendor should supply the necessary manuals such as</p> <ul style="list-style-type: none"> · Software instruction · Maintenance and trouble manual · Training · Installation and Commissioning · Handling of accessories · Software key (if any) · Software CDs
12.3	Warranty	The whole system and its accessories should be given two years warranty for the machine and three years for the spindle replacement and service against any design, manufacturing and workmanship defects from the date of installation and commissioning.

12.4	Technical support and service	Manufacturer should have established after sales & service network in India. The vendor shall have local service and application office and infrastructure to attend by visit within 48 hours of need. Technical support personnel must have adequate experience in this field. Technical support personnel details should be submitted. Name and address of the authorized service centre/ partner in India along with the certificate of authorization should be attached.
12.5	Annual Comprehensive Maintenance Contract (ACMC) as optional	Vendor should quote for Annual Comprehensive Maintenance Contract for the whole system and accessories supplied after the completion of performance warranty period. Supplier has to provide service support within 48 hours. Calibration of the machine shall be a part of warranty and ACMC. It shall also be mandatory to perform calibration after every major repair or breakdown