SANTAM

Materials Testing Equipment

SANTAM   SMD-200B

MDR

Rheometer

PRESSURE   LOWER TEMP.   UPPER TEMP.

POWER

Moving Die Rheometer

Rotorless

Rubber Curemeter

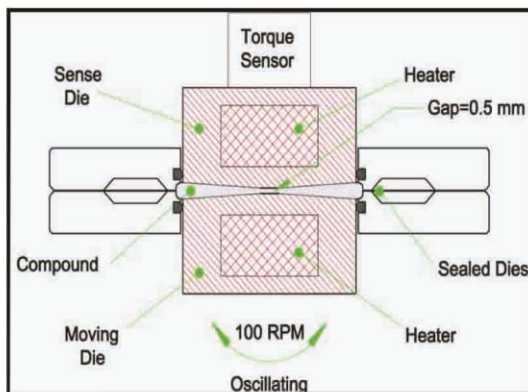## (Sealed Type)

SMD-200B

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Low Cost , High Performance

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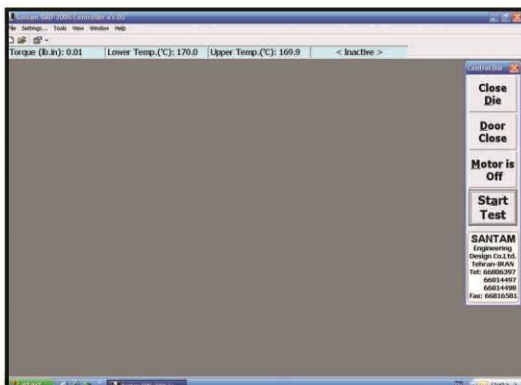

SMD-200B

Features

- **Fully Computerized (Computer Control Just by Serial Port)**
- **Accurate Torque & Temperature Measurement**
- **PID Temperature Controllers with Fast Response**
- **Easy-to-Use and Easy-to-Maintenance**
- **ASTM D5289 & ISO 6502 Standards**
- **High Repeatability & Reliability**
- **Enhanced Test Reports & Graphs**

Moving Die Sketch (Sealed Type)

Application

The Moving Die Rheometer (MDR) is one of the most important tests in the rheological behaviour of the rubber.

SANTAM SMD-200 machine is used in the rubber industries and research centers in order to determine main rheological properties of rubber such as Cure Times, Scorch Times, Elastic Modulus, Viscose Modulus and ... at constant oscillation frequency.

Easy to Use Operating Software

MDR Test

With advanced technology and high quality engineering, SANTAM has produced a machine that is accurate and easy-to-use.

SANTAM SMD-200 machine is designed without disk (Rotorless type) and two dies contact with the sample only. This method reduces heat loss due to heat transfer from disk in Oscillating Disk Rheometer (ODR).

Very fast response Temperature Controllers satisfy constant temperature condition according to standards and vulcanization of rubber can be investigated more accurately.

A compound is placed on the lower die as a sample and test startes just by a single clicking. Upper die (platen) is closed, the lower die is oscillated and variation of Torque and Temperature versus Time shown on the monitor and enhanced results are printed under the graph. SMD-200 Software carries out all test procedures automatically.

Machine Serial Port communication capability allows the operator to use PC (or Laptop) without inserting any interface cards.

Machine dies are designed modular in order to reduce maintenance time and cost. Dies consist of Heaters, Sensors, Insulating materials, Bodies and Standard Cavities which can be installed and replaced as a simple part of machine.

Changing of oscillation angle is carried out mechanically without changing part (Nobs) and the operator just needs to fix the crank mechanism position manually.

All electronic parts of SMD-200 are integrated to one modular internal board which connects to computer by RS-232 serial port. Due to the use of Digital Signal Processing (DSP) technology, the board doesn't require any adjustment and can be replaced in a few minutes by the technician.
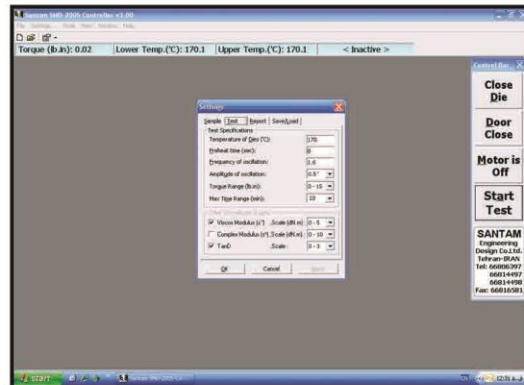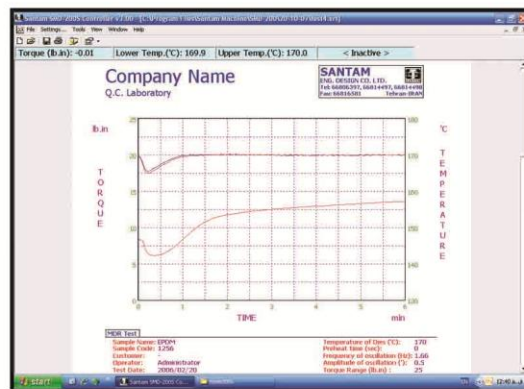

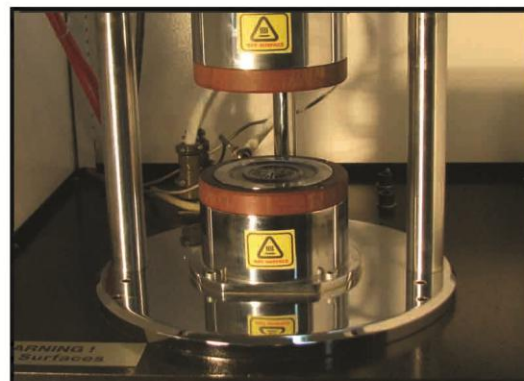Selection of Test Conditions, Graphs & Scales
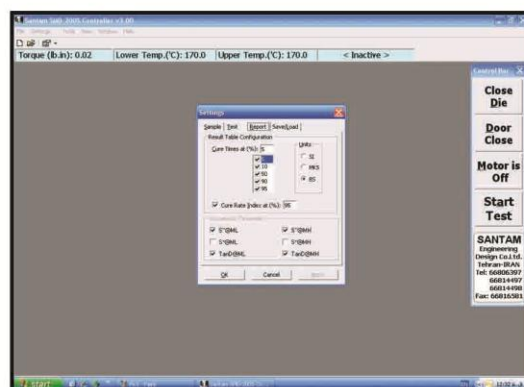
Selection of Cure Times, Cure Rate Index & Viscoelastic Parameters
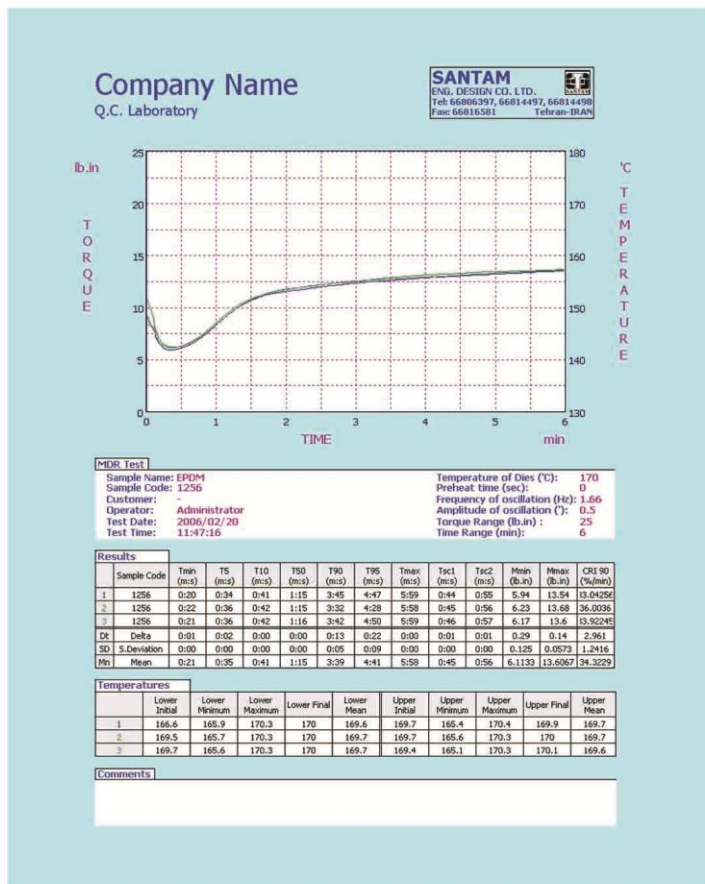
Typical Report of Over Layer Option

Real Time Torque & Temperature Graphs
Fast Response Temperature Controllers

Modular Design Dies

Technical Specifications

Standards	ASTM D5289 ,ISO 6502
Die Type	Torsion Shear Rotorless Un-Sealed Type (Sealed Type*)
Torque Measuring	0~200 dN.m (0.01 dN.m Resolution)
Temperature Measuring	- Range: 50~200 °C (0.1°C Resolution) - Temp. Control Systems: 2 x PID Controllers with Precision PT-100 Probes - Fast Control Response - Digital Adjustment of Set Points Directly from Computer (and/or Controller) - Digital Temp. Output Value (RS-485)
Oscillation Frequency	100 cpm (1.66 Hz)
Oscillation Angle	0.5°, 1°, 3° (Mechanical Adj.)
Air Pressure	6~10 Bar (±0.5 Bar Input Drift)
Die Closure	Pneumatic System, Load: Min 8 KN (Adj. by Internal Regulator) - Opening: Synchronous With Safety Door Opening - Closing: After Safety Door Closing Termination
Safety Door	Pneumatic System, Automatic Operation
Computer	Minimum Configuration PIII (With Serial & Parallel Ports)
Operating System**	Windows 98 / XP / 7 / 8 (English Version)
Connection Between Machine and Computer	Serial Port RS – 232 (Without any Interface Card)

Software	**Graphs:**
	. Torque , Upper and Lower Temperature Graphs
	. Elastic (s'), Viscose (s"), Complex (s*) & TanD Graphs*
	. Selectable Torque, Times & Temperature Ranges
	Reports:
	.Cure Times (t5, t10, t50, t90, t95 & tx ; x = At Each Selected Percent)
	. Scorch Times (ts1, ts2)
	. Max. & Min. Torques (ML, MH)
	. Viscoelastic Parameters* (S"@ML, S"@MH, S*@ML, S*@MH, TanD@ML, TanD@MH)
	. Cure Rate Index at Each Percent (CRIx)
	. Indication of Temperature Conditions (Tinitial, Tmin, Tmax, Tfinal & Tmean)
	  for Upper and Lower Dies
	Options:
	.Over Layer of Graphs (Torque – Time Graph Comparison)
	. Comparison Between Test Reports (Max–Min, Standard Deviation & Average
	  of Each Selected Parameters)
	. Mechanical Deflection (System Stiffness) Correction
	. Automatic Friction Determination & Correction
	. Units Selection (BS, SI, MKS)
	. Export Test Data to Excel ® Software*
	. Calibration of Torque
	. Increasing Time Scale During Test

Operating Conditions	Temp. : 10~38°C , Humidity : 10%~ 90% non-Condensing
Dimensions	55cm x 69cm x 105cm (Width x Depth x Height)
Weight	120 Kg (Without Computer)

* Optional (on request)
** Windows Operating System Software is not included and it must be supplied by customer (or with additional cost)

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ENG. DESIGN CO. LTD.

MADE IN IRAN

Agent

All of the specifications shown in this brochurs are subject to change without notice.