RHEOCHECK OD - DRIVE

OSCILLATING DISK RHEOMETER CONTROLLED BY PERSONAL COMPUTER.

gibitre®
INSTRUMENTS

Standards the instrument complies with:

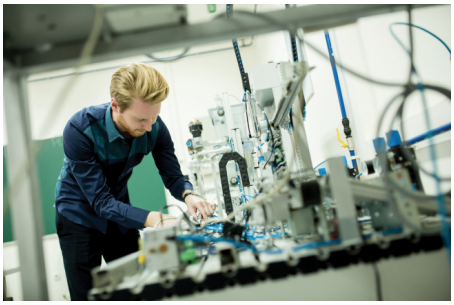
ASTM D2084; ISO 6502-1; ISO 6502-2;

Overview

The Rheocheck OD - Drive measures the cure characteristics of a rubber compound in conformity with the international standards ISO 6502-2 and ASTM D2084
The measure of the vulcanization is carried out by measuring the modification in the mechanical characteristics of the sample. The instrument permits to apply a cyclic strain to a test piece and to measure the associated force. The test is performed at a defined temperature and the measure of stiffness recorded continuously as a function of time.

Why choose Rheocheck OD - Drive?

- Totally developed and produced in Italy
- Top brand Components
- Test Chamber and Rotor in conformity with international standards
- Independent temperature controllers with 0.1°C resolution
- Touch-screen display for instrument control
- Full license of Rheocheck_10 software optimized for Bar-code sample identification
- Full license of Datagest_10 software for complete management of Gibitre SQL Database



The new 'Drive' generation

The new generation of 'Drive' instruments is the result of 40 years of experience in the measurement of rheology of rubber and incorporates the most modern technologies regarding mechanical construction, measurement sensors and control software.

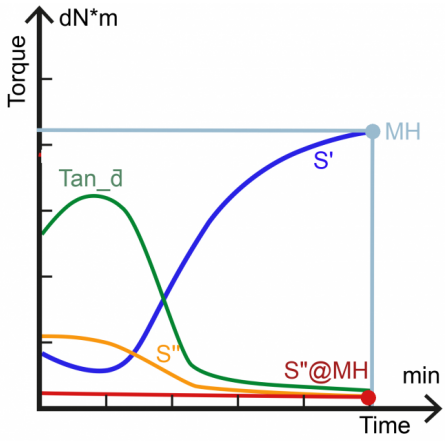
RheoCheck_10 Software

The RheoCheck_10 program connects to the **Gibitre SQL database** and allows you to collect all the results within the Datagest data management program.
The program allows you to:

- **Quickly identify the sequence of tests to be performed**
- Automatically adjust the instrument according to the required test conditions
- Analyze the Test curves (S', S", S* Tang_Delta, Der(S'), Temperatures of the dies)
- Compare the results with the tolerance limits
- Elaborate statistical analysis (Carta-X, Gaussiana, Media, Dev St., Max, Min, Cp, Cpk)
- Produce customized reports

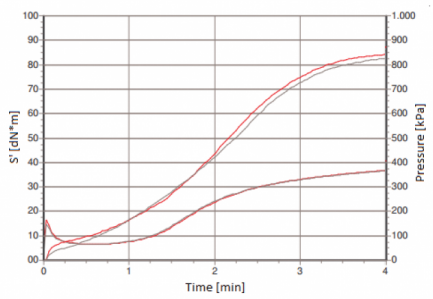
Calculated Results

The software allows you to prepare customized test procedures that include all the calculations required by the standards and product specifications.
The dedicated page describes all the available calculations.



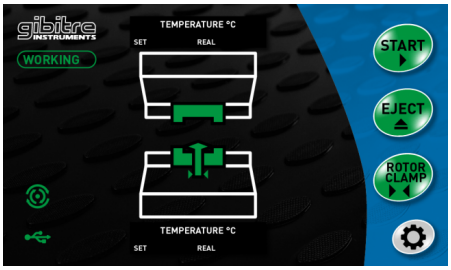
Pressure control

The instrument can be optionally equipped with a pressure sensor for the testing of the expansion evolution of the sample during the curing.
This option is useful for the analysis of cellular rubber formulations.



Instrument Control Panel

The instrument is equipped with a **large touch-screen display with dimensions 10.2"**. The buttons on the display permit to start and stop the tests. The display provides **complete information about the status of the instrument**: connection to the software, temperature of the dies, diagnostic of the sensors installed.

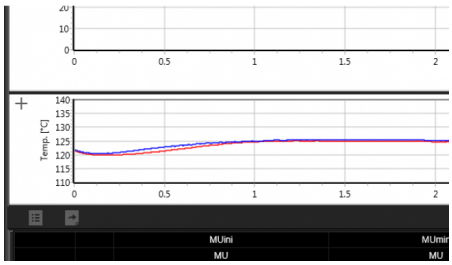


Light panel

A light panel, installed in the front part of the instrument, changes the color and permits to check the status of the instrument from a distance. The indicator light identifies the following statuses: Instrument ready, instrument under test, instrument setting test temperature.

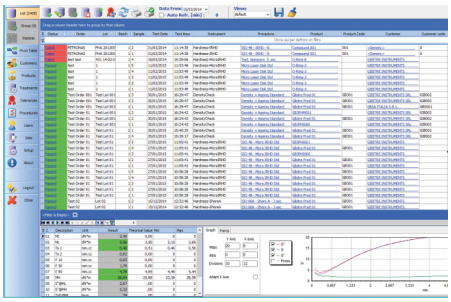
Temperature regulation

The regulation of the temperature is performed using thermo-regulators with PID micro-processor and with 0.1°C resolution.
Independent temperature control units ensure sophisticate temperature control and easy replacement in case of failure. Electrical heating resistances have been specifically designed for this instrument to ensure quick and efficient heating.



Datagest program: total Traceability

The Datagest program is the **Database Management Tool always installed in combination with all Gibitre instrument-control programs.**
The program permits to:
- **Select, filter, print, export and analyse the test results stored** with all the instruments connected.
- **Prepare test procedures** by defining the test conditions and the results to be produced
- **Set tolerance limits** for each product by manual insertion or using the statistical analysis (mean and standard deviation) of saved results
- **Prepare multi-instrument test reports**



Gibitre Standard SQL Database

All the Gibitre programs use a database with SQL structure for saving the results.
The database can be installed inside an SQL instance present on the company server or it can be installed on a PC connected to a measuring instrument.
The installation of the Microsoft SQL service (Express version) is included in the delivery.

Industry 4.0 integration

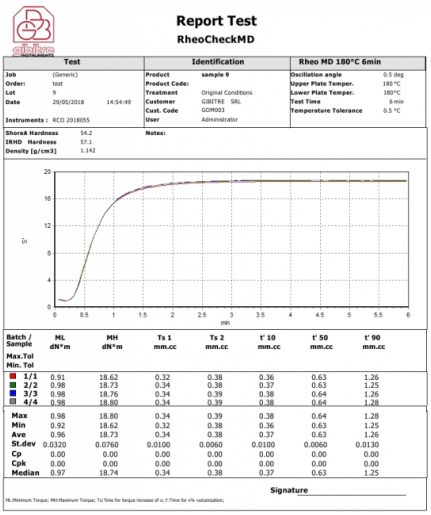
The instrument and the software have been specifically developed to optimize integration with other environments. The database in SQL format and the Gibitre_Company_Connect program allows you **synchronize your company management software** with Gibitre database and to speed up the identification of the tests and **to use bar-code readers** or similar devices.

Preparation of Test Reports

Version 10 programs make the following options available for preparing test reports:

- Selection of printing language
- Company logo insertion
- Print a single test / a Group of tests
- Print of Test Curves
- Print Numerical Results
- Print the Limits of Tolerance
- Print Statistical Results
- Print Legend with explanation of results
- Print the Operator Signature
- Print Customized Notes
- Preparation of PDF file

The program integrates a REPORT EDITOR that allows you to completely edit the report and prepare fully customized report formats.



Report Test
RheoCheckMD

Test			Identification		Rheo MD 180°C 6min	
Job	(Generic)		Product	sample 9	Oscillation angle	0.5 deg
Order:	test		Product Code:		Upper Plate Temper.	180 °C
Lot	9		Treatment	Original Conditions	Lower Plate Temper.	180°C
Date	29/05/2018	14:54:49	Customer	GIBITRE SRL	Test Time	6 min
			Cust. Code	GOM003	Temperature Tolerance	0.5 °C
Instruments :	RCD 2018055		User	Administrator		
ShoreA Hardness	54.2		Notes:			
IRHD Hardness	57.1					
Density [g/cm3]	1.142					

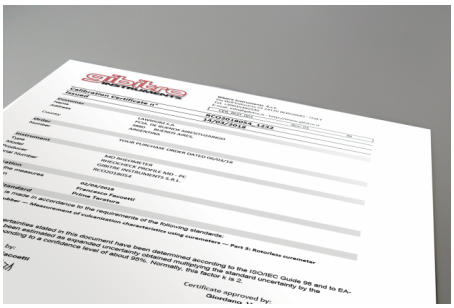
Batch / Sample	ML dN*m	MH dN*m	Ts 1 mm.cc	Ts 2 mm.cc	t' 10 mm.cc	t' 50 mm.cc	t' 90 mm.cc
Max.Tol							
Min. Tol							
1/1	0.91	18.62	0.32	0.38	0.36	0.63	1.26
2/2	0.98	18.73	0.34	0.38	0.37	0.63	1.25
3/3	0.98	18.76	0.34	0.39	0.38	0.64	1.26
4/4	0.98	18.80	0.34	0.39	0.38	0.64	1.28
Max	0.98	18.80	0.34	0.39	0.38	0.64	1.28
Min	0.92	18.62	0.32	0.38	0.36	0.63	1.25
Ave	0.96	18.73	0.34	0.38	0.37	0.63	1.26
St.dev	0.0320	0.0760	0.0100	0.0060	0.0100	0.0060	0.0130
Cp	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cpk	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Median	0.97	18.74	0.34	0.38	0.37	0.63	1.25

Signature _____

Calibration of the Instrument

The calibration is performed in conformity with the requirements of ISO 6502-2 standard.
The service includes:

- Ordinary maintenance of the instrument
- Calibration of the temperature of the dies at 3 temperatures (177°C, 190°C).
- Calibration of the time for temperature recovery at test start at 180°C (NEW)
- Calibration of the Torque (at 50 dN*m)
- Calibration of the torque standard supplied with the instrument.
- Final check with Standard Gibitre Compound (NEW)
- Issue and e-mail shipment of the Calibration Certificate with traceability to primary standards.



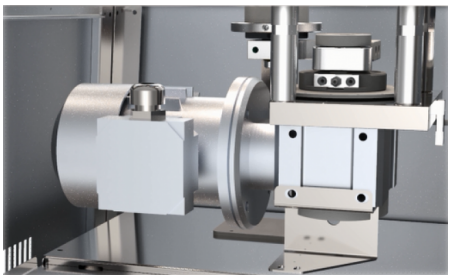
Safety devices

The instrument is equipped with:

- Class 1 Safety switch, which prevents the closure of the dies if the safety panel is not closed.
- Safety Push-button
- Safety lock of the maintenance access door, which ensures safe usage even in non-standard operation conditions.
- CE Labelling

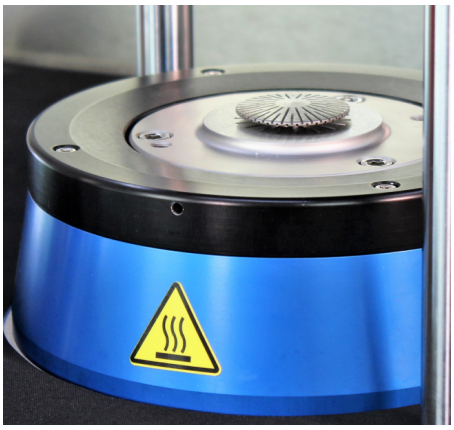
Die oscillation control

The kinematic for the oscillatory movement of the lower test chamber has been developed to ensure perfect operation of the instrument under heavy operating conditions and for extremely long periods: Siemens® motor, SKF® bearings
Calibrated gauges are supplied together with the instrument to easily set the oscillation angle to 1.0° or 3.0°.



Test dies

Test chamber and Rotor conforming to the international standards.
The seal around the rotor has been developed by Gibitre to ensure Low friction and long duration.



Development and production

The instrument is totally developed and produced in the plant of Gibitre Instruments in Italy.
All the mechanical parts are produced in the **company workshop using modern CNC machines**.
Components and sensors from well-known brands are selected in order to ensure the maximum reliability in the measures
Internal trained personnel takes care of all the production stages: **assembly, start-up, calibration, packing, shipment and installation**.

Constant Volume Sample Cutter

• Volumetric Die Cutter for the preparation of samples with constant volume required by the standard.

Instrument Characteristics	
Oscillation frequency	100 cycles /minute (1,7 ±0,1 Hz)
Oscillation Angle	1°, 3°. Easy adjustment with calibrated gauges
Temperature	Room Temperature to +250 °C - Resolution 0.1 °C
Torque sensor	Capacity: 220 N*m Resolution: 0.01 dN*m
Pressure Sensor (optional)	Resolution 0.1 bar, Scale base 200 bar
Software	
Numerical Test Data	Torque Values: MI, ML, M90, MX, MH, PCR, S"@ML, TanD@ML, S"@MH, TanD@MH (X=customer-defined) Scorch Time: tS1, tS2, tSX Cure Time: t90, tX, tML, tMH, tPCR, tRX Pressure (optional) PL, PH, tP, MPR, tMPR
Graphic representation	Elastic curve (S'), Viscose curve (S"), Complex curve (S*)Tan-Delta curve, Curing speed, Upper and Lower test chamber temperatures
Results storage	The test result sand the curves are stored in the SQL Gibitre database which is installed in combination with the software
Units	Torque: dNm or lbf.in. Time: minutes and seconds, minutes and minutes/100, seconds Temperature: °C, °F
Software usage Languages	Italian, English, French, Spanish, German, Portuguese, Russian, Chinese, Japanese, Turkish, Polish, Czech
Safety devices	The sample holder is protected with a transparent plastic cover fitted with a safety lock. The supply source is fitted with safety button
Safety Devices	

Safety Devices	Class 1 Safety switch for main piston (Idem) Safety Pushbutton Safety lock of the maintenance access door CE labelling
Labelling	CE Labelling
Calibration	
Calibration Report	Calibration report with traceability to primary standards in conformity with the Calibration requirements specified in ISO 6502-2 standard
Calibrated parameters	The certificate includes the calibration of: - Torque reading - Temperature of the dies - Speed of temperature recovery at test start. - Oscillation amplitude and frequency - Closure force of the dies - Final verification with standard compound
Torque Spring for calibration	Torque calibration spring supplied with the instrument
Construction Characteristics	
Power Supply	220 VAC ±10%,50 Hz ±3,4 A,single phase -Other on request
Electrical power	1100 Watt
Compressed air	6 bar
Dimensions of instrument	(Width x Depth x Height) 750 x 690 x 1330 mm
Weight	180 Kg
Personal computer	
Personal computer	Minimum Configuration: Intel Core i5 4 GB RAM. Compatible Operating Systems: Windows 10; Connection to the instrument via USB Cable (included)

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