

Sr.#	<u>DESCRIPTION</u>	QTY Nos.
01	<u>COMPRESSION TESTING MACHINE</u> Compression testing machine along with Standard Accessories Details as attached per page NO:- 02-07	01 Nos

Compressive Strength Testing Machine

We are looking for modern design of bench electromechanical compressive strength testing machine for glass/ceramics, manufactured by leading companies in the field of material testing. It should comprise state of the art testing specifications combined with a modern look and ergonomic design. Electrical servomotor driven, maintenance-free, for precise, quiet and smooth work in conformance to ASTM E4, E74, E1012, E1856, C158, C1424, C39 and ASTM C109 standards.

Sr. #	Technical Specification	Requirement
1	Load Capacity	5 - 100 kN
2	Force Measurement	Compression and flexural testing fixtures. Additional load cells can be installed.
3	Measuring Range	1 % to 100 % of the load cell nominal capacity. 1000 - 100,000 N
4	Precision: Class according ISO 7500	0.5
5	Force Resolution	0.1 (5 digits with floating point)
6	Columns	2 grounded columns, chrome-plated steel
7	Ball Screws	2 high precision ball screw, with scrapers
8	Mobile crosshead	Driven by the ball screws, guided by the 2 columns End of stroke with proximity detectors Automatic return to start test position, defined via application software.
9	Motor drive	Synchronous servomotor (Brushless) with direct drive to screws by reducers. Enables displacement and load closed loop control (servo-control)
10	Gear transmission	Motor-pulley and reducer-pulley connecting via HTD precision teeth belt. Adjustable belt-tightening system
11	Crosshead Movement speed range (mm/min)	0.001 - 500.00 (up to 250 mm at max. load)
12	Crosshead Load speed range (kN/s)	Between 1% and 10% of maximum load capacity, 0.01 - 10 kN/s

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13	Crosshead position measurement	Resolver
14	Crosshead position resolution	Resolution 0.001 mm
15	Power supply	Single-phase 220V + earth, 50 Hz
16	Power consumption	750 – 1000 W
17	Load / Displacement reading interchangeability	
	a. Load	N, kN, g, kg, lb
	b. Displacement	mm, cm, inch
18	Vertical free height with load cell without fixtures	1100 – 1300 mm
19	Horizontal free distance	450 mm
20	Safety	Emergency push-button, located in the front of the machine
21	Load Measurement	
	a. Load cell capacity.	100kN - 1 No. 50kN - 1 No. 10kN - 1 No.
	b. Accuracy	±0.5% of reading or 0.01% of capacity, whichever is less
	c. Repeatability	±0.25% of reading or 0.005% of capacity, whichever is less
	d. Resolution	0.0004% of capacity.(ex 1N for 100 KN) or less
	e.	All the load cells should be calibrated, duly certified as per ASTM E4 and ASTM E74.
	f. Load cell calibrator	Load cell calibrator - 1 No. each for 10 KN, 50 KN and 100 KN should be supplied along with the system.
Standard to be Followed / satisfied and applicable for acceptance		
a.	ASTM E4	Practice for force verification of testing machine
b.	ASTM E74	Practice for calibration of force measuring instrument for verifying the force indication of testing machine

Sr. #	Technical Specification	Requirement
22	d. ASTM E1012	Practice for verification of test frame and specimen alignment under tensile and compression axial force application
	e. ASTM E 1856	Standard guide for evaluating computerized data acquisition system used to acquire data
	f. ASTM C 158	Standard Test Methods for Strength of Glass by Flexure (Determination of Modulus of Rupture)
	g. ASTM C 1424	Standard Test Method for Monotonic Compressive Strength of Advanced Ceramics at Ambient Temperature
	h. ASTM C 39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
	i. ASTM C 109	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars Using 2-in. or [50-mm] Cube Specimens
	Grippers	
23	a. Compression Strength Testing	Square platens, circular and rectangular compression platens for fitting for testing requirement
	b. Flexural Strength Testing	Single load bending / flexural testing fixture. Two-points load can be applied with a double load roller bending / flexural fixture
	c. Alignment Fixture	Alignment Verification: According to ASTM E1012.
	Machine Control, Measuring Electronics & Software for Material Testing	
An integrated control system and measuring electronics with dedicated Graphical UI application software to performing following tests. Important specifications are given below.		
Cross Head Control:		
AC Servo Motor driven by digital controller with a minimum cross head movement resolution of 0.05 µm.		
Measuring Electronics:		
A computerized Data Acquisition Electronics with signal conditioning amplifiers with sufficient bandwidth for measurement of Load and Strain, Cross head position with integrated application software. The measuring electronics shall comply with the guidelines specified ASTM E1856.		
Electronic controller units MD specially designed for data acquisition and close loop control of testing instruments based in external modules, substitutes the old electronic cards mounted into the computer, improving the performance, reliability and data acquisition speed. Due to the external module configuration, the computer can be fast and easily changed by any other suitable PC, without need to make adjustments or calibrations.		
24	a. Data Acquisition	Sampling Rate Min 500 Hz
	b. Handheld Remote Unit	Shall be provided to move the Cross-head, Grippers, Emergency Stop etc. for test configuration and sample definition.

Sr. #	Technical Specification		Requirement
	c.	Control mode	The test controller should operate in a. Load control. b. Strain control. c. Stress-control. d. Speed control. e. Position Control
	d.	Test Mode	Latest application software/test software, Capable of testing materials for. • Compression test • 3 point bend tests (Flexural)
	e.	Methods	Should be able to create variety of test methods as per the popular ASTM and ISO standard and capable of creating customized test setups.
	f.	Graph Display on screen	Load Vs Displacement (i.e. Crosshead).
	g.	Data store	After Test, data sheet and graph should automatically store in defined folder (data sheet in excel and pdf format, Graph in JPEG, bit map, pdf etc.) apart from software.
	h.	Area Calculation	Should readily accept variety of sample geometry like, Rectangular, Cylindrical, Tube, ring etc. with option to enter the cross section area directly for irregular shaped sample. Calculation of area shall be automatic. In addition, the area calculation can be customized as per customer requirement.
	i.	Report generation	Should be customized to conform requirement.
	j.	Software Additional Specifications	Pre-test configuration, specimen identification, test development, test results: analysis and management, statistics package.
25	Computer and Printer Configuration		
	a.	Computer System	Standard Desktop Computer with following minimum configuration. CPU : Pentium i5 8 th generation or better RAM : min. 16 GB GDDR5, HDD : 1 TB HDD or better DVD R/W Drive, Keyboard and Mouse, 24" LED Monitor with resolution of 1920 X 1080 or "in one touch PC interface" or better OS : Windows 10 Pro or latest at the time of supply
	b.	Printer	Colour Laser printer minimum. 600 DPI, 4 PPM for Colour
	c.	Panel	Panel for computer, printer, controller, cables etc.
26	Standard Accessories should be provided along with the machine		
Proposed Model	Electromechanical Testing Machine TESTCOM-100 along with accessories ibertest Advanced Testing Solutions, or Equivalent.		

Notes:

1. Five years warranty or more of the equipment and accessories must be offered.
2. Installation of the equipment, accessories/components and technical support must be provided.
3. Computers and display units along-with colored printer (as per mentioned specifications) is required and must be provide as part of the offer.
4. Service/maintenance of the equipment during operation (if required) is mandatory on demand and must be provided by supplier
5. European, US and Japanese manufacturers will be preferred for these items.
6. All documents e.g. operation, maintenance and support manuals must be provided in English
7. Quotation must reflect Ex-works value, Freight charges, FOB and C&F vale distinctly.