

DATA SHEET

Fully Electro-Mechanical Gyrotory Compactor GALILEO Research



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General description

A robust precision-engineered steel structure incorporating the EmS Electromechanical servo-actuation mechanism for vertical load application and "Orbital" proprietary gyration and mould rotation system (Patent pending) delivering highly accurate and repeatable results, together with stiffness and angle stability values that fall comfortably within the limits defined in EN 12697-31.

The large 7" user-friendly integrated touchscreen control panel shows the test graph in real time. The on-board firmware includes nine languages and also offers the option to control the tests from a PC.

A traceable calibration certificate conforming ASTM and AASHTO Standards is also included.

Operating principle

Standard specify the method for compaction of cylindrical specimens of bituminous mixtures using a gyrotory compactor. Such compaction is achieved by combining a rotary shearing action with a vertical static force applied by a mechanical head.

The method can be used for:

- Preparation of specimens of a given height at a predetermined density, for subsequent testing of their mechanical properties;
- Derivation of a curve of density versus number of gyrations;
- Void content for a given number of gyrations.

Standards apply to bituminous mixtures (made either in laboratory or from on-site sampling), with aggregates not larger than 37.5 mm. During operation the bituminous mixture is contained in a cylindrical mould (100 or 150 mm diameter). Compaction is achieved by the simultaneous application of a low-static compression and a shearing action, which results in the motion of the centre-line of the test piece, which generates a conical surface of revolution while the ends of the test piece remain approximately perpendicular to the axis of the conical surface.

The **gyrotory compactor GALILEO RESEARCH** can be used as part of your Superpave performance based testing program.

Main features

- High precision, robust load mechanism combined with an extremely rigid frame assures high accuracy and repeatability
- Load cell fitted directly on the vertical actuator for accurate load measurement and feedback control
- User defined axial stress and speed of rotation

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- Sliding transparent door with safety interlock
- Catch tray to collect expelled liquids using perforated moulds
- Fresh concrete configuration available
- Easy control using the integrated 7" colour touchscreen panel or connected PC
- User friendly PC software for data analysis and tests set up. Remote communication is available to receive immediate diagnostics
- Automatic data saving on USB or on Windows PC
- Lightweight yet robust moulds strictly comply with international Standards
- Safe and easy mould insertion and extraction with automatic lifting ensures low effort for the operator and higher productivity
- Simultaneous extraction of last specimen for higher productivity
- Easy specimen extraction with the integrated extruder
- Perfect gyratory angle with real-time closed loop automatic angle adjustment recovering compliance and minor strains independently from the vertical loads
- Easy and accurate motorised regulation of the gyratory angle set and displayed from the control panels
- Possibility to automatically set the zero angle at the end of the test
- Mounted on swivel caster wheels for easy moving and positioning
- Real-time direct shear and torque resistance measurement. Automatic calculation of the compaction energy, an important parameter for Research
- Automatic weight acquisition and density calculation with the integrated balance (optional)

Standards

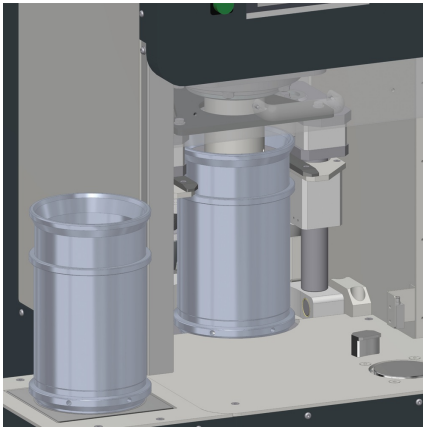
- EN 12697-10
- EN 12697-31
- AASHTO T312
- ASTM D6925
- AS 2891.2.2

Specifications

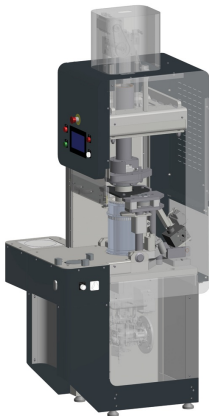
Model	Galileo Research 78-PV20R0X
Consolidation pressure	10 – 1000 kPa for 150 mm diam. 25 – 2200 kPa for 100 mm diam.
Gyratory motion and Vertical load	Electromechanical
Angle adjustment	EmS Electromechanical Servoactuation
Gyratory angle range	0 - 3° ±0.005
Gyratory angle measurement	Angle measured and displayed during test plus closed loop control
Zero angle at the end of the test	Yes (automatic procedure, user selectable)
Speed of gyration	5 – 60 rpm (120 on request)
Number of gyrations	0 -9999
Integrated Shear measurement	Yes
Moulds dimensions	100 and 150 mm diam., 250 mm height.
User interface	7" 16:9 Touch screen color display (PC for data analysis)
Connection	LAN - Ethernet
PC Software	Included
Extruder	Included (electromechanical)
Balance	Available as option with an accuracy of 1 g
Minimum specimen height	50 mm

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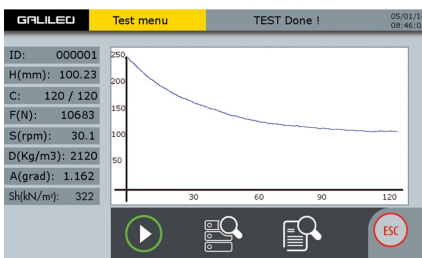
Maximum specimen height	Up to 200 mm depending on mix type
Height accuracy	Better than 0,1 mm
Suitable for water pouring test	Yes
Suitable for concrete/cement testing	Yes (on request)
Dimensions (w x d x h)	480 x 900 x 2150 mm
Weight approx..	420 kg



Particular detail of the interior part of GALILEO Research



Lateral section of GALILEO Research

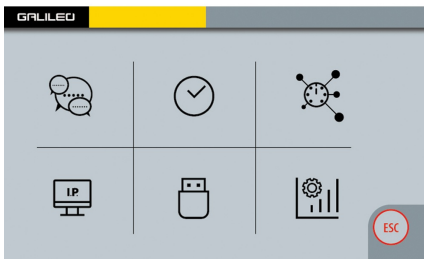


Test menu

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Parameter	Value
Profile name:	ASTM D150
Mould diameter (mm):	150
Load (KPa)	600
Angle (grad):	1.160
Speed (rpm):	30
Cycles number:	120
Extra cycles:	0
Cycles zero degree:	10

Parameters menu



Calibration menu



Fully electro-mechanical gyratory compactor GALILEO Research with balance

Products

78-PV20R02

Galileo Research, fully Electromechanical Gyratory compactor, including motorized mould lifting, shear measurement system, PC software for data analysis and integrated extruder. 230V/50-60Hz/1ph

78-PV20R04

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Galileo Research, fully Electromechanical Gyrotorycompactor, including motorized mould lifting, shear measurement system, PC software for data analysis and integrated extruder. 110V/60Hz/1ph

Accessories and consumables

78-PV0255

ILS device for internal angle measurement for Gyrotory compactors, conforming to EN 12697-31, annex B. Complete with Excel Macro and PC connection cable

78-PV0250/10

Hardened cylinder mould 150 mm dia. with holes for cold mix compaction. Complete with top and bottom plates

78-PV0250/11

Vertical force indicator, complete with 25kN load cell, base, spherical seat, load readout unit and calibration certificate

78-PV0250/13

Stainless steel wearing disc for 150mm dia. gyrotory compactor mould

78-PV0250/14

Stainless steel wearing disc for 100mm dia. gyrotory compactor mould

78-PV0250/2

Hardened cylinder mould 150 mm dia complete with top and bottom plates.

78-PV0250/3

Distance piece 150 mm dia x 50 mm for low samples

78-PV0250/4

Accessories to compact dia 100 mm specimens, required when 100mm cylinders (78-PV0250/5, 78-PV0250/8) are used. Mould not included.

78-PV0250/5

Hardened cylinder mould 100 mm dia complete with top and bottom plates.

78-PV0250/6

Distance piece 100 mm dia x 38 mm for low samples.

78-PV0250/8

Hardened cylinder mould 100 mm dia. with holes for cold mix compaction. Complete with top and bottom plates

78-PV20UP3

Electronic balance, 30 kg. cap., 1 g resolution. To weight the sample and to calculate the density. Suitable for Galileo standard and Galileo Research gyrotory compactors (To be specified at time of order)

78-PV20UP4

Traceable ACCREDIA certificate conforming to EN 12697-31 Ann. B (To be specified at time of order)

78-PV0250/16

Paper discs 150 mm diameter. (pack of 1000)

78-PV0250/17

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Paper discs 100 mm diameter. (pack of 1000)