

RHEOCHECK MD - DRIVE

MOVING DIE RHEOMETER CONTROLLED BY PERSONAL COMPUTER.

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Overview

The Rheocheck MD - Drive measures the cure characteristics of a rubber compound in conformity with the international standards ISO 6502-3 and ASTM D 5289.

The measure of the vulcanisation is performed by measuring the evolution of the mechanical characteristics of the sample. The instrument applies a cyclic strain to a test piece and measures the torque resistance of the sample. The test is carried out at a constant temperature and the measure of stiffness is recorded continuously as a function of time.



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.



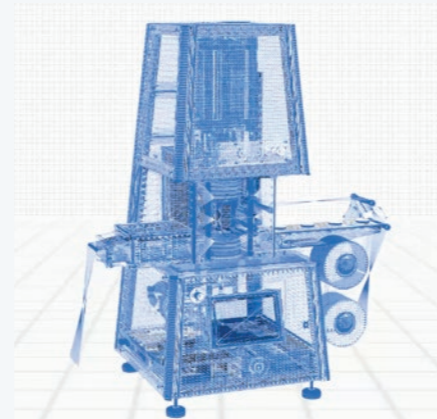
Construction characteristics

Solid steel frame with epoxy powder coating.

Easily accessible test area with transparent safety panel and safety lock.

Die closure system with 4 columns structure to ensure long time stability.

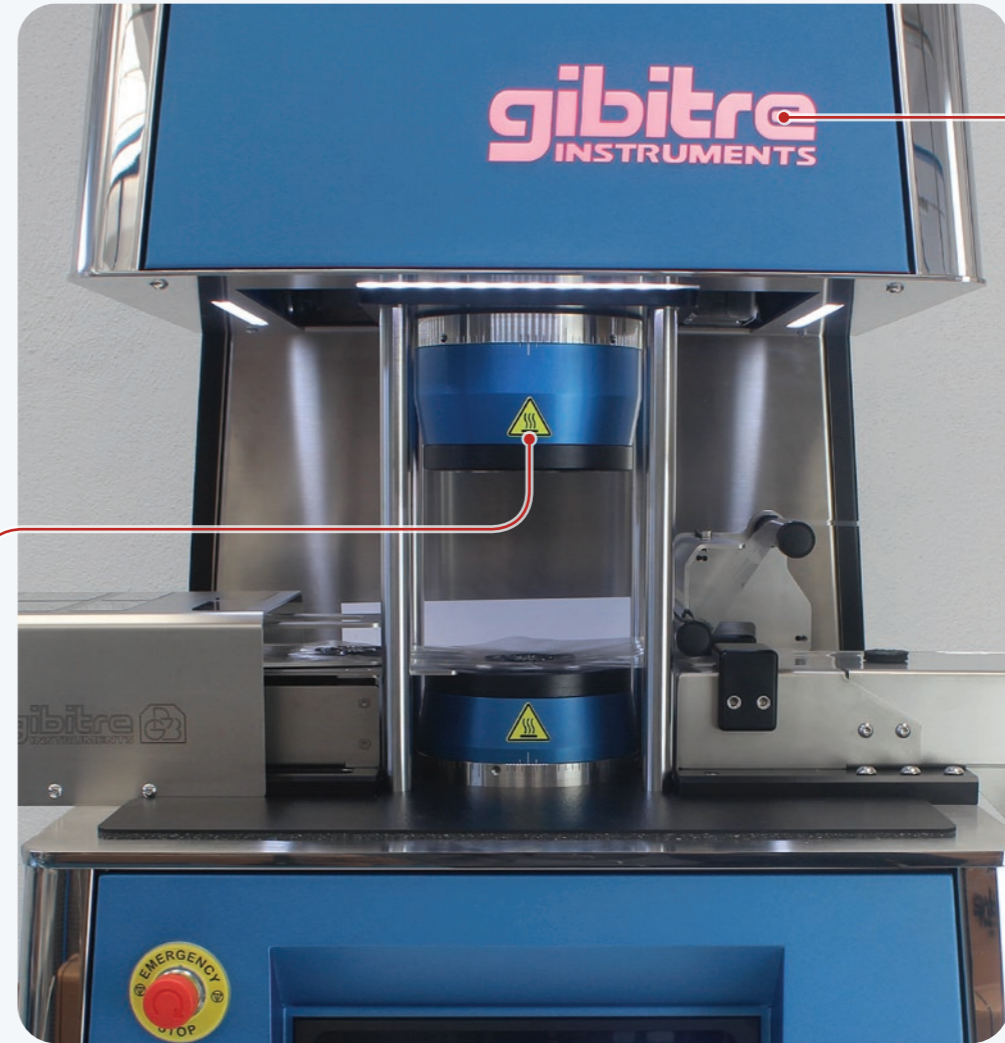
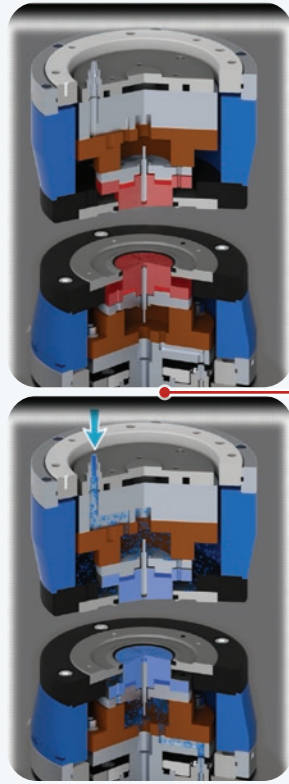
The top part of the frame is designed for the connection to a fume aspiration system. Air filter and pressure regulation unit for pneumatic devices is integrated into the instrument.



VIDEO



RHEOCHECK MD - DRIVE



Test dies

Pressurized test chamber conforming to the international standards. The formulation for the seals has been specifically developed by Gibitre to ensure low friction and long duration. The micrometric adjustment of the distance between the chambers is carried out independently by the exclusive mechanical adjustment vernier. The device allows you to easily adjust the thickness of the specimen to meet the requirements of ISO 6502-3.

The thermal insulators, used to avoid heat transmission, have been chosen for their excellent mechanical characteristics and low thermal conductivity. The insulators are coated with a surface treatment based on fluorinated polymers, which ensures extremely high resistance to chemical agents and ease of cleaning.

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 sophisticated temperature control and easy replacement in case of failure.

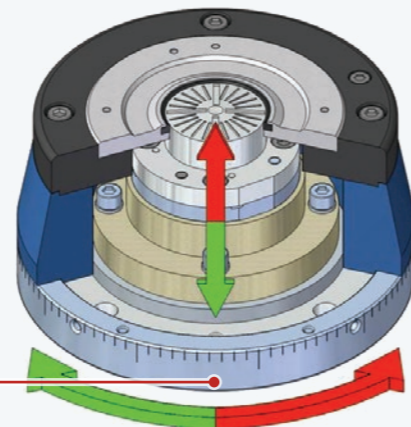
Electrical heating resistances have been specifically designed for this instrument to ensure quick and efficient heating.

The test chambers are equipped with a compressed air cooling circuit, controlled by the temperature control units, which allows rapid temperature reduction.

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 0.5° or 1.0°.



Torque transducer

The Interface® torque transducer is positioned in the upper test chamber to minimize the influence of friction and vibrations.

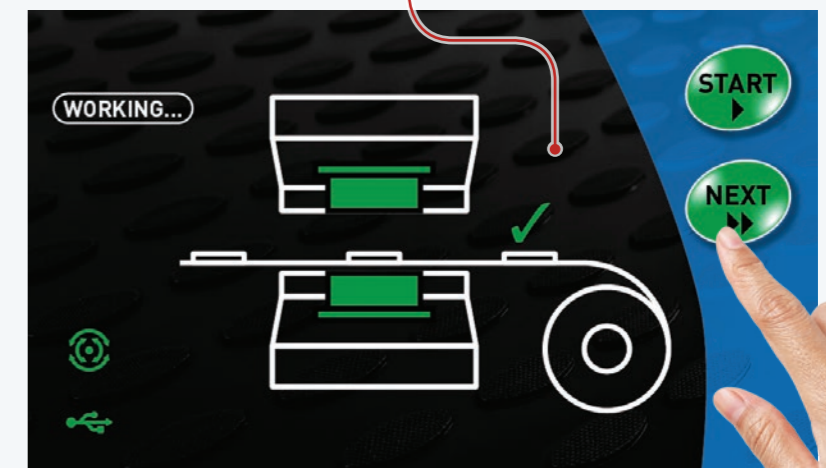
Instrument control devices

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.

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, no specimen in the queue (with autoloader).

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- Oscillating Disk Rheometer:
[RheoCheck Profile OD - PC](#)
- Mooney Viscometer for the performance of Viscosity, Scorch and Stress Relaxation tests:
[MooneyCheck Profile - PC](#)
- Pneumatic Die Cutter for the preparation of samples with constant volume:
[Volumetric Die Cutter](#)

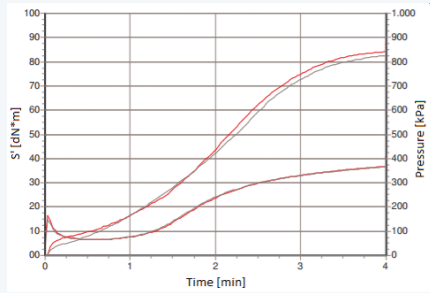


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Pressure control

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.



Calibration

The calibration of the instrument is performed in conformity with the requirements of international standards.

The report includes the following calibration steps: distance between the test dies, temperatures of the upper and lower dies, thermal recovery time at the beginning of the test, oscillation angle, oscillation frequency, closing force of the testing chambers, measurement of torque, measurement of the calibrator spring supplied to the customer, dimensions of testing dies (optional).

The calibration report includes complete traceability to the reference instruments used.

The calibration report includes the final check made with Gibitre standard rubber.

Automatic sample loader

The device allows to position 5 test pieces on the loading slide and automatically perform the tests on all the samples. Before starting a test, the software automatically regulates the instrument according to the test conditions required for the next sample in the queue.

When the test conditions are within the expected tolerance limits, the sample loader moves the sample in the right position and starts the test.

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.

The safety Pushbutton and safety lock of the maintenance access door ensure safe usage even in non-standard operation conditions.

The instrument is fully compliant with CE safety regulation.

Accessories

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

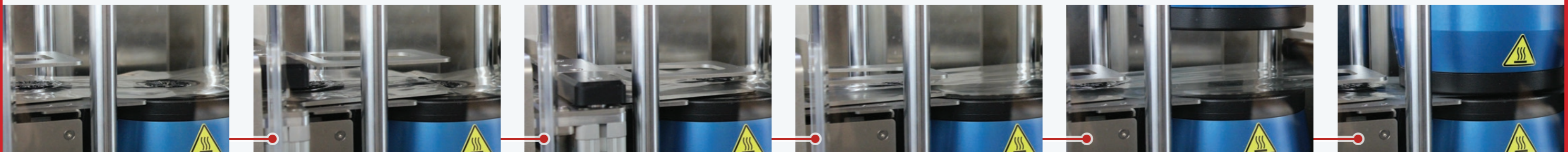
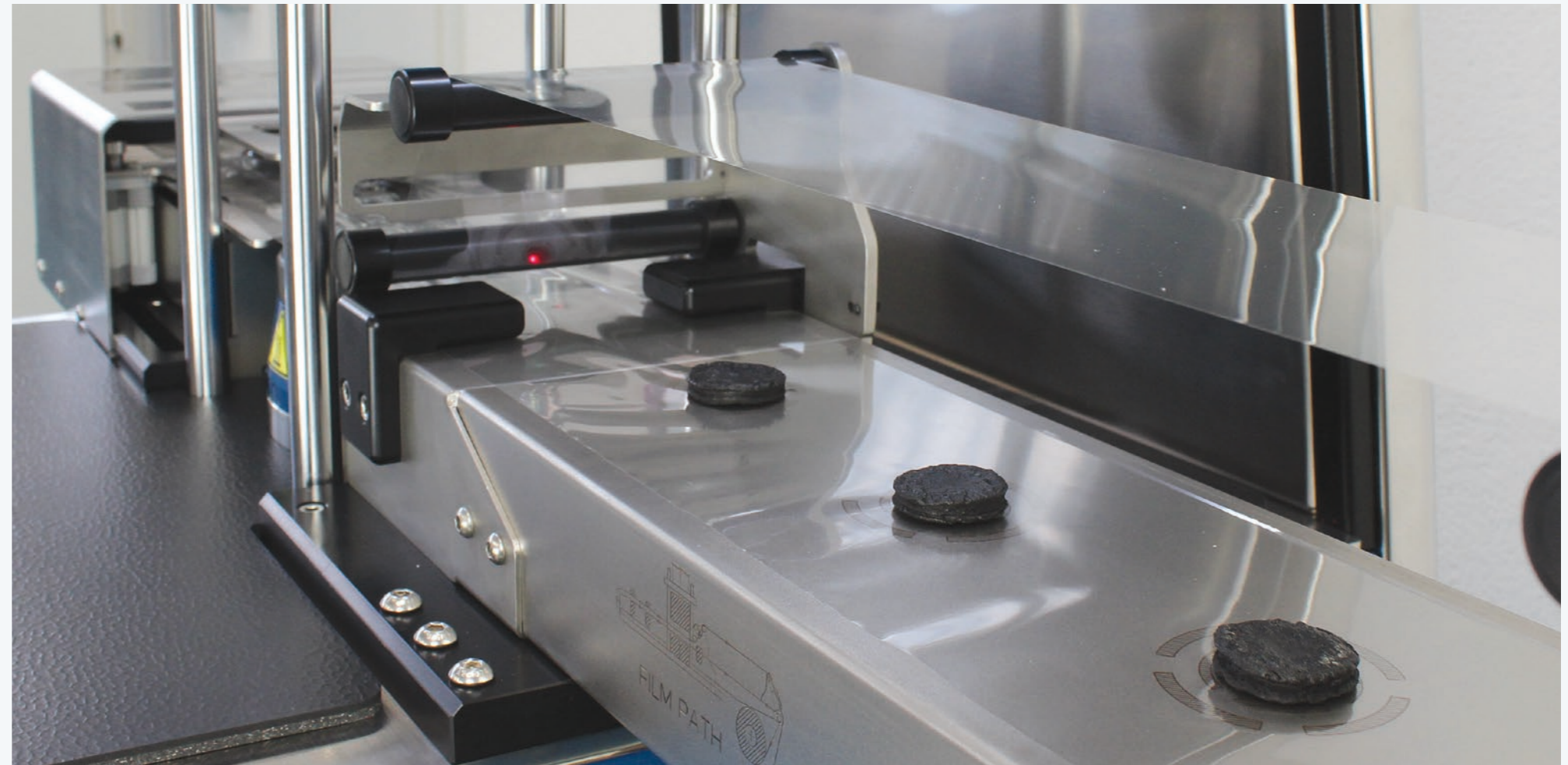
Polyester film rolls for the execution of tests with automatic sample loader.

Box of polyamide or polyester film sheets to perform tests without automatic loader.

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Gibitre-Rheo-Interactive software

The software is connected to the standard SQL Gibitre database to ensure safe and solid storage of test results and curves.

The program permits quick and easy identification of the tests to be performed and is optimized for the use of bar code reader (or similar identification device).

Before the test start, the program activa-

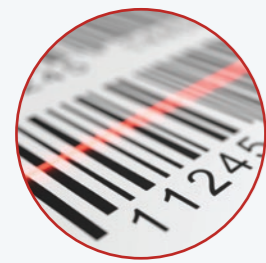
tes the test procedure set for the product, automatically adjusts the instrument and sets the tolerance limits for the verification of the results.

During the test you can plot the elastic curve (S'), viscose curve (S''), complex curve (S*), Tan-Delta curve, curing speed and the temperatures of the dies.

At the end of each test, the elastic curve is

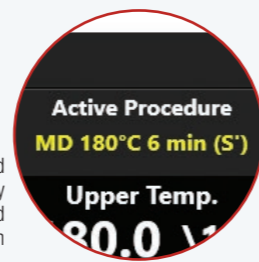
overlapped to the ones of the previous tests for immediate comparison. The curves are plot with different colors for easy identification.

At the end of the tests the program saves the results, verifies the conformity with the tolerance limits and processes the statistical analysis (X-Chart, Gaussian, Media, St. Dev., Max, Min, Cp, Cpk).



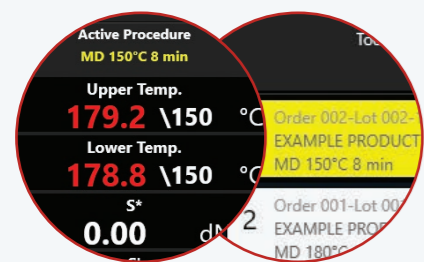
In any phase of operation of the instrument, the program is ready to receive the input of data related to the next samples to be tested.

If a barcode reader (or other automatic identification device) is used, the complete identification is performed by a single 'click'.

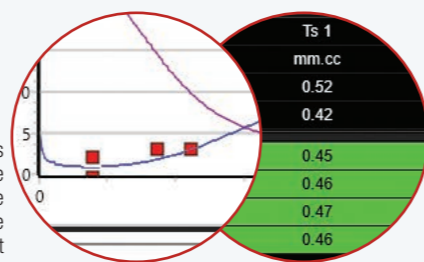


Depending on the selected product, the program automatically selects the test procedure to be used for the specimen

Programma Rheo-Interactive



If the autoloader is used, the instrument waits for the test specimen test temperature to be reached and starts the test.



The program checks the conformity of the results with respect to the tolerance limits set for the product

Test report

Can be printed or saved to pdf in one of the available languages. The format of the Test Report can be customized by the user.



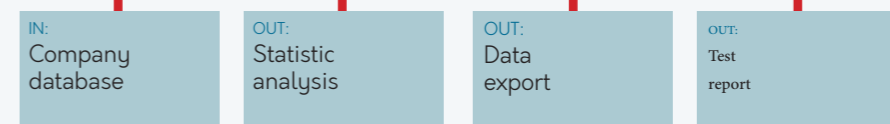
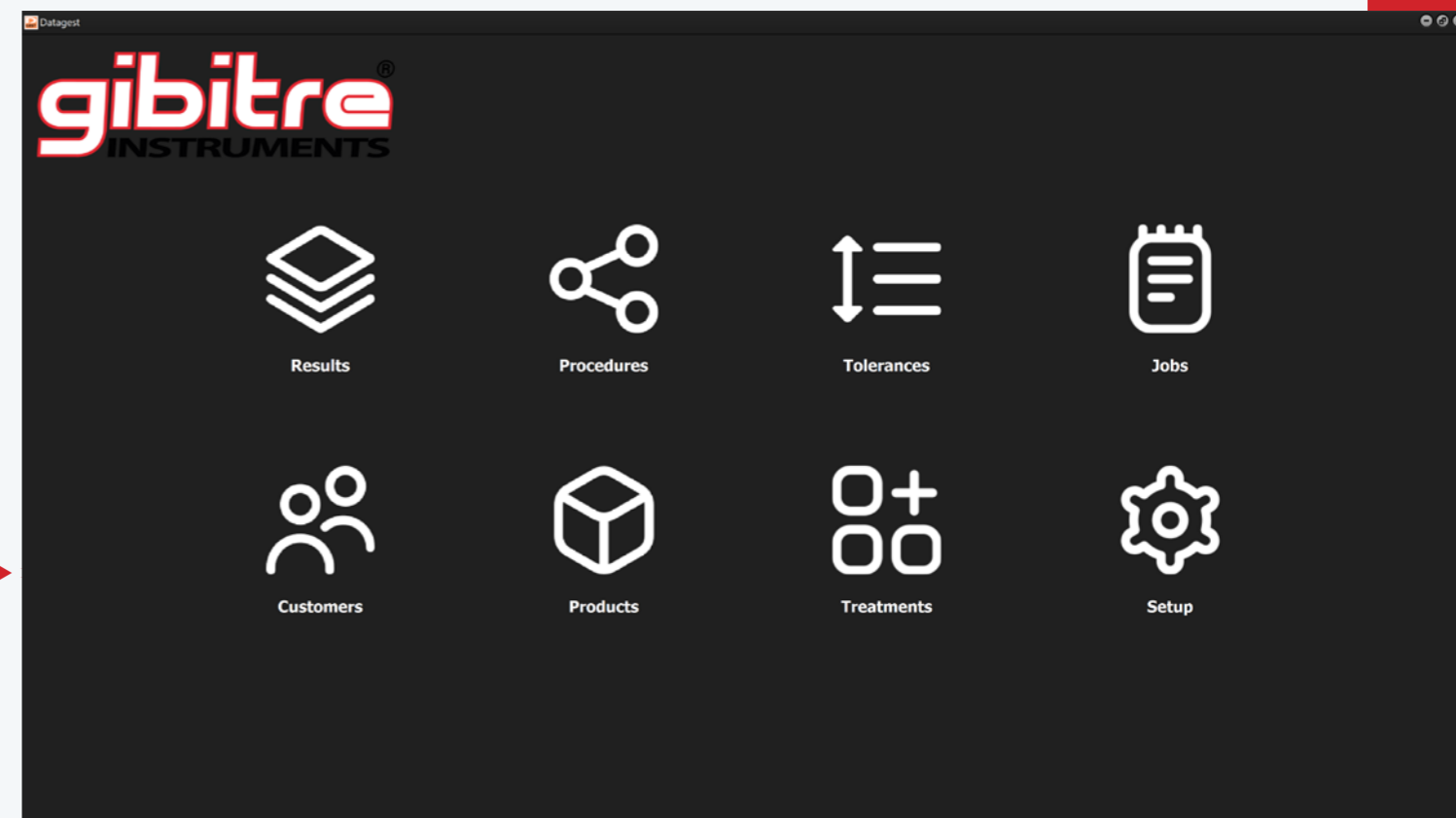
Datagest Program

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



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 Gi-

bitre_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.

The automatic logging service permits to send alarm information to the cloud-service platform of Gibitre Instruments in order to optimize the reaction times of the Service Support.

RHEOCHECK MD - DRIVE - TECHNICAL DETAILS

STANDARDS

Standards the instrument complies with	ISO 6502-3; ASTM D 5289; DIN 53 529-3
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SOFTWARE

Numerical test data

Torque	MI, ML, MX, MH, PCR, S"@ML, S"@MH, TanD@ML, TanD@MH, G"@ML, G"@MH, G"@ML, G"@MH, G"@X, G"@X.
Time	t90, tX, tML, tMH, tPCR, tRX, CRI (X= customer - defined)
Scorch	tS1, tS2, tSX
Pressure (optional)	PL, PH, tP, MPR, tMPR (For each test procedure up to 20 test results can be selected)
Test Curves	Elastic curve (S'), viscose cure (S"), complex curve (S*), Tan-Delta curve, curing speed, temperatures of the dies

Units

Torque	dNm or lbf.in
Time	minutes and seconds, minutes and minutes/100, seconds
Temperature	°C, °F
Selectable Languages	Italian, English, French, Spanish, German, Portuguese, Russian, Chinese, Japanese, Turkish, Polish, Czeck

CONTROL PANEL

Characteristics	dimensions 10.2"
Type of device	capacitive display (permits the use with gloves)
Data displayed	active connection to the software, motor on-off, temperatures of the dies, heating status, sample on sample-holder (with sample loader), test running

LIGHT PANEL

Permits to check from a distance the following statuses	Instrument ready, instrument under test, instrument setting test temperature, no specimen in the queue (with autoloader)
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CONSTRUCTION CHARACTERISTICS

Electronic card	Electronic card with STN 32F 429 micro-processor
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Torque Sensor

Brand	Interface®
Capacity	20 N*m
Resolution	0.01 dN*m
Linearity Error (%FS)	+/-0.25

Pressure Sensor (opzional)

Brand	Interface®
Resolution	0.1 kPa
Capacity	10 kN
Linearity Error (%FS)	+/-0.25

Oscillation frequency	100 cycles/minute (1,7 ± 0,1 Hz)
Oscillation angle	0.5°, 1°. Calibrated gauges are supplied together with the instrument to easily set the oscillation angle to 0.5° or 1,0°.

Temperature	between room temperature and +250 °C - Resolution 0.1 °C
Cooling system	compressed air cooling circuit
Power supply	220 VAC ± 10%, 50-60 Hz ± 3, 4 A, single phase 110 VAC ± 10%, 60 Hz ± 3 on request
Power	700 Watt
Compressed air	6 bar. Complessed air regulation unit integrated into the instrument

Dimensions and weight

Without sample loader (W x D x H)	684 x 671 x 1419 mm
With sample loader (W x D x H)	1229 x 671 x 1419 mm
Weight	180 Kg

SAFETY DEVICES

	Class 1 Safety switch for main piston (Idem)
	Safety Pushbutton
	Safety lock of the maintenance access door
	CE labelling

OPTIONS

Automatic sample loader	Automatic test of 5 samples
Volumetric Die Cutter	for the preparation of samples with constant volume

CALIBRATION

Calibration Report	with traceability to primary standards Torque calibration spring supplied with the instrument
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PERSONAL COMPUTER (optional)

Minimum configuration	Intel Core i5 4 GB RAM
Compatible Operating Systems	Windows 10 or 11
Connection to the instrument	USB port



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