

## **Specification For Compression Density Tester**

### **Introduction**

Compression densimeter (Density tester) is a semi-automated instrument for the determination of the density of unvulcanized rubber compounds and raw rubbers.

The instrument is designed for continuous operation in applications such as in-process quality control in rubber plants and other areas requiring repetitive testing of rubber and polymer samples. The instrument operates in a semi-automatic mode – the sample is placed on a balance station for 2 to 3 seconds and the sample weight which is automatically taken. Afterwards the sample is filled into a well dimensioned barrel where the sample is compressed with a high force and all air is removed from the material. As soon as the material reaches stable conditions, the volume of the material is taken and the density is calculated.

The instrument does not need any special sample preparation – just a rubber strip cut-off from e.g. a mill is sufficient. One test sequence only takes 15-25 seconds.

### **Measurements**

The following data is automatically calculated at the end of each test:

Sample density : Density of the test sample

Sample volume : Total volume of the test sample

Sample weight : Total weight of the test sample

Air pressure : Available air pressure during the test

## Specification

SL. No.	Description	Specification/Requirements	Compliance ( complying or not complying) – State reason for not complying
1.	Model No.	Party shall specify.	
2.	Manufacturer	Reputed	
3.	Application	Evaluate specific gravity of rubbers	
4.	Mode of operation	The instrument is designed for continuous operation in applications such as in-process quality control in rubber plants and other areas requiring repetitive testing of rubber and polymer samples. The instrument operates in a semi-automatic mode – the sample is placed on a balance station for 2 to 3 seconds and the sample weight which is automatically taken. Afterwards the sample is filled into a well dimensioned barrel where the sample is compressed with a high force and all air is removed from the material. As soon as the material reaches stable conditions, the volume of the material is taken and the density is calculated.	
5.	Measurement required to be reported	Sample density : Density of the test sample Sample volume : Total volume of the test sample Sample weight : Total weight of the test sample Air pressure : Available air pressure during the test	
6.	Test configuration	Air operated piston-cylinder test chamber Shall have provision for holding test material Fitted with weighing sensors and the sample contained within the chamber during test. Detail equipment features	
7.	Working standard	As per ASTM D 297	
8.	Density range	0.75- 2.65 g/cm <sup>3</sup>	
9.	Accuracy	0.10% or better	
10.	Reproducibility	0.03% or better	
11.	Measurement Units	grams / cm <sup>3</sup>	

12.	Sample mould Volume	40- 120 cm <sup>3</sup>	
13.	Recommended sample volume	about 100 cm <sup>3</sup>	
14.	Scale/ sample weighing	0- 320 Grams	
15.	Resolution	1 mg or lower	
16.	Barrel diameter	60 mm (max)	
17.	Barrel travel length	80 mm (min)	
18.	Compress. Force	about 40.0 kN	
19.	Operation temperature range	15-45 degree celcius	
20.	Operation relative humidity	5-95%	
21.	Operation	via integrated Touchscreen Terminal (minium 5 inch screen). Alternate arrangements if any shall be reported with details	
22.	Output interfaces	Ethernet 10/100 Mbit, RS 232	
23.	Electrical requirements	220 VAC $\pm$ 10 % 50/60 Hz $\pm$ 5 Hz 1 Amp single phase	
24.	Air pressure	min. 5.0 bar (= kg/cm <sup>2</sup> ) / 95 psi	
25.	Construction	stand alone machine with proper base fitted with anti-vibration mounts	
26.	Dimensions, mm (Width )	500-530 mm	
27.	Height	900-1100 mm	
28.	Depth	630-730 mm	
29.	Integrated computer and result printer	Printer integrated with the machine for direct printing of test and test series results.	
30.	Supply package shall include	All peripheral cables, regulators, connectors and data acquisition system. Free Technical support during warranty period One year traceable calibration certificate after installation at work site.	
31.	Installation and commissioning	To be attended by the party. VSSC shall arrange input electrical supply and compressed air supply. Party shall specify the pressure and current requirements for the machine in advance.	
32.	Safety features	Emergency stopping button Safety indications an stickers	
33.	Warranty	12 months (min) performance guarantee from the date of installation, commissioning and acceptance	
34.	Other accessories	Complete tool box, necessary seals and 3 sets of operation-cum-maintenance manual with mechanical, pneumatic and electrical part drawings	

		Required number of Anti vibration mounts to be provided Original test certificate for the materials used during fabrication of the machine to be supplied Machine to be equipped with handling provisions for easy handling.	
35.	General guidelines	Calibration demanded systems shall be attended by the party and item to be supplied with traceable calibration certificate. Scope of supply includes installation, commissioning and training at VSSC	
36.	Factory acceptance test report	Item shall be dispatched only after approval/clearance of VSSC on Factory acceptance Test report.	
37.	Spares	Minimum spares for operating the system for two years shall be supplied with the machine.	
38.	AMC	Party must quote for non comprehensive AMC for a period of 5 years post warranty	
39	Experience, list of machines in operation in India	Party must provide list of similar machines supplied in India with the correspondence details. The details should be provided with the offer.	
40.	Mooney viscosity range of rubbers to be measured	25-95 @ML(1+4) @ 100°C	