

SECTION C

CONCRETE



The accurate and satisfactory test of fresh and hardened concrete are essential elements for any type of building construction. The final quality of the concrete utilized in the structure depends on many variables like: workability, consistency, setting time, volumetric mass, air content, compressive strength, temperature, linear variations, etc.

Matest offers a complete range of testing and research equipment on concrete to satisfy all the above quality variables, in compliance with the EN, ASTM and most popular International Standards. In the second part of this section a complete range of instruments are available for non-destructive tests, to investigate and evaluate the progressive ageing and durability of concrete structures exposed to chemical attacks, air pollution, and time.



COMPRESSION AND FLEXURAL TESTING MACHINES

Matest has the widest and most complete range of compression and flexural testing machines today available on the global market, making Matest leading manufacturer of testing machines.

The versatility and flexibility of Matest testing machines allow the end-user to select and combine compression/flexural groups in order to meet custom requirements.

The next pages describe:

- 1) General features of the compression frames with different control and measuring systems (p. 217-218)
- 2) Compression testing machines, four columns prestressed frame, conforming to Standards:
ASTM C39 | BS 1610 | AASHTO T22 | NF P18-411 (p. 230...259)
- 3) Compression testing machines, four columns **tested for high stability frame**, conforming to Standards:
EN 12390-4 | and BS 1881 | DIN 51220 and the determination of the automatic secant compression **elastic modulus** on concrete with pace rate control also when releasing the load, conforming to Standards:
ASTM C469 | ISO 6784 | UNI 6556 | DIN 1048 (p. 261...281)
- 4) Flexural testing machines, conforming to Standards:
EN 12390-5, EN 1340:4 | ASTM C78, C293 | BS 1881:118
AASHTO T97 (p. 288...309)
- 5) Combined Groups for Compression, Flexural, Splitting, Block tests; cement compression/flexural frames, suitable to personalize and satisfy any specific requirement (p. 310)



COMPRESSION TESTING MACHINES

It is technically well-known that the welded frames may have structural unexpected values and problems, while the four columns configuration guarantees tensional uniformity at all load levels.

Matest manufactures **compression machines four columns frame only**, and supplies two basic frame designs:

■ MACHINES WITH FOUR COLUMNS PRESTRESSED FRAME

STANDARDS: ASTM C39 | BS 1610 | NF P18-411

AASHTO T22

Models described at p. 230...259

■ MACHINES WITH FOUR COLUMNS TESTED FOR HIGH STABILITY FRAME

STANDARDS: EN 12390-4 | BS 1881 | DIN 51220

Models described at p. 261...281



MAIN FEATURES

- Extremely strong and oversized load frame ensuring high rigidity and stability.
- Precision lapped upper ball-seat with compression platen.
- Compression platens are ground finish and surface hardened over 55 HRC.
- Designed to meet International Specifications: EN, ASTM, AASHTO, BS, NF, DIN.
- Available with 1300kN, 1500kN, 2000kN, 3000kN, 4000kN, 5000kN capacity to test cubes, cylinders and blocks.
- Both hand-operated and motorized versions with one or two gauges.
- Hydraulic device to stop the piston's stroke at its max excursion to avoid pumping the piston out of the cylinder.
- Available with automatic digital servo-controlled console and electronic digital display measuring system.
- Optional safety guards.

HYDRAULIC SYSTEM

Piston has a large diameter: this allows the hydraulic circuit to work at low pressure with a longer life of the working components and higher precision in the results. Piston is ground and lapped, and a high quality packing set of three elements is used. Motorized models are equipped with a dial device to display, pre-select and control the flow allowing an uniform load rate as requested by the Standards. A fast approach ram action device avoids dead times during the stroke of the ram. Power pump is multipiston, assuring continuity of delivery, now with **improved performances and more silent**.

A movement indicator shows instant by instant the piston excursion during the compression test. A hopper covering the piston is conceived to avoid the powder of the broken specimen to enter into the cylinder of the press and damage the packing set.

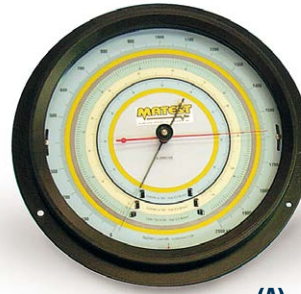


➤ NEW

LOAD MEASUREMENT SYSTEMS

A) GAUGES

The gauges are Bourdon tube type. They include max. load pointer, zero adjustment and mirror face to avoid parallax errors. Low pressure gauge is fully protected from overload by a pressure control device.



(A)

B) CYBER-PLUS Evolution, EIGHT analog channels system, for the acquisition, display and processing of test data, with software and printout of results and certificates.

Resolution up to 500.000 divisions.
TOUCH-SCREEN COLOUR display, same as PC.
Technical details: see mod. C109N, p. 222...228



B) C109N

BB) DIGITEC, TWO analog channels system, for the acquisition, display and processing of test data with software (accessory) and printout of results and certificates.

Technical details: see mod: C108N, p. 219...221



BB) C108N


C) SERVO-PLUS Evolution, automatic servo-controlled system, to provide fully automatic tests throughout all phases, with the support of the Cyber-Plus Evolution electronic technology.

Technical details: see mod: C104N, p. 222...228



C) C104N

C104-04

C104-04  **NEW**
 CONSOLE, lined with sound-proofing material for noise reduction, new design.

CC) AUTOTEC, automatic servo-controlled system, to provide fully automatic tests throughout all phases, with the support of the Digitec electronic technology

Technical details: see mod. C098N, p. 219...221



CC) C098N

CALIBRATION AND PRECISION

All testing machines are calibrated with high accuracy electronic instruments and are guaranteed in CLASS "1" (max. error \leq than $\pm 1\%$). Also starting from 1% of the full range.

A Calibration Certificate is supplied along with the machine.

C108N DIGITEC | C098N AUTOTEC

Two-channels computerised graphic display system to control and manage all sorts of automatic (Autotec C098N) and semi-automatic (Digitec C108N) testing machines, for acquisition, display, processing, printing and saving test data and certificates, with software for remote control from PC.

SUITABLE TO UPGRADE OR COMPLETE YOUR CONCRETE OR MORTAR COMPRESSION AND FLEXURE TESTING MACHINES (also from other manufacturers).



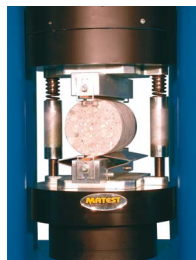
APPLICATIONS



Compression on concrete



Flexure on concrete



Splitting on concrete cubes and cylinders



Compression and Flexure on Mortars

SPECIFICATIONS DIGITEC | AUTOTEC

- **2 analogue-digital channels** accepting sensors, transducers or load cells at 2 mV/V, allows the connection to two different compression/flexure frames.
- Simple and immediate parameters set up and test execution, menu driven interface.
- Rapid approaching, touching on and breaking of the specimen under direct pump control (Autotec C098N)
- Automatic control of the pace rate (Autotec C098N)
- Continue load display.
- Breaking load detection.
- Automatic elaboration of the specific resistance value.
- Permanent file up to 1000 tests and file of 100 different types of specimens.
- Graphic display with high resolution: 192x64 pixels.
- Selectable measuring force: kN, lb
- Languages: English, French, German, Spanish, Italian, Polish, Czech, Turkish.
- **Class 1** starting from 10% of maximum value, on request from 1% of maximum value.
- **± 0.5% load accuracy.**

Menu

The display shows date and time, currently applied load and single load, latest effected tests, pace rate control, rapid commands functions, configuration in use, analogue channel and activated alarm.

TECHNICAL STRUCTURE

- Acquisition and data processing system at 24 bit, effective resolution: 17 bit.
- Operator interface composed by 5 multi-functions pushbuttons; function icons shown on the display.
- Different programmable safety devices for the machine or the specimen as the possibility to introduce a percentage of the maximum value reached during the text execution, thermal protection of the motor and different other settable alarms.
- The firmware contains a memory of the most used specimens: area, weight, specific weight.
- Possibility of personalization for special sized samples.
- RS232 interface: it allows the data transfer during the test or the test results directly to PC (via Microsoft Hyperterminal) or the remote control of the system by means of the UTM2 software (accessory).



Test setup



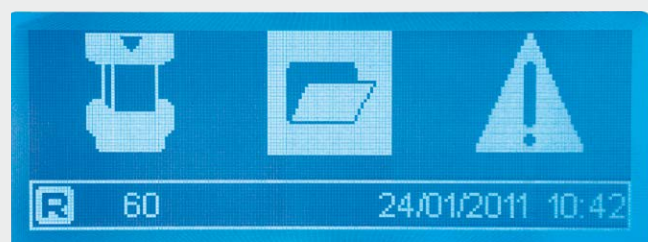
Test execution with pace rate controller



Max load alarm setting



Channel configuration/calibration



Functions icons (test selection, file, alarms visualisation)

MODELS

C108N DIGITEC

Two channels unit for data acquisition and elaboration, as described.

Power supply: 230V 1ph 50-60Hz

Dimensions: 260x250x210 mm

Weight: 4 kg



C098N AUTOTEC

Two channels servo controlled system for a fully automatic execution of the test.

The system comprises:

- Digitec C108N data acquisition unit
- Multi-piston electric pump with variable flow (see mod. C114) driven by a microprocessor (reliable and noiseless system, also for intensive and extended use)

Power supply: 230V 1ph 50Hz

Dimensions: 420x290x950 mm

Weight: 60 kg approx.



C098-01N AUTOTEC FOR TWO FRAMES

Two channels servo controlled system, complete with three way hydraulic valve for the optional to connection of two testing frames.



ACCESSORIES

C127N On board graphic printer on thermo-paper

C127-11 Spare roll of thermo-paper for printer

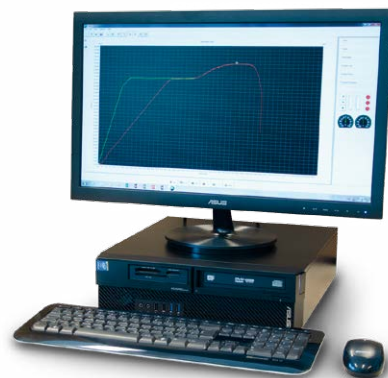
SOFTWARE

For the remote execution of the test and the automatic transfers and filing of the results on a computer

C109-10	Software for COMPRESSION test on Concrete
C109-11	Software for FLEXURAL test on Concrete
C109-12	Software for SPLITTING TEST on Concrete specimens
E163	Software for COMPRESSION test on Mortars
E164	Software for FLEXURAL test on Mortars
C123	Software "Servonet" for all the tests listed above. Suitable to be used only with the Autotec system.

H009-01 EN PERSONAL COMPUTER

Complete with LCD, monitor 22", keyboard, mouse, connection cables. The supply of the PC includes the installation of the purchased software.



H009-01 EN

PRESSURE TRANSDUCER

Used with both Digitec and Autotec, supplied along with proper connection cable and relative calibration certificate.

Available models: see p. 318



C116-09N

ULTIMATE DESIGN, TIME-PROVEN SYSTEM, TRUSTY PERFORMANCES

CYBER-PLUS EVOLUTION **NEW**

SEMI-AUTOMATIC APPLICATIONS

- Compression & flexural tests on concrete
- Compression & flexural tests on mortar
- Tensile, compression and bending tests on steel
- Splitting tensile tests on concrete cubes and cylinders



ADVANCED SERVO-PLUS EVOLUTION **NEW**

SOPHISTICATED AND RESEARCH APPLICATIONS

In addition Advanced Servo-Plus Evolution can perform:

- Elastic modulus on rocks, concrete and mortar
- Triaxial tests on rock specimens



SERVO-PLUS EVOLUTION **NEW**

FULLY AUTOMATIC APPLICATIONS

- Strain, ductility and post-breaking behaviour
- Deflection on fiber reinforced concrete beams
- Punching test on sprayed concrete specimens with energy absorption measurement



SERVO-PLUS RESEARCH **NEW**

HIGH PERFORMANCE SERVO-PLUS SERVO-STRAIN

Performing tests in load, displacement and strain rate control:

- Compression, flexure and splitting tensile
- Elastic modulus and fiber reinforced concrete and shotcrete
- Triaxial test on rocks and Stress-path test procedure
- Suitable also for dynamic tests, at low frequencies up to 0.1 Hz



C099N INVERTER DEVICE

- **Improved motor efficiency** with important reduction of absorbed power and electric consumption.
- **Reduction of noise pollution** thanks to a balanced and efficient delivery of the flow rate.
- **Improved piston speed** for a faster approach to reach the specimen with the result of having a considerable reduction in the overall test time.
- Improved reliability and life of the hydraulic pump thanks to a **decreased heating and mechanical stress**.
- **Better sensitivity** of load, deformation and speed adjustment.
- Accepts both 50Hz and 60Hz supply.



C099N inverter

CONSOLE

SILENT.STYLISH.STANDOUT.

- New console **with pumping unit lined with sound proofing material** in order to reduce noise.
- The design allows for the inverter integration.
- **The semi-automatic version (C104-06) grants an automatic speed selection by eliminating the manual pace-rate adjustment at minimum.**
- The only manual intervention required by the operator is the opening and closing of the dump valve for the hydraulic circuit.



C109N Cyber-plus +
C104-06 console +
C099N inverter +
C114 pumping unit

Note:

The Inverter device may be mounted only on those machines equipped with **Servo-Plus** or **Servo-Plus Evolution** systems. With the Inverter device it is necessary to include also the Console C104-04 (fully automatic) or the Console C104-06 (semi-automatic).

C099-01 BARCODE SCANNER



This instrument allows specimen file and identification by barcodes reading.

It can be connected cyber-plus / servo-plus control panels by USB, to automatically register specimen code and add it as a description of the test for all tests done with compression and flexure machines. Supplied complete with USB cable.



TECHNICAL SPECIFICATIONS

- Codification capacity: UPC/EAN, UPC/EAN with supplements, Code 128, UCC/EAN 128, Code 39, Code 39 Full ASCII, Code 128 Full ASCII, Codabar, Interleaved 2 of 5, Code 93, MSI, Code 11, ISBN, ISSN, usw, etc...;
- Reader type: bidirectional;
- Light: 650 nm wavelength, laser-diode;
- Resolution: 0.10 mm;
- Reading distance: 3...400 mm;
- Reading angle: inclination angle 45°, elevation angle 60°;

Dimensions: 81x97x165 mm

Weight: 136 g

C109N CYBER-PLUS | C104N SERVO-PLUS



An electronic evolution with 8 analog inputs for compression and flexural testing machines on concrete and mortar.

Designed with the latest technology, an innovative PC-like Touch Screen system, employed to control and manage all sorts of automatic (Servo-Plus Evolution C104N) and semi-automatic (Cyber-Plus Evolution C109N) testing machines.

To update or complete your compression and flexural testing machine on concrete and mortar (also on Non-Matest brands)



APPLICATIONS



Compression on concrete



Flexure on concrete



Splitting on concrete cubes and cylinders



Compression and Flexure on Mortars



Tensile on steel

MAIN FEATURES

- The control unit Cyber/Servo-Plus Evolution runs like a standard PC based on Windows operating system.
- The touch-screen graphical user-friendly interface allows an easy set up of the parameters and an immediate execution of the test.
- High resolution color display, ¼ VGA, offers all the functions of a PC for the management and analysis of data, test results, and graphs.

ITOUCH TECHNOLOGY



ONE TECHNOLOGY, MANY SOLUTIONS

IT TECH is Matest brand-new concept which aims to offer innovative and user-friendly technology to control and manage the most advanced material testing machines for the construction industry. This technology is the core feature of Matest control unit, a PC-based and touch screen system which is modular, flexible and multi-functions.

- IT TECH stands for:
- INNOVATION
 - ICON INTERFACE
 - INTERNET CONNECTION
 - INDUSTRIAL TECHNOLOGY

Graphic on board printer

Safety cut out switch

8 analog inputs for connecting load cells and transducers

2 USB-Host ports

SD card slot (unlimited memory)

C109N / C104N

1

2

3

3 OPERATING MODES

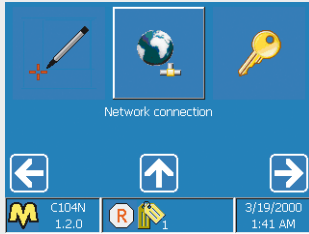
1 Control from user friendly Touch-Screen display

2 Large directional arrow-keys for gloved use

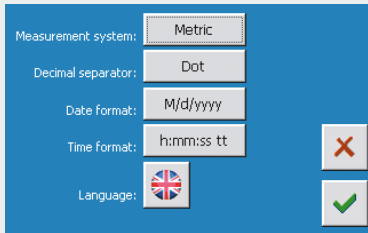
3 Connection of a keyboard or mouse



Direct connection of the Cyber/Servo Plus Evolution to the Intranet (direct connection to a LAN network) and Internet to establish a remote communication and receive diagnostic analysis of potential problems, the ability to execute the test from distance and provide software updates. Matest technicians will check the unit located abroad to guarantee a prompt and professional assistance.



Internet direct connection for remote assistance



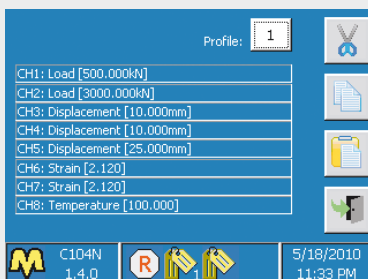
International settings and unlimited language selection



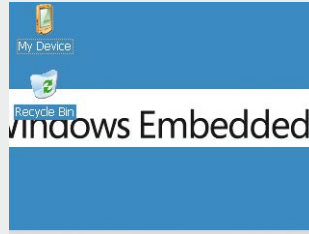
Easy and straightforward selection of the tests (compression)



Unlimited memory storage with: 2 USB-Host ports* for PC, 1 SD card slot* (*memory hardware not included)



Endless number of test combinations and profile calibrations



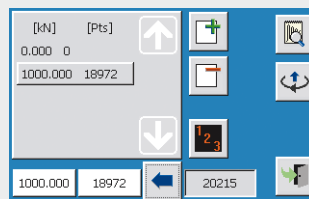
Windows operating system like a standard PC. Touch-Screen color display, 1/4 VGA



Traditional directional key pad with 5 arrow-keys for standard use or when wearing gloves



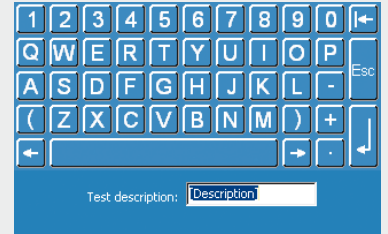
Selection examples, Elastic Modulus



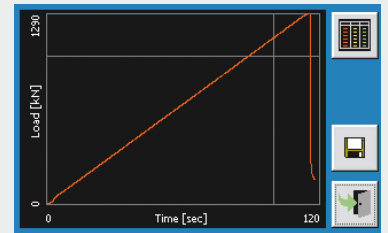
Calibration menu of a load channel. Easy set up of the calibration channel



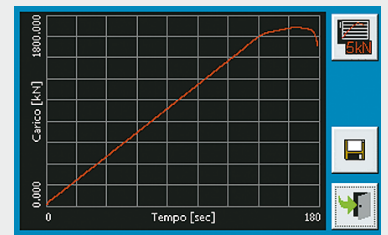
On board graphic printer



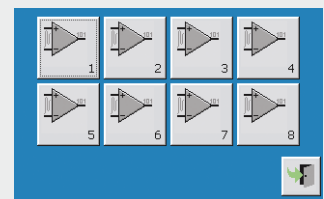
Qwerty Touch-Screen virtual alpha-numerical keyboard, user-friendly



Compression Test. Visualization of the load/time graph in real time



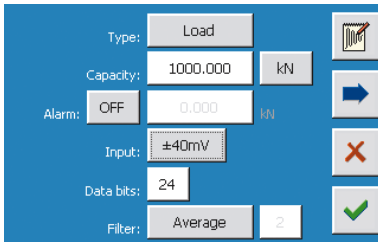
Automatic pace rate up to failure to avoid specimen's crumbling according to ASTM C39 Specification.



Simple and user-friendly functional channel configuration. 8 analog inputs for connecting up to 8 load cells or transducers



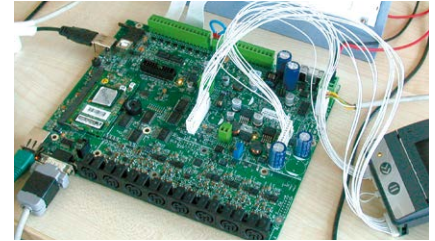
Laser printer for graphs and certificates with direct connection via USB.



Configuration menu of a load channel.
Rapid channel configuration



RS232 for PC connection only upon
customer request LAN connection to internet



High technology and high
performance hardware

MAIN FUNCTIONS

- More intuitive interface which simplifies the use of the machine (test begins after a few simple inputs)
- Greater calculation ability and data display (on board charts and graphic print-outs)
- High management capacity for the multilingual framework and international settings (date and time, decimal units, unit of measure).
- Elastic software which allows the installation of new tests when desired.
- Profile configuration manager
- Configuration and calibration supervision of the analog channel
- Alarms manager
- Ethernet parameters configuration
- International settings configuration
- Hardware diagnosis functions
- Functions for the software updates and licenses
- Execution of tests through parameters set up customization
- Several levels of protection (passwords) to prevent the accessibility to the configuration menus by unauthorized staff.

Cyber-Plus Evolution C109N and **Servo-Plus Evolution C104N** are supplied complete with licenses for the execution of the following tests:

- COMPRESSION on Concrete
- FLEXURAL on Concrete
- SPLITTING TEST on cylinders and concrete cubes
- COMPRESSION on mortar
- FLEXURAL on mortar

In accordance to the following standards:
EN, ASTM, BS, NF, DIN etc.



MATEST CUSTOMER SERVICE

C104-05 AFTER SALES TECHNICAL ASSISTANCE

Two hours of remote technical assistance, through a direct connection to the machine via internet. Customers are provided with diagnostics, any software updates or function restoring, all through a remote-access line, via mail, skype or phone, according to their needs.



MODELS
**C109N
 CYBER-PLUS EVOLUTION**

8 channel unit for data acquisition and elaboration.

Power Supply: 230V 1F 50-60Hz 70W

Dimensions: 260x260x155 mm

Weight: 5 kg approx.


C109N
**C104-01N
 SERVO-PLUS EVOLUTION FOR TWO FRAMES**

Servo controlled unit supplied with three way hydraulic valve for the option to connect and use up to TWO TESTING FRAMES.

**C104-02N
 SERVO-PLUS EVOLUTION FOR THREE FRAMES**

Servo-controlled unit supplied with four way hydraulic valve for the option to connect and use up to THREE TESTING FRAMES.


C127N
C104-01N
C104-04
**C104N
 SERVO-PLUS EVOLUTION**

8 channel servo controlled unit for a fully automatic execution of the test. The machine comprises:

- Cyber-Plus Evolution C109N data acquisition system
- Multi-piston electric pump with variable flow (see mod. C114) driven by a microprocessor (reliable and noiseless system, also for intensive and extended use)

Power supply: 230V 1ph 50Hz 750W

Dimensions: 420x290x1120 mm

Weight: 60 kg approx.


C127N
C127N
C104N
C104N + C104-04
ACCESSORIES
C104-04

CONSOLE HOUSING THE SERVO-PLUS EVOLUTION

The pump assembly **lined with sound-proofing material for noise reduction** and the digital system are encased to enhance the design and look of the machine.

C104-09

CONFIGURATION OF ADVANCED PARAMETERS THROUGH TESTS ON REAL SAMPLES

Valid for all MATEST testing machines equipped with SERVOPLUS/ CYBERPLUS controlling unit.

When ordered, the setting of the advanced parameters becomes a phase of the production process. Through tests on real samples, it's possible to define in details the behavior of the tested material and therefore set into the SERVOPLUS/CYBERPLUS controlling units advanced parameters accordingly. For the setting of the advanced parameters, it's necessary to have some real samples available at MATEST's premises.

COMPRESSION TESTING MACHINES, FOUR COLUMNS PRESTRESSED FRAME FOR PRODUCTION ROUTINE TESTS

These models are described at p. 230...259

STANDARDS: ASTM C39 | BS 1610 | NF P18-411 | AASHTO T22

MAIN FEATURES

- Compression platens are surface hardened over 55 HRC and rectified.
- Device to check piston's excursion during test.
- The columns are prestressed to provide a very high rigidity.
- Piston having 50 mm stroke and cylinder are coupled with high quality packing set.
- The tank has an oil level and oil discharge.
- Dial speed selector to display, pre-select and control oil flow.
- Multipiston power pump assuring continuity of delivery.
- Fast approach ram device to avoid dead times.
- Ball seating is accurately machined.

Available capacities:

1300 kN | 1500 kN | 2000 kN | 2000 kN BLOCKS | 3000 kN | 3000 kN BLOCKS | 5000 kN

Motorized or hand operated models.

Load measuring system: bourdon type gauges, **DIGITEC** or **CYBER-PLUS** graphic display units, **AUTOTEC** or **SERVO-PLUS EVOLUTION** servo-controlled automatic systems.



COMPRESSION TESTING MACHINE 1300 KN CAPACITY

TO TEST CYLINDERS UP TO Ø 160X320 MM AND CUBES UP TO 150 MM SIDE

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 1300 kN div. 4 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 336 mm
- Horizontal daylight between columns: 270 mm ▶ NEW
- Compression platens Ø 216 mm
- High stiffness and heavy weight 4 columns frame (german-style).
- Calibration accuracy: Class 1
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 230V 1ph 50Hz 750W
- Dimensions: 900x730x280 mm approx.
- Weight: 580...620 kg



C022



C025A + C127N + C111 + C121

COMPRESSION 1300 kN capacity

LOAD MEASURING SYSTEM

MODEL	Hand Operated	Motorized	LOAD MEASURING SYSTEM			
			1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C020	▼		▼			
C021	▼			▼		
C022		▼	▼			
C023		▼		▼		
C024D		▼			▼	
C025A *		▼				▼

COMPRESSION TESTING MACHINE HIGH-END MODELS

TO TEST CYLINDERS UP TO Ø 160X320 MM AND CUBES UP TO 150 MM SIDE

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610



1300 KN CAPACITY

**CYBER-PLUS OR SERVO-PLUS EVOLUTION** DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTERFor a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223**BARCODE**Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223**C024N****C025N + C127N + C111-01 + C121**

COMPRESSION 1300 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p.224)	Servo-Plus Evolution mod. C104N (p.224)
C024N	▼	▼	
C025N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 1300 kN MACHINES FROM MOD. C020 TO C025N


- C111-30** DISTANCE PIECE, 20 mm high for cylinders
 \varnothing 150x300 mm
- C111** DISTANCE PIECE, 176 high for cubes 150 mm side
- C111-01** DISTANCE PIECES, 176+50 mm high for cubes 150 and 100 mm side
- C111-03** DISTANCE PIECE, 100 high for cylinders \varnothing 110x220 mm
- C111-03 + C111-30** DISTANCE PIECES, 100 + 20 mm high for cylinders \varnothing 100x200 mm
- C111-21** DISTANCE PIECE, 50 mm high

 **Note:** the cylinders \varnothing 160x320 mm do not require any distance piece.

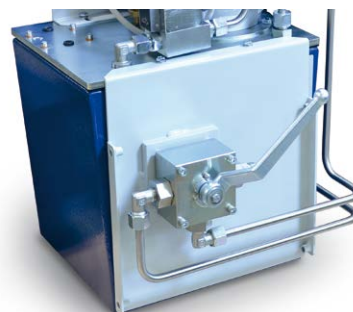
- C127N** GRAPHIC PRINTER on thermo-paper on board for digital models
- C127-11** THERMO-PAPER roll for printer (pack of 10 rolls)
- C121** SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. p. 317
- C121-51** STOP SWITCH on safety guard. See p. 317
- C041-11** TESTING CHAMBER with vertical clearance of 376 mm, complete with distance piece 40 mm high, that allows to test cylinders \varnothing 150x300 mm and 160x320 mm with **capping retainers** (ASTM C1231 | AASHTO T22, T851)
- C107-10** CAPPING RETAINERS (set of two) for cylinders \varnothing 150 mm and 6"
- C107-12** CAPPING RETAINERS (set of two) for cylinders \varnothing 160 mm
- C107-20** NEOPRENE PADS (set of two) for cylinders \varnothing 150 mm 60 shore A
- C107-21** NEOPRENE PADS (set of two) for cylinders \varnothing 150 mm 70 shore A


C107-10 + C107-20

- C107-25** NEOPRENE PADS (set of two) for cylinders \varnothing 160mm 60 shore A
- C107-26** NEOPRENE PADS (set of two) for cylinders \varnothing 160 mm 70 shore A

 **Note:** The capping retainers can be used only with the testing chamber having vertical clearance of 376 mm, mod. C041-11
 Technical details: see p. 316

- C115-01** TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318


C115-01

- C097-05** CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

- C097-01** DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Recommended range 0-250kN. Technical details: see p. 313


C097-01

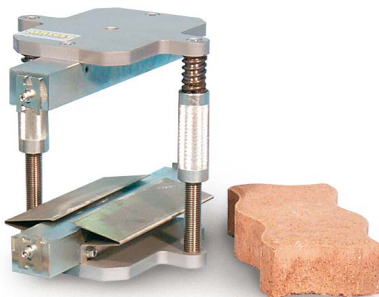
- C107** AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders \varnothing 100 and 150 mm. Technical details: see p. 316


C107

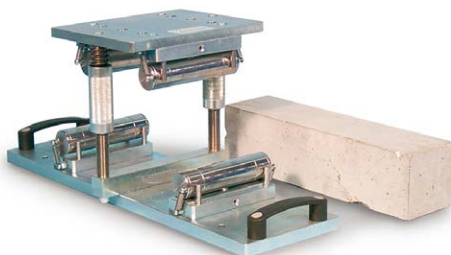
- C100** SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314

**C100**

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

**C103**

- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens
40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly "lined" with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 312

**C025N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 1500 KN CAPACITY

TO TEST CUBES UP TO 150 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 1500 kN div. 5 kN
600 kN div. 2 kN



C038 + C126

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 336 mm
- Horizontal daylight between columns: 270 mm ➤ NEW
- Compression platens Ø 216 mm
- High stiffness and heavy weight 4 columns frame (german-style).
- Calibration accuracy: Class 1
- Max. ram travel 55 mm approx.
- Power supply (motorized models): 230V 1ph 50Hz 750W
- Dimensions: 900x730x280 mm approx.
- Weight: 580...620 kg



C040D + C127N + C111-01

COMPRESSION 1500 kN capacity

LOAD MEASURING SYSTEM

MODEL	OPERATION		LOAD MEASURING SYSTEM			
	Hand Operated	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C036	▼		▼			
C037	▼			▼		
C038		▼	▼			
C039		▼		▼		
C040D		▼			▼	
C041A *		▼				▼

COMPRESSION TESTING MACHINE HIGH-END MODELS

TO TEST CUBES UP TO 150 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610



1500 KN CAPACITY

**CYBER-PLUS OR SERVO-PLUS EVOLUTION** DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223

**BARCODE**

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223

**C040N****C041N + C127N + C104-04**

COMPRESSION 1500 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C040N	▼	▼	
C041N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 1500 kN MACHINES FROM MOD. C036 TO C041N


- C111-30** DISTANCE PIECE, 20 mm high for cylinders
 \varnothing 150x300 mm
- C111** DISTANCE PIECE, 176 high for cubes 150 mm side
- C111-01** DISTANCE PIECES, 176+50 mm high for cubes 150 and
 100 mm side
- C111-03** DISTANCE PIECE, 100 high for cylinders \varnothing 110x220 mm
- C111-03 + C111-30** DISTANCE PIECES, 100 + 20 mm high for
 cylinders \varnothing 100x200 mm
- C111-21** DISTANCE PIECE, 50 mm high

 **Note:** the cylinders \varnothing 160x320 mm do not require any distance piece.

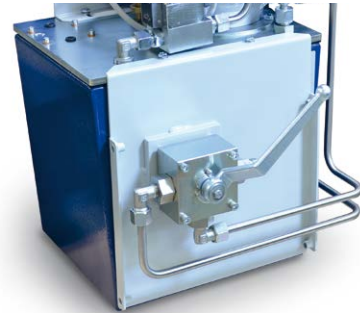
- C127N** GRAPHIC PRINTER on thermo-paper on board for digital models
- C127-11** THERMO-PAPER roll for printer (pack of 10 rolls)
- C121** SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. p. 317
- C121-51** STOP SWITCH on safety guard. See p. 317
- C041-11** TESTING CHAMBER with vertical clearance of 376 mm, complete with distance piece 40 mm high, that allows to test cylinders \varnothing 150x300 mm and 160x320 mm with **capping retainers** (ASTM C1231 | AASHTO T22, T851)
- C107-10** CAPPING RETAINERS (set of two) for cylinders \varnothing 150 mm and 6"
- C107-12** CAPPING RETAINERS (set of two) for cylinders \varnothing 160 mm
- C107-20** NEOPRENE PADS (set of two) for cylinders \varnothing 150 mm 60 shore A
- C107-21** NEOPRENE PADS (set of two) for cylinders \varnothing 150 mm 70 shore A


C107-10 + C107-20

- C107-25** NEOPRENE PADS (set of two) for cylinders \varnothing 160mm 60 shore A
- C107-26** NEOPRENE PADS (set of two) for cylinders \varnothing 160 mm 70 shore A

 **Note:** The capping retainers can be used only with the testing chamber having vertical clearance of 376 mm, mod. C041-11
 Technical details: see p. 316

- C115-01** TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318


C115-01

- C097-05** CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

- C097-01** DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Recommended range 0-250kN. Technical details: see p. 313


C097-01

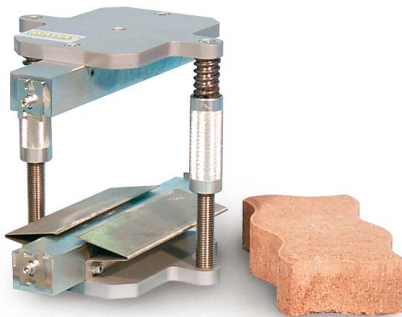
- C107** AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders \varnothing 100 and 150 mm. Technical details: see p. 316


C107

- C100** SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314

**C100**

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

**C103**

- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens
40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 312

**C041N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 2000 KN CAPACITY

TO TEST CUBES UP TO 150 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 2000 kN div. 5 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 336 mm
- Horizontal daylight between columns: 270 mm ➤ NEW
- Compression platens Ø 216 mm
- High stiffness and heavy weight 4 columns frame (german-style).
- Calibration accuracy: Class 1
- Max. ram travel 55 mm approx.
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 1000x780x300 mm approx.
- Weight: 670...720 kg



C055D + C111



C056A + C127N

COMPRESSION 2000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C053	▼	▼			
C054	▼		▼		
C055D	▼			▼	
C056A *	▼				▼

COMPRESSION TESTING MACHINE HIGH-END MODELS

TO TEST CUBES UP TO 150 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610



2000 KN CAPACITY

**CYBER-PLUS OR SERVO-PLUS EVOLUTION** DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223

**BARCODE**

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223



C055N + C127N + C111



C056N + C127N + C111 + C104-04 + C121-05

COMPRESSION 2000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C055N	▼	▼	
C056N *	▼		▼


* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 2000 kN MACHINES FROM MOD. C053 TO C056N

- C111-30** DISTANCE PIECE, 20 mm high for cylinders
 \varnothing 150x300 mm
- C111** DISTANCE PIECE, 176 high for cubes 150 mm side
- C111-01** DISTANCE PIECES, 176+50 mm high for cubes 150 and 100 mm side
- C111-03** DISTANCE PIECE, 100 high for cylinders \varnothing 110x220 mm
- C111-03 + C111-30** DISTANCE PIECES, 100 + 20 mm high for cylinders \varnothing 100x200 mm
- C111-21** DISTANCE PIECE, 50 mm high

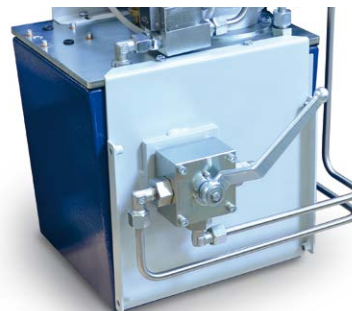
 **Note:** the cylinders \varnothing 160x320 mm do not require any distance piece.

- C127N** GRAPHIC PRINTER on thermo-paper on board for digital models
- C127-11** THERMO-PAPER roll for printer (pack of 10 rolls)
- C121-05** SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. p. 317
- C121-51** STOP SWITCH on safety guard. See p. 317
- C056-11** TESTING CHAMBER with vertical clearance of 376 mm, complete with distance piece 40 mm high, that allows to test cylinders \varnothing 150x300 mm and 160x320 mm with **capping retainers** (ASTM C1231 | AASHTO T22, T851)
- C107-10** CAPPING RETAINERS (set of two) for cylinders \varnothing 150 mm and 6"
- C107-12** CAPPING RETAINERS (set of two) for cylinders \varnothing 160 mm
- C107-20** NEOPRENE PADS (set of two) for cylinders \varnothing 150 mm 60 shore A
- C107-25** NEOPRENE PADS (set of two) for cylinders \varnothing 160mm 60 shore A

 **Note:** The capping retainers can be used only with the testing chamber having vertical clearance of 376 mm, mod. C041-11
 Technical details: see p. 316


C107-10 + C107-20

- C115-01** TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318


C115-01

- C097-05** CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

- C097-01** DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Recommended range 0-250kN. Technical details: see p. 313


C097-01

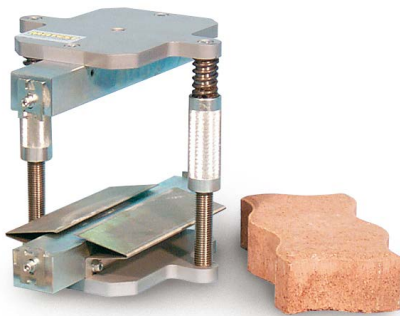
- C107** AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders \varnothing 100 and 150 mm. Technical details: see p. 316


C107

- C100** SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314

**C100**

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

**C103**

- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens
40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 312

**C056N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 2000 KN CAPACITY

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 280 MM HEIGHT

STANDARDS: ASTM C39 | AASHTO T22 | BS 1610

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 2000 kN div. 5 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 282 mm
- Horizontal daylight between columns: 270 mm ➤ NEW
- Compression platens Ø 287 mm
- High stiffness and heavy weight 4 columns frame (german-style).
- Calibration accuracy: Class 1
- Max. ram travel 55 mm approx.
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 690x400x1320 mm approx.
- Weight: 670...720 kg



C058-04D + C127N + C111-22



C058-05A + C127N + C121-05 + C111-26 + C111-22

COMPRESSION 2000 kN capacity

LOAD MEASURIG SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C058-02	▼	▼			
C058-03	▼		▼		
C058-04D	▼			▼	
C058-05A *	▼				▼

COMPRESSION TESTING MACHINE HIGH-END MODELS

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 280 MM HEIGHT

STANDARDS: ASTM C39 | AASHTO T22 | BS 1610



2000 KN CAPACITY

**CYBER-PLUS OR SERVO-PLUS EVOLUTION** DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223

**BARCODE**

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223



C058-04N + C127N + C111-26 + C111-22



C058-05N + C104-04 + C127N + C111-26 + C111-22 + C121-05

COMPRESSION 2000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C058-04N	▼	▼	
C058-05N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 2000 KN MACHINES FROM MOD C058-02 TO C058-05N

C111-26 DISTANCE PIECE, 76 mm high for cubes 200 mm side

C111-26 + C111-22

DISTANCE PIECES, 76+50 mm high for cubes 200 and 150 mm side

C111-26 + C111-22 + C111-22

DISTANCE PIECES 76+50+50 mm high for cubes 200, 150 and 100 mm side

C111-22 DISTANCE PIECE 50 mm high

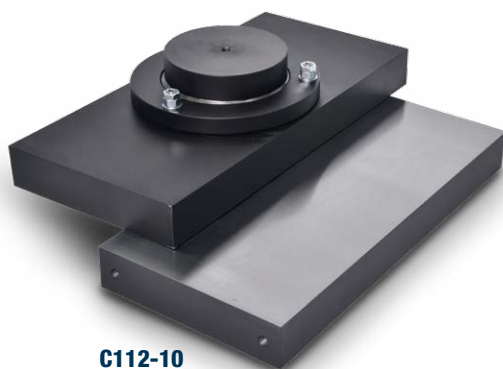
C111-31 DISTANCE PIECE 20 mm high

C110-15 LOWER COMPRESSION PLATEN, Ø 216x40 mm, hardened and rectified to test cubes 100 and 150 mm, as an alternative to the standard platen Ø 278 mm
 Technical details: see p. 319



C110-15

C112-10 UPPER+LOWER LARGE COMPRESSION PLATENS 245x510x55 mm WITH SEAT BALL to test **also** blocks.



C112-10

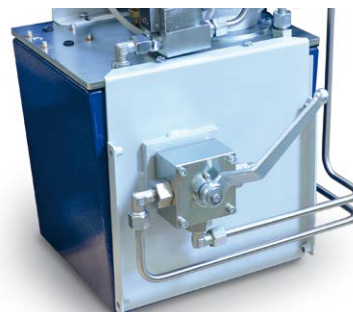
C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-05 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard.
 See p. 317

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Recommended range 0-250kN.
 Technical details: see p. 313



C097-01

C107-01 AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders Ø 100 mm
 Technical details: see p. 316



C107-01

- C100** SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314

**C100**

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

**C103**

- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens
40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly lined with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 312

**C058-05N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 2000 KN CAPACITY

TO TEST BLOCKS MAX. 500X300 MM, CUBES UP TO 300 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 772-1 | ASTM C39, C140, C1314 | AASHTO T22 | NF P18-411 | BS 1610, 6073

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 2000 kN div. 5 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 336 mm
- Horizontal daylight between columns: 324 mm
- Compression platens 510x320x55 mm
- High stiffness and heavy weight 4 columns frame (german-style).
- Calibration accuracy: Class 1
- Max. ram travel 55 mm approx.
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 870x600x1400 mm approx.
- Weight: 850...900



C077D + C127N + C105 + C111-08



C078A + C105 + C111-08

COMPRESSION 2000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C075	▼	▼			
C076	▼		▼		
C077D	▼			▼	
C078A *	▼				▼

COMPRESSION TESTING MACHINE HIGH-END MODELS

TO TEST BLOCKS MAX. 500X300 MM, CUBES UP TO 300 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 772-1 | ASTM C39, C140, C1314 | AASHTO T22 | NF P18-411 | BS 1610, 6073 **2000 KN CAPACITY**



CYBER-PLUS OR SERVO-PLUS EVOLUTION DIGITAL TOUCH SCREEN DISPLAY



Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N). Technical details, p. 223



BARCODE

Scanner for specimen file/identification, (optional device code C099-01). Details, p. 223



C077N + C127N + C111-22



C078N + C104-04 + C127N + C105 + C111-08

COMPRESSION 2000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C077N	▼	▼	
C078N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 2000 KN BLOCKS MACHINES FROM MOD. C075 TO C078N


C111-31 DISTANCE PIECE, 20 mm high for cylinders Ø 150x300 mm

C111-04 DISTANCE PIECE, 126 mm high for cubes 200 mm side

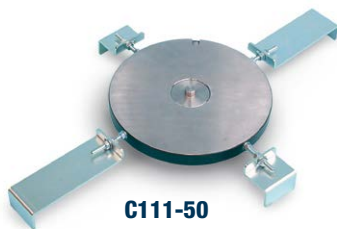
C111-05 DISTANCE PIECES, 126+50 mm high for cubes 200 and 150 mm side

C111-06 DISTANCE PIECES 126+50+50 mm high for cubes 200, 150 and 100 mm side

C111-22 DISTANCE PIECE 50 mm high

 **Note:** The cylinders Ø 160x320 mm do not require any distance piece.

C111-50 DISTANCE PIECE, it eliminates the heavy procedure to lift the lower rectangular platen and to add distance pieces. Technical details: see p. 320



C111-50

AS AN ALTERNATIVE:

C112-05 KIT of 4 HANDLES to lift the lower platen, making the positioning of distance pieces easier. Technical details: see p. 320



C112-05

AS AN ALTERNATIVE:

C105 CENTRAL SCREW, to get easier the adjustment between the big sized compression platens. Technical details: see p. 313

C111-27 SLOTTED DISTANCE PIECE, 20 mm high, for central screw

C111-23 SLOTTED DISTANCE PIECE, 50 mm high for central screw

C111-28 SLOTTED DISTANCE PIECE, 76 mm high for central screw

C111-08 SLOTTED DISTANCE PIECE, 126 mm high for central screw

C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-01 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C107-10 CAPPING RETAINERS (set of two) for cylinders 150 mm and 6". Other models: see p. 316

C107-20 NEOPRENE PADS (set of two) for cylinders Ø 150 mm 60 shore A. Other models: see p. 316



C107-10 + C107-20



C110-30

C110-30 UPPER COMPRESSION PLATEN+SPHERICAL SEAT, to fix on the testing machine, in replacement of the standard platen + seat to obtain an increased vertical clearance of the testing chamber and to meet ASTM C39, C1231 and AASHTO T22, T851 Platen dimensions: Ø 165x30 mm Weight: 10 kg approx. Technical details: see p. 316

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with appropriate pressure transducer, only for digital machines. Recommended range 0-250kN. Technical details: see p. 313



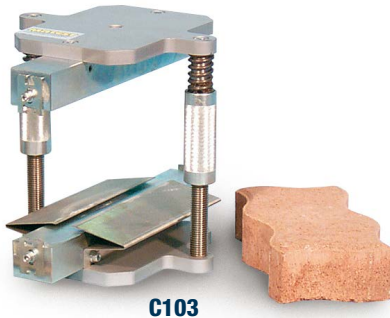
C097-01

C100 SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496 Technical details and other models: see p. 314



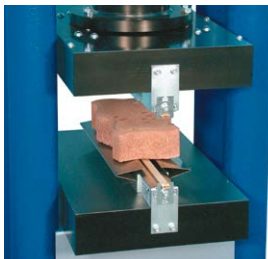
C100

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

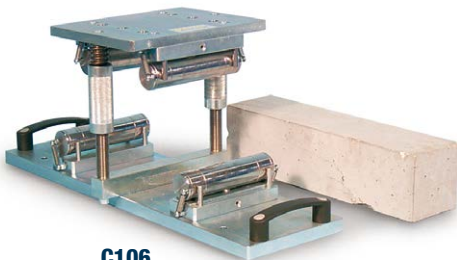
**C103**

AS AN ALTERNATIVE:

- C103-01** SPLITTING TENSILE test device for self blocking pavers and cubes having max. dimensions 300x500 mm, directly fixed on the large compression platens. EN 1338, 12390-6. Technical details: see p. 314

**C103-01**

- C106** FLEXURAL TEST DEVICE for concrete beams. EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 312

**C078N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 3000 KN CAPACITY

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 3000 kN div. 10 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 336 mm
- Horizontal daylight between columns: 272 mm
- Compression platens Ø 287 mm
- High stiffness and heavy weight 4 columns frame (german-style).
- Calibration accuracy: Class 1
- Max. ram travel 55 mm approx.
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 860x470x1450 mm approx.
- Weight: 1050...1120 kg



C070D + C111-05



C071A + C127N + C111-05 + C121-07

COMPRESSION 3000 kN capacity

LOAD MEASURIG SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C068	▼	▼			
C069	▼		▼		
C070D	▼			▼	
C071A *	▼				▼

COMPRESSION TESTING MACHINE HIGH-END MODELS

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: ASTM C39 | AASHTO T22 | NF P18-411 | BS 1610



3000 KN CAPACITY

**CYBER-PLUS OR SERVO-PLUS EVOLUTION** DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223

**BARCODE**

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223



C070N + C127N + C111-05



C071N + C104-04 + C127N + C111-05 + C121-07

COMPRESSION 3000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C070N	▼	▼	
C071N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 3000 kN MACHINES FROM MOD. C068 TO C071N

C111-31 DISTANCE PIECE, 20 mm high for cylinders Ø 150x300 mm

C111-04 DISTANCE PIECE, 126 mm high for cubes 200 mm side


C111-05 DISTANCE PIECES, 126+50 mm high for cubes 200 and 150 mm side

C111-06 DISTANCE PIECES 126+50+50 mm high for cubes 200, 150 and 100 mm side

C111-07 + C111-31 DISTANCE PIECES, high 50+50+20 mm for cylinders Ø 100x200 mm

C111-22 DISTANCE PIECE, 50 mm high

C110-15 LOWER COMPRESSION PLATEN, Ø 216x40 mm, hardened and rectified to test cubes 100 and 150 mm, as an alternative to the standard platen Ø 278 mm
 Technical details: see p. 319

 **Note:** the cylinders Ø 160x320 mm do not require any distance piece.



C110-15

C112-10 UPPER+LOWER LARGE COMPRESSION PLATENS 245x510x55 mm complete with SEAT BALL to test also blocks.

C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-07 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. p. 317

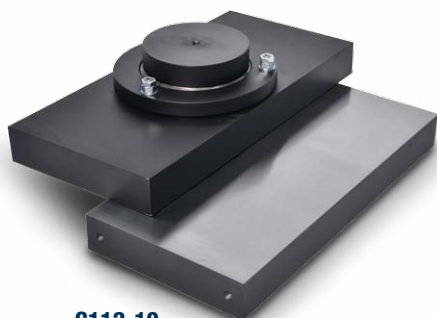
C121-51 STOP SWITCH on safety guard. See p. 319

C107-10 CAPPING RETAINERS (set of two) for cylinders Ø 150 mm and 6". Other models: see p. 316

C107-12 CAPPING RETAINERS (set of two) for cylinders Ø 160 mm

C107-20 NEOPRENE PADS (set of two) for cylinders Ø 150mm 60 shore A

C107-25 NEOPRENE PADS (set of two) for cylinders Ø 160 mm 60 shore A. Other models: see p. 316



C112-10



C107-10 + C107-20

C110-30 UPPER COMPRESSION PLATEN+SPHERICAL SEAT, to fix on the testing machine, in replacement of the standard platen + seat to obtain an increased vertical clearance of the testing chamber and to meet the ASTM C39, C1231 and AASHTO T22, T851
 Platen dimensions: Ø 165x30 mm
 Weight: 10 kg approx.
 Technical details: see p. 316



C110-30

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with appropriate pressure transducer, only for digital machines. Recommended range 0-250kN.
 Technical details: see p. 313



C097-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C107-01 AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders Ø 100 and 150 mm.
 Technical details: see p. 316

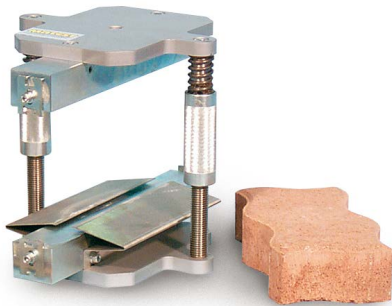


C107-01

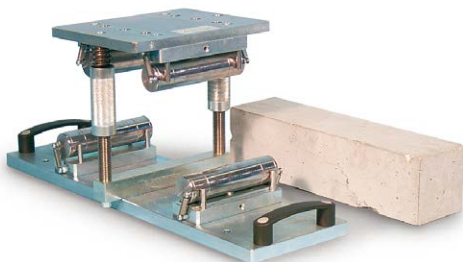
- C100** SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314

**C100**

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

**C103**

- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens
40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 314

**C071N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 3000 kN CAPACITY

TO TEST BLOCKS MAX. 500X300 MM, CUBES UP TO 300 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 772-1 | ASTM C39, C140, C1314 | AASHTO T22 | NF P18-411 | BS 1610, 6073

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 3000 kN div. 10 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight between platens: 336 mm
- Horizontal daylight between columns: 340 mm
- Compression platens 510x320xh55 mm
- High stiffness and heavy weight 4 columns frame (german-style).
- Calibration accuracy: Class 1
- Max. ram travel 55 mm approx.
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 900x600x1500 mm approx.
- Weight: 1150...1220 kg



C079-05D + C105 + C127N + C111-28



C079-06A + C105 + C111-28

COMPRESSION 3000 kN capacity

LOAD MEASURIG SYSTEM

MODEL	Motorized	LOAD MEASURIG SYSTEM			
		1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C079-03	▼	▼			
C079-04	▼		▼		
C079-05D	▼			▼	
C079-06A *	▼				▼

COMPRESSION TESTING MACHINE HIGH-END MODELS

TO TEST BLOCKS MAX. 500X300 MM, CUBES UP TO 300 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 772-1 | ASTM C39, C140, C1314 | AASHTO T22 | NF P18-411 | BS 1610, 6073

3000 KN CAPACITY



CYBER-PLUS OR SERVO-PLUS EVOLUTION DIGITAL TOUCH SCREEN DISPLAY



Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223



BARCODE

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223



C079-05N + C127N + C111-22

C079-06N + C105 + C127N + C104-04 + C111-28

COMPRESSION 3000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C079-05N	▼	▼	
C079-06N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 3000 kN BLOCKS MACHINES FROM MOD. C079-03 TO C079-06N


C111-31 DISTANCE PIECE, 20 mm high for cylinders Ø 150x300 mm

C111-04 DISTANCE PIECE, 126 mm high for cubes 200 mm side

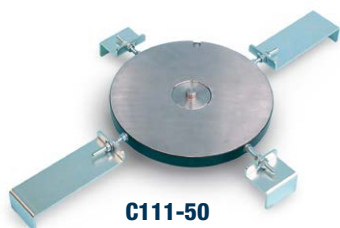
C111-05 DISTANCE PIECES, 126+50 mm high for cubes 200 and 150 mm side

C111-06 DISTANCE PIECES 126+50+50 mm high for cubes 200, 150 and 100 mm side

C111-22 DISTANCE PIECE 50 mm high

 **Note:** The cylinders Ø 160x320 mm do not require any distance piece.

C111-50 DISTANCE PIECE, it eliminates the heavy procedure to lift the lower rectangular platen and to add distance pieces. Technical details: see p. 320



C111-50

AS AN ALTERNATIVE:

C112-05 KIT of 4 HANDLES to lift the lower platen, making the positioning of distance pieces easier. Technical details: see p. 320



C112-05

AS AN ALTERNATIVE:

C105 CENTRAL SCREW, to get easier the adjustment between the big sized compression platens. Technical details: see p. 313

C111-27 SLOTTED DISTANCE PIECE, 20 mm high, for central screw

C111-23 SLOTTED DISTANCE PIECE, 50 mm high for central screw

C111-28 SLOTTED DISTANCE PIECE, 76 mm high for central screw

C111-08 SLOTTED DISTANCE PIECE, 126 mm high for central screw

C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-08 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C107-10 CAPPING RETAINERS (set of two) for cylinders 150 mm and 6". Other models: see p. 316

C107-20 NEOPRENE PADS (set of two) for cylinders Ø 150 mm 60 shore A. Other models: see p. 316



C107-10 + C107-20



C110-30

C110-30 UPPER COMPRESSION PLATEN+SPHERICAL SEAT, to fix on the testing machine, in replacement of the standard platen + seat to obtain an increased vertical clearance of the testing chamber and to meet the ASTM C39, C1231 and AASHTO T22, T851 Platen dimensions: Ø 165x30 mm Weight: 10 kg approx. Technical details: see p. 316

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Recommended range 0-250kN. Technical details: see p. 313



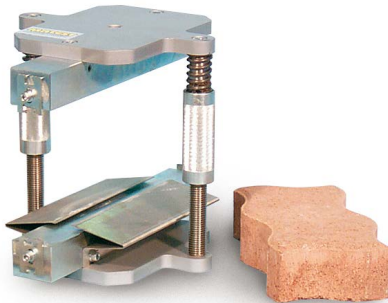
C097-01

C100 SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496 Technical details and other models: see p. 314



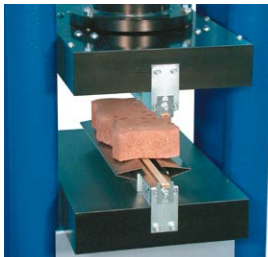
C100

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

**C103**

AS AN ALTERNATIVE:

- C103-01** SPLITTING TENSILE test device for self blocking pavers and cubes having max. dimensions 300x500mm, directly fixed on the large compression platens.
EN 1338, 12390-6. Technical details: see pag. 314

**C103-01**

- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly lined with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 312

**C079-06N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 5000 KN CAPACITY HIGH-END MODELS
TO TEST CUBES UP TO 300 MM SIDE AND CYLINDERS UP TO Ø 250X500 MM
STANDARDS: BS 1610 | NF P18-411 | ASTM C39 | AASHTO T22



5000 KN CAPACITY

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 530 mm
- Horizontal daylight between columns: 340 mm
- Compression platens 310x310 mm
- Calibration accuracy: Class 1
- Max. ram travel 60 mm approx.
- High stiffness and heavy weight 4 columns frame (german-style).
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 1200x900x1900 mm approx.
- Weight: 2800...2900 kg approx.



CYBER-PLUS OR SERVO-PLUS EVOLUTION
DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER



For a further improvement of energy efficiency and silent operation, (optional device code C099N). Technical details, p. 223

BARCODE

Scanner for specimen file/identification, (optional device code C099-01). Details, p. 223



C086-02N + C127N



C086-03N + C086-10

COMPRESSION 5000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C086-02N	▼	▼	
C086-03N *	▼		▼

* Servo-Plus model feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 5000 KN MACHINES

C086-10 DISTANCE PIECE, 50 mm high

C086-11 DISTANCE PIECE, 25 mm high

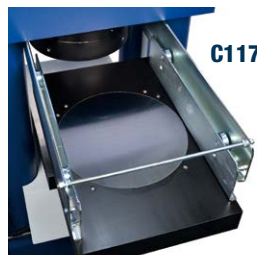
Note: Vertical daylight of the compression platens is 530 mm. The operator will have to buy the needed distance pieces to reduce the daylight between the compression platens to get the correct daylight of the specimen under test plus approx. 10 to 15 mm



C112-11

C112-11 UPPER+LOWER LARGE COMPRESSION PLATENS+SEAT BALL 310x510x55 mm to test **also** blocks. It is necessary to have also the sliding rail carriage mod. C117

C117 SLIDING RAIL CARRIAGE, for an easy removal of the large block upper platen



C117

C127N GRAPHIC PRINTER on thermo-paper on board

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-04 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C097-01

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**. Recommended range 0-250kN. Technical details: see p. 313



C097-01

C097-05 CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine.

C100

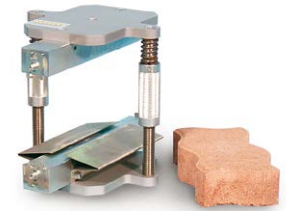
SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
Technical details and other models: see p. 314



C100

C103

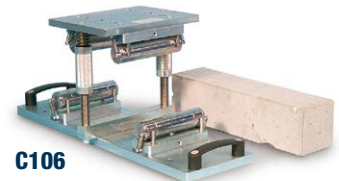
SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314



C103

C106

FLEXURAL TEST DEVICE for concrete beams. EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315



C106

E170

COMPRESSION DEVICE to test cement specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 317

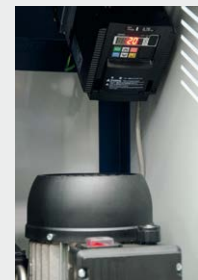


E170

C099N **NEW**

INVERTER DEVICE

Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223



C099N

SOFTWARE for CYBER / SERVO PLUS models

C109-10N	SOFTWARE for compression tests
C123N	SOFTWARE Servonet for remote control through PC
C109-11N	SOFTWARE for flexural tests
C109-12N	SOFTWARE for splitting tensile

Technical detail: see p. 18

COMPRESSION AND FLEXURAL FRAMES ONLY

The compression frame is supplied complete with upper compression platen + spherical seat and lower compression platen, pressure transducer and flexible connection pipe to separate control console.

The two-way hydraulic valve mod. C115-01 (see p. 318), the distance pieces and the safety guards are not included and must be ordered separately.

Code	Capacity	Technical details at pages	Cube/Cylinder	Blocks	ASTM Spec.	EN High Stability Spec.
C036F	1300/1500 kN	230, 234	▼		▼	
C051F	2000 kN	238	▼		▼	
C058F	2000 kN	242	▼		▼	
C073F	2000 kN	246	▼	▼	▼	
C066F	3000 kN	250	▼		▼	
C079-01F	3000 kN	254	▼	▼	▼	
C089F	2000 kN	262	▼			▼
C089-22F	2000 kN	266	▼	▼		▼
C089-06F	3000 kN	270	▼			▼
C089-15F	3000 kN	274	▼	▼		▼
C090F	150 kN	290	beams		▼	▼
C091-01F*	150 kN	292	multipurpose		▼	▼
C090-06F*	200 kN	294	multipurpose		▼	▼
C095F*	320 kN	296	multipurpose		▼	▼
C096F*	360 kN	300	multipurpose		▼	▼

*Note: rollers are not included



C051F



C089F



C095F



C090F



C090-06F



C091-01F

COMPRESSION TESTING MACHINES TESTED FOR HIGH STABILITY

FOUR COLUMNS PRESTRESSED FRAME

The compression machines **tested for high stability** meet the stringent requirements of the: EN 12390-4 | BS 1881:115 | DIN 51220 | UNI 6686, part 3 | NF P18-411 | UNE 83304 | ASTM C39 | AASHTO T22

The machines are manufactured with specific quality features (processing, tolerances) of frame, piston/cylinder group, spherical seat, compression platens, distance pieces etc., conforming and meeting the high stability verification. (force distribution).

The conformity of the stability is certified with the verification of the self-alignment (foot-meter test) of the machines components and the restraint on movement of the upper spherical seat/platen, by using a special electric strain load column at 5 measuring points which is connected to its suitable datalogger (technical details: see p. 325)

An incorrect and not uniform load application to the specimen causes irregular, unsatisfactory and premature failure. The obtained compression resistance can be substantially lower than the effective resistance.

The most important feature of the high stability frames is their uniform distribution of the applied load on all the specimen surface under test. The sample breakage is satisfactory and the strength results are correct, high and true.

- The four columns frame is prestressed on 8 ring nuts and the clamping is obtained and checked by a dynamometric spanner, allowing to get a very high stiffness and stability on all load range and to keep these features in the time.
- The spherical seat, in oil bath with null end float, is studied and manufactured to grant, during the starting phase of the test, an accurate self-alignment without frictions of the upper compression platen to the specimen. By applying the load, the ball seating assembly locks and keeps the position until the specimen's failure.
- Piston and cylinder are coupled with high quality packing set.
- Compression platens are hardened over 55 HRC and rectified.



Available in the capacities: 2000 kN | 2000 kN blocks | 3000 kN | 3000 kN blocks | 4000 kN | 5000 kN

Load measuring system: Bourdon type gauge

Digitec or **Cyber-Plus Evolution** graphic display unit

Servo-controlled automatic system **Autotec** or **Servo-Plus Evolution** with optional **Servo-Strain** and **Elastic Modulus** determination.

Described and pictured in the next p. 262...281

COMPRESSION TESTING MACHINE 2000 KN CAPACITY TESTED FOR HIGH STABILITY

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4 | BS 1881:115 | DIN 51220 | ASTM C39 | NF P18-411 | AASHTO T22

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 2000 kN div. 5 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 334.5 mm
- Horizontal daylight between columns: 260 mm
- Compression platens Ø 287X60 mm
- Calibration accuracy: Class 1
- Max. ram travel 60 mm approx.
- High stiffness and heavy weight 4 columns frame (german-style).
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 690x400x1400 mm approx.
- Weight: 850...920 kg



C089-02D+C127N+C121-06+C111-13



C089-04A+C127N+C111-13

COMPRESSION 2000 kN High Stability

LOAD MEASURING SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C089	▼	▼			
C089-01	▼		▼		
C089-02D	▼			▼	
C089-04A *	▼				▼

COMPRESSION TESTING MACHINE TESTED FOR HIGH STABILITY HIGH-END MODELS

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4 | BS 1881:115 | DIN 51220 | ASTM C39 | NF P18-411 | AASHTO T22

2000 KN CAPACITY**CYBER-PLUS OR SERVO-PLUS EVOLUTION** DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223

**BARCODE**

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223

**C089-02N+C111-13****C089-04N+C104-04+C127N+C121-06+C111-13**

COMPRESSION 2000 KN High Stability

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C089-02N	▼	▼	
C089-04N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 2000 KN MACHINES FROM MOD. C089 TO C089-04N

C111-32 DISTANCE PIECE, 20 mm high for cylinders Ø 150x300 mm

C111-12 DISTANCE PIECE, 73+50 mm high for cubes 200 mm side

C111-13 DISTANCE PIECES, 73+50+50 mm high for cubes 200 and 150 mm side

C111-14 DISTANCE PIECES, 73+50+50+50 mm high for cubes 200, 150 and 100 mm side

C111-15 DISTANCE PIECES, 50+50 mm high for cylinders Ø 110x220 mm

C111-24 DISTANCE PIECE 50 mm high

C111-25 DISTANCE PIECE 73 mm high

C110-15 LOWER COMPRESSION PLATEN, Ø 216x40 mm, hardened and rectified to test cubes 100 and 150 mm, as an alternative to the standard platen Ø 278 mm
 Technical details: see p. 319



C110-15

Note: the cylinders Ø 160x320 mm do not require any distance piece.

C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-06 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C107-10 CAPPING RETAINERS (set of two) for cylinders Ø 150 mm and 6". Other models: see p. 316

C107-20 NEOPRENE PADS (set of two) for cylinders Ø 150 mm 60 shore A. Other models: see p. 316



C107-10 + C107-20

C110-30 UPPER COMPRESSION PLATEN+SPHERICAL SEAT, to fix on the testing machine, in replacement of the standard platen + seat to obtain an increased vertical clearance of the testing chamber and to meet the ASTM C39, C1231 and AASHTO T22, T851
 Platen dimensions: Ø 165x30 mm
 Weight: 10 kg approx.
 Technical details: see p. 316



C110-30

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with appropriate pressure transducer, only for digital machines. Recommended range 0-250kN.
 Technical details: see p. 313



C097-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C097-08 OFFICIAL ACCREDIA (Equivalent UKAS, ENAC, DAKKS, SAS, COFRAC etc.) HARDNESS CERTIFICATE of upper and lower compression platens. Minimum hardness: 55 HRC. See p. 313

C107-01 AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders Ø 100 and 150 mm.
 Technical details: see p. 316



C107-01

- C100** SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314

**C100**

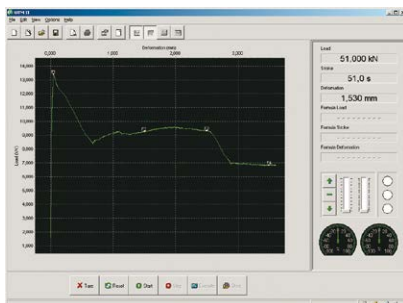
- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens
40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C104-10N** SERVO-STRAIN
Servocontrolled Software, system of:
- Load or Strength
- Displacement
- Strain
This system can be used only with Servo-Plus Evolution machine mod. C089-04N. Technical details see p. 282

**C104-10N**

- C125N** ELASTIC MODULUS determination of the secant compression on concrete. Automatic system with pace rate control also when releasing the load, applicable only to high stability frames with Servo-Plus Evolution.
EN 12390-13, 13412, 13286-43, UNI 6556, ASTM C469, ISO 6784, DIN 1048, BS 1888:121
Technical details: see p. 284

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 314

**C089-04N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

- | | |
|---------------------|--|
| C109-10 (N)* | SOFTWARE for compression tests |
| C123 (N)* | SOFTWARE Servonet for remote control through PC |
| C109-11 (N)* | SOFTWARE for flexural tests |
| C109-12 (N)* | SOFTWARE for splitting tensile |

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 2000 KN CAPACITY TESTED FOR HIGH STABILITY

TO TEST BLOCKS MAX 500X300 MM, CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4, EN 772-1 | BS 1881:115, 6073 | DIN 51220 | NF P18-411 | ASTM C39, C140, C1314 | AASHTO T22

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 2000 kN div. 10 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight to test blocks: 283 mm
- Horizontal daylight between columns: 340 mm
- Compression platens for blocks: 510x320x55 mm
- Max. vertical daylight to test cubes and cylinders: 334.5 mm
- Compression platens to test cubes, cylinders: Ø 287x60 mm
- Calibration accuracy: Class 1
- Max. ram travel 60 mm approx.
- High stiffness and heavy weight 4 columns frame (german-style).
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 750x520x1500 mm approx.
- Weight: 1000...1070 kg



C089-21D + C127N



C089-22A + C127N

COMPRESSION 2000 kN High Stability Blocks

LOAD MEASURIG SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C089 B	▼	▼			
C089-01B	▼		▼		
C089-21D	▼			▼	
C089-22A *	▼				▼

COMPRESSION TESTING MACHINE TESTED FOR HIGH STABILITY HIGH-END MODELS

TO TEST BLOCKS MAX 500X300 MM, CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4, EN 772-1 | BS 1881:115, 6073 | DIN 51220 | NF P18-411 | ASTM C39, C140, C1314 | AASHTO T22

2000 KN CAPACITY**CYBER-PLUS OR SERVO-PLUS EVOLUTION** DIGITAL TOUCH SCREEN DISPLAY

Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223

**BARCODE**

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223

**C089-21N****C089-22N + C127N + C104-04**

COMPRESSION 2000 KN High Stability Blocks

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C089-21N	▼	▼	
C089-22N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 2000 KN BLOCKS MACHINES FROM MOD. C089B TO C089-22N

C111-32 DISTANCE PIECE, 20 mm high for cylinders Ø 150x300 mm

C111-12 DISTANCE PIECE, 73+50 mm high for cubes 200 mm side


C111-13 DISTANCE PIECES, 73+50+50 mm high for cubes 200 and 150 mm side

C111-14 DISTANCE PIECES 73+50+50+50 mm high for cubes 200, 150 and 100 mm side

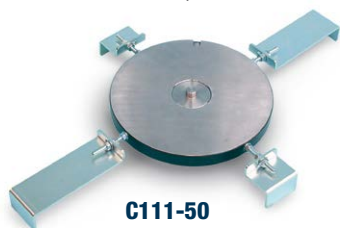
C111-15 DISTANCE PIECES 50+50 mm high for cylinders Ø 110x220 mm

C111-24 DISTANCE PIECE 50 mm high

C111-25 DISTANCE PIECE 73 mm high

 **Note:** The cylinders Ø 160x320 mm do not require any distance piece.

C111-50 DISTANCE PIECE, it eliminates the heavy procedure to lift the lower rectangular platen and to add distance pieces. Technical details: see p. 320



C111-50

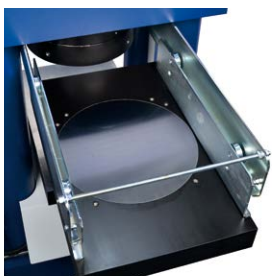
AS AN ALTERNATIVE:

C112-05 KIT of 4 HANDLES to lift the lower platen, making the positioning of distance pieces easier. Technical details: see p. 320



C112-05

C117 SLIDING RAIL CARRIAGE, for an easy removal of the upper block platen, to perform tests on blocks or on standard cubes and cylinders.



C117

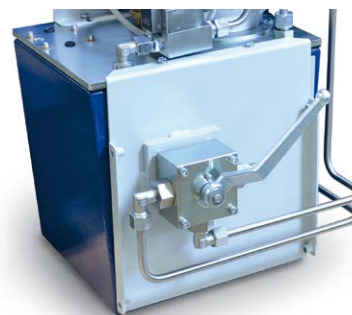
C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-10 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C097-08 OFFICIAL ACCREDIA (Equivalent UKAS, ENAC, DAKKS, SAS, COFRAC etc.) HARDNESS CERTIFICATE of upper and lower compression platens. Minimum hardness: 55 HRC. See p. 313

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Recommended range 0-250kN. Technical details: see p. 313



C097-01

C100 SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
 Technical details and other models: see p. 314

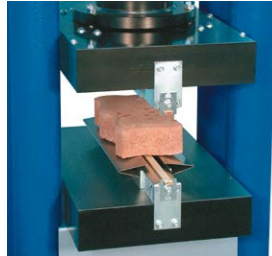


C100

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

AS AN ALTERNATIVE:

- C103-01** SPLITTING TENSILE test device for self blocking pavers and cubes having max. dimensions 300x500mm, directly fixed on the large compression platens. EN 1338, 12390-6.
Technical details: see p. 314



C103-01

- C106** FLEXURAL TEST DEVICE for concrete beams. EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315



C106

- E170** COMPRESSION DEVICE to test cement specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315



E170

- C104-10N** SERVO-STRAIN
Servocontrolled Software, system of:
- Load or Strength
- Displacement
- Strain

This system can be used only with Servo-Plus Evolution machine mod. C089-22N. Technical details see p. 282

- C125N** ELASTIC MODULUS determination of the secant compression on concrete. Automatic system with pace rate control also when releasing the load, applicable only to high stability frames with Servo-Plus Evolution. EN 12390-13, 13412, 13286-43, UNI 6556, ASTM C469, ISO 6784, DIN 1048, BS 1888:121
Technical details: see p. 284

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 314



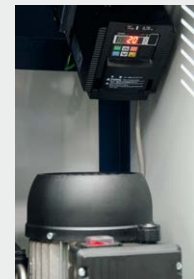
C089-22N

C104-04

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223



C104-06



C099N

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 3000 KN CAPACITY TESTED FOR HIGH STABILITY

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4 | BS 1881:115 | DIN 51220 | ASTM C39 | NF P18-411 | AASHTO T22

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 3000 kN div. 10 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 334.5 mm
- Horizontal daylight between columns: 272 mm
- Compression platens Ø 287X60 mm
- Calibration accuracy: Class 1
- Max. ram travel 60 mm approx.
- High stiffness and heavy weight 4 columns frame (german-style).
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 750x450x1500 mm approx.
- Weight: 1200...1250 kg



C089-08D + C127N + C111-13



C089-10A + C127N + C111-13

COMPRESSION 3000 kN High Stability

LOAD MEASURING SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C089-06	▼	▼			
C089-07	▼		▼		
C089-08D	▼			▼	
C089-10A *	▼				▼

COMPRESSION TESTING MACHINE TESTED FOR HIGH STABILITY HIGH-END MODELS

TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4 | BS 1881:115 | DIN 51220 | ASTM C39 | NF P18-411 | AASHTO T22

3000 KN CAPACITY



CYBER-PLUS OR SERVO-PLUS EVOLUTION DIGITAL TOUCH SCREEN DISPLAY



Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223



BARCODE

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223



C089-08N + C127N + C111-13



C089-10N + C104-04 + C121-07 + C111-13

COMPRESSION 3000 kN High Stability

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C089-08N	▼	▼	
C089-10N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 3000 kN MACHINES FROM MOD. C089-06 TO C089-10N

C111-32 DISTANCE PIECE, 20 mm high for cylinders Ø 150x300 mm

C111-12 DISTANCE PIECE, 73+50 mm high for cubes 200 mm side

C111-13 DISTANCE PIECES, 73+50+50 mm high for cubes 200 and 150 mm side

C111-14 DISTANCE PIECES, 73+50+50+50 mm high for cubes 200, 150 and 100 mm side

C111-15 DISTANCE PIECES, 50+50 mm high for cylinders Ø 110x220 mm

C111-24 DISTANCE PIECE 50 mm high

C111-25 DISTANCE PIECE 73 mm high

C110-15 LOWER COMPRESSION PLATEN, Ø 216x40 mm, hardened and rectified to test cubes 100 and 150 mm, as an alternative to the standard platen Ø 278 mm
 Technical details: see p. 319

 **Note:** the cylinders Ø 160x320 mm do not require any distance piece.



C110-15

C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-07 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C107-10 CAPPING RETAINERS (set of two) for cylinders Ø 150 mm and 6". Other models: see p. 316

C107-20 NEOPRENE PADS (set of two) for cylinders Ø 150 mm 60 shore A. Other models: see p. 316



C107-10 + C107-20

C110-30 UPPER COMPRESSION PLATEN+SPHERICAL SEAT, to fix on the testing machine, in replacement of the standard platen + seat to obtain an increased vertical clearance of the testing chamber and to meet the ASTM C39, C1231 and AASHTO T22, T851
 Platen dimensions: Ø 165x30 mm
 Weight: 10 kg approx.
 Technical details: see p. 316



C110-30

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with appropriate pressure transducer, only for digital machines. Recommended range 0-250kN.
 Technical details: see p. 313



C097-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C097-08 OFFICIAL ACCREDIA (Equivalent UKAS, ENAC, DAKKS, SAS, COFRAC etc.) HARDNESS CERTIFICATE of upper and lower compression platens. Minimum hardness: 55 HRC. See p. 313

C107-01 AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders Ø 100 and 150 mm.
 Technical details: see p. 316



C107-01

- C100** SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314

**C100**

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

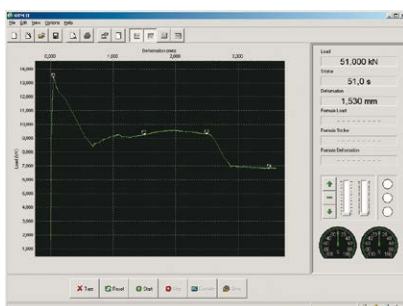
- C106** FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315

**C106**

- E170** COMPRESSION DEVICE to test cement specimens
40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

**E170**

- C104-10N** SERVO-STRAIN
Servocontrolled Software, system of:
- Load or Strength
- Displacement
- Strain
This system can be used only with Servo-Plus Evolution machine mod. C089-10N. Technical details see p. 282

**C104-10N**

- C125N** ELASTIC MODULUS determination of the secant compression on concrete. Automatic system with pace rate control also when releasing the load, applicable only to high stability frames with Servo-Plus Evolution.
EN 12390-13, 13412, 13286-43, UNI 6556, ASTM C469, ISO 6784, DIN 1048, BS 1888:121
Technical details: see p. 284

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 314

**C089-10N****C104-04**

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223

**C104-06****C099N**

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 3000 KN CAPACITY TESTED FOR HIGH STABILITY

TO TEST BLOCKS MAX 500X300 MM, CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4, EN 772-1 | BS 1881:115, 6073 | DIN 51220 | NF P18-411 | ASTM C39, C140, C1314 | AASHTO T22

DIAL GAUGES MODELS

- Gauges Ø 250 mm with specific resistance scales for cubes 150 mm and cylinders Ø 150 - 160 mm
- Gauges divisions: 3000 kN div. 10 kN
600 kN div. 2 kN

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight to test blocks: 283 mm
- Horizontal daylight between columns: 340 mm
- Compression platens for blocks: 510x320x55 mm
- Max. vertical daylight to test cubes and cylinders: 334.5 mm
- Compression platens to test cubes, cylinders: Ø 287x60 mm
- Calibration accuracy: Class 1
- Max. ram travel 60 mm approx.
- High stiffness and heavy weight 4 columns frame (german-style).
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 750x520x1500 mm approx.
- Weight: 1350...1400 kg



C089-17D + C127N



C089-19A + C127N

COMPRESSION 3000 kN High Stability Blocks

LOAD MEASURIG SYSTEM

MODEL	Motorized	1 Gauge	2 Gauge	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C089-15	▼	▼			
C089-16	▼		▼		
C089-17D	▼			▼	
C089-19A *	▼				▼

COMPRESSION TESTING MACHINE TESTED FOR HIGH STABILITY **HIGH-END MODELS**

TO TEST BLOCKS MAX 500X300 MM, CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 160X320 MM

STANDARDS: EN 12390-4, EN 772-1 | BS 1881:115, 6073 | DIN 51220 | NF P18-411 | ASTM C39, C140, C1314 | AASHTO T22

3000 KN CAPACITY



CYBER-PLUS OR SERVO-PLUS EVOLUTION DIGITAL TOUCH SCREEN DISPLAY



Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
Technical details, p. 223



BARCODE

Scanner for specimen file/identification, (optional device code C099-01).
Details, p. 223



C089-17N



C089-19N + C104-04 + C127N

COMPRESSION 3000 kN High Stability Blocks

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C089-17N	▼	▼	
C089-19N *	▼		▼

* Servo-Plus/Autotec models feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 3000 kN BLOCKS MACHINES FROM MOD. C089-15 TO C089-19N

C111-32 DISTANCE PIECE, 20 mm high for cylinders Ø 150x300 mm

C111-12 DISTANCE PIECE, 73+50 mm high for cubes 200 mm side

C111-13 DISTANCE PIECES, 73+50+50 mm high for cubes 200 and 150 mm side

C111-14 DISTANCE PIECES 73+50+50+50 mm high for cubes 200, 150 and 100 mm side

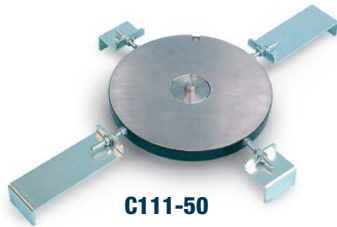
C111-15 DISTANCE PIECES 50+50 mm high for cylinders Ø 110x220 mm

C111-24 DISTANCE PIECE 50 mm high

C111-25 DISTANCE PIECE 73 mm high

 **Note:** The cylinders Ø 160x320 mm do not require any distance piece.

C111-50 DISTANCE PIECE, it eliminates the heavy procedure to lift the lower rectangular platen and to add distance pieces. Technical details: see p. 320



C111-50

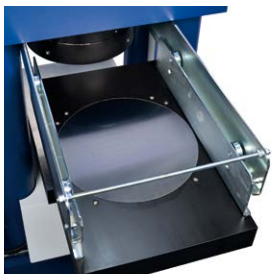
AS AN ALTERNATIVE:

C112-05 KIT of 4 HANDLES to lift the lower platen, making the positioning of distance pieces easier. Technical details: see p. 320



C112-05

C117 SLIDING RAIL CARRIAGE, for an easy removal of the upper block platen, to perform tests on blocks or on standard cubes and cylinders.



C117

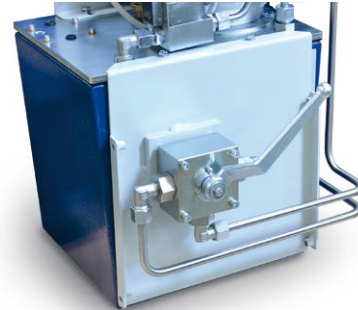
C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C121-08 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine. Applicable only on digital machines.

C097-08 OFFICIAL ACCREDIA (Equivalent UKAS, ENAC, DAKKS, SAS, COFRAC etc.) HARDNESS CERTIFICATE of upper and lower compression platens. Minimum hardness: 55 HRC. See p. 313

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Recommended range 0-250kN. Technical details: see p. 313



C097-01

C100 SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
 Technical details and other models: see p. 314

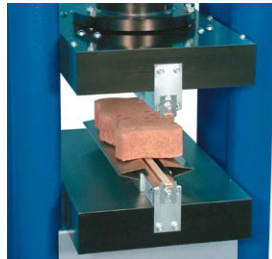


C100

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314

AS AN ALTERNATIVE:

- C103-01** SPLITTING TENSILE test device for self blocking pavers and cubes having max. dimensions 300x500mm, directly fixed on the large compression platens. EN 1338, 12390-6.
Technical details: see p. 314



C103-01

- C106** FLEXURAL TEST DEVICE for concrete beams. EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315



C106

- E170** COMPRESSION DEVICE to test cement specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315



E170

- C104-10N** SERVO-STRAIN
Servocontrolled Software, system of:
- Load or Strength
- Displacement
- Strain

This system can be used only with Servo-Plus Evolution machine mod. C089-19N. Technical details see p. 282

- C125N** ELASTIC MODULUS determination of the secant compression on concrete. Automatic system with pace rate control also when releasing the load, applicable only to high stability frames with Servo-Plus Evolution. EN 12390-13, 13412, 13286-43, UNI 6556, ASTM C469, ISO 6784, DIN 1048, BS 1888:121
Technical details: see p. 284

- C126** BENCH to hold the compression machine. See p. 317

- C104-04** CONSOLE HOUSING THE SERVO-PLUS EVOLUTION
The pump assembly **lined** with sound proofing material for noise reduction and the digital system are encased to enhance the design and look of the machine.
Technical details: see p. 314



C089-19N

C104-04

- C099N** INVERTER DEVICE
NEW Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223



C104-06



C099N

- C104-06** CONSOLE HOUSING THE CYBER-PLUS EVOLUTION
NEW New console internally lined with sound proofing material, to reduce noise and allow for the inverter integration. Detail: see p. 223

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINE 4000 KN CAPACITY TESTED FOR HIGH STABILITY HIGH-END MODELS
TO TEST CUBES UP TO 200 MM SIDE AND CYLINDERS UP TO Ø 250X500 MM

STANDARDS: EN 12390-4 | BS 1881:115 | DIN 51220 | NF P18-411 | ASTM C39 | AASHTO T22

4000 KN CAPACITY

MAIN FEATURES FOR ALL MODELS

- Max. vertical daylight: 590 mm
- Horizontal daylight between columns: 340 mm
- Compression platens Ø 287x60 mm
- Calibration accuracy: Class 1
- Max. ram travel 60 mm approx.
- High stiffness and heavy weight 4 columns frame (german-style).
- Power supply (motorized models): 230V 1ph 50Hz 750W
- Dimensions: 1200x900x1900 mm approx.
- Weight: 2800...2900 kg



CYBER-PLUS OR SERVO-PLUS EVOLUTION
DIGITAL TOUCH SCREEN DISPLAY



Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER



For a further improvement of energy efficiency and silent operation, (optional device code C099N). Technical details, p. 223

BARCODE

Scanner for specimen file/identification, (optional device code C099-01). Details, p. 223



C088-11N + C121-04 + C121-51 + C086-10

C088-10N + C127N + C121-04 - C181-51 + C086-10

COMPRESSION 4000 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
C088-10N	▼	▼	
C088-11N *	▼		▼

* Servo-Plus model feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 4000 kN MACHINES

C086-10 DISTANCE PIECE, 50 mm high

C086-11 DISTANCE PIECE, 25 mm high

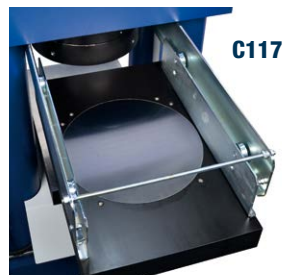
Note: Vertical daylight of the compression platens is 530 mm. The operator will have to buy the needed distance pieces to reduce the daylight between the compression platens to get the correct daylight of the specimen under test plus approx. 10 to 15 mm



C112-11

C112-11 UPPER+LOWER LARGE COMPRESSION PLATENS 320x510x55 mm to test **also** blocks. It is necessary to have also the sliding rail carriage mod. C117

C117 SLIDING RAIL CARRIAGE, for an easy removal of the large block upper platen



C117

C127N GRAPHIC PRINTER on thermo-paper on board

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C104-10N SERVO-STRAIN
Servocontrolled Software, system of:
- Load or Strength
- Displacement
- Strain

This system can be used only with Servo-Plus Evolution machine mod. C088-11N. Technical details see p. 282

C125N ELASTIC MODULUS determination of the secant compression on concrete. Automatic system with pace rate control also when releasing the load, applicable only to high stability frames with Servo-Plus Evolution. EN 12390-13, 13412, 13286-43, UNI 6556, ASTM C469, ISO 6784, DIN 1048, BS 1888:121
Technical details: see p. 284

C121-04 SAFETY GUARDS, polycarbonate, with hinges and lock, to CE Directive. See p. 317

C121-51 STOP SWITCH on safety guard. See p. 317

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-05 CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine.

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with appropriate pressure transducer. Recommended range 0-250kN. Technical details: see p. 313

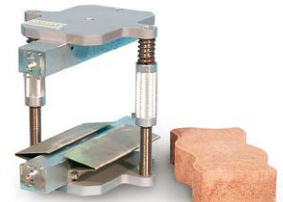


C097-01

C097-08 OFFICIAL ACCREDIA (Equivalent UKAS, ENAC, DAKKS, SAS, COFRAC etc.) HARDNESS CERTIFICATE of upper and lower compression platens. Minimum hardness: 55 HRC. See p. 313

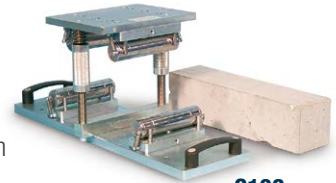
C107-01 AUTO-CENTERING DEVICE for cubes 100 and 150 mm side, and cylinders Ø 100 and 150 mm. Technical details: see p. 316

C103
SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6. Technical details: see p. 314



C103

C106
FLEXURAL TEST DEVICE for concrete beams. EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315



C106

E170
COMPRESSION DEVICE to test cement specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

C099N **NEW**

INVERTER DEVICE
Applicable only on Cyber-Plus and Servo-Plus Evolution machines. Technical details: see p. 223



C099N

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10 (N)*	SOFTWARE for compression tests
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

COMPRESSION TESTING MACHINES 3000 kN AND 5000 kN CAPACITY TESTED FOR HIGH STABILITY

THIS OVERSIZED ISOSTATIC HIGH STABILITY STIFFNESS FRAME FOR CENTRAL AND RESEARCH LABORATORIES TO TEST HIGH STRENGTH SPECIMENS, EXPLOSIVE SAMPLES, ROCK AND CERAMIC

STANDARDS: EN 12390-4 | BS 1881:115 | DIN 51220 | NF P18-411

HIGH-END MODELS

3000/5000 kN CAPACITY

MAIN FEATURES FOR ALL MODELS

- Compression platens Ø 316x60 mm
- Hydraulic pressure: 360 bar max.
- Max. vertical daylight: 411 mm
- Horizontal daylight between columns: 321 - 345 mm
- Max. ram travel: 100 mm
- High stiffness and heavy weight 4 columns frame: 0.3 mm at max. load (german-style).
- Safety guards to CE Directive ■ Class "1"
- Frame size 3000 kN: 725x710x1570 mm
- Frame size 5000 kN: 750x750x1700 mm
- Power supply: 230V 1ph 50Hz 750W
- Weight frame 3000 kN: 2500 kg / 5000 kN: 4000 kg



CYBER-PLUS OR SERVO-PLUS EVOLUTION
DIGITAL TOUCH SCREEN DISPLAY



Cyber and Servo-Plus models have robust and reliable electronic controller, 5.7" touch screen color display. 2 USB ports, 1 SD port, 8 channels for pressure transducers (force measurement) or displacement transducers (Elastic Modulus and Poisson ratio measurement).

INVERTER



For a further improvement of energy efficiency and silent operation, (optional device code C099N). Technical details, p. 223

BARCODE

Scanner for specimen file/identification, (optional device code C099-01). Details, p. 223



C088-01N



C087N

COMPRESSION 3000/5000 kN High Stability

LOAD MEASURING SYSTEM

MODEL	Code	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)
3000 kN	C087N	▼	▼	
3000 kN	C087-01N	▼		▼
5000 kN	C088N	▼	▼	
5000 kN	C088-01N	▼		▼

★ Servo-Plus model feature fully automatic power pack - electrovalve operated test start (no manual lever).

ACCESSORIES FOR 3000 kN and 5000 kN MACHINES

C087-11 DISTANCE PIECE, 50 mm high

C087-12 DISTANCE PIECE, 25 mm high

C087-15 DISTANCE PIECE, 100 mm high

Note:

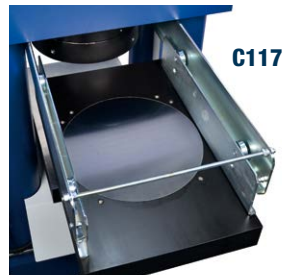
Vertical daylight of the compression platens is 411 mm. The operator will have to buy the needed distance pieces to reduce the daylight between the compression platens to get the correct daylight of the specimen under test plus approx. 10 to 15 mm



C112-11

C112-11 UPPER+LOWER LARGE COMPRESSION PLATENS 320x510x55 mm to test **also** blocks. It is necessary to have also the sliding rail carriage mod. C117

C117 SLIDING RAIL CARRIAGE, for an easy removal of the large block upper platen



C117

C127N GRAPHIC PRINTER on thermo-paper on board

C127-11 THERMO-PAPER roll for printer (pack of 10 rolls)

C104-10N SERVO-STRAIN
Servocontrolled Software, system of:
- Load or Strength
- Displacement
- Strain
This system can be used only with Servo-Plus machines.
Technical details p. 282

C125N ELASTIC MODULUS determination of the secant compression on concrete. Automatic system with pace rate control also when releasing the load, applicable only to high stability frames with Servo-Plus Evolution.
EN 12390-13, 13412, 13286-43, UNI 6556, ASTM C469, ISO 6784, DIN 1048, BS 1888:121
Technical details: see p. 284

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame.
Technical details: see p. 318



C115-01

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**. Recommended range 0-250kN.
Technical details: see p. 313



C097-01

C097-05 CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the compression machine.

C097-08 OFFICIAL ACCREDIA (Equivalent UKAS, ENAC, DAKKS, SAS, COFRAC etc.) HARDNESS CERTIFICATE of upper and lower compression platens. Minimum hardness: 55 HRC. See p. 313

C100

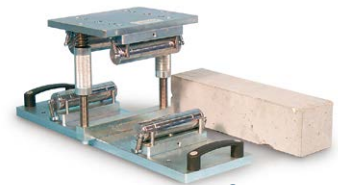
SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
Technical details and other models: see p. 314



C100

C106

FLEXURAL TEST DEVICE for concrete beams.
EN 12390-5 | ASTM C78, C293 | AASHTO T97
Technical details: see p. 315



C106

E170

COMPRESSION DEVICE to test cement specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315



E170

C099N

INVERTER DEVICE
Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223



C099N

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-10N	SOFTWARE for compression tests
C123N	SOFTWARE Servonet for remote control through PC
C109-11N	SOFTWARE for flexural tests
C109-12N	SOFTWARE for splitting tensile

Technical detail: see p. 18

SERVO-STRAIN

SOFTWARE-FIRMWARE for the automatic servo-controlled management of the testing machine to measure:

- LOAD OR STRENGTH
- DISPLACEMENT
- STRAIN

The **servo-strain** software/firmware can be applied **ONLY** to Matest **servo-plus evolution** testing machines.

The system is connected to displacement or strain transducers allowing to automatically perform the following tests:

- Deflection on fiber reinforced concrete beams (ASTM C1018, C1609 | EN 11039-03, 14487-1, 14488-3, 14651-05) see p. 305
- Punching of sprayed concrete plate with measurement of the absorbed energy (EN 10834, 14488-3, 14488-05) see p. 306
- Deformation and ductility on building materials, **with C104-10N**
- Lightweight Aggregates for concrete, mortar and grout (EN 13055-1 method 1) by using the suitable device mod. A081-01 described at p. 45
- Deflection on fiber reinforced concrete beams (ASTM C1018, C1609 | EN 11039-03, 14487-1, 14488-3, 14651-05) see p. 305
- Punching of sprayed concrete plate with measurement of the absorbed energy (EN 10834, 14488-3, 14488-05) see p. 306
- Research tests

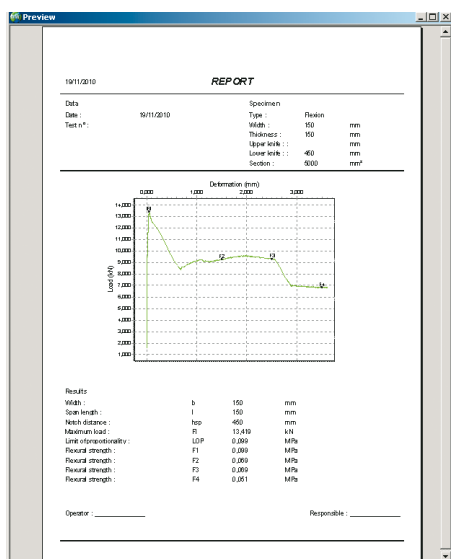
The applied load is automatically controlled by the **servo-plus evolution** machine.

The displacement of the piston or the strain/deformation of the sample are controlled by the **servo-strain** software, through a linear strain gage transducer (accessory), calculating values such as deflection, energy absorption, ductility.

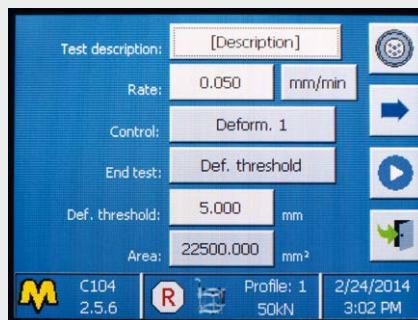
TECHNICAL FEATURES

Same to **servo-plus evolution** model C104N (p. 224), and in addition:

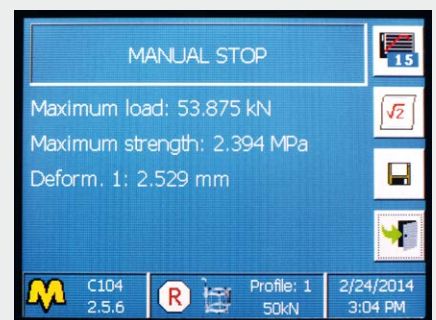
- Real time Graphical/Numerical display of all test data (load, strain, displacement, energy absorption, deflection, ductility etc.)
- Printing of test results and certificate on the onboard printer, or on a laser printer (accessories) directly connected to the machine via USB port.
- Personalized management of the archive exportable through pendrive.
- Possibility to connect up to 3 test frames
- Eight analog channels to connect load cells or pressure transducers with strain gage technology, linear displacement/deformation transducers and with strain gage technology.



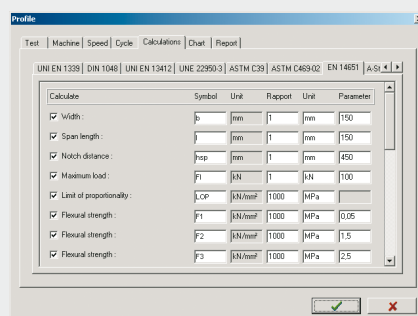
C104-10N Test report



C104-10N
Set up of customized compression test



C104-10N
Example of test result



C109-15N Calculation set up



C104-10N Test graph

SERVO-STRAIN APPLICATIONS

C104-10N

STRAIN, DUCTILITY, POST-BREAKING BEHAVIOUR

LIGHTWEIGHT AGGREGATES FOR CONCRETE | EN 13055-1

Compression tests on concrete specimens, steel fiber reinforced concrete (FRC), building material, and for research and experimental tests in order to evaluate the behavior of a specimen subjected to compression stress.

NEEDED ACCESSORIES for High stability

Servo-Plus Evolution compression machines

C104-31SP

SUPPORTING DEVICE for displacement transducer, able to grant an high precision and an high stability control of the test in mm/min.

S336-14

LINEAR DISPLACEMENT TRANSDUCER, strain gage technology, 50 mm travel to permit a control between 0.2 mm/min and 2 mm/min
Other models of linear displacement transducers at p. 549

Note: To permit a control lower than 0.2 mm/min. other transducers available on request.

NEEDED ACCESSORY

for all the other Servo-Plus Evolution machines

C104-31 HOLDER for displacement transducer.

S336-14 LINEAR DISPLACEMENT TRANSDUCER
Strain gage technology, 50 mm travel.
Other models of linear displacement transducers listed at p. 549

C109-15N

DEFLECTION MEASUREMENT ON STEEL FIBER REINFORCED CONCRETE BEAMS

100x100x400(500) mm AND 150x150x500(600) mm

STANDARDS: EN 11039-03, 14487-1, 14488-3, 14651-05 | ASTM C1018, C1609

Used on a flexural frame machine complete with Servo-Plus Evolution (to be selected among the models C090-07N, C091-03N) and by adding the specific equipment required to perform the test, that is described and illustrated in detail at p. 295

PUNCHING TEST ON SPRAYED CONCRETE SPECIMENS WITH MEASUREMENTS OF THE ENERGY ABSORPTION

STANDARDS: EN 10834, 14488-3, 14488-05 | UNI 10834

Used on a flexural frame machine and a Servotronic model C090-07N, with the addition of the specific equipment required to perform the test, that is described and illustrated in detail at p. 295



C090-14 + S336-14 + C109-15N
fixed on the flexural machine **C090-07N**



C090-15 + C109-15N fixed on the flexural machine **C090-07N**



C089-10N + C104-10N



S336-14 + C104-31SP

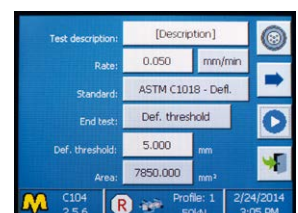


S336-14 + C104-31SP
Detail

C109-15N
Test result



C109-15N
Set up of deflection



C125N
DETERMINATION OF THE SECANT COMPRESSION ELASTIC MODULUS ON CONCRETE

AUTOMATIC WITH PACE RATE CONTROL ALSO WHEN RELEASING THE LOAD

STANDARDS: EN 12390-13, EN 13412, EN 13286-43 | ASTM C469 | ISO 6784 | UNI 6556 | DIN 1048 | BS 1888:121



It can be used with a MATEST high stability frame 2000 or 3000 or 5000 kN capacity, coupled to the automatic servo-controlled system "Servo-Plus Evolution" (mod. C104N) housed in a separate pyramidal frame.

The appliance includes:

■ HYDRAULIC SYSTEM

It is an hydraulic installation and has a high performance valve directly controlled by the digital unit that grants the automatic control of the pace rate increasing the load, keeps a certain load and then controls the pace rate decreasing the load.

The setting of the pace rate is made by a very sensitive valve controlled by a stepper motor thus allowing a micrometric action on the pace rate granting excellent results.

A laser position detector allows a rapid positioning of the piston. This grants a touching sensitivity of test starting at about 0.1 per thousand of the maximum capacity.

■ ELECTRONIC MEASURING SYSTEM

The high performance control and data processing unit controlled by a 32 bit microprocessor, can manage up to 8 high resolution channels for the control of load cells or transducers with strain gages bridge.

The unit contains two Analogical/Digital last generation converters with 24 bits resolution. The system processes the signals coming from the load cells and from the extensometers giving all the results required for further processing following the most updated International Standards for this application.

■ DATA ACQUISITION AND PROCESSING UTM2 SOFTWARE LICENSE FOR ELASTIC MODULUS ON CONCRETE

The software has been developed on the working line of the already known software UTM-2 (Windows menu). It contains the profiles of the main Standards used, but the user can modify as he likes and personalize the test profile that will be carried out in a completely automatic way by the testing machine.

The software allows to determine both the initial and stabilized **secant modulus of elasticity** as requested by **EN 12390-13** Standard. The software gives the possibility to print on a standard printer a test certificate reporting all the data concerning the test and the specimen and the graph of the test. The software includes the license "Servonet" mod. C123N, while the extensometers (two models are proposed: **A** and **B**) are not included in the standard supply and must be ordered separately (see accessories).

ACCESSORY

C125-01N

SOFTWARE FOR ELASTIC MODULUS TESTS ON ROCKS
STANDARDS: ASTM D3148, D5407, D2664,
EN 14580, EN 1926 | ISRM

Note: The Elastic Modulus on Concrete mod. C125N can be used together with:

A) EXTENSOMETERS (STRAIN GAGES), SINGLE USE, ELECTRIC, available in different sizes, mod. C125-10 to C125-13 (see accessories).

or:

B) EXTENSOMETERS /COMPRESSOMETERS, electronic, universal, mechanical frame, mod. C134 (see accessories)

AS AN ALTERNATIVE:

B) C134

EXTENSOMETER / COMPRESSOMETER, ELECTRONIC, UNIVERSAL, MECHANICAL FRAME. It can be used only with samples having minimum height of 130 mm. Technical details: see p. 286



C134

C134-10

TEMPLATE, to regulate and calibrate the base length of the C134 extensometer.

ACCESSORIES

A) EXTENSOMETERS (STRAIN GAGES), SINGLE USE, ELECTRIC
Pack of 10 pieces

Available models:

C125-10 Electric extensometer, base length 10 mm

C125-11 Electric extensometer, base length 20 mm

C125-12 Electric extensometer, base length 30 mm

C125-13 Electric extensometer, base length 60 mm

C125-14 Electric extensometer, base length 120 mm

C125-15

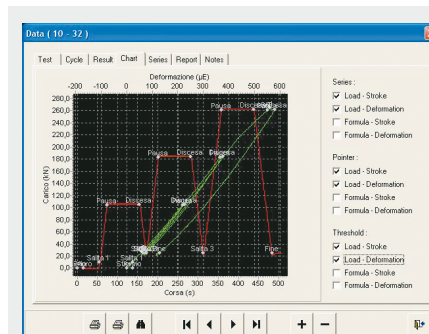
KIT for the application of single use extensometers composed by: glue, welder, solder, cleaning liquid, accessories, the whole in carrying case.

C125-09

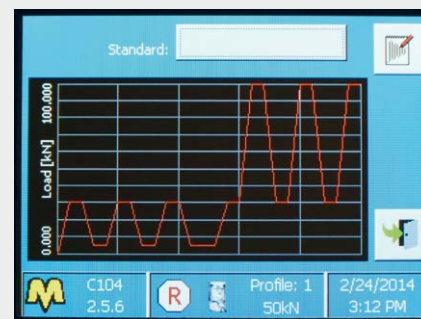
INTERFACE MODULE, a **needed accessory** to connect up to 4 electric single use extensometers. This module allows also the automatic calibration of the zero and of the measuring range after a special thermal compensation. This grants a five times better accuracy than the one requested by the Standards.



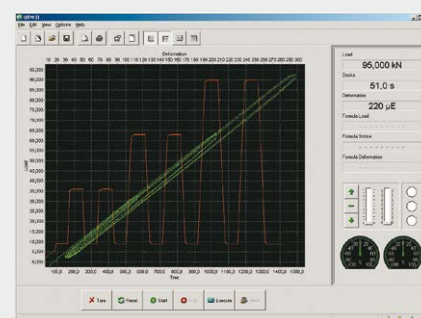
C125-09



Screen during a test and marker indicating any change.



Test graph to EN 12390-13



Test with longitudinal and transversal deformations

Test	Result	Cycle	Series	Chart	Report	Notes
#	µE					
1	1	Base deformation 1:	e01	38,633	µE	
1	2	Base deformation 2:	e02	45,9	µE	
1	3	Base deformation 3:	e03	51,267	µE	
1	4	Advanced deformation 1:	e1	152,633	µE	
1	5	Advanced deformation 2:	e2	278,787	µE	
1	6	Advanced deformation 3:	e3	392,467	µE	
1	7	Base strength 1:	o01	1,142	N/mm²	
1	8	Base strength 2:	o02	1,136	N/mm²	
1	9	Base strength 3:	o03	1,162	N/mm²	
1	10	Advanced strength 1:	o1	4,576	N/mm²	
1	11	Advanced strength 2:	o2	6,075	N/mm²	
1	12	Advanced strength 3:	o3	11,466	N/mm²	
1	13	Compression module 1:	E1	29901,164	(N/mm²)/E	
1	14	Compression module 2:	E2	29827,405	(N/mm²)/E	
1	15	Compression module 3:	E3	30205,376	(N/mm²)/E	

Test data

DETERMINATION OF THE SECANT COMPRESSION ELASTIC MODULUS TEST ON CONCRETE AND MORTAR SPECIMENS

C134

ELECTRONIC UNIVERSAL EXTENSOMETER/COMPRESSOMETER

STANDARDS: EN 12390-14, EN 13412, EN 13286-43 | ASTM C469 | ISO 6784 | BS 1881:121 | DIN 1048 | UNI 6556

Made of two anodized aluminium pieces, one fixed and the other sliding and housing a displacement transducer that measures with high accuracy the movement of two conical points made of hardened steel and attached at the two ends of the electronic sensor. An aluminium template (optional mod C134-10) is used to regulate and to calibrate the base length.

The two conical points are coupled to the surface of the sample with a rapid and simple attachment system by means of two adjustable elastic straps.

The instrument is equipped with a mechanical knob to lock and unlock the displacement transducer, allowing to safeguard the selected base length while attaching of the device to the sample. Normally the test is performed on cylinders by using 3 extensometers/compressometers, and on cubes or beams by using 2 or 4 instruments.

The extensometer is suitable to test cubes, cylinders and beam specimens, having minimum height of 130 mm

It is also possible to test mortar prisms 40x40x160 mm by using a block for reducing length.

Gauge length adjustable from 50 to 160 mm

Feeding up to 10 V

Travel: ± 1.5 mm

Sensitivity less than 0.01 micron

Supplied complete with reducing block for mortar prisms, elastic straps, carrying case.

Weight: 1000 g approx.

ACCESSORIES

C134-10 TEMPLATE, anodized aluminium made, used to regulate and calibrate the base length.

S337-51 CALIBRATION PROCESS for one Extensometer/Compressometer combined with digital unit.

Note:

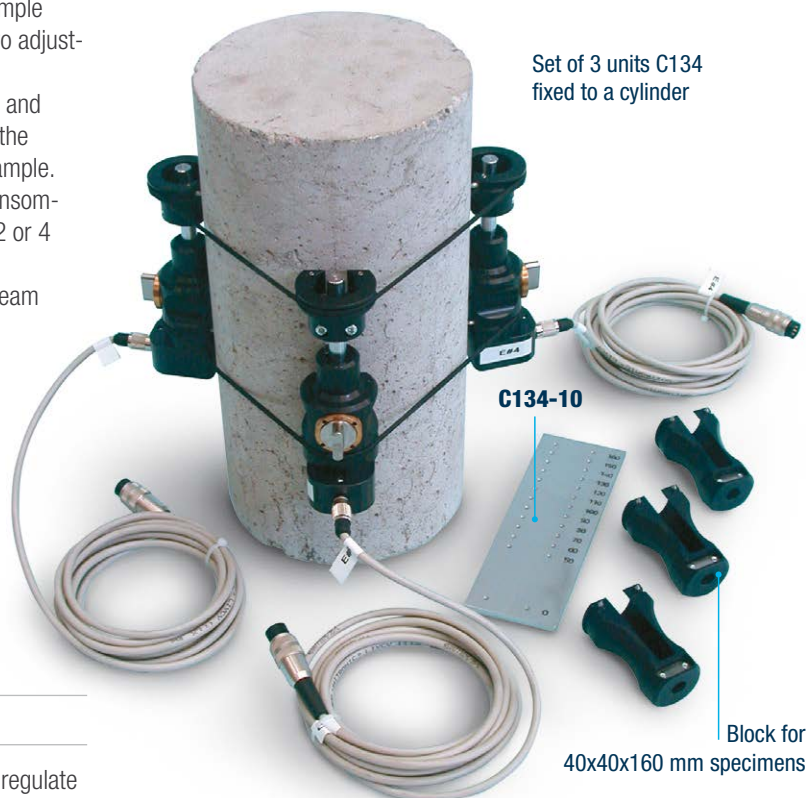
The Compressometers and the Compressometer/Extensometer connected to electronic linear transducers (accessory mod. S336-11) can be used with:

- Matest Servo-Plus Evolution compression machines equipped with Automatic Elastic Modulus system (mod. C125N) in complete accordance with EN, ASTM, ISO, DIN, BS, UNI Specifications (see p. 284)
- Matest Cyber-Plus and Servo-Plus compression machines. The electric cable of the displacement transducer is "directly" connected to one of the eight channels available on the digital unit.

Through the suitable Software (accessory mod. C130-05), the digital unit will automatically elaborate the data, supplying the load/deformation graph with certificate printing.



C134 with case



Set of 3 units C134 fixed to a cylinder

C134-10

Block for 40x40x160 mm specimens

C130-05

FIRMWARE for Elastic Modulus test on Concrete, Mortar, Rock specimens and tests according to API 19C and ISO 13503-2 Automatic data and processing acquisition, load/deformation graph and certificate printing with direct management of the testing machine. The software can be installed only on Cyber and Servo-Plus Evolution systems.



C130-05 Test execution

Note:

The Elastic Modulus test, to fully comply EN, ASTM, ISO, DIN, UNI, BS Standards, must be carried out with a Servo-Plus Matest machine equipped with C125N automatic system with pace rate load and "unload" control.

STATIC ELASTIC MODULUS OF CONCRETE

COMPRESSOMETER

Used to determine the strain and deformation characteristics of concrete specimens. It comprises two steel rings for clamping to the specimen, two gauge length bars, and spherically-seated lever unit. Supplied **without** dial gauge or strain transducer to be ordered separately (see accessories).



C132N + S375

C131N1 + S375

C130N + S375

AVAILABLE MODELS

- C130N** COMPRESSOMETER for cylinders \varnothing 150x300 mm; \varnothing 160x320 mm; \varnothing 6"x12"
- C131N1** COMPRESSOMETER for cylinders \varnothing 100x200 mm; \varnothing 112.8x220 mm; \varnothing 4"x8"
- C132N** COMPRESSOMETER for cubes 150 mm side.
- C132-01N** COMPRESSOMETER for cubes 200 mm side.

NEEDED ACCESSORY

- S375** DIAL GAUGE, 5 mm travel by 0.001 mm subd.

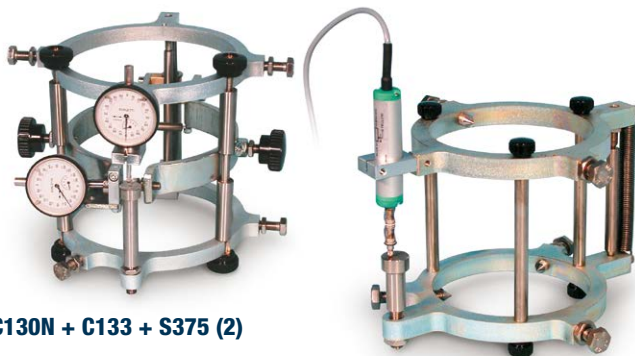
AS AN ALTERNATIVE:

- S336-11** ELECTRONIC LINEAR DISPLACEMENT TRANSDUCER, 10 mm travel, complete with cable.
Technical details: see p. 549

Note:

The Compressometers and the Compressometer/Extensometer connected to electronic linear transducers (accessory mod. S336-11) can be used with:

- Matest Servo-Plus Evolution compression machines equipped with Automatic Elastic Modulus system (mod. C125N) in complete accordance with ASTM C469, ISO 6784, UNI 6556 Specifications (see p. 284)
- Matest Cyber-Plus and Servo-Plus compression machines. The electric cable of the displacement transducer is "directly" connected to one of the eight channels available on the digital unit. Through the suitable Software (accessory mod. C130-05), the digital unit will automatically elaborate the data, supplying the load/deformation graphic with certificate printing.



C130N + C133 + S375 (2)

C130N + S336-11

C133

COMPRESSOMETER-EXTENSOMETER \varnothing 150-160 mm

STANDARD: ASTM C469

To measure both axial deformation and diametrical extension of cylinder specimens \varnothing 150x300 mm, 160x320 mm, 6"x 12" under compression stress, by determining the elastic modulus.

It consists of a central ring for the diametrical extension measure, to be fixed on the C130N compressometer.

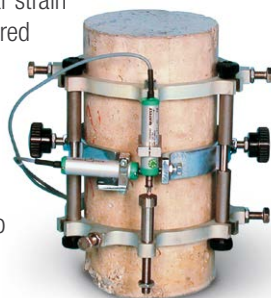
Supplied **without** dial gauges or linear strain transducers (**two required**) to be ordered separately (see accessories).

C133-01

COMPRESSOMETER

EXTENSOMETER \varnothing 100-112.8 mm

Same as mod. C133 but, connected to C131N1. It is suitable to test cylinders from \varnothing 100x200 to 112.8x220 mm.



C130N + C133 + S336-11(2)

- C130-05** SOFTWARE for Elastic Modulus test on Concrete Mortar specimens and tests according to API 19C and ISO 13503-2

Automatic data and processing acquisition, load/deformation graphic and certificate printing with direct management of the testing machine. The software can be used only with Cyber and Servo-Plus Evolution systems.

- S337-51** CALIBRATION PROCESS of one displacement transducer S336-11 combined with Cyber or Servo-Plus Matest compression machine.

Note:

The Elastic Modulus test, to fully comply EN, ASTM, ISO, DIN, UNI, BS Standards, must be carried out with a Servo-Plus Matest machine equipped with C125N automatic system with pace rate load and "unload" control.

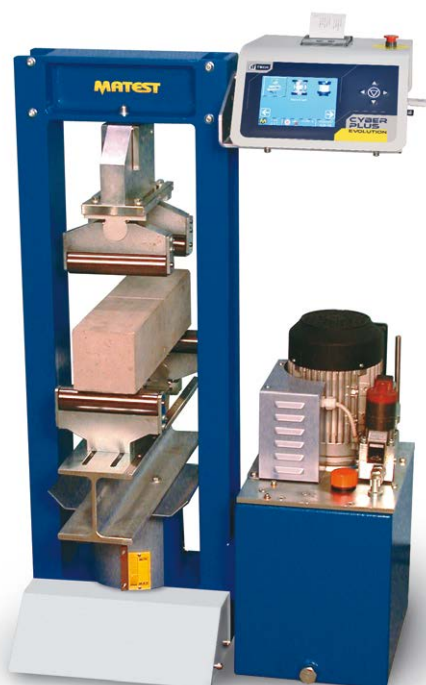
FLEXURE TESTING MACHINES

MAIN FEATURES

- Motorized or hand operated models.
- Gauge load measuring system.
- **Digitec** or **Cyber-Plus Evolution** graphic display unit.
- **Autotec** or **Servo-Plus Evolution** servo-controlled automatic system.
- Stand-alone frame, or combined to another frame.
- Possibility of two-point loading or centre-point loading by simply removing one upper roller and placing the other in the centre.
- Graduated scales to get easy rollers adjustment.
- Rollers are hardened, case hardened and rectified.

WE PROPOSE VARIOUS FLEXURAL FRAMES:

- **C090** Series with frame 150 kN capacity frame to perform flexural tests on concrete beam specimens having max. dimensions of 150x150x750 mm. See p. 290



C090 SERIE

- **C091** Series with **open sided frame** 150 kN capacity to perform flexural tests on concrete beam specimens having max. dimensions of 200x200x800 mm;
 - Flat blocks (max. width 600 mm);
 - Flagstones and Kerbs;
 - Any type of beam having max. size 600xh250 mm (lower rollers max. length 1325 mm). See p. 292



C091 SERIE

- **C090-06** Series with 200 kN capacity, high stiffness flexure frame to perform tests on concrete beams max. dimensions 150x150x750 mm;
 - Flat blocks, max. width 600 mm
 - Flagstones and Kerbs
 - Any type of beam having max. width 600 mm and max. height 150 mm
 - Energy absorption on sprayed concrete samples
 See p. 294



C090-06 SERIE

C095N
FLEXURAL AND TRANSVERSE MULTIPURPOSE TESTING MACHINE
 320 KN CAPACITY, **C-SHAPED OPEN FRAME**

To perform a wide range of flexural/compression tests on concrete specimens, paving slabs, kerbs, mortar specimens, flexural toughness of steel FRC concrete, energy absorption of sprayed concrete, beam deflection and toughness of steel FRC/Shotcrete, measurement of crack opening (CTOD-CMOD) etc. See p. 296



C095N

C096N
HIGH STIFFNESS FLEXURAL MACHINE
 360 KN CAPACITY.

See p. 300



C096N

■ **C109-09N + C093-05N**

CONCRETE PIPE TESTING MACHINE, 1000 kN capacity to test pipes \varnothing 450 to 2600 mm. See p. 307

- **C093** Series to perform flexural tests on concrete beam specimens having max. dimensions 200x200x800 mm and to perform tests on any kind of other product with max. dimensions 550x550 mm (adjustable distance between lower rollers up to max. 1325 mm). See p. 308



C093 SERIE



C109-09N

C093-05N

FLEXURAL TESTING MACHINE 150 KN CAPACITY

FOR FLEXURAL TESTS ON CONCRETE BEAM SPECIMENS MAX. DIMENSIONS 150X150X600 (750) MM

STANDARDS: EN 12390-5 | ASTM C78, C293 | AASHTO T97 | BS 1881:118

150 KN CAPACITY

MAIN FEATURES

- Max. vertical daylight between upper/lower rollers: 160 mm
- Rollers dimensions: Ø 40x160 mm
- Complete with 4 adjustable and articulated rollers.
- Distance of lower rollers adjustable from 100 to 455 mm
- Distance of upper rollers adjustable from 40 to 155 mm
- Gauge diameter 250 mm with 0.5 kN divisions.
- Max. ram travel 50 mm approx.
- Calibration accuracy: class 1.0
- Hydraulic device to stop the piston stroke at its max excursion, to avoid pumping the piston out of the cylinder.
- Power supply (motorized models): 230V 1ph 50Hz 750W
- Dimensions: 540x460x960 mm
- Weight: 180...240 kg approx.

INVERTER

Details, p. 223



C090-03N + C104-04 + C127N

C090-02D

C090-01 + C111-16

FLEXURAL 150 kN capacity

LOAD MEASURING SYSTEM

MODEL	Hand Operated	Motorized	1 Gauge	Cyber-Plus Evolution mod. C109N (p.224)	Servo-Plus Evolution mod. C104N (p.224)	Digitec mod. C108N (p.219)	Autotec mod. C098N (p.219)
C090	▼		▼				
C090-01		▼	▼				
C090-02N		▼		▼			
C090-03N		▼			▼		
C090-02D		▼				▼	
C090-03A		▼					▼

ACCESSORIES FOR 150 kN FLEXURAL MACHINES

C111-16 DISTANCE PIECE, 50 mm high to test beams 100x100x400/500 mm

C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C104-04 CONSOLE HOUSING THE SERVO-PLUS EVOLUTION, the pump assembly is lined with sound-proofing material for noise reduction and encased to enhance the design of the machine. See p. 314



C104-04

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Range selectable from 10 kN to 100 kN. Technical details: see p. 313



C097-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the flexural machine. Applicable only on digital machines.

C100 SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
Technical details and other models: see p. 314



C100

E170 COMPRESSION DEVICE to test mortar specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315



E170

E172-01 FLEXURE DEVICE for mortar prisms 40.1x40x160 mm. EN 196 / EN ISO 679 (it can be used only with the dual low capacity digital range 0-15kN).
Technical details and other models: see p. 428



E172-01

C126 BENCH to hold the compression machine. See p. 317



C126

C099N  **NEW**
INVERTER DEVICE
Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223



C099N

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-16 (N)*	SOFTWARE for flexural tests on clay blocks
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

FLEXURAL TESTING MACHINE 150KN CAPACITY OPEN-SIDED FRAME

FOR FLEXURAL TESTS ON CONCRETE BEAM SPECIMENS MAX. DIMENSIONS 200X200X800 MM, FLAT BLOCKS, FLAGSTONES, KERBS, TILES, SLABS, MASONRY UNITS, AND ANY TYPE OF MATERIAL HAVING MAX. SIZE 600X250 MM (LOWER ROLLERS MAX. DISTANCE 1325 MM)

STANDARDS: EN 12390-5 | EN 1340:4 | ASTM C78, C293 | AASHTO T97 | BS1881 :118, BS 6073-1, BS 7263

150 KN CAPACITY

MAIN FEATURES

- **Open-sided frame** for an easy and fast positioning of the specimen between the rollers
- **Max. vertical daylight** between upper/lower rollers: 260 mm, intermediate daylight positions: 210, 160, 110 and 60 mm
- **Roller dimensions:** Ø 40x613 mm
- **Ram travel** 110mm approx.
- **Calibration accuracy:** class 1.0
- **Simple action piston** with counterweights to minimize frictions
- **Power supply:** 230V 1ph 50Hz 750W
- **Dimensions:** 1400x1200x1430 mm
- **Weight:** 350 kg approx.


INVERTER

Details, p. 223

BARCODE

Details, p. 223

C091-03N + C091-11 + PC

FLEXURAL 150 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C091-02N	▼	▼			
C091-03N	▼		▼		
C091-02D	▼			▼	
C091-03A	▼				▼

ACCESSORIES FOR FLEXURAL 150 kN "OPEN SIDED FRAME"

- C091-10** ROLLERS GROUP: lower adjustable from 75 to 525 mm, and **only one** upper central roller for single point method.
- C091-11** ROLLERS GROUP: lower adjustable from 75 to 525 mm, and upper adjustable from 75 to 180 mm for two points method.
- C091-12** ROLLERS GROUP: lower adjustable from 75 to 1325 mm, and upper adjustable from 75 to 575 mm for two points method.
- C091-14** ROLLERS GROUP: lower adjustable from 75 to 1325 mm, and **only one** upper central roller for single point method.



- C091-13** UPPER TAMPER (steel made), for concrete KERBS tests. The tamper is mounted on a rotating coupling and fixed to the upper part of the machine to apply a flexural strength on three points on the kerb, without any torsional stress. STANDARD: EN 1340

- C090-15** DEFLECTION MEASUREMENT TEST on fiber reinforced concrete beams 100x100x400(500) mm and 150x150x500(600) mm
STANDARDS: EN 14488-3 | ASTM C1609, C1018
The test is performed with the specific equipment (deflection measurement device, displacement transducers) described at pag. 305 and the automatic servocontrolled system of load and displacement Servo-Strain (see p. 282)



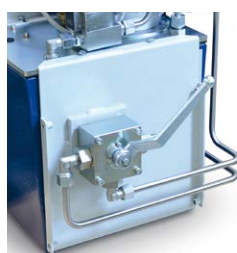
C090-15



C093-11

- C093-11** DEVICE for flexural tests on clay blocks for flooring.
STANDARDS: EN 15037-2, 15037-3 | UNI 9730-3
- C127N** GRAPHIC PRINTER on thermo-paper on board for digital models
- C127-11** THERMO-PAPER roll for printer (pack of 10 rolls)

- C115-01** TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

- C097-01** DUAL LOW CAPACITY DIGITAL RANGE, complete with **appropriate pressure transducer**, only for digital machines. Range selectable from 10 kN to 100 kN. Technical details: see p. 313



C097-01

- C097-05** CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the flexural machine. Applicable only on digital machines.

- C100** SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
Technical details and other models: see p. 314



C100

- C103** SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6. Technical details: see p. 314



C103

AS AN ALTERNATIVE:

- C103-02** SPLITTING TENSILE test device for self blocking pavers and cubes, max dimensions 300x500 mm. EN 1338, 12390-6. Technical details: see p. 314

- E170** COMPRESSION DEVICE to test mortar specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315

- E172-01** FLEXURE DEVICE for mortar prisms 40.1x40x160 mm EN 196 / EN 1015 (it can be used only with the dual low capacity digital range 0-15kN). Technical details and other models: see p. 428

C099N NEW

- INVERTER DEVICE
Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223



C099N

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

- | | |
|---------------------|--|
| C109-15 (N)* | SOFTWARE for deflection measurement test |
| C109-16 (N)* | SOFTWARE for flexural tests on clay blocks |
| C123 (N)* | SOFTWARE Servonet for remote control through PC |
| C109-11 (N)* | SOFTWARE for flexural tests |
| C109-12 (N)* | SOFTWARE for splitting tensile |

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

FLEXURAL FRAME, 200 KN CAPACITY HIGH STIFFNESS AND STABILITY

FOR FLEXURAL TESTS ON CONCRETE BEAMS MAX. DIMENSIONS 150X150X600/750 MM, FLAT BLOCKS, FLAGSTONES, KERBS, TILES, SLABS, MASONRY UNITS, AND ANY TYPE OF MATERIAL HAVING MAX. WIDTH 600 MM AND MAX. HEIGHT 150 MM

STANDARDS: EN 12390-5 | EN 1340:4 | BS 1881:118, 6073-1, 7263 | ASTM C78, C293 | AASHTO T97

200 KN CAPACITY
MAIN FEATURES

- High stiffness frame with minimum deflection at maximum load (0.9 mm)
- Max. vertical daylight between upper/lower rollers: 160 mm
- Ram travel: 110 mm, to get minimum daylight of 50 mm
- Horizontal daylight of the testing chamber: 720 mm
- Simple action piston with counterweights to maximize frictions
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 990x970x1105 mm
- Weight: 190...250 kg approx.

INVERTER

For a further improvement of energy efficiency and silent operation, (optional device code C099N).
 Technical details, p. 223


BARCODE

Scanner for specimen file/identification, (optional device code C099-01).
 Details, p. 223



THE FRAME IS SUPPLIED **WITHOUT** UPPER/LOWER ROLLERS GROUP, TAMPER, BASE SUPPORT ETC. TO BE ORDERED SEPARATELY (see accessories).


C090-07N + C090-13
C090-07N + C127N + C104-04 + C090-13

FLEXURAL 200 kN capacity High Stiffness

LOAD MEASURING SYSTEM

MODEL	Capacity kN	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C090-06N	200	▼			
C090-07N	200		▼		
C090-06D	200			▼	
C090-07A	200				▼

ACCESSORIES FOR FLEXURAL 200 KN HIGH STIFFNESS

Rollers, Ø 40 mm, hardened and rectified, cadmium plated against corrosion.

Lower rollers have adjustable distance from 75 to 900 mm, and upper rollers have adjustable distance from 75 to 180 mm for two points loading tests.

Possibility to easily place in the centre one upper roller for centre point loading tests.

Models:

C090-12 ROLLERS GROUP upper and lower, 160 mm long.

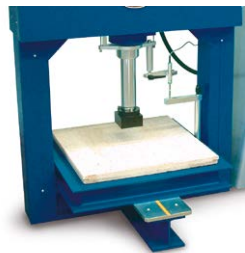
C090-13 ROLLERS GROUP upper and lower, 613 mm long.

ACCESSORY FOR C090-13

C090-21 ROLLERS-HOLDERS (lowers only) 613 mm long, to be installed on the C090-13 group in order to modify the max. vertical daylight at 60 mm and min. at -50 mm to test tiles, slabs etc. with max. thickness of 50 mm and flexibility up to -45 mm

C090-14 ENERGY ABSORPTION TEST on sprayed concrete specimens. STANDARDS: EN 14488-5 | UNI 10834

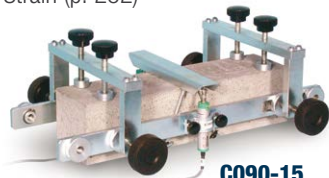
The test is performed with the specific equipment (square base with useful size of 500x500 mm, loading element, displacement transducer) described at p. 283 and the Software/Firmware automatic system of load and displacement Servo Strain (p. 282)



C090-14

C090-15 DEFLECTION MEASUREMENT TEST on fiber reinforced concrete beams 100x100x400(500) mm and 150x150x500(600) mm
STANDARDS: EN 14488-3
ASTM C1609, C1018

The test is performed with the specific equipment (deflection measurement device, displacement transducers) described at p. 305 and the Software/Firmware automatic system of load and displacement Servo Strain (p. 282)



C090-15

C111-17 DISTANCE PIECE 40 mm high, needed to perform the deflection test to EN 14488-3

C091-13 UPPER TAMPER (steel made), for concrete KERBS tests. The tamper is mounted on a rotating coupling and fixed to the upper part of the machine to apply a flexural strength on three points on the kerb, without any torsional stress. STANDARD: EN 1340



C091-13

C093-11 DEVICE for flexural tests on clay blocks for flooring. STANDARDS: EN 15037 | UNI 9730-3

C127N GRAPHIC PRINTER on thermo-paper on board for digital models

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with appropriate pressure transducer.

Range selectable from 10 kN to 100 kN. Technical details: see p. 313



C093-11



C097-01

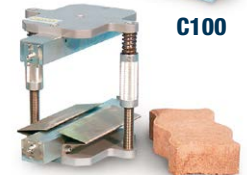
C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the flexural machine.

C100 SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
Technical details and other models: see p. 314



C100

C103 SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6.
Technical details: see p. 314



C103

As alternative:

C103-02 SPLITTING TENSILE TEST DEVICE for self blocking pavers and cubes, max. dimensions 300x500 mm
EN 1338, 12390-6
Technical details: see p. 314

E170 COMPRESSION DEVICE to test mortar specimens 40.1x40 mm
EN 196 | ASTM C349
Technical details and other models: see p. 315



C103-02

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-15 (N)*	SOFTWARE for deflection measurement test
C109-16 (N)*	SOFTWARE for flexural tests on clay blocks
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

C095N

FLEXURAL AND TRANSVERSE MULTIPURPOSE TESTING MACHINE, 320 KN CAPACITY
C-SHAPED OPEN FRAME

 STANDARDS: EN 12390-5, 12390-6, 14488-5, 1338, 1339, 1340, 196
 ASTM C78, C293, C1550, C496, C349 | UNI 9730-3


320 KN CAPACITY

MAIN FEATURES

- Servo-Plus evolution 8-channel servo controlled system for a fully automatic execution of the test (mod. C104N).
- Load is measured by a high accuracy electric strain cell, eliminating the piston's weight and friction.
- C-shaped open frame for an easy and fast positioning of the specimen between the rollers.
- Frame is closed by a hydraulic vertical rod, granting high rigidity.
- Ram travel: 110 mm
- Maximum vertical daylight between upper/lower rollers: 263 mm
- Horizontal clearance (between uprights): 1040 mm
- Possibility to easily place one upper roller in the centre for centre-point loading.
- Graduated scales are foreseen for easy roller adjustment.
- Simple action piston with counterweights to minimize frictions.
- Calibration accuracy: class 1
- Power supply: 230V 1ph 50Hz 750W
- Frame dimensions: 1700x1470x1557 mm
- Frame weight: 800 kg + 100 kg approx. of control console.

INVERTER


For a further improvement of energy efficiency and silent operation, (optional device code C099N). Technical details, p. 223

BARCODE

Scanner for specimen file/identification, (optional device code C099-01). Details, p. 223


C095N with accessories

C095N SPECIFIC APPLICATIONS



C095N-11 FLEXURAL TESTS ON CONCRETE BEAMS

STANDARDS: EN 12390-5 | ASTM C78, C293

Upper and lower roller group for third point and centre tests on concrete beams up to 200x200x800 mm

Rollers size: 30 mm Ø by 312 mm long, cadmium plated against corrosion.

Span between upper rollers adjustable from 75 to 570 mm

Span between lower rollers adjustable from 75 to 1560 mm

Weight: 65 kg approx.

NEEDED ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light of the frame from 263 to 177 mm (67 mm with piston excursion)



C095N-12 FLEXURAL TESTS ON PAVING SLABS AND ANY TYPE OF MATERIAL HAVING MAX. WIDTH 600 MM

STANDARD: EN 1339

One upper centre loading roller and two lower roller assembly for tests on paving slabs.

Rollers size: 40 mm Ø by 620 mm long, cadmium plated against corrosion.

Span between lower rollers adjustable from 75 to 1560 mm

Weight: 76 kg approx.



NEEDED ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light of the frame from 263 to 177 mm (67 mm with piston excursion)

C095N-19 FLEXURAL TESTS ON CONCRETE BEAMS

STANDARDS: EN 12390-5

Two upper loading rollers for third point and centre tests on concrete beams up to 200x200x800 mm

Rollers size: 40 mm Ø by 312 mm long, cadmium plated against corrosion, to be used with the rollers assembly C095N-12.

Span between upper rollers adjustable from 75 to 570 mm

Weight: 65 kg approx.

NEEDED ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light of the frame from 263 to 177 mm (67 mm with piston excursion)

C095N-13 UPPER TAMPER FOR TESTING KERBS

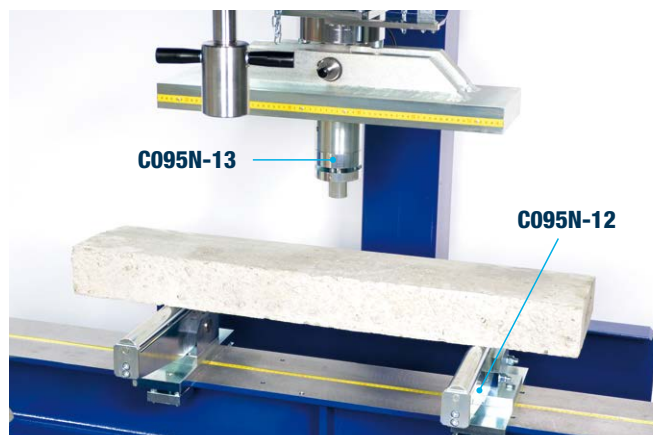
STANDARDS: EN 1340

The Tamper, steel made, is mounted on a rotating coupling and fixed to the upper part of the machine to apply a flexural load on the kerb, without any torsional stress.

To be used with the rollers assembly C095N-12.

The vertical useful light is 221 mm (111 mm with piston excursion).

Weight: 6 kg approx.



ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light from 221 to 135 mm (25 mm with piston excursion)

C095N SPECIFIC APPLICATIONS

C095N-14 COMPRESSION TESTS UP TO 320KN CAPACITY

The multipurpose (flexural) frame can be equipped with Lower platen and Upper spherically seated platen, having Ø 165 mm by 30 mm thick, to perform compression tests on low strength and small size specimens.

To be used with the four distance pieces C095N-18

The vertical useful light is from 350 to 178 mm (68mm with piston excursion).

The device can be used also for compression tests on mortar specimens (by using suitable devices E170 etc. listed on page 315, splitting tensile tests (by using suitable C100, C103 etc. devices listed on page 314).

Weight:

20 kg approx.



C095N-14 / C095N-18

C095N-15

DISPLACEMENT TRANSDUCER, to measure the piston travel.
Supplied complete with holder to the test frame.

Travel: 100 mm

Full bridge at 350 Ohm

Independent linearity: < 0.1%

Standard sensitivity: 2 mV/V

C095N-16 ENERGY ABSORPTION TEST ON SPRAYED CONCRETE SLABS

STANDARD: EN 14488-5

SQUARE BASE SUPPORT FRAME useful inside dimensions 500x500 mm, holding the sprayed concrete slab, complete with spherically upper loading element.

Weight:

125 kg approx.



C095N-16 + S336-14 with sample

NEEDED ACCESSORY

S336-14 DISPLACEMENT TRANSDUCER, to measure the central deformation of the slab under concentrated load.
Travel: 50 mm
Full bridge at 350 Ohm
Independent linearity: < 0.1%
Standard sensitivity: 2 mV/V

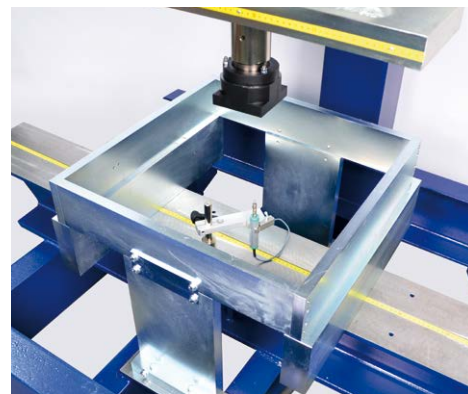
C109-15N

FIRMWARE / SOFTWARE for:

- Measurement of deflection on fibre reinforced concrete beams
- Determination of toughness, first crack strength and ductility
- Energy absorption test on sprayed specimens.

STANDARD: EN 14488-5

(see p. 283)



C095N-16 / S336-14 without sample

C095N-17 FLEXURAL TOUGHNESS OF FIBRE REINFORCED CONCRETE (FCR) SLABS

STANDARD: ASTM C1550

BASE SUPPORT FRAME, holding the concrete slabs having 800 mm diameter by 75 mm thick, complete with upper loading element.

Weight: 60 kg approx.



C095N-17

NEEDED ACCESSORY

S336-14 DISPLACEMENT TRANSDUCER, to measure the central deformation of the slab under concentrated load.
Travel: 50 mm
Full bridge at 350 Ohm
Independent linearity: < 0.1%
Standard sensitivity: 2 mV/V

C109-15N

FIRMWARE / SOFTWARE for:

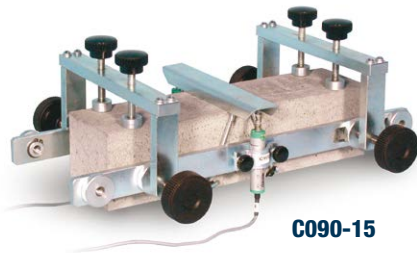
- Measurement of deflection on fibre reinforced concrete beams
- Determination of toughness, first crack strength and ductility
- Energy absorption test on sprayed specimens.

STANDARD: EN 14488-5 | ASTM C1550

(see p. 283)

C095N SPECIFIC APPLICATIONS

C090-15 DEFLECTION MEASUREMENT TEST on fiber reinforced concrete beams 100x100x400(500) mm and 150x150x500(600) mm
STANDARDS: EN 14488-3 ASTM C1609, C1018
The test is performed with the specific equipment (deflection measurement device, displacement transducers) described at p. 305 and the Software/Firmware automatic system of load and displacement Servo Strain (p. 282)



C090-15

C127N GRAPHIC PRINTER on thermo-paper on board

C115-01 TWO-WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the flexural machine.

C100 SPLITTING TENSILE test device for cylinders.
EN 12390-6 | ASTM C496
Technical details and other models: see p. 314



C100

C103 SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6
Technical details: see p. 314



C103

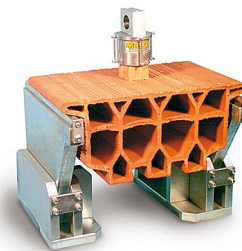
AS AN ALTERNATIVE:

C103-02 SPLITTING TENSILE test device for self blocking pavers and cubes, max dimensions 300x500 mm.
EN 1338, 12390-6. Technical details: see p. 314



C103-02

C093-11 DEVICE for flexural tests on clay blocks for flooring.
STANDARD: UNI 9730-3



C093-11

E170 COMPRESSION DEVICE to test mortar specimens 40.1 x 40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315



E170

SOFTWARE for CYBER models

C109-16N	SOFTWARE for flexural tests on clay blocks
C123N	SOFTWARE Servonet for remote control through PC
C109-11N	SOFTWARE for flexural tests

Technical detail: see p. 18

Note:

Accessories for specific applications listed above are common for different tests. We recommend to check them when ordering, to avoid duplications.

C096N
HIGH STIFFNESS FLEXURAL MACHINE, 360 KN CAPACITY


STANDARDS: EN 12390-5, 1339, 1340, 14488-5 | ASTM C78, C293, C1550

360 KN CAPACITY

The frame has been designed to perform different kind of tests, from the simple third/centre point flexural test on beams to the advanced FRC displacement controlled tests and energy absorption tests on sprayed concrete. Accurate results are granted by the high stiffness of the frame according to the international Standards requirement (more than 200 kN/mm) and by a high precision load cell measurement system fitted into the frame. The high horizontal daylight of the testing chamber allows to test big dimension specimens. **Rollers are optional and must be ordered separately** according to user needs.

MAIN FEATURES

- 1 mm deformation every 200 kN.
- Easy positioning of the specimen.
- High precision load cell.
- Possibility to test any type of specimen: beams, flagstones, blocks, kerbs, FRC, slabs.
- Graduated scales for an easy rollers adjustment.
- Piston travel limit device.
- Simple action piston with counterweights.
- Power supply: 230V 1ph 50Hz 750W.

INVERTER


For a further improvement of energy efficiency and silent operation, (optional device code C099N). Technical details, p. 223


C096N + C095N-12

C096N SPECIFIC APPLICATIONS



TECHNICAL SPECIFICATIONS

Model		C096N
Load capacity		360 kN
Load reading		Load cell
Horizontal daylight of the testing chamber		980 mm
Max. vertical daylight between upper/lower rollers	With C095N-11	263 mm
	With C095N-12	253 mm
	With C095N-13	221 mm
	With C095N-19	253 mm
	With C095N-14	350 mm
Upper rollers adjustable distance		From 75 to 210 mm
Lower rollers adjustable distance		From 75 to 850 mm
Ram travel		140 mm
Dimensions		600x1240x1400 mm
Weight (approx.)		900 kg

C095N-11 FLEXURAL TESTS ON CONCRETE BEAMS

STANDARDS: EN 12390-5 | ASTM C78, C293

Upper and lower roller group for third point and centre tests on concrete beams up to 200x200x800 mm

Rollers size:
30 mm Ø by 312 mm long, cadmium plated against corrosion.

Weight: 65 kg approx.



NEEDED ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light of the frame.

C095N-12 FLEXURAL TESTS ON PAVING SLABS AND ANY TYPE OF MATERIAL HAVING MAX. WIDTH 600 MM

STANDARD: EN 1339

One upper centre loading roller and two lower roller assembly for tests on paving slabs.

Rollers size:
40 mm Ø by 620 mm long, cadmium plated against corrosion.

Weight: 76 kg approx.



NEEDED ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light of the frame.

C095N-19 FLEXURAL TESTS ON CONCRETE BEAMS

STANDARDS: EN 12390-5

Two upper loading rollers for third point and centre tests on concrete beams up to 200x200x800 mm

Rollers size: 40 mm Ø by 312 mm long, cadmium plated against corrosion, to be used with the rollers assembly C095N-12.

Weight: 65 kg approx.

NEEDED ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light of the frame.

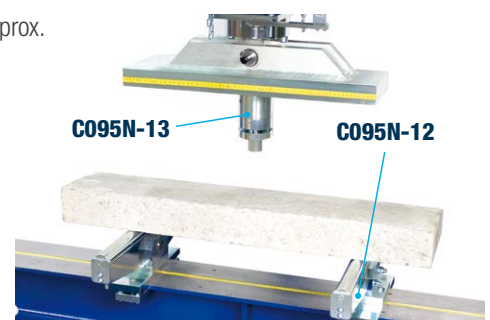
C095N-13 UPPER TAMPER FOR TESTING KERBS

STANDARDS: EN 1340

The Tamper, steel made, is mounted on a rotating coupling and fixed to the upper part of the machine to apply a flexural load on the kerb, without any torsional stress.

To be used with the rollers assembly C095N-12.

Weight: 6 kg approx.



ACCESSORY

C095N-18 FOUR DISTANCE PIECES height 43 mm each, to adjust the vertical useful light from 221 to 135 mm (25 mm with piston excursion)

C096N SPECIFIC APPLICATIONS

C095N-14 COMPRESSION TESTS UP TO 320KN CAPACITY

The multipurpose (flexural) frame can be equipped with Lower platen and Upper spherically seated platen, having \varnothing 165 mm by 30 mm thick, to perform compression tests on low strength and small size specimens.

To be used with the four distance pieces C095N-18.

The device can be used also for compression tests on mortar specimens (by using suitable devices E170 etc. listed on page 315, splitting tensile tests (by using suitable C100, C103 etc. devices listed on page 314).

Weight: 20 kg approx.



C095N-14 / C095N-18

C095N-15

DISPLACEMENT TRANSDUCER, to measure the piston travel. Supplied complete with holder to the test frame.

Travel: 100 mm

Full bridge at 350 Ohm

Independent linearity: < 0.1%

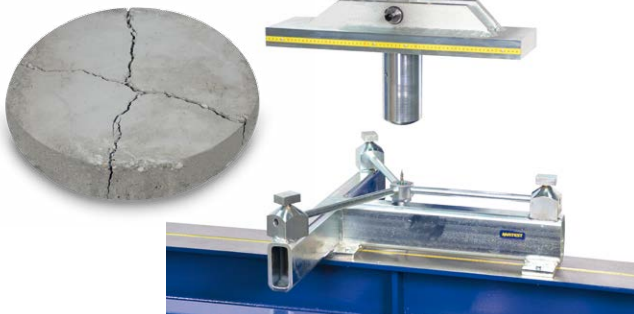
Standard sensitivity: 2 mV/V

C095N-17 FLEXURAL TOUGHNESS OF FIBRE REINFORCED CONCRETE (FCR) SLABS

STANDARD: ASTM C1550

BASE SUPPORT FRAME, holding the concrete slabs having 800 mm diameter by 75 mm thick, complete with upper loading element.

Weight: 60 kg approx.



C095N-17

NEEDED ACCESSORY

S336-14 DISPLACEMENT TRANSDUCER, to measure the central deformation of the slab under concentrated load.
 Travel: 50 mm
 Full bridge at 350 Ohm
 Independent linearity: < 0.1%
 Standard sensitivity: 2 mV/V



C096N + C095N-17

C090-14SP ENERGY ABSORPTION TEST ON SPRAYED CONCRETE SLABS

STANDARD: EN 14488-5

SQUARE BASE SUPPORT FRAME, holding the sprayed concrete slab with useful inside dimensions 500x500 mm, complete with spherically upper loading element.

Weight: 125 kg approx.



C090-14SP + S336-14 with sample

NEEDED ACCESSORY

S336-14 DISPLACEMENT TRANSDUCER, to measure the central deformation of the slab under concentrated load.
 Travel: 50 mm
 Full bridge at 350 Ohm
 Independent linearity: < 0.1%
 Standard sensitivity: 2 mV/V

C096N SPECIFIC APPLICATIONS

C090-15

DEFLECTION MEASUREMENT DEVICE

STANDARDS: EN 14488-3 | ASTM C1609, C1018

This device is fixed directly on the fiber reinforced concrete beam under test.

The device is placed between the loading bearers of a flexure frame or of a flexure device in a compression frame.

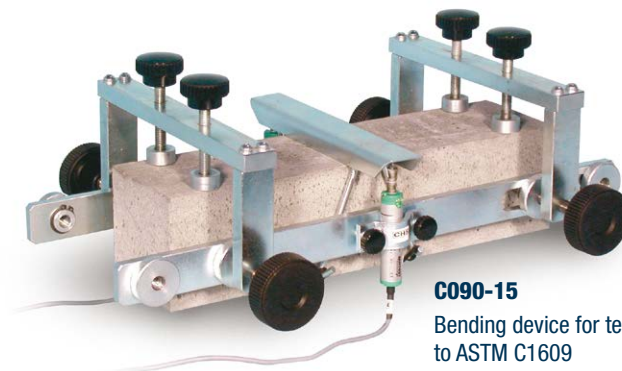
The test is performed by applying a flexural load to the concrete beam with load and displacement control and with automatic deflection measurement of the loaded specimen.

It is possible to test fibre reinforced concrete beams 100x100x400 or 500 mm and 150x150x500 or 600 mm dimensions.

The deflection device is steel made with chromed finishing; it is supplied complete with transducer holders, vertically positioned on the two opposite sides of the beam, but without the two transducers, for the measurement of deflection (mod. S336-11), and without the fork form transducer (mod. C090-16) to be ordered separately.

Dimensions: 300x450x300 mm

Weight: 8 kg approx.



C090-15
Bending device for testing
to ASTM C1609

S336-11

DISPLACEMENT TRANSDUCER, HIGH PRECISION

STANDARDS: EN 14488-3 | ASTM C1609, C1018

To be attached to the device C090-15 for the measurement of deflection and determination of toughness on fibre reinforced concrete beams. Travel: 10 mm

Complete with cable and connector.

Two transducers are required.

C109-15N

FIRMWARE/SOFTWARE for:

- Measurement of deflection on fibre reinforced concrete beams.
- Determination of toughness, first crack strength and ductility.
- Energy absorption test on sprayed specimens. (see p. 283)

STANDARD: EN 14488-5

C109-14N

FIRMWARE/SOFTWARE for flexural strengths (first peak, ultimate and residual) EN 14488-3 (see p. 18).



C090-18

C090-20

C090-16

FORK FORM TRANSDUCER

STANDARDS: EN 11039-2, EN 14651

For the measurement of the Crack Mouth Opening Displacement (CMOD) and the Crack Base, Medium and Tip Opening Displacement (CTOD). Measuring range: 5 mm

Complete with cable and connector.



EN 14651 Clip gauge device

C090-18

DATUM BLOCK, to be glued on the lower side of the concrete beam for the first crack strength test (CMOD). Pack of 24 pieces.

C090-20

DATUM BLOCK, square, to be glued on the concrete beam surface for the deflection measurement on the two opposite sides (CTOD). Pack of 24 pieces.

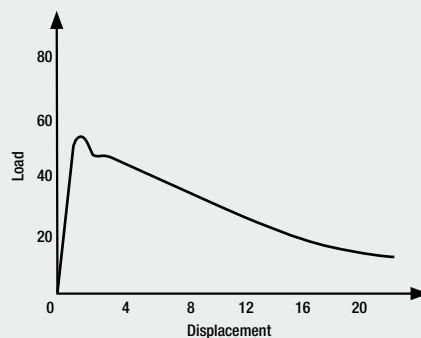
FIBER REINFORCED CONCRETE AND SHOTCRETE

In order to improve concrete performance in the plastic state, macrofibers are added to the concrete mix to increase the post-crack bending strength. This process improves the capacity of the material to absorb energy after cracking (toughness property). There are basically two test methods of the American Society of Materials Testing (ASTM) for evaluating the toughness of fiber-reinforced concrete:

ASTM C1609 for beams and ASTM C1550 for round panels. The European Committee for Standardization (CEN) proposes the method **EN 14651 for beam specimens and EN 14488-5 for square panels.**

Fibers-Reinforced Concrete Beam Specimens

The test evaluates the mechanical bending properties derived from the FRC in terms of area under the curve. This provides an indication of the **energy absorption capacity** (better known as **toughness**) of the beam and its magnitude depends directly on the geometric characteristics of the beam itself, with consideration of the applied load. The flexural test result can be represented by the load-deflection curve and index according to C1609; Or between the load and crack opening (CMOD, Crack Mouth Opening Displacement) of a notched beam, according to EN 14651.



Load – Displacement curve according to EN 14651

Fibers-Reinforced Concrete and Shotcrete Panel Specimens

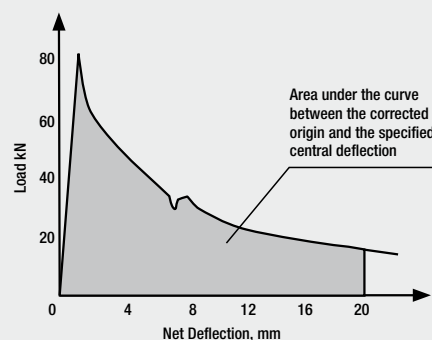
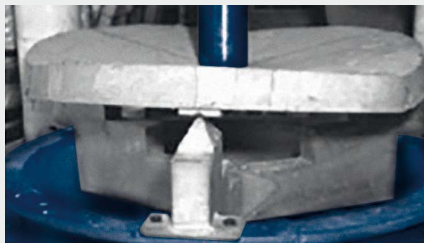
Since real structures are characterized by a high degree of hyperstaticity, whereby the redistribution of the stresses generates larger areas of fracture and therefore more energy absorbed, specimens with larger fracture areas can be required (such as large beams or panels).

The toughness is evaluated through the records of the load-displacement curve, where the load is monitored until a preset value is achieved. With the flexural test on square panels according to EN 14488-5, the concrete specimen rests on a rigid square frame and is loaded through a square steel block; In this case the sample is subjected to a previously set displacement level.

Accordingly to the above, toughness can be specified as the energy absorbed for a given displacement.

On the other hand, the ASTM C1550 proposes a circular panel, better known as "Round Determinate Panel (RDP)".

In this reference test, the sample rests on symmetrical steel ball pivots (120°), resulting in a statically determined scheme.



Test on RDP and Load-deflection curve according to ASTM C1550

As the loading process develops, the strain is recorded in the center of the panel, so as it is possible to plot the load-deflection curve, which area is subsequently integrated, to obtain the energy- deflection curve.

I MEASUREMENT OF DEFLECTION ON FIBRE REINFORCED CONCRETE BEAMS 100X100X400(500) MM AND 150X150X500(600) MM DURING FLEXURE TEST.

STANDARDS: EN 14488-3 | ASTM C1609, C1018

I DETERMINATION OF TOUGHNESS, FIRST CRACK STRENGTH (CRACK OPENING) AND DUCTILITY OF FIBRE REINFORCED CONCRETE. STANDARDS: EN 11039-2, EN 14651

I FLEXURAL STRENGTHS (FIRST PEAK, ULTIMATE AND RESIDUAL) OF FIBRE REINFORCED BEAM SPECIMENS.

STANDARD: EN 14488-3

The equipment can be used **only** with the Servo-Plus Evolution machines.

Connected to the **Servo-Strain** Software/Firmware mod. C109-15N (see p. 283) for the automatic management of load and displacement.

It is necessary to contact Matest representative for the appropriate machine selection according to the FRC application.

The equipment consists of:

C090-15

DEFLECTION MEASUREMENT DEVICE

STANDARDS: EN 14488-3 | ASTM C1609, C1018

This device is fixed directly on the fiber reinforced concrete beam under test. The device is placed between the loading bearers of a flexure frame or of a flexure device in a compression frame.

The test is performed by applying a flexural load to the concrete beam with load and displacement control and with automatic deflection measurement of the loaded specimen.

It is possible to test fibre reinforced concrete beams 100x100x400 or 500 mm and 150x150x500 or 600 mm dimensions.

The deflection device is made with chromed finishing; it is supplied complete with transducer holders, vertically positioned on the two opposite sides of the beam, but **without** the two transducers, for the measurement of deflection (mod. S336-11), and **without** the fork form transducer (mod. C090-16) to be ordered separately.

Dimensions: 300x450x300 mm

Weight: 8 kg approx.

S336-11

DISPLACEMENT TRANSDUCER, HIGH PRECISION

STANDARDS: EN 14488-3 | ASTM C1609, C1018

To be attached to the device C090-15 for the measurement of deflection and determination of toughness on fibre reinforced concrete beams. Travel: 10 mm

Complete with cable and connector.

Two transducers are required.

C109-15N

FIRMWARE/SOFTWARE for:

- Measurement of deflection on fibre reinforced concrete beams.
- Determination of toughness, first crack strength and ductility.
- Energy absorption test on sprayed specimens. (see p. 18)

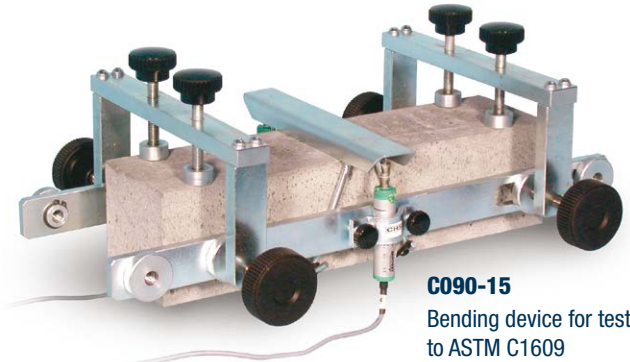
C109-14N

FIRMWARE/SOFTWARE for flexural strengths (first peak, ultimate and residual) EN 14488-3 (see p. 18).



C090-18

C090-20



C090-15

Bending device for testing to ASTM C1609

C090-20

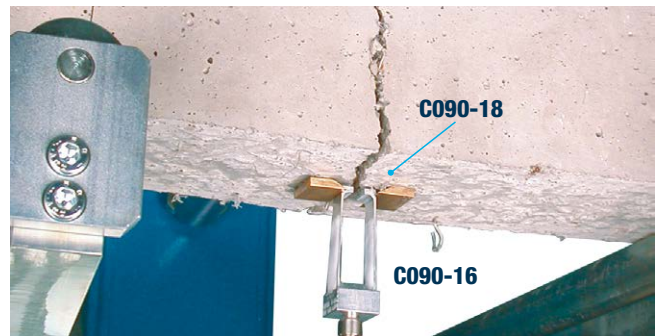
DATUM BLOCK, square, to be glued on the concrete beam surface for the deflection measurement on the two opposite sides (CTOD). Pack of 24 pieces.

C090-16

FORK FORM TRANSDUCER

STANDARDS: EN 11039-2, EN 14651

For the measurement of the Crack Mouth Opening Displacement (CMOD) and the Crack Base, Medium and Tip Opening Displacement (CTOD). Measuring range: 5 mm Complete with cable and connector.



EN 14651 Clip gauge device

C090-18 DATUM BLOCK, to be glued on the lower side of the concrete beam for the first crack strength test (CMOD). Pack of 24 pieces.



C090-07N + C090-13 + C109-15N + C090-15 + S336-11
Servo-controlled machine

ENERGY ABSORPTION TEST ON SPRAYED CONCRETE SPECIMENS

STANDARDS: EN 14488-05 | UNI 10834

The equipment can be used **only** with the flexure Servo-Plus Evolution testing machine mod:

C090-07N Flexure **high stiffness** 200 kN capacity

C095N Flexure **multipurpose** 320 kN capacity

C096N Flexure **polyframe** 360 kN capacity.

Connected to the automatic servocontrolled system of load and displacement **Servo-Strain** mod C109-15N (see p. 283)

The equipment consists of:

C109-15N

FIRMWARE/SOFTWARE for:

- Measurement of deflection on fibre reinforced concrete beams.
- Determination of toughness, first crack strength and ductility.
- Energy absorption test on sprayed specimens.

(see p. 18)

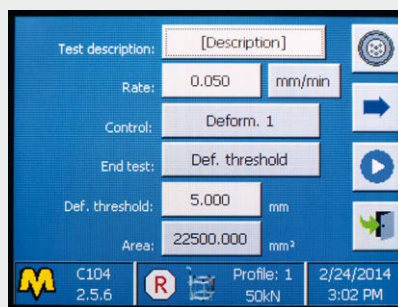


C090-07N + C109-15N + C090-14 + S336-14 + C090-19 + C104-04

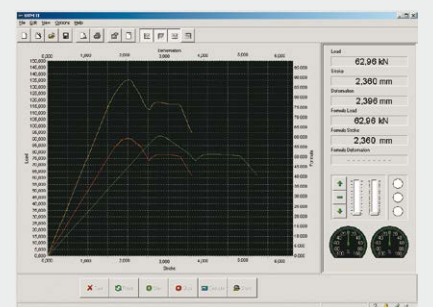
Test on square panels according to EN 14488-5



C109-15N Test result



C109-15N Set up of deflection



C109-15N Test graph

Software for real time test plot and result determination

C090-14 SQUARE BASE FRAME

Dimensions 500x500 mm, complete with upper loading element, for energy absorption tests on sprayed concrete specimens.

C090-19 HOLDER FOR TRANSDUCER

To be fixed to the high stiffness frame with square base.

S336-14 DISPLACEMENT TRANSDUCER, HIGH PRECISION

To be fixed to the high stiffness frame equipped with the square base.

Travel: 50 mm

Full bridge at 350 Ohm

Independent linearity: < 0.1%

Standard sensitivity: 2 mV/V

CONCRETE PIPE TESTING MACHINE

Designed and manufactured to test concrete sewer and drain pipes used in drainage works, water and irrigation supply systems etc.
STANDARD: EN 1916 comparable to ASTM C301, C497 | BS 5911 | DIN 4035

The machine is composed of two parts:

- Electro-Hydraulic loading and control system
- Testing frame, steel made

C109-09N ELECTRO-HYDRAULIC LOADING AND CONTROL SYSTEM, 1000 KN CAPACITY

- Double action alloy steel ram + cylinder.
- Ram travel: 400 mm
- The ram is ground.
- Upper attachment for steel frame cross-beam coupling.
- Spherical seat fixed to the ram for an uniform loading.
- Hydro-Plus Evolution loading and control cabinet, complete with hydraulic multipiston power pack group, maximum pressure safety valve, decompression valve, oil flow control valve granting smooth and accurate load pace.
- Computerized graphic display **Cyber-Plus Evolution** unit mod. C109N (technical details: see p. 000) with software for the acquisition, visualization, processing, printing and saving of the test data and certificates.
- Electric load cell 1000 kN capacity, for accurate load measurement directly from the ram.
- Two flexible high pressure hoses, to connect the cylinder to the hydraulic power pack.

Power supply: 230V 1ph 50Hz 1000W

Dimensions: 500 x 530 xh 1300 mm

Weight: 150 kg approx.

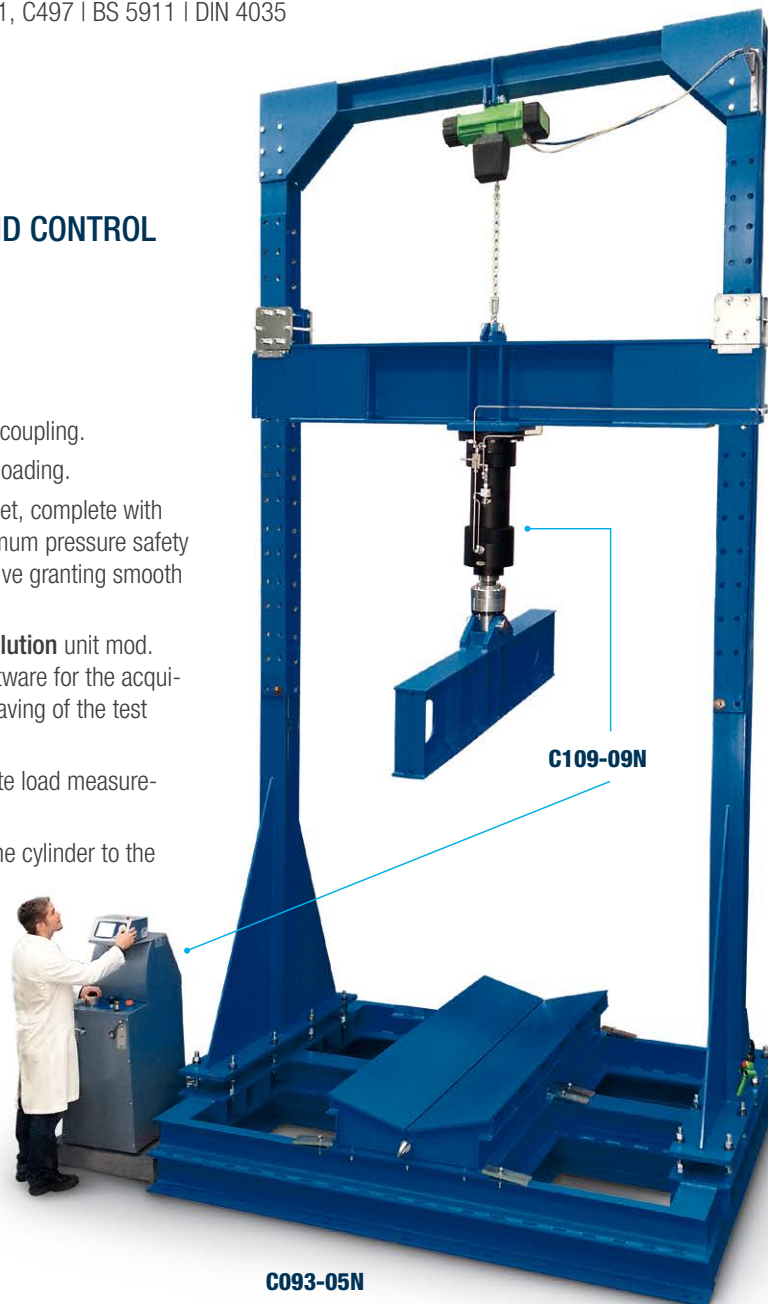
C093-05N TESTING FRAME, STEEL MADE

- Pipe max. diameter (external): 2600 mm
- Pipe min. diameter (external): 450 mm
- Pipe max. length: 2500 mm
- Lower bearers: 2500 mm long
- Upper crossbeam: 2500 mm long
- Frame of structural steel, bolted together with high strength bolts, so it can be easily assembled/disassembled for delivery or for site displacements. The frame has to be locked to a concrete base to be prepared by the customer.
- Two upper crossbeams, raised and lowered by a motor two speed operated winch. The upper frame crossbeam is locked in position by pins inserted through the columns.
- Two lower bearers supporting the pipe to be tested. The bearers are supplied both flat and "V" shaped as requested by the EN 1916 Spec.
- Upper loading beam, floating on a seat.

Power supply of the winch: 230/400V 3ph 50Hz 2000W

Frame dimensions: 3700x2500x6900 mm approx.

Weight: 7000 kg approx.



Note:

The testing frame is delivered disassembled and has to be mounted on site following the instructions. The customer can also manufacture locally the testing frame, and purchase the loading/control system only.

Testing frames with different capacity and features can be manufactured as per customer's requirements.

Quoted testing frame cannot be sold in the CE markets.



C109-09N detail

UNIVERSAL FLEXURAL AND TRANSVERSE MACHINE 150 kN CAPACITY

FOR FLEXURAL TESTS ON CONCRETE BEAM SPECIMENS MAX. SIZE 200X200X800 MM, FLAT BLOCKS, FLAGSTONES, KERBS, TILES, SLABS, MASONRY UNITS, PIPES, AND ANY TYPE OF MATERIAL HAVING MAX. SIZE 550XH550 MM (LOWER ROLLERS MAX. LENGTH 1325 MM)

STANDARDS: EN 12390-5 | EN 1340:4 | ASTM C78, C293 | AASHTO T97 | BS 1881:118, 6073-1, 7263

150 kN CAPACITY

MAIN FEATURES

- Vertical daylight between upper/lower rollers: max. 825 - min. 65 mm adjustable each 76 mm by hand winch with counterweights
- Rollers dimensions: Ø 40x613 mm
- Complete with 4 adjustable and articulated rollers for two point loading
- Distance between lower rollers from 75 to 1325 mm
- Distance between upper rollers from 75 to 575 mm
- Ram travel 110 mm approx.
- Simple action piston with counterweights to optimize frictions
- Power supply: 230V 1ph 50Hz 750W
- Dimensions: 970x1400x2000 mm
- Weight: 800...850 kg approx.



INVERTER

Details, p. 223

BARCODE

Details, p. 223

C093-03N + PC

UNIVERSAL FLEXURAL 150 kN capacity

LOAD MEASURING SYSTEM

MODEL	Motorized	Cyber-Plus Evolution mod. C109N (p. 224)	Servo-Plus Evolution mod. C104N (p. 224)	Digitec mod. C108N (p. 219)	Autotec mod. C098N (p. 219)
C093-02N	▼	▼			
C093-03N	▼		▼		
C093-02D	▼			▼	
C093-03A	▼				▼

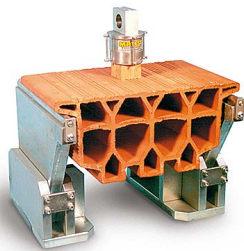
ACCESSORIES FOR UNIVERSAL FLEXURAL 150 KN

C091-13 UPPER TAMPER (steel made), for concrete KERBS tests. The tamper is mounted on a rotating coupling and fixed to the upper part of the machine to apply a flexural strength on three points on the kerb, without any torsional stress. STANDARD: EN 1340



C091-13

C093-11 DEVICE for flexural tests on clay blocks for flooring. STANDARD: EN 15037
UNI 9730-3



C093-11

C127N GRAPHIC PRINTER on thermo-paper on board

C115-01 TWO WAY HYDRAULIC VALVE, connected to the motorized pumping unit of the machine to activate a second frame. Technical details: see p. 318



C115-01

C097-01 DUAL LOW CAPACITY DIGITAL RANGE, complete with appropriate pressure transducer. Range selectable from 10 kN to 100 kN. Technical details: see p. 313



C097-01

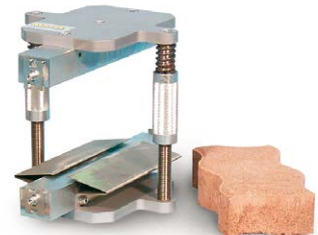
C097-05 CALIBRATION CLASS 1, starting from 1% of the full range. With a special calibration procedure it is possible to grant Class 1 practically on the full range of the flexural machine.

C100 SPLITTING TENSILE test device for cylinders. EN 12390-6 | ASTM C496
Technical details and other models: see p. 314



C100

C103 SPLITTING TENSILE test device for self blocking pavers and cubes. EN 1338, 12390-6
Technical details: see p. 314



C103

E170 COMPRESSION DEVICE to test mortar specimens 40.1x40 mm EN 196 | ASTM C349
Technical details and other models: see p. 315



E170

E172-01 FLEXURE DEVICE for mortar prisms 40.1x40x160 mm. EN 196 / EN ISO 679 (it can be used only with the dual low capacity digital range 0-15kN).
Technical details and other models: see p. 428



E172-01

C099N  NEW

INVERTER DEVICE
Applicable only on Cyber-Plus and Servo-Plus Evolution machines.
Technical details: see p. 223



C099N

SOFTWARE for DIGITEC / AUTOTEC or CYBER / SERVO PLUS models

C109-16 (N)*	SOFTWARE for flexural tests on clay blocks
C123 (N)*	SOFTWARE Servonet for remote control through PC
C109-11 (N)*	SOFTWARE for flexural tests
C109-12 (N)*	SOFTWARE for splitting tensile

Technical detail: see p. 18

(N)* for Cyber - Servo Plus models.

UPGRADING OPTION: COMBINED TWO FRAMES GROUP

All motorized compression testing machines listed in the previous pages can be upgraded with an hydraulic two ways distribution valve for connection and control (alternative, and non-simultaneous) to a second frame, like for example flexural frame or cement compression frame, with obvious functional and economic advantages (especially in the digital solutions).

A hydraulic two ways distribution valve may activate the standard frame or the second combined frame by using only one hydraulic pressure source.

The load of the second combined frame is measured by using one of the channels foreseen on the readout unit connected to the specific pressure transducer fixed on the second frame.

The additional combined frame is supplied complete with a hydraulic two way distribution valve, specific pressure transducer connected to one channel of the digital readout unit, pipes, connectors, accessories, Matest calibration certificate.

The two frames group can be combined with many different solutions, according to the specific exigences of the customer, with the possibility to perform:

- **COMPRESSION TESTS ON CONCRETE CUBE, CYLINDER AND BLOCK SAMPLES**, by choosing the standard compression machine among our different available models from 1300kN to 5000kN capacity (see p. 230...281)
- **FLEXURAL TESTS ON CONCRETE BEAMS, FLAT BLOCKS, FLAGSTONES, KERBS, SLABS, TILES** etc. (see p. 288...303)
- **COMPRESSION AND FLEXURE TESTS ON MORTAR SPECIMENS** (see p. 412...431)

The composition of the combined group is obtained by:

C092-01

FLEXURAL FRAME 150 KN CAPACITY

(technical details and specific accessories at p. 290) complete with pressure transducer, two way hydraulic valve, used in conjunction with a digital compression machine (Digitec, Autotec, Cyber-Plus / Servo-Plus Evolution) (see p. 230...281).

C092-11

FLEXURAL OPEN SIDED FRAME 150 KN CAPACITY

(technical details and specific accessories at p. 292) complete with pressure transducer, two way hydraulic valve, used in conjunction with a digital compression machine (Digitec, Autotec, Cyber-Plus / Servo-Plus Evolution) (see p. 230...281).



C055N

C092-01



C077N

C092-11 + C091-12

C092-15 FLEXURAL HIGH STIFFNESS FRAME

200 KN CAPACITY

(technical details and specific accessories at p. 294) complete with pressure transducer, two way hydraulic valve, used in conjunction with a digital compression machine (Digitec, Autotec, Cyber-Plus, Servo-Plus Evolution) (see p. 230...281)



C077N

C092-15 with accessories

C095N-05 FLEXURAL AND TRANSVERSE MULTIPURPOSE FRAME

320 KN CAPACITY

C-SHAPED OPEN FRAME

Technical details and specific accessories at p. 296.

Complete with pressure transducer, two way hydraulic valve, used in conjunction with a Servo-Plus Evolution compression machine (see p. 230...281).



C095N-05

C092-05 COMPRESSION FRAME ON MORTAR SPECIMENS

250 KN OR 500 KN CAPACITY

(mod. E159D, E159N, E159-01D, E159-01N, E161A, E161N, E161-02A, E161-02N technical details and specific accessories at p. 416...421).

Complete with pressure transducer, two way hydraulic valve, used in conjunction with a digital concrete compression machine (Digitec, Autotec, Cyber-Plus / Servo-Plus Evolution) (see p. 230...281).



C055N

C092-05 / C092-06

C092-06 COMPRESSION/FLEXURAL FRAME ON MORTAR SPECIMENS

Dual range:

0-250 kN (or 500 kN) for compression tests

0-15 kN for flexure tests (mod. E160N, E160-01N, E161-01N, E161-03N technical details and specific accessories at p. 422...425) complete with two pressure transducers, two way hydraulic valve, used in conjunction with a digital concrete compression machine (only Cyber-Plus / Servo-Plus Evolution) (see p. 230...281).

In addition to the proposed groups, it is possible to compose many other alternative testing groups, with the digital display measuring system, like for ex:

- Group formed by two concrete compression frames.
- Group formed by one concrete flexural frame and one mortar compression frame...etc.

Please contact Matest technicians for your needs and you will receive the most suitable solution.



Group Example

C104-03N

SPR

SERVO-PLUS RESEARCH CONTROL UNIT

RESEARCH

HIGH PERFORMANCE SERVO-PLUS SERVO-STRAIN

MAIN FEATURES

- Possibility to perform tests in load, displacement and strain rate control.
- Firmware and software for standard tests already included.
- Fully customizable test ramps.
- Possibility to set different sampling frequencies at desired thresholds during the tests.
- Fully automatic test frame selection between 2 frames, with the possibility to add electrovalves for automatic selection up to 4 frames.
- Complete with inverter device, reducing noise pollution and decreasing heating and mechanical stress (see p. 223)


NEW


C104-03N

INVERTER

Details, p. 223

BARCODE

Details, p. 223



The High Performances Servo-plus Servo-strain Research Control Unit allows to perform tests where the highest performances are required from a control system.

In addition to the common standard tests, which are already included in the control unit firmware, **customized ramp sequences can be set from the user**, measuring and displaying load, stress, displacement and strain related graphs.

It features a servo-controlled proportional valve which allows to promptly react to sudden drops of specimen resistance, keeping all the test parameters set by the user, and high-resolution channels allow to describe accurately the specimen behavior during such drops.

The **possibility to pre-set different sampling frequencies at desired thresholds during the tests**, makes possible to avoid the post processing phase where customers filter and reduce the number of data where high sampling frequency is not needed, that is when specimen behavior is almost constant.

This control unit is suitable also for dynamic tests, at low frequencies up to 0.1 Hz.

All these possibilities make this control unit the best choice for research laboratories that need to perform tests not yet described by any standard.

The control unit is supplied without PC and printer, to be ordered separately.

Power supply: 230V 1ph 50-60Hz

Dimensions: 650x660x1260 mm

Weight: 90 kg approx.

HYDRAULIC SYSTEM SPECIFICATIONS

- Max hydraulic pressure: 700 bar
- 4 pistons pump granting oil supply from 0.05 to 1.35 l/min
- Forced ventilation oil cooling system
- Pump oil filter with automatic alarms in case of low oil level or dirty oil filter
- Servo controlled proportional valve with high control frequency
- 2 electronic valves to automatically select the test frame
- Inverter device

HARDWARE AND FIRMWARE SPECIFICATIONS

- 8 channels, each one able to control the test and each one suitable to connect load sensors (load cells or pressure transducers), displacement transducers (potentiometric, full bridge, LVDT, magnetostrictive) and deformation transducers (extensometers, strain gauges)
- Each channel effective resolution 19-bit, 524'288 divisions
- Closed loop control with PID parameters adjustable in real time during the test by the user
- Control frequency can be adjusted up to 200 Hz
- 7" LCD touch-screen
- Sampling frequency can be adjusted up to 4 kHz

ELECTRICAL CHARACTERISTICS OF THE CHANNEL CONDITIONERS

- Feed LVDT $\pm 15V$
- Output signal from -2.5 to +2.5V DC
- Data acquisition synchronized on all channels
- Calibration of the 8 channels in divisions (up to 40 steps), with polynomial function which allows the best approximation of readings accuracy over the whole test range

SOFTWARE

- Possibility to control the test by remote via PC
- Software includes the test standards to perform **compression, flexure and splitting tensile tests**
- Rocks and concrete **elastic modulus tests** (see p. 68 and 284) can be performed, either by following the test standards or by setting fully customized cycles.
- **Toughness** of fiber reinforced concrete, energy absorption of sprayed concrete tests can be performed.
- **FRC tests** (see p. 305) can be performed (Deflection, CMOD, CTOD and flexural strength).
- **Triaxial test on rocks and Stress-path test** procedure, if completed with C104NLP system for the lateral pressure application and it is accessories listed at p. 70.

**C096F + E183F + C089F + C104-03N + C104-03P**

C104-03P

KIT of rigid pipes for connection between C104-03N and a flexure frame, needed accessory for research tests on FRC specimens.

C115N

AUTOMATIC HYDRAULIC VALVE

Installed on the pumping unit of the Servo-Plus machines to automatically select one additional testing frame. Upon request, it is possible to connect up to max four different frames. Our technical dept. is at your disposal for any specific demand.

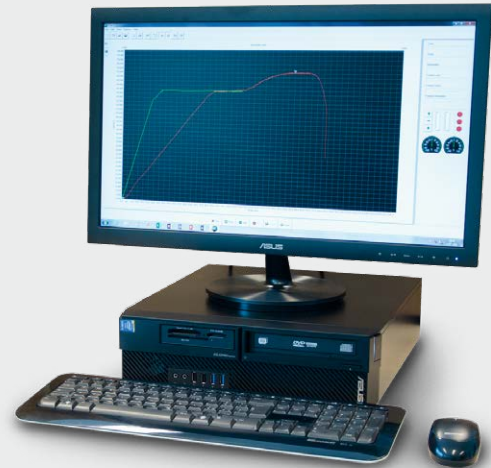


4 x **C115N** (2 x **C115N** + 2 already included in **C104-03N**) 4 electronic valves to automatically select the test frame among 4 frames

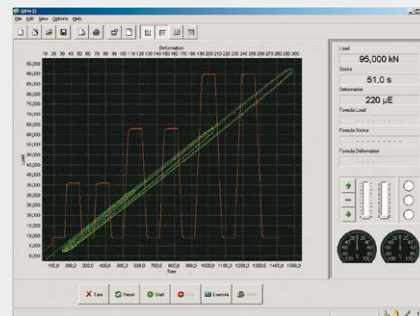
H009-01

PERSONAL COMPUTER

Complete with LCD monitor, keyboard, mouse, connection cables, it is applicable with all the Matest testing machines equipped with digital display measuring system. The PC supply includes the installation and the setting up of the purchased Software (see p. 18).



H009-01



Test with longitudinal and transversal deformations

C127

ON-BOARD GRAPHIC PRINTER

On-Board printer for digital models.



C127 On board graphic printer

C128

BENCH LASER PRINTER

For the graphic and test certificate printing, applicable on all Matest testing machines with digital display measuring system. The connection is direct by parallel interface also without PC.



C128

ACCESSORIES TO COMPRESSION AND FLEXURAL TESTING MACHINES

C097-01 DUAL LOW CAPACITY DIGITAL RANGE

(From 1/3 to 1/20 of the nominal range), complete with **Appropriate pressure transducer**, hydraulic installation and cock, fitted on testing machines equipped with digital display measuring unit. This solution offers very high accuracy also for measurements of low strength, which is necessary to perform compression tests on mortar specimens, flexural tests on concrete beams, split cylinder test on cylinder and cube specimens, tests on kerbs, slabs etc., by utilizing a concrete compression machine.



C097-01

C097-02 DUAL LOW CAPACITY DIGITAL RANGE 0-300 KN

Complete with **strain gage load cell**, cables, fitted on concrete compression testing machines equipped with digital display measuring system.

This solution eliminates the weights of the piston and lower compression platen, paking set frictions etc., granting very high accuracy (Class 1; max. error within $\pm 0.5\%$) in the measuring range 30...300 kN.



C097-02

C105 DEVICE WITH CENTRAL SCREW

Very practical to adjust the light between the compression platens of a machine, according to the height of the specimen to be tested. Recommended solution for machines equipped with big sized platens. This device can be foreseen on all models of concrete compression machines, except High Stability models.



C097-05 CLASS 1 STARTING FROM 1% OF THE FULL RANGE

Applicable only to digital machines. By following a special calibration procedure, Matest is capable to grant the Class 1 practically on the full range, upgrading the machine to be used for a considerable number of applications where low strength value are expected, including:

- Lightweight concrete, or early strength concrete
- Small size samples, soil cement mixtures
- Flexural and tensile tests, slabs, kerbs, etc.

C097-08 OFFICIAL ACCREDIA HARDNESS CERTIFICATE

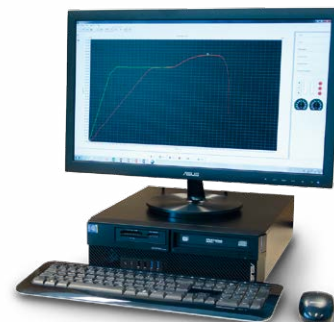
(Equivalent UKAS, ENAC, DAKKS, SAS, COFRAC etc.) of upper and lower compression platens. Minimum hardness: 55 HRC.

TEST REPORT									
Number: 503/091/1/13	Call: 20/11/2013								
OMECO Ref.: 2340	Page 1 of 1								
CUSTOMER Ref.: CMO 89671 251 1/13									
Sample: N 2 PLATES Ø 287mm x 80 mm Identification: A1 - B1 Date of receipt: 27/11/2013 Test standards: UNI EN ISO 6508-1:2008 Equipments: Hardness test machine identified 090-0060									
Obtained results:									
<table border="1"> <thead> <tr> <th colspan="2">ROCKWELL HARDNESS TEST</th> </tr> <tr> <th>Identif.</th> <th>HRC</th> </tr> </thead> <tbody> <tr> <td>A1</td> <td>57.5 - 59.0 - 60.5</td> </tr> <tr> <td>B1</td> <td>55.5 - 59.0 - 61.0</td> </tr> </tbody> </table>		ROCKWELL HARDNESS TEST		Identif.	HRC	A1	57.5 - 59.0 - 60.5	B1	55.5 - 59.0 - 61.0
ROCKWELL HARDNESS TEST									
Identif.	HRC								
A1	57.5 - 59.0 - 60.5								
B1	55.5 - 59.0 - 61.0								
<small>This test report concerns only the samples submitted to the test. If not otherwise indicated, the sampling operation was justified by the Customer. Date of execution: 28/11/2013 At: OMECO Lab. - Albano S. Alessandro - Bg. Note: Measurement uncertainty, we refer to table "incertezza" of Omeo procedure PEM-010 Rev. 6 Ed. 11 (data available on request). The services have to be held under the best conditions: 20 days prior to use of Law 1089 and subsequent laws and 8 months (or more) in case of other tests.</small>									
<table border="1"> <tr> <td>Operator:</td> <td>Technical Manager:</td> </tr> <tr> <td>Operator:</td> <td>Operator:</td> </tr> </table>		Operator:	Technical Manager:	Operator:	Operator:				
Operator:	Technical Manager:								
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C097-08

H009-01 PERSONAL COMPUTER

Complete with LCD monitor, keyboard, mouse, connection cables, it is applicable with all the Matest testing machines equipped with digital display measuring system. The PC supply includes the installation and the setting up of the purchased Software (see p. 18)



H009-01

C128 BENCH LASER PRINTER

For the graphic and test certificate printing, applicable on all Matest testing machines with digital display measuring system. The connection is direct by parallel interface also without PC.



C128

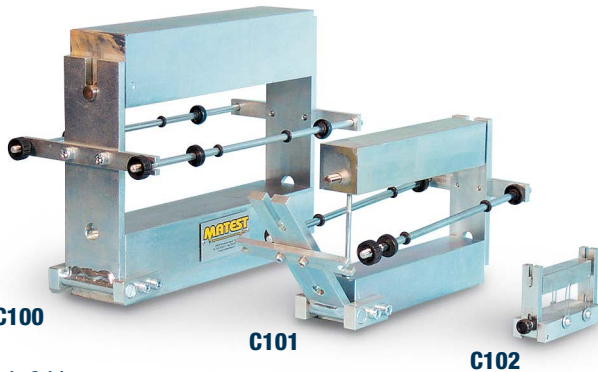
ACCESSORIES TO COMPRESSION AND FLEXURAL TESTING MACHINES

SPLITTING TENSILE TEST DEVICES

For cylindrical specimens.

STANDARDS: EN 12390-6 | ASTM C496 | NF P18-408

Model	Cylinders Ø x height mm	Weight kg	Height mm
C100*	150x300, 160x320, 6"x 12"	20	280
C101*	100x200, 110x220, 4"x 8"	12	220
C102*	40 x 80	1	90



C101-01* SPLITTING TENSILE TEST DEVICE

For cylindrical specimens from Ø 100x200 mm (4"x8") to Ø 160x320 mm (6"x12").

The base is equipped with flat springs centering and keeping in position the specimen.

Two columns with adjustable height sustain the upper plate by two springs.

This item is an alternative solution to mod. C100 + C101

Dimensions: 350x250xh264 mm

Weight: 17 kg approx.



C103* SPLITTING TENSILE TEST DEVICE

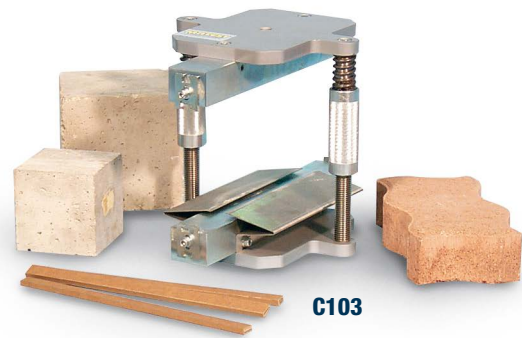
Used to perform tests on concrete cube specimens 100 and 150 mm and on concrete block pavers.

STANDARDS: EN 12390-6, EN 1338

Dimensions: 350x250x264 mm

Weight: 17 kg approx.

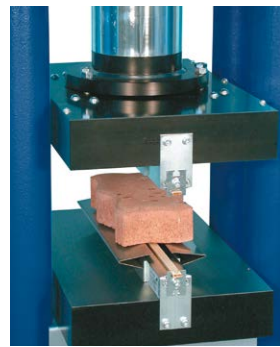
***Note:** To perform the test, these devices have to be used with a concrete compression machine equipped with a low capacity measuring range (see dual low range, p. 313), or with a flexural frame.



C103-01* SPLITTING TENSILE TEST DEVICE

Same as mod. C103 but to perform tests on concrete block pavers having max. dimensions 300 x 500 mm, and for tests on concrete cube specimens 100, 150, 200 mm, and any type of block and prismatic specimens. This splitting device is directly fixed on the compression platens of the block testers having 2000kN or 3000kN capacity.

Weight: 10 kg approx.



C103-01



C103-02

C103-02* SPLITTING TENSILE TEST DEVICE

Same to mod. C103-01, but to be fixed to the flexural frames serie C091-02N (p. 292), C090-06 (p. 294), C095N (p. 296) and C096N (p. 300).

ACCESSORIES

- C100-01** STANDARD: EN 12390-6
PACKING STRIPS, dimensions 4x10x350 mm to be used for splitting tensile tests with mod. C100, C101, C101-01 C103. Pack of 100 pieces.
- C100-02** STANDARDS: EN 1338, EN 12390-6
PACKING STRIPS, dimensions 4x15x350 mm to be used for splitting tensile tests with mod. C103. Pack of 100 pieces.
- C100-03** STANDARDS: EN 1338, EN 12390-6
PACKING STRIPS, dimensions 4x15x540 mm, to be used for splitting tensile tests with the device mod. C103-01. Pack of 100 pieces
- C109-12(N)** SOFTWARE UTM2 (Universal Testing Machine 2)
Licence for TENSILE SPLITTING TESTS on cylinders, cubes and concrete blocks.
STANDARDS: EN 1338, EN 12390-6

General description and technical details: see UTM2 p. 18

ACCESSORIES TO COMPRESSION AND FLEXURAL TESTING MACHINES

C106 FLEXURAL DEVICE FOR TWO POINT AND CENTRE POINT TESTS ON CONCRETE BEAMS 100X100X400/500 AND 150X150X600/750 MM

STANDARDS: EN 12390-5 | ASTM C78, C293 | AASHTO T97
BS 1881:118

Equipped with two lower rollers, one of them articulated, and two upper rollers for third point tests.

- Two fix distances between lower rollers: 300 and 450 mm
- Two fix distances between upper rollers: 100 and 150 mm

It is possible to place in the centre only one upper roller for centre point tests.

To perform the flexural test, this device has to be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01, C097-02) see p. 313

Dimension: 610x200x320 mm

Weight: 27 kg approx.

E170 COMPRESSION DEVICE TO TEST MORTAR PRISMS 40.1X40X160 MM BROKEN IN FLEXURE

STANDARDS: EN 196-1 | ASTM C349

To be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01, C097-02) or with a flexural frame.

Dimensions: Ø 153xh182 mm.

Weight: 12 kg approx.



E170

E171 COMPRESSION DEVICE TO TEST MORTAR CUBE SPECIMENS 50 MM (2")

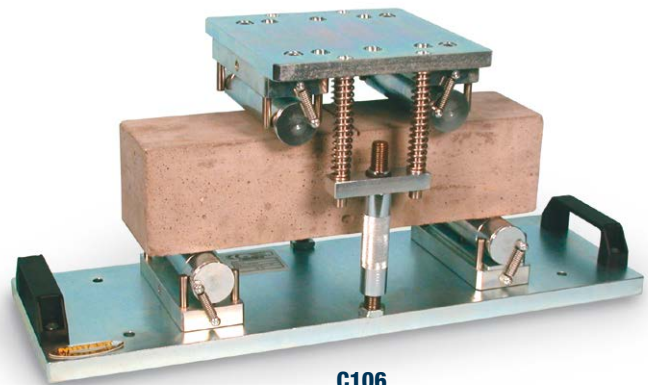
STANDARD: ASTM C109

It is possible to test also cylindrical specimens Ø 50xh50 mm. To be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01, C097-02) or with a flexural frame.

Weight: 12 kg approx.



E171



C106

E171-01 COMPRESSION DEVICE TO TEST MORTAR CUBE SPECIMENS 70.7 MM

STANDARD: BS 4550

It is possible to test also cylindrical specimens Ø 70x70 mm.

To be used with a concrete compression machine foreseen of low capacity measuring range (mod. C097-01, C097-02) or with a flexural frame.

Weight: 12 kg approx.



E171-01

C091-13 CONCRETE KERBS AND SLABS DEVICE FLEXURAL STRENGTH MEASUREMENTS

STANDARD: EN 1340

The equipment consists of a steel tamper mounted on a rotating coupling which is fixed to the upper part of the flexural testing machine (to be selected from serie mod. C090-06, C091, C093 and C095N) to apply a flexural strength on three points on the concrete kerb, without any torsional stress.



C091-13

ACCESSORIES TO COMPRESSION AND FLEXURAL TESTING MACHINES

UNBONDED CAPPING PADS AND RETAINERS

STANDARDS: ASTM C1231 | AASHTO T22, T851

Used for compression tests on concrete cylinder specimens, as an alternative method to the sulphur capping and grinding machine. Two steel capping retainers are applied on the two flat surfaces of the cylinder. Two neoprene pads are put between them, for a better load distribution.

The neoprene pads are available in two models:

- 60 shore hardness pads for expected strength from 10 to 48 MPa
 - 70 shore hardness pads for expected strength over 48 MPa
- The system is not applicable for expected strength lower than 10 Mpa

MODELS

- C107-09** CAPPING RETAINERS (couple) for Ø 100x200 mm cylinders.
- C107-10** CAPPING RETAINERS (couple) for Ø 150x300 mm and 6"x12" cylinders.
- C107-12** CAPPING RETAINERS (couple) for Ø 160x320 mm cylinders.
- C107-18** NEOPRENE PADS (couple) 60 shore A for Ø 100x200 mm and 4"x8" cylinders.
- C107-19** NEOPRENE PADS (couple) 70 shore A for Ø 100x200 mm and 4"x8" cylinders.
- C107-20** NEOPRENE PADS (couple) 60 shore A for Ø 150x300 mm and 6"x12" cylinders.
- C107-21** NEOPRENE PADS (couple) 70 shore A for Ø 150x300 mm and 6"x12" cylinders.
- C107-25** NEOPRENE PADS (couple) 60 shore A for Ø 160x320 mm cylinders.
- C107-26** NEOPRENE PADS (couple) 70 shore A for Ø 160x320 mm cylinders.
- C107-29** NEOPRENE SHEET (couple) 60 shore A.
Dimension: 600x400x12 mm
For tests on blocks.

Note:

The capping retainers can be used only with compression testers having increased vertical clearance of the testing chamber, respectively to minimum 356 mm for the cylinders Ø 150x300 mm or 6"x 12"; and minimum 376 mm for the cylinders Ø 160x320 mm.

C110-30 UPPER COMPRESSION PLATEN + SPHERICAL SEAT

For tests on cylinder specimens diameters 100x200, 150x300, 160x320 mm and 4"x8", 6"x12" (to fix on the testing machine, in replacement of the standard one where requested), to meet the ASTM C39, AASHTO T22 Specifications. Platen dimensions: Ø 165x30 mm

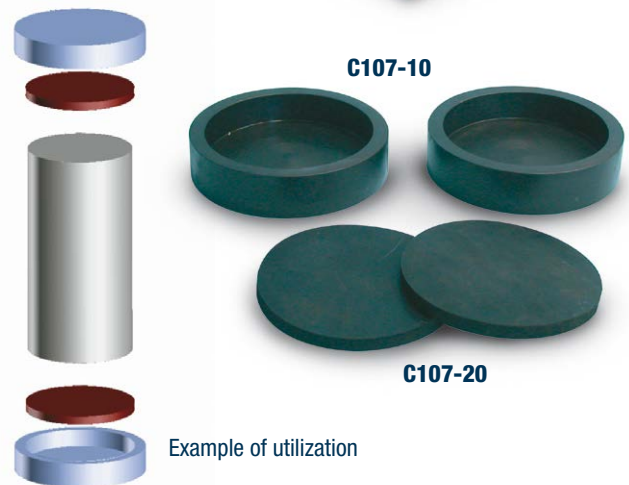
Weight: 10 kg approx.



C110-30



C107-29



Example of utilization

AUTO-CENTERING DEVICE

For cubes 100 and 150 mm side and cylinders Ø 100 and 150 mm. The lower compression platen of the testing machine is marked with a serie of concentric circles to facilitate the correct centering of the specimens. However to grant a rapid and accurate centering of concrete cube and cylinder specimens, this "Auto-Centering" device is recommended.

MODELS

- C107** Auto-Centering Device, to be used with compression machine having platen Ø 216 mm (1300, 1500 and 2000 kN)
- C107-01** Auto-Centering Device, to be used with compression machine having platen Ø 287 mm (3000 kN and high stability machines)



C107

ACCESSORIES AND SPARES TO COMPRESSION TESTING MACHINES

SAFETY GUARDS

Compliant with CE Safety Directive, manufactured of highly resistant transparent polycarbonate material and complete with hinges and lock. The guards are both on front and back sides.



C121

MODELS

- C121** For machines 1200kN, 1300kN and 1500kN
- C121-05** For machines 2000kN (mod C051 to C058-05N)
- C121-01** For machines with block platens 2000kN (C073 to C078N)
- C121-06** For machines high stability 2000kN (C089 to C089-04N)
- C121-10** For machines high stability with block platens 2000kN capacity (mod C089B to C089-22N)
- C121-07** For machines 3000kN (mod C066 to C071N) and high stability 3000kN (mod C089-06 to C089-10N)
- C121-08** For machines with block platens 3000kN (mod C079-01 to C079-06N) and high stability with block platens 3000kN (C089-15 to C089-19N)
- C121-04** For machines 5000kN (mod C086-02 to C086-03N)

C126 BENCH

Used to hold the compression (or flexural) testing frame, to set the machine at a proper height for its utilization.

Alternative solution to a concrete holding base.

Made from heavy welded steel, it can be moved in the laboratory both from front or lateral side by a forklift.

When ordering, please specify the model of testing machine the bench is to be designed.

Weight: 55 kg approx.

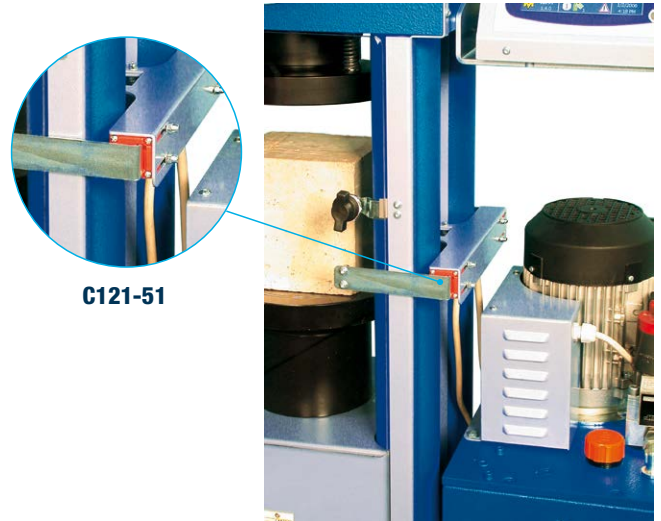


C126

C121-51 DOOR STOP SAFETY SWITCH

This door locking electric switch if fixed on the front door of the compression machine as safety device. It cuts off mains and stops the machine when the door is open.

This locking switch can be installed only on digital compression machines equipped with safety guards with hinges and lock.



C121-51

GAUGE

Diameter 250 mm foreseen for max. load pointer, zero adjustment and mirror face. Spare part for compression and flexure machines. Supplied pre-calibrated.



C118-05

Models	Gauge
C118-14	Range 0 - 1300 kN
C118-03	Range 0 - 1500 kN
C118-04	Range 0 - 600 kN for 1300-1500kN machine
C118-05	Range 0 - 2000 kN
C118-06	Range 0 - 600 kN for 2000kN machine
C118-07	Range 0 - 3000 kN
C118-08	Range 0 - 600 kN for 3000kN machine
C118-09	Range 0 - 150 kN for flexure press C090 serie
C118-10	Range 0 - 150 kN for flexure press C091, C093 serie
C118-11	Range 0 - 1500 kN for tensile press H010
C118-12	Range 0 - 300 kN for cement machine
C118-13	Range 0 - 50 kN for cement machine

ACCESSORIES AND SPARES TO COMPRESSION AND FLEXURAL TESTING MACHINES
**C113
 PUMPING UNIT, HAND OPERATED**

Complete with tank, accessories and connectors.
 Spare part for compression and flexure machines.

Weight: 20 kg approx.

**C114
 PUMPING UNIT, MOTORIZED**

Complete with tank, speed selector, hydraulic cock, accessories and connectors.

Spare part for compression and flexure machines.

Hydraulic pressure: 0...700 Bar

Oil supply from 0.05 to 0.7 litre/min.

Supplied **without** hydraulic oil to be ordered separately (see mod. C114-10N).

Power supply: 230V 1ph 50 Hz 750 W

Weight: 40 kg approx.

**C114-01
 PUMPING UNIT, MOTORIZED**

Identical to mod. C114, but equipped also of a two way hydraulic valve (C115-01) to activate, alternatively, two testing frames.

Supplied complete.

**C114-10N
 HYDRAULIC OIL**

For compression/flexural testing machines.

Can of 20 litres.

**C115-01
 TWO-WAY HYDRAULIC VALVE**

Installed on the pumping unit mod. C114, to activate alternatively two testing frames by using the same pumping unit.

Complete with protection case.

**C115N
 AUTOMATIC HYDRAULIC VALVE ➤ NEW**

Installed on the pumping unit of the Servo-Plus machines to automatically activate alternatively two testing frames. Upon request, it is possible to connect up to four different frames. Our technical dept. is at your disposal for any specific demand.



C115N four frames connection

PRESSURE TRANSDUCER

Used in conjunction with digital units Cyber-Plus C109N, Servo-Plus C104N, Digitec C108N, Autotec C098N.

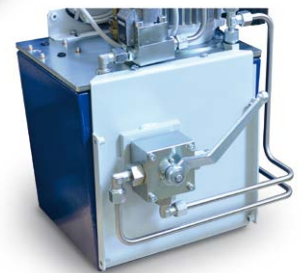
Supplied complete with cable, calibration certificate.

Nominal sensitivity: 2 mV/V. Accuracy: $\pm 0.5\%$

Models	Pressure Transducer
C116-01N	range: 0 - 10 bar
C116-02N	range: 0 - 20 bar
C116-03N	range: 0 - 35 bar
C116-04N	range: 0 - 50 bar
C116-05N	range: 0 - 100 bar
C116-06N	range: 0 - 200 bar
C116-07N	range: 0 - 350 bar
C116-08N	range: 0 - 500 bar
C116-09N	range: 0 - 700 bar
C116-10N	range: 0 - 400 bar
C116-11N	range: 0 - 600 bar
C116-12N	range: 0 - 160 bar
C116-13N	range: 0 - 60 bar



C116-01N...C116-13N



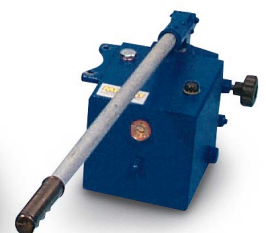
C115-01
 Without case



C114-01



C114



C113

C115-01

ACCESSORIES AND SPARES TO COMPRESSION AND FLEXURAL TESTING MACHINES

PACKING SET

Comprising three elements, for piston/cylinder coupling

MODELS

- C122** For compression machine 1200 kN capacity
- C122-01** For compression machines 1300-1500 kN capacity
- C122-02** For compression machine 2000 kN capacity
- C122-03** For compression machine 3000 kN capacity
- C122-04** For flexure machine 150 kN capacity, C090 serie
- C122-06** For flexure machine 150kN capacity, C091, C093 serie
- C122-07** For flexure machine 200 kN capacity, C090-06 and C090-07 serie
- C122-05** Packing set for the hand-operated pump of testing machines
- E161-15** For Cement testing machines mod. E151 to E161
- E183-11** For Cement machines mod. E181, E183, piston 250kN
- E183-12** For Cement machines mod. E181, E183, piston 15kN



C110-15

C110-15 LOWER COMPRESSION PLATEN



Hardened and rectified, Ø 216x40 mm, complete with distance piece 20 mm high to test cubes 100, 150 mm and cylinders up to Ø 160x320 mm

Weight: kg 11.3 + kg 3

This simple and low cost solution is recommended for an easier use of the **High Stability** Compression Testing Machines and the compression machines equipped with lower platen Ø 287 mm to test cube specimens 100 and 150 mm side and cylinders up to Ø 160x320 mm

It consists of replacing the **heavy** lower compression platen having Ø 287 mm by 60 mm height (weight 30.3 kg) with a smaller platen having only Ø 216 mm by 40 mm height (weight 11.3 kg), together with the suitable 20 mm high distance piece.

This test solution allows a much easier removal and positioning of the lower compression platen when the distance pieces have to be fitted in and out, based on the specimen size the user needs to test (cube 100 or 150 mm or cylinder 150x300 mm or 160x320 mm diameter).

This solution is **not valid** only when a cube specimen 200 mm side has to be tested. In this case the lower compression platen 287 mm diameter must be foreseen to cover the full surface of the 200 mm cube specimen.



C089-02N with **C110-15** light lower plate Ø 216 mm (weight 11.3 kg)



C089-02N with standard lower plate Ø 287 mm (weight 30.3 kg)

ACCESSORIES AND SPARES TO COMPRESSION AND FLEXURAL TESTING MACHINES
COMPRESSION PLATENS

Surface hardened over 55 HRC and finish-grinding.

UPPER PLATEN

Model	Ø mm	Machine
C110	165x30	1200kN
C110-01	216x30	1300kN, 1500kN and 2000kN
C110-02	287x51	3000kN and 2000kN serie C058
C110-03	287x60	2000kN and 3000kN high stability complete with "ball seating"

LOWER PLATEN

Model	Ø mm	Machine
C110-11	165x30	1200kN
C110-12	216x30	1300kN, 1500kN and 2000kN
C110-13	287x51	3000kN and 2000kN serie C058
C110-14	287x60	2000kN and 3000kN high stability

C112-10

UPPER and LOWER COMPRESSION PLATENS, complete with "ball seating", dimensions 510x245x55 mm for tests on blocks.

C112-11

UPPER and LOWER COMPRESSION PLATENS, complete with "ball seating", dimensions 510x320x55 mm for tests on blocks.

C112-05

Kit of 4 handles to lift the lower platen, making the positioning of distance pieces easier.

AS AN ALTERNATIVE
C111-50
DISTANCE PIECE

To be used with compression testers equipped with rectangular platens 510x320 mm to test blocks.

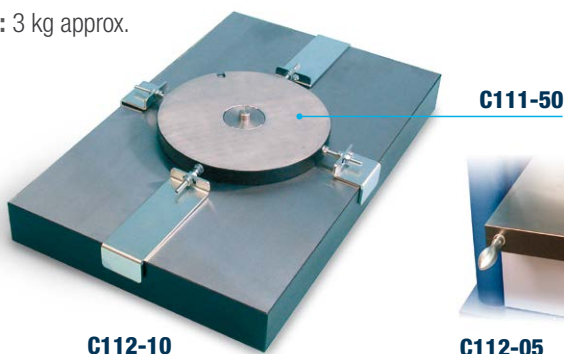
This device eliminates the heavy procedure to lift the lower rectangular platen and to add distance pieces to perform compression tests also on cube specimens.

This distance pieces is fixed over the lower rectangular platen through 4 adjustable couplers allowing a quick, correct and stable fixing.

On the distance piece it is now possible to put the round compression platen Ø 216 or 287 mm foreseen by the specific machine.

This distance piece is finish-grinded (suitable also for high stability testers), has Ø 210 mm, height 20 mm.

Weight: 3 kg approx.


DISTANCE PIECES

Used to reduce the vertical clearance between the compression platens, according to the height of the specimen to be tested, so to avoid the ram to make its max. excursion (approx. 50-55 mm) without having compressed the specimen.

The distance pieces are placed between the ram and the lower compression platen.

MODELS

DISTANCE PIECES Ø 140 mm for machines: 1200kN, 1300kN, 1500kN, 2000kN (C051 to C056N)

C111-30 High 20 mm **C111-21** High 50 mm

C111-03 High 100 mm **C111** High 176 mm

C111-02 High 226 mm

DISTANCE PIECES Ø 200 mm for machines: 2000kN (C058 to C058-05N), 3000kN (C066 to C071N), 2000kN blocks (C073 to C078N), 3000kN blocks (C079-01 to C079-06N)

C111-31 High 20 mm **C111-22** High 50 mm

C111-26 High 76 mm **C111-04** High 126 mm

SLOTTED DISTANCE PIECES Ø 150 mm for central screw machines: 2000kN (C073 to C078N), 3000kN (C079-01 to C079-06N)

C111-27 High 20 mm **C111-23** High 50 mm

C111-28 High 76 mm **C111-08** High 126 mm

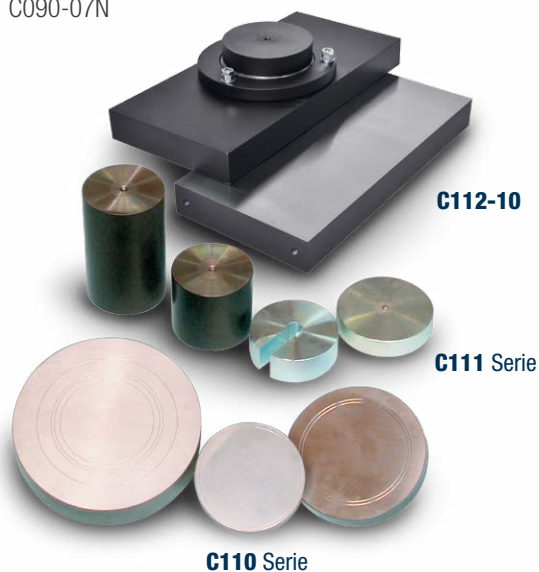
DISTANCE PIECES Ø 210 mm, finish-grinding, for **high stability** machines: 2000kN, 3000kN, 2000kN blocks and 3000kN blocks.

C111-32 High 20 mm **C111-24** High 50 mm

C111-25 High 73 mm

C111-16 DISTANCE PIECE, high 50 mm for flexure machines serie C090

C111-17 DISTANCE PIECE, high 40 mm for flexure machines serie C090-07N


C112-10
C111 Serie
C110 Serie
C112-05
C112-10

S205N

UNITRONIC 50 KN >NEW**UNIVERSAL MULTIPURPOSE FRAME**

FOR COMPRESSION / FLEXURAL TESTS, 50 KN MAX. CAPACITY LOAD
WITH AUTOMATIC LOAD OR DISPLACEMENT/DEFORMATION CONTROL, testing:

Concrete:

- FLEXURE ON BEAMS
- FLEXURE ON TILES

Clay Blocks, Tiles:

- PUNCHING
- TRANSVERSE/DEFORMATION on adhesives for tiles - EN 12002 (see p. 506)

Cement, Asphalt, Metal, Wires, Ropes, Plastic, Papers, Textiles, etc.

Rock and stones, Soil

Unitronic technical details and additional specific tests are described at p. 500

SPECIFIC APPLICATIONS**FLEXURAL TEST WITH CENTRE POINT ON CONCRETE BEAMS AND CLAY TILES**

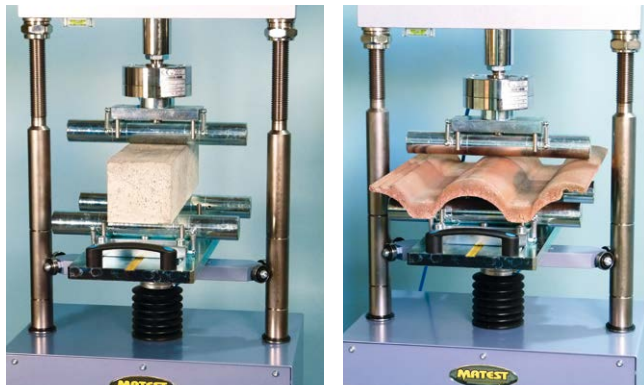
STANDARDS: EN 12390-5 | ASTM C78, C293 | BS 1881:118

Test development with load control.

NEEDED ACCESSORIES

- S337-34** STRAIN GAUGE LOAD CELL, 50 kN capacity
- S205-18** FLEXURE DEVICE for centre point loading to test clay tiles and concrete beams dimensions 100x100x400(500) mm. Consisting of lower beam with two bearers (one articulated) adjustable from 100 to 315 mm, and upper central articulated bearer fixed to the load cell. Bearer dimensions: Ø 38 mm by 300 mm long.
- Weight:** 20 kg approx.

C109-11N SOFTWARE for flexure tests on concrete beams.

**S205-18****S205N + S337-34****PUNCHING TEST ON CLAY BLOCKS**

STANDARDS: EN 15037 | UNI 9730-3

Test development with load control.

NEEDED ACCESSORIES

- S337-32** STRAIN GAUGE LOAD CELL 10 kN capacity.
- C093-11** FLEXURAL PUNCHING DEVICE
- S205-15** HOLDING BEAM for the punching device

**C093-11****C095-05****FLEXURE TEST ON CLAY BLOCK PORTION**

STANDARD: UNI 8942-3, 9730-3

The apparatus consists of:

- digital loading balance 16 kg capacity x 0.1g sens, with software to display and hold the failure load
- flexure device fitted on the balance, with central rotating knob for load application.

The strip sample is got from one internal wall of the clay block. The load is obtained by simply rotating the knob that applies a flexural pressure on the strip sample up to the failure. The balance displays and holds the failure load.

Weight: 14 kg approx.

**C095-05**

S206N
UNITRONIC 200 KN
UNIVERSAL MULTIPURPOSE FRAME

FOR COMPRESSION / FLEXURAL TESTS, 200 KN MAX. CAPACITY LOAD
 AND TENSILE TESTS 50 KN MAX. LOAD

WITH AUTOMATIC LOAD OR DISPLACEMENT/DEFORMATION CONTROL, testing:

- FLEXURE ON CONCRETE BEAMS AND TILES
- COMPRESSION ON MORTAR CUBES 40, 50, 70 MM
- PUNCHING ON CLAY BLOCKS FOR FLOORING

Asphalt, Metal, Wires, Ropes, Plastic, Papers, Textiles, etc.

Rock and stones, Soil

Unitronic 200 kN technical details and additional specific tests
 are described at p. 508


S206N
SPECIFIC APPLICATIONS
FLEXURAL TEST WITH CENTRE POINT

ON CONCRETE BEAMS AND CLAY TILES

STANDARDS: EN 12390-5 | ASTM C78, C293 | BS 1881:118

S205-18

Flexure device with centre point loading to test clay tiles and concrete beams dimensions 100x100x400(500) mm. Consisting of lower beam with two bearers (one articulated) adjustable from 100 to 315mm, and upper central articulated bearer fixed to the load cell. Weight: 20 kg approx.


S205-18
C109-11N

Software for flexural tests on concrete beams (p. 18)

TWO POINT FLEXURAL AND TRANSVERSE TESTS ON CONCRETE BEAMS AND BENDING TEST METHOD ON GLASS-FIBRE REINFORCED CONCRETE

STANDARDS: EN 1170-4, EN 12390-5 | ASTM C70, C29

S205-16

Two-point flexure device to test glass-fibre reinforced cement. Rollers dimensions: Ø 40 by 310 mm long. Lower rollers adjustable from 110 to 310 mm. Upper rollers adjustable from 45 to 120 mm. Weight: 20 kg approx.


S205-16
C109-11N

Software for flexure tests on concrete beams (p. 18)

FLEXURAL TEST ON CONCRETE BEAMS

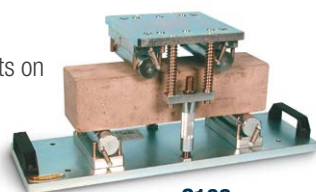
STANDARDS: EN 12390-5 | ASTM C78, C293 | AASHTO T97
 NF P18-407 | BS 1881:118 | UNE 83305

C106

Flexure device (p. 315)

C109-11N

Software for flexural tests on concrete beams (p. 18)


C106
SPLITTING TENSILE TEST ON CONCRETE CYLINDERS

STANDARDS: EN 12390-6 | ASTM C496 | NF P18-408 | BS 1881:117

C101-01

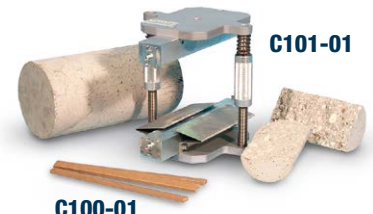
Splitting tensile test device (technical details p. 314)

C100-01

Packing strips (100 pieces)

C109-12N

Software for splitting tensile test (p. 18)


C100-01
SPLITTING TENSILE TEST ON CONCRETE CUBES AND BLOCK PAVERS

STANDARDS: EN 1338 | EN 12390-6

C103

Splitting tensile test device (p. 314)

C100-02

Packing strips (100 pcs)

C109-12N

Software for Splitting tensile test (p. 18)


C100-02
PUNCHING TEST ON CLAY BLOCKS

STANDARD: EN 15037 | UNI 9730-3

C093-11

Punching device for clay block for flooring tests

S205-15

Holding beam for the device

C109-16N

Software for the punching test (p. 18)


S205-11

C094N PORTABLE DIGITAL PRESS, 56 kN CAPACITY

Used for compression tests on small cylinder specimens and core samples up to \varnothing 60x100 mm

The load is applied by a hand pump, and is measured by a **high precision electric load cell** with a digital display unit range 0-56 kN providing:

- 65,000 divisions
- 0.001 kN resolution
- Linearity: 0.05%
- Hysteresis: 0.03%
- Repeatability: 0.02%

The compression platens have \varnothing 65 mm, the upper one has a spherical seat and the vertical daylight is 110 mm

Complete with wooden carrying case, accessories.

Dimensions: 370x320x710 mm

Weight: 25 kg approx.



C094N

ACCESSORY

- A125-01** SET OF TWO HARDENED CONICAL POINTS, to modify the press mod. C094N into the **Point load tester** (see section aggregates mod. A125N p. 64), for the rock strength index test.



A125-01

C095 FLEXURAL TESTING MACHINE, 50 kN CAPACITY

DESIGNED TO TEST:

- CONCRETE TILES: EN 491
- CLAY TILES: EN 538
- FLAT BLOCKS: BS 6073:1 app. C.
- HOLLOW TILES: UNI 2107
- CLAY FLOORING BLOCKS: UNI 9730-3
- PAVING SLABS, ROOF TILES, FLOOR TILES, TERRAZZO TILES, CERAMICS, BRICKS, etc.

The machine consists of: steel frame, one upper bearer and two lower adjustable bearers, mechanical hand-operated screw jack and a 10 kN capacity proving ring to measure the applied load.



C095

TECHNICAL DETAILS

- Proving ring 10 kN capacity, complete with calibration certificate (proving rings with larger capacities up to 50 kN on request p. 000)
- Vertical clearance between the bearers, adjustable from 50 to 300 mm
- Distance between lower bearers, adjustable from 50 to 500 mm
- Bearers dimensions: \varnothing 25x500 mm
- Accuracy: 1% of the applied load

Dimensions: 710x610x1520 mm

Weight: 120 kg approx.

C096 IMPACT FAILURE TEST ON TILES AND PAVING MATERIALS

STANDARD: Art. 3 n° 2234 - 1939

Utilized to verify the quality of paving materials like tiles, ceramics, bricks, floor tiles etc. by the impact method.

The specimen under test is placed on the base of the device which has been previously filled with sand. Then a spherical ball of approx. 1000 gr. is dropped on the tile from a known height, to measure the height under which the specimen will break.

Dimensions:

810x810x1300 mm

Weight: 70 kg approx.



C096

ABRASION MEASURING BASED ON BÖHME

C129 ABRASION TESTER BÖHME

STANDARDS: EN 1338, 1339, 1340 | EN 13748-2, 13892-3
EN 14157 | DIN 52108



C129

The instrument measures a volume loss in a specimen under abrasion test and it's used in tests such as:

- paving stones
- concrete slabs
- slabs made of natural rocks
- natural stone slabs
- terrazzo tiles

The test is performed by positioning a specimen to be verified in a abrasion tester Böhme apparatus on the test track on which has been spread normalized abrasive; the grinding wheel it's made rotate and the specimen submitted to the abrasive load of 294 N for a certain number of cycles.

Before doing a test, establish the specimen's bulk density by measuring weight and thickness.

Perform the test for 16 cycles composed of 22 turn each, calculating at the end a worn as a average loss in volume and weight.

The apparatus is basically composed of:

- Cast iron horizontal disc with a speed of 30 rpm and a diameter of 750mm furnished of a 200mm test track to position a specimen.
- Separate control panel with digital revolutions counter with automatic stop after preset revolutions.
- Specimen's holder.
- Adjustable charger used to produce a force of 294 N \pm 3 N on a specimen.

Power supply: 230V 50Hz 1PH 800W

Dimension: 1500x1000x850 mm

Weight: 320 kg approx.

ACCESSORIES

C129-01N ABRASIVE MATERIAL composed of fused alumina (artificial corundum)
Pack of 25 kg



C129-02

C129-02 MEASURER THICKER REDUCTION, composed of dial gauge with anular contact face with a diameter of 8-5 mm and measuring board.

A113 SKID RESISTANCE AND FRICTION TESTER

STANDARDS: EN 1338, EN 1340, EN 1341, 1342, EN 1339

Used for tests on concrete block pavers, natural stones, and skidding tests on wooden floor.

Technical details: see p. 56



A113

ACCESSORIES

A110-11 METAL BASE PLATE.

A110-13 CLAMPING DEVICE for tests on concrete block pavers (EN 1338); natural stones (EN 1341, 1342); skidding tests on wooden floor (EN 1339).

VERIFICATION OF FORCE TRANSFER

STANDARDS: EN 12390-4 | BS 1881:115 | DIN 51302

The equipment to perform this test is composed of:



C155N DIGITAL MEASURING TESTER

CYBER PLUS EVOLUTION TOUCH-SCREEN

This unit reads simultaneously the four values supplied by the electric strain load cell. The values are memorized, automatically elaborated and visualized, to directly supply the various coefficients resulting by the calculations, and printed on laser printer (accessory C128) directly connected via USB to the tester.

The unit, through the wide display, shows to the utilizer the different test procedures, as requested by previously selected specification (EN, BS, DIN).

At the end of the test, the display automatically visualizes the test results, by informing also if the frame under test is conforming to the requirements of the selected specification as regards the stability (axial transmission of the loads, self-alignment of the seat ball etc.).

The digital readout unit is also foreseen of a fifth digital reading channel allowing to perform load calibration tests on compression machines up to 3000 kN capacity.

Supplied complete with kit of 5 cables and connectors for load cell coupling, accessories, carrying case.

Power supply: 230V 1ph 50Hz

Dimensions: 450x350x160 mm

Weight: 8 kg approx.

C154

ELECTRIC STRAIN LOAD CELL 3000 KN CAPACITY

Consisting of a strain steel cylinder where four balanced strain gauge bridges are centered to measure the deformation on 4 generatrix in relation with two diameters, orthogonal between them, so that both axial and circumferential deformations can be measured.

The cell incorporates a fifth strain gauge utilized for load measurement calibration tests.

Supplied complete with connectors, cables, calibration certificate.

Dimensions: Ø 130 by 200 mm high.

Weight: 18 kg approx.

C154-01 POSITIONING DEVICE

Manufactured with special steel, hardened and rectified, it allows to correctly position the load cell on the lower platen of the compression frame, to carry out the footmeter test as described by the Standards.

Dimensions: 150x150x50 mm

C155-05

CALIBRATION PROCESS of the load cell to the digital tester, complete with Matest calibration certificate.

ACCESSORY (recommended)

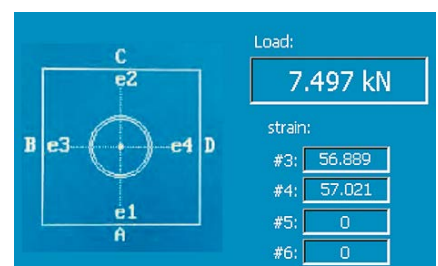
C155-10N SOFTWARE

To download to PC the results with possibility of certificate printout. Supplied on CD Rom for PC installation.



MATEST										
VERIFICATION following BS 1881										
Machine Type	C 069/17			Footmeter			C155 Matest			
Serial No.	1 ord.Exp.5.355			Verified on			05/01/11			
Place / date	Treviolo 10/04/11			Load cell			C/PA 3000 kN			
Resolution	0.2 Class 1			Verified on			09/02/11			
Range from	0 to 2000 kN			Temperature			21.0 C			
UPPER PLATE SELF-ALIGNMENT CHECK										
Lean	e1	R1	e2	R2	e3	R3	e4	R4	avg	
A	0.172	-0.078	0.200	0.071	0.185	-0.012	0.190	0.018	0.187	
C	0.186	-0.008	0.188	0.003	0.188	0.004	0.188	0.001	0.187	
B	0.173	-0.070	0.198	0.065	0.181	-0.031	0.193	0.036	0.186	
D	0.181	-0.031	0.191	0.025	0.190	0.045	0.179	-0.019	0.187	
Max-Min	0.0690 Ok		0.0683 Ok		0.0758 Ok		0.0732 Ok			
Avg. R	-0.0464 Ok		0.0408 Ok		0.0014 Ok		0.0042 Ok			
SELF-LOCKING CHECK										
Pos.	e1	R1	e2	R2	e3	R3	e4	R4	avg	
A	0.238	-0.261	0.235	0.259	0.197	---	0.180	---	0.187	
C	0.241	0.289	0.133	-0.250	0.189	---	0.195	---	0.197	
B	0.175	---	0.190	---	0.143	-0.223	0.232	0.256	0.185	
D	0.180	---	0.184	---	0.237	0.270	0.138	-0.261	0.187	
dAC	0.046 Ok		dBD 0.042 Ok							
SELF-LOCKING CHECK										
Pos.	e1	R1	e2	R2	e3	R3	e4	R4	avg	
A	1.550	-0.170	2.182	0.168	1.903	---	1.837	---	1.868	
C	2.170	0.162	1.964	-0.163	1.887	---	1.850	---	1.868	
B	1.864	---	1.850	---	1.812	-0.136	2.127	0.140	1.868	
D	1.851	---	1.872	---	2.145	0.148	1.995	-0.146	1.868	
dAC	0.028 Ok		dBD 0.024 Ok							

Certificate example



C138N UNIVERSAL DIGITAL TESTER WITH MICROPROCESSOR FOR LOAD CELLS

CYBER PLUS 8 EVOLUTION TOUCH-SCREEN

STANDARDS: EN ISO 376 | EN 10002-3
 UNI 6326 | DIN 51220 | NF P18-411
 ASTM E74 | BS 1610



C140...C142-07



C138N

C140-01

MAIN FEATURES

- Up to 5 decimal points visualization.
- LCD display 320x240 pixel.
- Large internal memory for load cell calibrations.
- Lan and RS232 connections.
- Language selection.

This user friendly menu driven digital display, connected to load cells (mod. C140 to C140-10 and mod. C142 to C142-08) allows to perform an accurate verification of the loads measured from machines under control and it allows to produce the corresponding certificate.

The instrument foresees three memorized cycle verification program composed of ten measurements each.

At the end of the test the unit automatically elaborates the stored value and displays:

Effective applied load;
 Measured load (over three verification cycles);
 Average measured load;
 Accuracy in %;
 Repeatability;
 Relative readability;
 Max error.

The tester's accuracy is $\pm 0.5\%$ of the indicated load.

TECHNICAL SPECIFICATIONS

HARDWARE:

- High resolution converter up to 24 bit.
- Excitation at 5Vcc
- Standard signals: feed + feed - (0V) signal + signal - and shield
- Remote push button to facilitate the readings' confirmation during the calibration and the execution of the cycle of verification.

FIRMWARE:

- Software administration up to ten load cells. It can be used one cell at a time, selectable among with the ones correctly configured and installed
- Load measuring range: kN, kg, lb
- Date of test and/or calibration
- Linearization steps or polynomial
- Digital filter of the first programmable order that is able to filter and settle the value acquired by the electrical cell.

FUNCTIONS:

- Unlimited execution of verification tests
- Code of the device under verification
- Execution of the verification cycles according to the European EN Standards
- Calculation of all the fundamental parameters required: repeatability and accuracy percentage error, residual error on the 0 point, maximum relative resolution and class of the device under verification
- Sending all the data tests to PC, importable in excel
- Direct USB printer connection (PCL compatible printers)
- Administration of tests by Matcal software (accessory).

MAIN PAGE:

- Visualization of all the device data of the selected cell
- Date and time
- Available languages: Italian, English, French, German and Spanish, Polish (other languages on request).

SOFTWARE:

To download to PC the results (accessory C155-10N).

Hardware technical details: see p. 18

The apparatus, and all the accessories, is contained in a strong and practical suitcase, immersion resistant with a depressurisation valve.

Power supply: 230V 1ph 50-60 Hz

Dimensions: 360x300x200 mm

Weight: 5 kg approx.

C138-05 FORCE CALIBRATION PROCESS of one load cell to the digital tester, complete with Matest calibration certificate. EN ISO 376 | EN 10002-3 Class 2

ACCESSORY (recommended)

C155-10N SOFTWARE
To download to PC the results with possibility of certificate printout.

STANDARD LOAD CELLS

TO BE USED WITH THE C138N DIGITAL INDICATOR FOR CALIBRATION OF TESTING MACHINES

STANDARDS: EN ISO 376 | EN 10002-3 Class 2 | ASTM E74 Class A

These load cells are suitable for the calibration of compression testing machines. They consist of a high quality steel block, named sensitive element, where some strains have been fitted: the whole is housed in a stainless steel sheathing. While the load is applied, strains are transmitted to an amplifier (mod C138N) which gives a load digital reading. Further advantages is the possibility to equip different load cells on the same measuring tester and therefore to check all load capacities.

Model	Capacity kN	Dimensions Ø x height mm
C140	25	82x59
C140-01	50	82x59
C140-02	75	82x59
C140-03	100	82x59
C140-04	300	135x160
C140-05	600	135x160
C140-06	1000	135x200
C140-07	2000	135x200
C140-08	3000	135x200
C140-09	5000	180x200
C140-10	500	for tensile tests

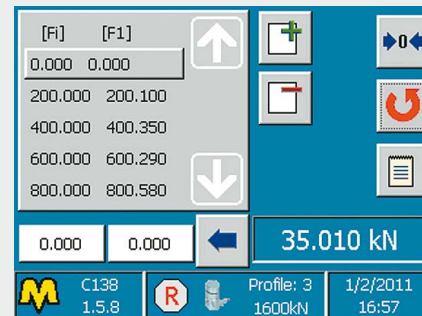
TECHNICAL SPECIFICATIONS

- Full Scale nominal output: 2 mV/V
- Linearity + Hysteresis: $\pm 0.3\%$ of full scale
- Repeatability: $\pm 0.03\%$ of full scale
- CLASS: A

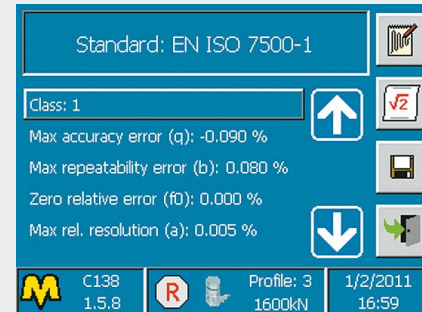


C140...C142-07

SCREEN EXAMPLE:



Main Window



Cell's calibration

STRAIN LOAD CELLS HIGH PERFORMANCE

TO BE USED WITH THE C138N DIGITAL INDICATOR FOR CALIBRATION OF TESTING MACHINES

STANDARDS: EN ISO 376 | EN 10002-3, Class 1 | ASTM E74 Class AA

These electrical strain gauge load cells of high accuracy and stability, are proposed as an alternative to the standard load cells, for verification and calibrations of high precision, repeatability, and are recommended for a professional use, Metrologic Laboratories, SIT centres. To be used with the Digital Indicator mod. C138N.

Model	Capacity kN	Dimensions Ø x height mm
C142	30	100x127
C142-01	100	105x160
C142-02	300	140x160
C142-03	600	140x160
C142-04	1000	150x200
C142-05	2000	135x200
C142-06	3000	135x200
C142-07	5000	135x200
C142-08	600	tensile/compression

TECHNICAL SPECIFICATIONS

- Full Scale nominal output: 2 mV/V
- Linearity + Hysteresis: $\pm 0.1\%$ of full scale
- Repeatability: $\pm 0.03\%$ of full scale
- CLASS: AA

C138-11 to C138-14

CALIBRATION CERTIFICATE, issued by an Official Calibration Institute (ACCREDIA) for one load cell connected to the digital tester mod. C138N

TURBO FORCED MIXERS, PAN TYPE WITH VERTICAL AXIS

STANDARD: EN 12390-2

Used to prepare concrete specimens or mixtures, these mixers ensure an uniform, efficient and fast mixture action. They are of easy and practical utilisation, absorb fewer air during mixing and are suitable for laboratory and field purposes.

TECHNICAL SPECIFICATIONS

- Parallel shaft gearbox (mod. C163, C164, C165)
- Oil bath epicycloidal gearbox (mod. C164-01)
- Wear-resistant steel pan (mod. C163, C164, C165)
- Pan and main parts in wearproof steel (mod. C164-01)
- Safety grid with bag breaker
- Adjustable mixing blades
- Manual discharge mouth on the bottom
- Wheels + tow bar (mod. C163, C164, C165)
- Axle with tire wheels and drive drawbar (mod. C164-01)
- Electric control with magnetothermal overload cutout
- Power supply: 230V 1ph 50Hz (mod C165, C163SP)
- Power supply: 400V 3ph 50Hz (mod C163, C164, C164-01)



C164-01

Models		C165	C163/C163SP	C164	C164-01
Pan capacity (volume)	Litres	100	150	200	300
Yield per mixture	Litres	55	80	135	220
Pan dimensions (Ø x h)	cm	70x30	70x43	80x40	110x40
Motor power	KW	1.1	1.8	4	5.5
Dimensions (Ø x h)	cm	71x115	71x150	110x137	130x135
Weight	kg	115	130	225	420



C164

C163

C165

C165N PAN TYPE MIXER, HIGH QUALITY

STANDARD: EN 12390-2

This High quality mixer guarantees excellent mixing results particularly using the smallest quantities of material.

High level mixing performances for both mortar and concrete (mixtures up to a grain size of 16mm)

Quick and practical drainage through a valve placed in the base of the drum.

Very long lifespan thanks to a solid and robust construction.

Pan capacity: 100 litres

Mixing amount: max. 60 litres

Pan dimension: Ø 642x310 mm

Power supply: 230V 50Hz 1ph

Dimensions: 675x825x1215 mm

Weight: 162 kg approx.



C165N



C165N Detail

C162 PAN TYPE MIXER 56 LITRES CAPACITY

STANDARD: EN 12390-2

This multiframe mixer absorbs fewer air during mixing, requires shorter mixing time and grants a perfect homogeneity in mixtures having a low water cement ratio.

The pan is easily removable by means of a trolley (accessory).

The blades are hardened against wear.

Mixing pan: Ø 640 mm x 330 mm deep

Not sellable in CE markets without security cabinet

(see mod. C162-02)

Power supply: 230V 1ph 50Hz 2 Hp

Dimensions: 800x850x850 mm

Weight: 250 kg approx.



C162

C162-01

ACCESSORIES FOR MOD. C162

C162-01 TROLLEY for fast and easy removal of the mixing pan of the multi-flow mixer

C162-02 SECURITY CABINET, manufactured from steel sheet, conforming to CE Safety Directive.

C161 DRUM TYPE MIXER

Suitable for field mixes of low/medium strength concrete.

Drum volume: 130 litres

Yield: 75 litres of concrete

Power supply:

230V 1ph 50-60Hz - 0.3HP

Dimensions:

720x1320x1280 mm

Weight: 60 kg approx.



C161

TESTING FRESH SELF COMPACTING CONCRETE (S C C)

ERMCO/EFNARC European Guidelines.

FREE FLOW AND TIME FLOW DETERMINATION

SPRAY-TEST

STANDARD: EN 12350-8

To evaluate the deformability of fresh concrete through free flow, and the time needed to spread a 500 mm diameter.

Applicable to concrete with aggregates of 25 mm max. size

C181 SLUMP CONE, galvanized steel, to EN 12350-2 Spec.

C170-01 PLATE, galvanized steel made, dimensions 900x900 mm, with engraved two circles having 210 and 500 mm diameter and central X cross.



FLOW TIME DETERMINATION V-FUNNEL TEST

STANDARD: EN 12350-9

To evaluate the segregation resistance of self-compacting freshly mixed concrete through the flowing speed from a funnel.

Applicable to concrete with aggregates of 25 mm max. size.

C171 V-FUNNEL, **stainless steel** made, stand mounted. The upper edge of the funnel is smooth and reinforced, and the outflow orifice is equipped of an openable seal valve. Dimensions: 640x340x1050 mm
Weight : 20 kg approx.

C171-11 FILLING HOPPER stainless steel made, to pour the concrete into the funnel in one operation, as specified by the Standard.

V127 BOX, polythene made, to collect the concrete.

C262 STRAIGHT EDGE, 460 mm, to level the concrete.



CONFINED FLOWABILITY DETERMINATION

L-SHAPE BOX

STANDARD: EN 12350-10

To determine the confined flowability of self-compacting freshly mixed concrete, and to evaluate the filling and passing ability and segregation resistance.

Applicable to concrete with aggregates of 25 mm max. size.

C172 L-BOX, **stainless steel** made, consisting of:

- container with inside rigid surfaces,
- obstacle of two different interchangeable set of grids:
- one set of 3 vertical bars having \varnothing 12 mm and free light of 41 mm
- one set of 2 vertical bars having \varnothing 12 mm and free light of 59 mm
- gate in guillotine form

Dimensions: 712x280x682 mm

Weight: 40 kg approx.

S200-11 STRAIGHT EDGE, 300 mm long, galvanized steel, to level the concrete.

CONFINED FLOWABILITY DETERMINATION

U-SHAPE BOX

STANDARDS: UNI 11044 | RILEM report N. 23

To evaluate the filling speed and height of the concrete sample under its own self-weight, in the U-shape filling box, to determine the self-compactability. The test is performed with highly fluidised fresh concrete with superplasticiser.

Applicable to concrete with aggregates of 25 mm max. size.

C173 U-BOX, **stainless steel** made, with inside smooth walls, equipped of a flow obstacle formed by four vertical reinforcement bars. The bars have \varnothing 10 mm and the light between them is 35 mm.
A gate in guillotine form splits the vertical portion of the box from the horizontal one.

Dimensions: 480x250x680 mm

Weight: 20 kg approx.

S200-11

STRAIGHT EDGE, 300 mm long, galvanized steel, to level the concrete.

CONFINED FLOWABILITY DETERMINATION

J-RING APPARATUS

STANDARD: EN 12350-12

To determine the flowability, i.e. the flow time and the capability of the self compacting concrete to pass through obstacles.

C174 N

J-RING APPARATUS, galvanized steel made, having rectangular section 30x15 mm and median diameter of 300 mm. The median circumference of the ring is drilled, and n. 16 cylindrical bars \varnothing 18x140 mm are fixed into the holes. The bars have a close distance of 41 mm between them, to simulate a condition of higher density of the reinforced bars.

C174-01N

J-RING APPARATUS, similar to C174N, but having n° 12 cylindrical bars and 59 mm distance between them, to simulate a condition of standard density of the reinforced bars.

C170

SLUMP CONE, galvanized steel, conforming to EN 12350-2 Spec.

C170-01

PLATE, galvanized steel made, dimensions 900x900 mm, with engraved two circles having 210 and 500 mm diameter and central X cross.

C183

VEBÉ CONSISTOMETER

STANDARD: EN 12350-3

The Vebé consistometer method is based on the same principle of the simple slump cone test method, for the determination of the workability of concrete, but it has the advantage of a mechanized action. After removing the slump cone, the concrete undergoes a vibration to determine its slump. Supplied complete.

Power supply: 230V 1ph 50Hz 250W

Dimensions: 260x380x700 mm

Weight: 90 kg approx.



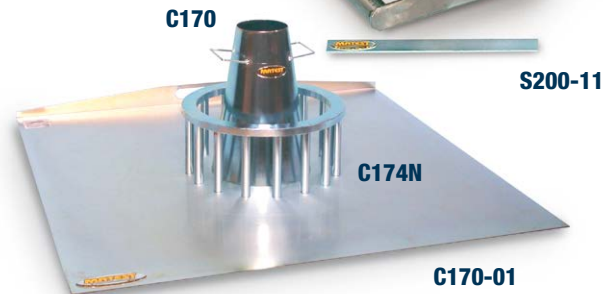
C183



C184N



C173



C170

S200-11

C174N

C170-01

C184N

VIBRATING TABLE (Vebé consistometer)


STANDARD: ASTM C1170-14

For determining the consistency and density of roller-compacted concrete. Similar to mod. C183, but conforming to ASTM C1170-14 Spec. with sliding weight of 50 lbs

*** Power Supply:** 230V 1F 50Hz 180W

Dimensions: 280x400x900 mm

Weight: 110 kg approx.

 ***Note:** The vibrating table is available also at: 230V 60Hz and 110V 60Hz



ACCESSORY for the C184N table

C184-10N SLIDING WEIGHT 20 LBS (that replaces the standard 50 lbs one) + base to fix a cylinder mould \varnothing 6"x12" (optional mod. C258-03) to conform the Vibrating Table to the ASTM C1176-14 Specifications.



C258-03

C184-10N

SLUMP CONE TEST KITS

STANDARDS: EN 12350-2 | EN 12350-8 | ASTM C143
 BS 1881:102 | AASHTO T119 | NF P18-305

SLUMP CONE COMPLETE TEST KITS. Matest proposes different versions:

C180-KIT SLUMP CONE, COMPLETE SET, ideal for laboratory tests including:

- C180-01** Slump Cone, **stainless steel** made
- C180-02** Tamping rod, galvanized steel, Ø 16x600 mm
- C180-03** Slump Cone funnel, galvanized steel
- C180-06** Graduated slump scale **engraved in 0.5 cm** increments with sliding measuring rod
- C180-07** Base, galvanized steel, complete
- V184** Aluminium scoop, 500 cc capacity
- V178-01** Fine wire brush

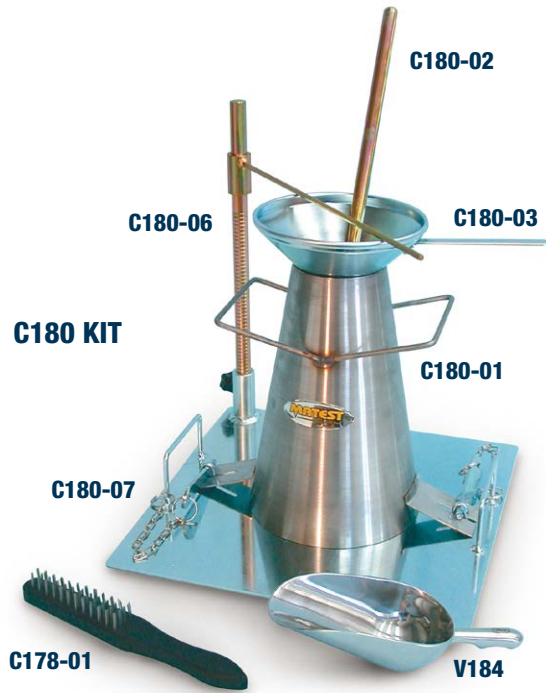
Weight: 10 kg approx.



C178-KIT PORTABLE SLUMP CONE TEST SET, including:

- C181** Slump Cone, **galvanized steel**
- C179-02** **Graduated** steel tamping rod, galvanized, Ø 16x600 mm
- C179-01** Base, manufactured from heavy duty galvanized steel, complete with clamps and measuring bridge which is also used as carrying handle. The slump is measured using the tamping rod having a graduated scale engraved in 1 cm increments. The components of the set are fitted together for easy carrying. Very practical, robust, ideal for site use.

Weight: 8 kg approx.



C182-KIT SLUMP CONE, COMPLETE SET, including:

- C181** Slump Cone, **galvanized steel**
- C180-02** Tamping rod, galvanized steel, Ø 16 x 600 mm
- C180-04** Base plate, galvanized steel
- V176-01** Stainless steel rule, 300 mm long
- V184** Aluminium scoop, 500 cc capacity
- V178-01** Fine wire brush

Weight: 5 kg approx.



C179-KIT PORTABLE SLUMP CONE TEST SET, including:

- C180-01** Slump Cone, **stainless steel** made
- C179-02** **Graduated** steel tamping rod, galvanized, Ø 16x600 mm
- C179-01** Base, galvanized steel, complete with clamps and measuring bridge, as described above.

Weight: 8 kg approx.

Note:

Each component of the kits can be ordered separately. The user can personalize the kit composition for the Slump Cone test.

C182P KIT**SLUMP CONE, PLASTIC**, complete set including:

- C181P** Slump Cone, **plastic**. Max. temperature: 40 °C
Weight: 750 g
- C180-02** Tamping rod, galvanized steel, Ø 16x600 mm
- C180-04** Base plate, galvanized steel
- V176-01** Stainless steel rule, 300 mm long
- V184** Aluminium scoop, 500 cc capacity
- V178-01** Fine wire brush

Weight: 5 kg approx.**ACCESSORY**

- C180-03P** Cone Filling Funnel, **plastic**. Weight: 250 g

 **Note:** Each component of this kit can be ordered separately.

C180-01

SLUMP CONE only, manufactured from **stainless steel**, diameter 100/200 mm, height 300 mm, thickness 1.5 mm

Weight: 2 kg approx.**C181**

SLUMP CONE only, **galvanized steel**, Ø 100/200 mm, height 300 mm, thickness 1.5 mm

Weight: 2 kg approx.**V185-03****SCOOP, STAINLESS STEEL**

STANDARD: EN 12350-1

Used to sample fresh concrete

Capacity: 5 kg of concrete

Dimensions: Ø 125x250 mm

C185**COMPACTING FACTOR APPARATUS**

STANDARD: BS 1881:103

Designed to undertake a more precise and sensitive test procedure than the simple slump test.

The apparatus consists of two conical hoppers mounted on a cylinder. Each hopper has a hinged flange with quick release mechanism and everything is mounted on a rigid steel stand.

The compacting factor is the ratio between the weight of the partially compacted concrete and the weight of the fully compacted concrete. Supplied complete with tamping rod diameter mm 16x600 long.

Dimensions: 500x400x1510 mm**Weight:** 55 kg approx.**V185-03****C185****C182P KIT****C180-01****C181****C180-03P****C181P****C192 KIT**
FLOW TABLE

STANDARDS: EN 12350-5 | DIN 1048

The apparatus comprises a galvanized steel conical mould, Ø 130/200x200 mm, double steel flow table with galvanized top plane, guide device, wooden tamper.

Used to determine the workability of concrete. The top table has a square surface of 700x700 mm, hinged on one side.

Weight: 30 kg approx.**SPARES**

- C192-01** Conical mould, galvanized steel made, Ø 130/200x200 mm

- C192-02** Wooden tamper

**C192 KIT**

C187
K-SLUMP TESTER

STANDARD: ASTM C1362

To determine the degree of compaction and the workability of fresh concrete. Used for in-situ measurements or inside test moulds. Test results can be correlated against the slump values.

Weight: 500 g

C187

C188
C188
WALZ CONSISTOMETER

STANDARDS: EN 12350-4 | DIN 1048

To measure the consistency of fresh concrete. It consists of a metal box with handles 200x200 mm by height 400 mm, painted for rust protection.

Weight: 6 kg approx.

C189
CONCRETE WORKABILITY METER

STANDARD: NF P18-452

The concrete workability meter (also known as plastometer) is designed to test concrete for dynamic workability.

It is suitable for field and laboratory tests to check:

- concrete mix for consistency, especially water content
- optimum proportioning of concrete constituents (sand, gravel, water, cement)
- possible improvement when admixing a plastifier
- comparing two concrete types

The unit consists of a prismatic receiver divided into two unequal volumes by a removable partition, and an electric vibrator.

The fresh concrete is poured into the large volume space, the separating partition is removed, and the vibrator starts automatically.

The test consists in measuring the time required for the concrete to reach a uniform distribution in the receivers

Power supply: 230V 1ph 50Hz 300W

Dimensions: 820x420x410 mm

Weight: 80 kg approx.

C189
C186
KELLY BALL APPARATUS

STANDARD: ASTM C360

Consisting of a hemispherically ended cylinder with guiding frame and a handle graduated in inch, it is used to determine the workability of fresh concrete. The ball is lowered into the concrete and the penetration measured.

It can be used on site or in laboratory.

Cadmium plated for rust protection.

Weight: 15 kg approx.

C186
C190
PLASTICITY METER

Used for quick and easy measurements of the plasticity of mixtures, especially concrete, and so to detect rapidly any excess of water.

The measuring system is related to the shear strength applied by a three blade head to the mixture under test.

It is possible to measure the plasticity at several different points, and directly in the mixture, with multiple checking, and obtained values can be easily compared with the values got by the slump Abrams cone test.

Dimensions: Ø 130x180 mm

Weight: 2 kg

C190

SETTING TIME OF CONCRETE BY PENETRATION

STANDARDS: ASTM C403 | AASHTO T197 | UNI 7123

C213 CONCRETE PENETROMETER

Used to determine the setting time of the mortar fraction in concrete mixes with slump greater than zero, by testing mortar sieved from mix. The apparatus consists of a spring penetrometer (capacity 100 kgf, precision 1 kgf) and six interchangeable stainless steel needle pointers of 16-32-65-160-325-650 mm² area. A sliding ring indicates the reached load on the handle of the penetrometer. Supplied complete with carrying case.

Dimensions: 450x160x70 mm

Weight: 5 kg approx.



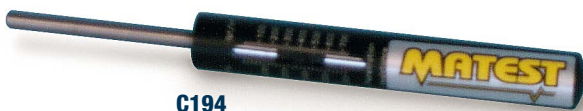
C213

C194 CONCRETE POCKET PENETROMETER

Used for the evaluation of the initial set of the concrete mortar. The penetration plunger has a tip area of 32 sq/mm. It is plunged into the mortar to a depth of 25.4 mm, indicated on the plunger. The resistance expressed in Kpa and Lbf/sq.in. is shown on the marked direct-reading scale.

Dimensions: Ø 25x210 mm

Weight: 400 g



C194

C194-01 CONCRETE POCKET DIAL PENETROMETER

To evaluate the initial set of concrete, and the effect of the retarders in the setting time.

The plunger has Ø ¼" (32.3 sq.mm.); the dial has dual scale: 0-700 p.s.i. and 0-50 kg/sq.cm.

Supplied complete with plastic case.

Weight: 300 g approx.



C194-01

C211 JOISEL APPARATUS Ø 140X220 MM HIGH

STANDARD: LCPC French Method

Used to separate the various elements of the fresh concrete such as cement, sand, aggregates. All made from stainless steel.

Weight: 2 kg



C211

C220 WATER TEST SET FOR CONCRETE MIXING WATER

STANDARDS: EN 1008 | EN 206 | DIN 4030

This kit, utilized to test the water mixing concrete, is composed by different dropping bottles, water-proof colors scales, test strips. It is suitable, to carry out more than 50 analysis of: total or momentaneous pH, magnesium, ammonium, chloride, sulphate, lime dissolving CO₂, carbonate hardness, total hardness etc. Contained in carrying cases.

Weight: 2 kg



C220

C195
AIR ENTRAINMENT METER, WATER COLUMN TYPE
 5 LITRES CAPACITY

STANDARDS: EN 12350-7 | ASTM C231 type A

Made from cast aluminium alloy. It records directly the percentage of air enclosed in freshly mixed concrete by operating according to the air pressure principle.

The instrument is supplied complete with pressure gauge tamping rod and hand pump.

Air content range 0...8% - div. 0.1%

Dimensions: Ø 250x700 mm

Weight: 13 kg approx.

ACCESSORY
C195-01

CALIBRATION CYLINDER to check and calibrate the air meter mod. C195


C195
C195-01
C198
AIR ENTRAINMENT METER, PRESSURE GAUGE TYPE
 7 LITRES CAPACITY

STANDARDS: EN 12350-7 | ASTM C231 type B | AASHTO T152

It consists of an aluminium cylindrical vessel with airtight cover assembly incorporating an air pump, a precision pressure gauge 90 mm dia. and valves.

Capacity: 7 litres.

Air content range: 0 - 100%

Gauge graduations: 0.1% up to 6% of the scale; 0.2% from 6% to 10% of the scale. Lightweight, compact and durable, this meter allows quick clamping system and testing with few pump strokes. It is not affected by change in atmospheric pressures. The container can be used also for unit weight measures of fresh concrete and aggregates. Supplied complete with calibration kit, accessories, robust plastic carrying case.

Dimensions: Ø 250 by 500 mm approx.

Weight: 10 kg approx.

C196
AIR ENTRAINMENT METER, PRESSURE GAUGE TYPE
 8 LITRES CAPACITY

STANDARDS: EN 12350-7 | DIN 1048 | ASTM C231 type B

It consists of an aluminium vessel with built in hand operated pressure pump, connected to the measuring gauge showing directly the air content in percentage.

Air content range: 0...10% div. 0.1% up to 8% and 0.5% over

Dimensions: Ø 250x450 mm

Weight: 12 kg approx.


C196

C197
C197
AIR ENTRAINMENT METER, PRESSURE GAUGE TYPE
 8 LITRES, ELECTRIC

Identical to mod. C196 but with built in automatic electric air compressor giving air pressure, and keeping it constant all along the test.

Power supply: 230V 1ph 50-60Hz

Dimensions: Ø 250x450 mm

Weight: 14 kg approx.

ACCESSORY
C197-01

FILLING HOPPER for the air entrainment meters C196 and C197


C198

DENSITY OF FRESH CONCRETE

C199

UNIT WEIGHT MEASURE, 10 LITRES CAPACITY

STANDARD: EN 12350-6

Used to determine the weight per cubic metre of freshly mixed and compacted concrete.

Made from steel, 4 mm thick, with inside radius between wall and base of 20 mm, with machined rim and base.

Inside diameter 200 by height 320 mm

Weight: 9 kg approx.



C199

UNIT WEIGHT MEASURES

STANDARDS: Comparable to ASTM C29, C138 | AASHTO T19

Made from heavy steel sheet, they are used to determine the weight per cubic metre of freshly mixed and compacted concrete, and as per ASTM Standards also the air content of fresh concrete.



C200...C205-01

ADMIXTURES FOR CONCRETE, MORTAR AND GROUT.

DETERMINATION OF BLEEDING OF CONCRETE

STANDARD: EN 480-4

C199-10

CONTAINER, having \varnothing 250 mm by 280 mm height, complete with cover. **Stainless steel manufactured**, it is used for the determination of the relative bleeding of a fresh concrete sample, using aggregates having max. size of 50 mm.

Weight: 5 kg approx.

ACCESSORY

C199-11

TAMPER, stainless steel made, \varnothing 100 mm



C199-11

C199-10

DENSITY OF HARDENED CONCRETE

STANDARDS: EN 12390-7, EN 1097-6 | BS 812, 1881:114

V085 SPECIFIC GRAVITY FRAME. Technical details: see p. 582

V085-01 CRADLE for holding specimens

V041 DENSITY BASKET \varnothing 200 by 200 mm stainless steel, 3.35 mm mesh size.

 **Note:**

Balances for specific gravity tests: see p. 580



V041

V085

Models	Capacity Litres	Inside diameter mm	Useful height mm	Sheet thick mm	Weight kg
C200	1	108.3	108.6	3	2
C201	2	108.3	217.1	3	3
C201-01	3	160	149.2	3	3.5
C202	5	187.7	180.7	3	4
C202-01	7	187.7	253	3	5
C203	10	265	181.3	4	7
C204	14	265	253.8	4	9
C204-01	15	265	272	4	12
C205	28	345.6	298.5	5	14
C205-01	30	345.6	319.8	5	15

CONCRETE FLOW TABLE

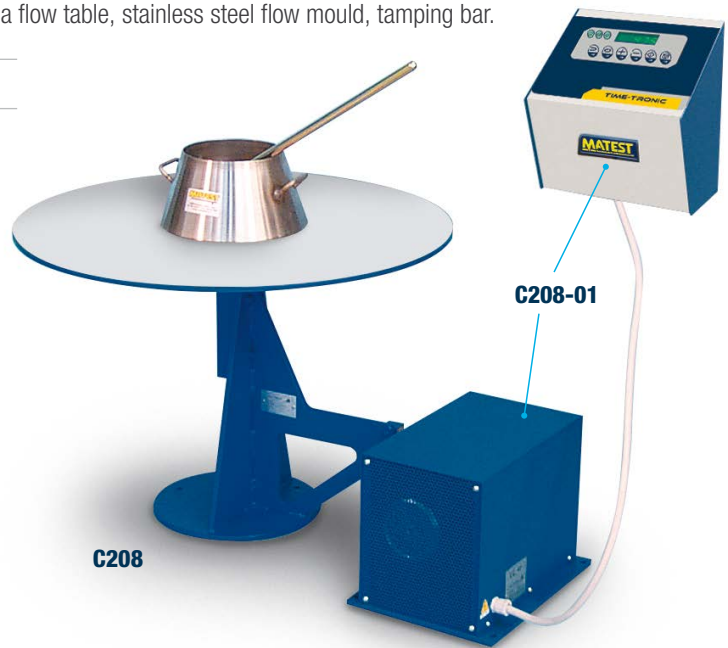
STANDARD: ASTM C124

Used to determine the flow of concrete. The apparatus consists of a flow table, stainless steel flow mould, tamping bar.

MODELS

C208 FLOW TABLE
 Hand-operated by crank handle.
 Table diameter 762 mm
Weight: 100 kg approx.

C208-01 MOTORIZATION KIT to be connected to the flow table mod. C208 and to get it automatic.
 Complete with separate control panel and automatic digital drops counter.
Power Supply: 230V 1ph 50Hz 750W
Weight: 15 kg approx.



C216 FOUR CHANNELS THERMOMETER K-TYPE THERMOCOUPLE



Used to automatically measure and store the temperature of concrete casting during the curing phase.

- The thermometer is provided with four inputs to connect separately four K-type thermocouple probes.
- It can measure and store up to four simultaneous different points at selectable sampling intervals from 1 to 3600 seconds.
- Measuring range: from -100 °C to 1370 °C
- Resolution: 0.1 °C
- Reading selectable: °C and °F
- Display size: 52x38 mm with green backlight (ON/OFF)
- **SD memory card capacity 8Gb, USB/SD adapter**
- Microcomputer circuit provides intelligent function and high accuracy.
- Real time SD memory and Datalogger, built-in Clock and Calendar, real time data recorder.
- Innovation and easy operation, after tests execution, just take away the SD card from the meter and plug into the PC; it download all the measured values and the user can make the further data or graphic analysis.
- Automatic temperature compensation and linear compensation for the full range.
- Auto power off if any button is not pressed within 10 minutes.
- Operating conditions: 0 to 50 °C and less than 85% R.H.

Supplied complete with: 50 meters coil K-type thermocouple, set of 4 probes with male connectors, USB/SD adapter, SD card 8Gb, batteries, carrying case.

Power supply: 6 x 1.5V battery.
Dimensions (of the thermometer):
 177x68x45 mm
Weight: 500 g approx.



C216

SPARE

C216-01 K-Type
 Thermocouple coil (50 meters)

C214 CEMENTOMETER

For the rapid determination of moisture content in wet cement and concrete.

Fast and easy to use; simply insert the prongs into the material being tested,

Accurate and instantaneous readings, digital portable meter.

Ratio range: 0.35 to 0.70 water/cement.

The unit can store over 150 readings.

Data can be recalled via RS-232 interface to using WIN98 and above.

Power: 4AA Batteries

Weight: 2 kg approx.

C214-01 CEMENTOMETER

Same to mod. C214 but with ratio range: 0.25 to 0.5 for low water cement ranges



C214

VERIFICATION OF FLATNESS, PERPENDICULARITY, STRAIGHTNESS AND DIMENSIONS OF MOULDS AND SPECIMENS

STANDARD: EN 12390-1

The appendix of EN 12390-1 Standard calls for a set of instruments to be used for dimensional and tolerance verification of the mould and the specimens got from the same.

V175-03

VERNIER CALIPER, digital, 153x0.01 mm, for dimensional measurements.

V175-03CER

VERNIER CALIPER, digital, 153x0.01 mm, for dimensional measurements, complete with Calibration Certificate issued by an Accredited Laboratory (SIT).

in alternative:

V175-02

VERNIER CALIPER, digital, 200x0.01 mm, for dimensional measurements.

V175-02CER

VERNIER CALIPER, digital, 200x0.01 mm, for dimensional measurements, complete with Calibration Certificate issued by an Accredited Laboratory (SIT).

C250-10

RULE RIGHT ANGLE (square), steel made, 150x100 mm, rectangular section.

C250-12

FEELER GAUGE, comprising a set of strips from 0.05 to 0.50 mm, with blade 100 mm long.

C250-14

RULE (straightedge), 300 mm long.

C250-16

GO-NOT GO GAUGE, for 100 mm cube moulds.

C250-16CER

GO-NOT GO GAUGE, for 100 mm cube moulds, complete with Calibration Certificate issued by an Accredited Laboratory (SIT).

C250-17

GO-NOT GO GAUGE, for 150 mm cube moulds.

C250-17CER

GO-NOT GO GAUGE, for 150 mm cube moulds, complete with Calibration Certificate issued by an Accredited Laboratory (SIT).



Dimensional verification



Flatness verification



Go-not go verification

PLASTIC CUBE, CYLINDER AND BEAM MOULDS **MADE IN MATEST**

These one-piece moulds, very appreciated by the user, are made from hard plastic, strong, light, undeformable; resistant to vibrations shocks and wear. They do not require mounting and dismounting operations, thus saving time and labour. They just require a simple clean and demould oiling before being ready for use again for many times. The specimen is expelled from the mould by compressed air or water.

The moulds: **C223, C224, C230L, C230N, C232N, C228, C229** are produced by Matest and have competitive manufacturer prices.

CUBE MOULDS 150 MM SIDE

The cube moulds 150 mm side can be supplied in three different models, each one with different characteristics and weight.

All the models have a reinforced band on the walls, and the inside surfaces are very smoothed getting easier the specimen's ejection.

Models C223 and C224, Matest made, have also **reinforced corners**, granting an additional resistance, and foresee a **X reinforced band on the base**, improving the strenght of the mould, and allowing the user to give small blows with a rubber heated hammer (mod. V195) by easing the specimen's ejection. All the moulds are supplied with engraved the logo Matest.

All the moulds are also available unbranded, and on request they can be supplied with engraved the customer's logo.

MODELS

C223 MADE IN MATEST

CUBE MOULD, 150 mm side, with X reinforced band on the base, and reinforced corners.

Weight: 1300 g approx.

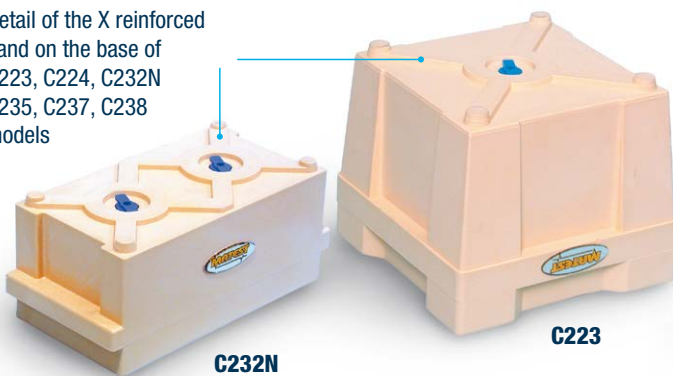
C224 MADE IN MATEST

CUBE MOULD, 150 mm side, **HIGH DENSITY**, with X reinforced band on the base and reinforced corners. The mould same to mod. C223 is manufactured from **high density mixture** with total weight 1600 g, by obtaining a higher hardness and strength of the plastic material.

- It increases the abrasion resistance, by reducing the wear action.
- It improves the pressure resistance during the specimen's ejection, by reducing mould breakages.
- It ensures a larger number of utilisations (with the same use care).

Weight: 1600 g approx.

Detail of the X reinforced band on the base of C223, C224, C232N, C235, C237, C238 models



C232N

C223

Reinforced corners



C223 / C224

C232N MADE IN MATEST

CUBE MOULD, 100 mm side, TWO GANGS, with X reinforced band on the base. The inside surfaces are very smoothed getting easier the specimen's ejection. **Weight:** 1050 g approx.

C232

CUBE MOULD, 100 mm side, TWO GANGS, with reinforced corners and band on the walls. **Weight:** 1200 g approx.



C232

C232N

C230N MADE IN MATEST

CUBE MOULD, standard, reinforced band, 150 mm side.

Weight: 1250 g approx



C230-03

C230N

C230L MADE IN MATEST

CUBE MOULD, 150 mm side, standard, **lightweight**, entry level price.

Weight: 850...950 g approx



C230L

C235

CUBE MOULD, 200 mm side, with X reinforced band on the base and upper double reinforced walls and corners.

Weight: 2550 g approx.

C235**C237**

BEAM MOULD, 100x100x500 mm sides, with X reinforced bands on the base and upper double reinforced walls and corners.

Weight: 2100 g approx.

C238

BEAM MOULD, 150x150x600 mm sides, with X reinforced bands on the base and upper double reinforced walls and corners.

Weight: 4400 g approx.

C228 MADE IN MATEST

CYLINDER MOULD, Ø 150x300 mm with upper and lower reinforced bands. **Weight:** 2150 g approx.

C228-01

CYLINDER MOULD, Ø 100x200 mm with reinforced bands.

Weight: 920 g approx.

C229 MADE IN MATEST

CYLINDER MOULD, Ø 160x320 mm with upper and lower reinforced bands. **Weight:** 2200 g approx.

**C228-01****C228****C229****C230-05****C234-03****C223-01****ACCESSORIES**

C223-01 COVER, plastic, for C223, C224, C230N, C230L moulds. Useful for transportations. Pack of 10 pcs.

C234-03 STOPPER, plastic, to plug the hole of the moulds C223, C224, C228, C230N, C230L, C229. Pack of 10 pcs.

C232-01 STOPPER, plastic, to plug the hole of the mould C232N. Pack of 10 pcs.

C235-01 STOPPER, plastic, to plug the hole of the moulds C228-01, C232, C235, C237, C238. Pack of 10 pcs.

C230-01 FILLING HOPPER, stainless steel made, for an easier filling of fresh concrete into the moulds: C223, C224, C230, C230N. Supplied complete of clamping elastics.

C230-03 GRASPING PLIERS for C230 and C230N moulds, to get easier the carriage.

C230-05 GUN, to connect to a water or air pressure, to eject the specimen from the mould.

C223-05

IDENTIFICATION LABEL. Pack of 250 labels

C233-05**C231N1****POLYSTYRENE CUBE MOULD 150 MM, ONE GANG**

This cube mould, polystyrene made, is utilized for only one test, because it must be broken when the specimen is demoulded. It gives different advantages:

- it is provided of a top cover keeping inside heat and humidity constant and acting as a curing room
- it protects the specimen as a packing during transport of the same
- it is extremely light
- any trouble concerning the cleaning, demoulding and maintenance of the mould are eliminated.

Pack of 45 pieces.

**C231N1**

STEEL CUBE, CYLINDER AND BEAM MOULDS

Nominal moulds dimensions meet to requirements of

STANDARDS: EN 12390-1 | BS 1881:108 | ASTM C192, C39 | AASHTO T23, T126 | NF P18-400

STEEL CUBE AND BEAM MOULDS

These models of steel cube and beams moulds are extremely sturdy and the inside surfaces are accurately machined.

Nominal dimensions meet to EN 12390-1 requirements.

Cube Mould	Dimensions	Gang	Weight
C247	100 mm side	1 gang.	6 kg
C247-01	150 mm side	1 gang.	13 kg
C247-02	200 mm side	1 gang.	25 kg
C247-03	300 mm side	1 gang.	90 kg
C248	100 mm side	2 gangs.	11 kg
C248-01	150 mm side	2 gangs.	30 kg
C248-02	200 mm side	2 gangs.	45 kg
C248-03	100 mm side	3 gangs.	17 kg
C248-04	140 mm side	3 gangs.	30 kg
C248-05	150 mm side	3 gangs.	38 kg
C249	100 mm side	4 gangs.	20 kg
C249-01	150 mm side	4 gangs.	45 kg



C247...C249-01

Beam Mould	Dimensions	Weight
C254	100x100x400 mm	20 kg
C254-01	100x100x500 mm	23 kg
C254-02	150x150x600 mm	44 kg
C254-03	150x150x750 mm	47 kg
C254-04	200x200x800 mm	86 kg
C254-05	140x140x560 mm	38 kg



C254...C254-05

C230-01

FUNNEL (FILLING HOPPER) for an easier filling of fresh concrete into the cube moulds C247-01, C253-01, C253-03. Stainless steel sheet made.



C230-01

STEEL CYLINDER MOULDS

STANDARDS: EN 12390-1 | ASTM C39, C192

AASHTO T23, T126 | NF P18-400

Internal surface, base, top and bottom ring are accurately machined.

Models	Dimensions Ø x height	Weight
C258	100x200 mm	8 kg
C258-01	112.8x220 mm	8 kg
C258-02	150x300 mm	15 kg
C258-03	6" x 12"	15 kg
C258-04	159.6x320 mm	17 kg
C258-04 CO	159.6x320 mm fast clamping	18 kg
C258-05	250x500 mm	80 kg
C258-06	150x150 mm	10 kg



C258...C258-06



C258-04CO

CAST IRON SPLIT CYLINDER MOULDS ➤ NEW

STANDARDS: EN 12390-1 | ASTM C39 | AASHTO T23, T126
NF P18-400

Cast iron made, heavy duty, they are checked in the shape, dimensions and tolerance with instruments certified by an Official SIT Institute (or equivalent).

Foreseen with fast clamping system with inbuilt revolving screws. They are easy to use with practical and fast demoulding; recommended for field use.

The produced cylinder specimen meet the Standards, by avoiding to the enduser any expensive dimensional verification.

Complete with base, clamp type.

MODELS

C259-05 ➤ NEW

CAST IRON SPLIT MOULD, to produce a Cylinder Specimen Ø 150x300 mm
STANDARDS: EN 12390-1 | ASTM C39 | AASHTO T23, T126

Weight: 10 kg approx.

C259-06 ➤ NEW

CAST IRON SPLIT MOULD, to produce a Cylinder Specimen Ø 160x320 mm
STANDARD: NF P18-400

Weight: 11.2 kg approx.



C180-02...V195

CAST IRON CUBE MOULDS, ONE GANG

STANDARDS: EN 12390-1 | BS 1881:108

These moulds meet the requirements of EN 12390-1 Specifications. They are checked in the shape, dimensions and tolerance with instruments certified by an Official SIT Institute (or equivalent), and have a Serial Number marked on each side.

The produced cube specimens meet the Standards, by avoiding to the enduser any expensive dimensional verification.

Complete with base plate, clamp type.

Two models are available:

- four part wall equal design
- two part wall "V" shaped



Models	Description	Weight kg
C253	Cube Mould 100 mm four part	8.3
C253-01	Cube Mould 150 mm four part	15.5
C253-02	Cube Mould 100 mm two V shaped part	8.3
C253-03	Cube Mould 150 mm two V shaped part	15.5
C253-06	Cube Mould 200 mm four part ➤ NEW	27.0

ACCESSORIES FOR MOULDS

- C180-02** TAMPING ROD, Ø 16 mm x 610 mm long.
- C261** TAMPING BAR, 25 mm square area x 380 mm long.
- C262** STRAIGHT EDGE, 460 mm long.
- V178-01** WIRE BRUSH, used to clean moulds.
- C265** DEMOULDING OIL. Can of 25 litres
- V184-01** ROUND ALUMINIUM SCOOP 1000 ml capacity
- V187** TROWEL STAINLESS STEEL 120x260 mm
- V195** RUBBER MALLET, head Ø 55 mm
- V182** MIXING TRAY, galvanized 600x600x80 mm

VIBRATING TABLES

STANDARDS: EN 12390-2 | BS 1881:108

Used for the compaction of concrete specimens in laboratory, they are manufactured from rugged steel sheet.

Equipped with motor-vibrator having 3000 vibrations-minute, it is possible to vary the vibration intensity by acting on the excentric masses.

The height of the table is 410 mm.

All the vibrating tables accept the clamping device, pedal switch or control panel (see accessories).

Power supply: 230V 1ph 50Hz

Models	Table dimensions mm	Power W	Weight kg	*Clamping device
C278	600x400	180	60	C281-01
C278-01	800x400	180	85	C281-02
C278-02	800x800	180	115	C281-03
C279	1100x550	180	145	C281-04

* The clamping device is used to fix the moulds to the table during the vibrating action.



C278 with moulds C253-01



C279



C281N

PORTABLE VIBRATING TABLES

Similar to the above Vibrating Tables, suitable for site and laboratory use, they accept ONE GANG cube moulds (max. 200 mm side) or cylinders max. 160x320 mm, both plastic and metal made.

Table dimensions: 400x300 mm, height 200 mm

Weight: 16 kg approx.

MODELS

C281N VIBRATING TABLE, PORTABLE, 12V DC

Suitable for site use, where no electric supply is available.

Lightweight and small sized, it can be handled by one person and easily stored in the car trunk.

Supplied complete with On/Off switch and connector for the vehicle cigar lighter, and elastic bands to fix the mould to the table.

C282 VIBRATING TABLE

Similar to mod. C281N, but for laboratory use

Power supply:

230V 1ph 50Hz 110W



C282



C282

ACCESSORIES FOR VIBRATING TABLES

- C279-04** PEDAL SWITCH, water tight. It can be fixed to the table **only as an alternative** to the Control Panel mod. C279-02
- C279-02** CONTROL PANEL, separate, complete with On/Off switch and timer, getting also the tables to CE Safety Directive. It cannot be used with the table mod. C281N
- C281-05** CLAMPING DEVICE, to fix the mould to the table, suitable **only** for tables mod. C281N and C282. Alternative solution to the elastic bands. Recommended for the laboratory table C282
- C279-01** MOTOR-VIBRATOR, additional, (only for table mod. C279) to obtain an unidirectional vibration and a vibrating power of 300 kg of mass.

POKER VIBRATORS

STANDARDS: EN 12390-2 | ASTM C31, C192 | AASHTO T23, T126
Suitable for the internal compaction of concrete specimens both in laboratory and in site.

The diameter of the needle must not exceed the 25% of the smallest dimension of the specimen.

Different models available: electric, petrol, battery operated.

C271N

POKER VIBRATOR, portable, petrol operated.
Honda motor, 4-stroke, 1.6HP, 35,8cc
Tip dimensions: Ø 25 mm by 250 mm long.
Flexible shaft: 2 metres long.
Frequency: 10000 vibrations/min.
Supplied complete with knapsack.

Weight: 7 kg approx.

C272

POKER VIBRATOR, portable, electric.
Tip dimensions: Ø 25 mm by 290 mm long.
Flexible shaft 2 meters long.
Frequency: 12000 vibr./minute.
Amplitude: 0.65 mm
Centrifugal force: 0.8 kN (80 kg)

Power supply: 230V 1ph 50/60Hz 2300W

Dimensions: 180x350x220 mm approx.

Weight: 9 kg approx.



SPARES

- C272-10** TIP, Ø 25 mm by 290 mm long, complete with flexible shaft 2 metres long, for the vibrator mod. C272.
- C271-10N** TIP, Ø 25 mm by 250 mm long, complete with flexible shaft 2 metres long, for the vibrator C271N



C274M-KIT

POKER VIBRATOR, battery operated, original Makita,
Tip dimensions: Ø 25 mm by 250 mm long.
Flexible shaft: 800 mm long
Frequency: 13000 vibr./minute
Battery power: 18V 3.0Ah
Supplied complete with rechargeable battery and battery charger, original Makita.

Weight: 3 kg approx.

ACCESSORY

- C274-03M** CARRYNG CASE for Makita vibrator and accessories.

SPARES

- C274M** Poker Vibrator, **without** battery and charger.
- C274-01M** Battery Charger, original Makita.
- C274-02M** Rechargeable battery, original Makita.

CURING TANKS FOR CONCRETE SPECIMENS

STANDARDS: EN 12390-2 | ASTM C31, C192 | AASHTO T23

C302 KIT

CURING TANK 650 LITRES CAPACITY

HEAVY PLASTIC

Made from extremely robust and stable polyethylene, complete with base rack.

Supplied **without** thermostat heating system, to be ordered separately (see accessories).

Inside dimensions: 1040x1040x605 mm

Weight: 60 kg approx.



C302 KIT

C302-10 KIT

CURING TANK, 550 LITRES CAPACITY

HEAVY PLASTIC

Same to mod C302 KIT but having:

Water discharge cock incorporated into the tank

Inside dimensions: 1100x710x690 mm

Overall dimensions: 1200x80x850 mm

Weight: 55 kg approx.

C304-01



C302-10 KIT

Discharge
cock

C304

CURING TANK 1000 LITRES CAPACITY

Made from steel sheet, zinc coated to prevent it from corrosion.

Complete with base rack and stopper for an easy water discharge.

Supplied **without** thermostat heating system, to be ordered separately (see accessories).

The tank can accommodate up to 64 cubes 150mm side, or up to 48 cubes 200mm side.

Inside dimensions: 1500x750x750 mm

Weight: 120 kg approx.



C304

NEEDED ACCESSORY

Available in two versions:

C302-01 THERMOSTAT ANALOGIC HEATING SYSTEM, for the tank mod. C302 KIT
230V 1ph 50-60Hz 2000W

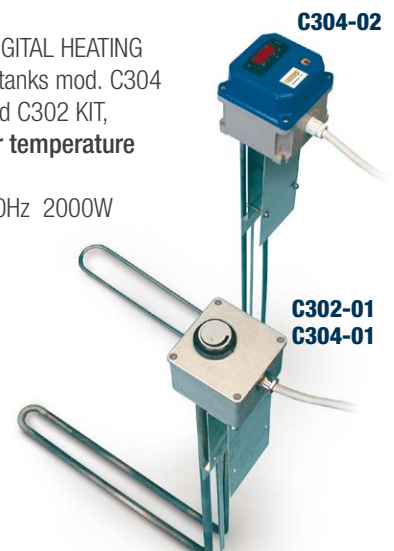
C304-01 THERMOSTAT ANALOGIC HEATING SYSTEM, for the tanks mod. C302-10 KIT and C304
230V 1ph 50-60Hz 2000W

AS AN ALTERNATIVE

C304-02 THERMOSTAT DIGITAL HEATING SYSTEM for the tanks mod. C304 C302-10 KIT and C302 KIT, **ensuring better temperature accuracy**
230V 1ph 50-60Hz 2000W



C304-02 Detail



**C302-01
C304-01**

ACCESSORIES FOR CURING TANKS

- C305-01** PLASTIC COVER for the C302 KIT tank
C302-11 PLASTIC COVER for the C302-10 KIT tank
C306-04 STEEL ZINC COATED COVER for the C304 tank
C306-01 UPPER RACK for the C304 tank to store cubes max.150 mm
 Max. 8 racks per tank
C306-02 SUBMERSIBLE WATER CIRCULATING PUMP, also used for
 an easy water discharge from the tank 230V 1ph 50/60Hz
C306-03 SEPARATE CONTROL PANEL, complete with switch and
 electric protections, to get the tanks to CE Safety Directive



C306-05 ANALOGIC THERMOSTAT

Complete with heating element. Used to thermostate any type of tank from 300 to 1000 litres capacity.

Power supply:
230V 1ph 50-60Hz 2000W



E141

E141 WATER REFRIGERATOR

It cools the water from room temperature up to +10 °C. It is connected to the tank where a lower temperature than the room one is required. See Section "E" Cement, p. 411

C307 ACCELERATED CONCRETE CURING TANK

STANDARDS: ASTM C684 | BS 1881:112

This tank has been designed for accelerated concrete strength curing. It comprises a fully insulated double wall tank with cover, inside all from stainless steel, outside from steel painted sheet with an intermediate layer of insulating mineral wool.

This tank can hold up to 16 cubic 150 mm side specimens; or 16 cylindrical Ø 150 mm specimens; or 8 cubic 200 mm side specimens. The test consists essentially in curing the concrete specimens with water heated by 3 electric elements of 1500W each.

Temperature range: from ambient to 100 °C.

The separate control panel is provided with a thermoregulator, timer, pilot lights, main switch.

Inside dimensions: 910x660x680 mm

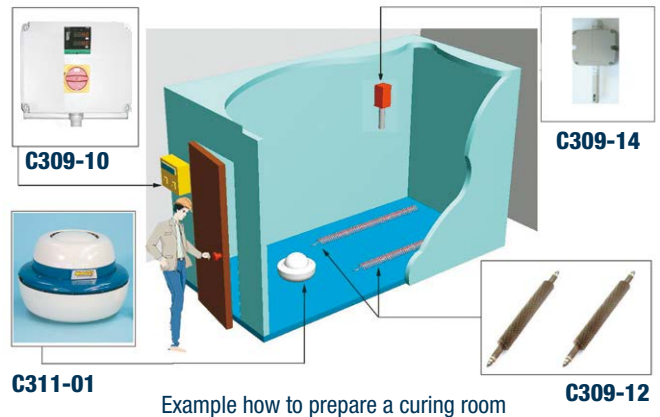
Overall dimensions: 970x720x900 mm

Power supply: 230V 1ph 50-60 Hz 4500W

Weight: 130 kg approx.

EQUIPMENT TO PREPARE A TEMPERATURE AND HUMIDITY CONTROLLED ROOM

The following equipment are suggested as alternative to the curing tanks and climatic chambers indicated in this catalogue or by necessity of a wide area for curing a big quantity of specimens. They are suitable to prepare an already existing room/box or one to be realized by the customer. The temperature of the room can be only increased compared to the external temperature but not decreased.



C311-01

Example how to prepare a curing room

C309-12

NEEDED DEVICES

- C309-10** CONTROL PANEL of temperature and humidity.
 It is usually placed on the outer side of the room, and allows to set, display and control the desired parameters of temperature and humidity.
Power supply: 230V 1F 50-60Hz
Dimensions: 240x130x310 mm **Weight:** 5 kg
- C309-12** HEATING RESISTANCE in tubular frame, finned type.
 Normally one heating resistance is enough for its purpose, provided that the range between the external and internal temperature set in the room (anyway well insulated) is kept within 15 °C.
Dimensions: Ø 40x1100 mm **Weight:** 2000 g approx.
- C309-14** SENSOR PROBE to measure temperature and humidity.
 Temperature measuring range from -10 to +90 °C and humidity up to 100%. It is fixed inside the room and connected to the control panel.
- C311-01** VAPORISER
 Used to humidify curing rooms up to 150 cubic/metre.
 Technical data: see p. 350



C307

CLIMATIC CABINETS



The climatic cabinet is available in two versions:

- **C313N** Temperature and humidity controlled from -30 to +70 °C and 20% to 95% respectively for testing concrete (EN 12390-2), cement (EN 196-1), aggregates (EN 1367-1) and many other applications.
- **C316N** Only temperature controlled from -30 to +70 °C for the determinations of the behavior and resultance to freezing and thawing of aggregates (EN 1367-1) and different other applications on concrete and building materials.

MAIN FEATURES

- Real-Time display of temperature and humidity parameters.
- High quality thermal insulation material.
- Temperature control from -30 to +70 °C with high stability (± 0.15 °C).
- Humidity control from 20% to 95% with $\pm 5\%$ stability and $\pm 1\%$ accuracy (within temperature +10 to +70 °C).

C313N TEMPERATURE AND HUMIDITY CONTROLLED CABINET 535 LITRES CAPACITY

STANDARDS: EN 196-1, EN 1367-1, EN 12390-2, EN 12390-9

Designed for all research and control laboratories to perform: cold and/or hot temperature measurement at controlled humidity conditions, any kind of freezing/thawing tests and accelerated curing tests. Used to cure concrete (EN 12390-2) and cement specimens (EN 196-1) and analyze the behavior to freezing and thawing of aggregates (EN 1367-1) and concrete (EN 12390-9).

Internal and external frame is made of stainless steel AISI 304.

Polyurethane insulation: 60 mm thick.

Internal ventilation.

Door with 180° opening angle, equipped magnetic gasket and integrated heater against freezing.

Shelves can be taken off and adjustable in height; adjustable feet.

Temperature and humidity sensors wall mounted inside cabinet

The cabinet is supplied with a **two stage filter**; mechanic and mixed ionic/cationic resins. It works with demineralized, softened waters, or tap water with hardness rate up to 300 PPM assuring an excellent functioning along the time.

Equipped with microprocessor temperature/humidity controller with integrated cycles multiple segments programmer.

- panel mount 144x130 mm format
- 5" color graphic display
- 50 programs with 100 segments and real time clock
- Logging function with PC interface (optional)

Visual alarm for minimum and maximum temperature

Supplied complete with 3 adjustable shelves suitable to withstand weights up to 40 kg

Inside dimensions: 590x670x1360 mm

Overall dimensions: 710x820x2080 mm

Power supply: 230V 1ph 50-60Hz 2570W

Weight: 170 kg approx.



C313N

C313-01N TEMPERATURE AND HUMIDITY CONTROLLED CABINET 1200 LITRES CAPACITY

Same as C313N model, but with an internal capacity of 1200 liters. Internal ventilation.

Door with 180° opening angle, equipped magnetic gasket and integrated heater against freezing.

Shelves can be taken off and adjustable in height; adjustable feet.

Temperature and humidity sensors wall mounted inside cabinet

Visual alarm for minimum and maximum temperature

Supplied complete with 6 adjustable shelves suitable to withstand weights up to 40 kg.

Inside dimensions: 1300x670x1360 mm

Overall dimensions: 1500x820x2080 mm

Power supply: 230V 1ph 50-60Hz 2900W

Weight: 230 kg approx.

C316N TEMPERATURE CONTROLLED CABINET

535 LITRES CAPACITY

STANDARDS: EN 1367-1

Technical specifications:

Same as mod. C313N, except for the humidity control that is not included.

ACCESSORIES

C313-11N ADDITIONAL BASKET SHELVE : Made of Stainless Steel grid, suitable for loads up to 40 Kg.

C313-12N MOBILE TEMPERATURE PROBE: Type PT100 in stainless steel bulb for free positioning in the chamber and on the specimen.

C313-13N LOGGING FUNCTION: Logging upgrade function for on-board Jumo controller with enabling of "real time trend" and "Historical trend" of variables and predisposition of PC interface.

C313-15N PC INTERFACE: Consist of Cables, PC interface converter and Jumo software for editing and real-time view.

ADHESIVES FOR TILES



DETERMINATION OF TENSILE ADHESION
STRENGTH FOR CEMENTITIOUS ADHESIVES
STANDARDS: EN 1348 | EN 12004

C313-05N INTERNAL FLOODING SYSTEM

Applicable only to temperature and humidity controlled cabinets C313N, C313-01N.

Used for the determination of tensile adhesion strength for cementitious adhesives.

It is composed of two stainless steel vessels and a discharging system for the water.

The system allows to empty and fill the inner vessel with water without opening the climatic cabinet.

Inner vessel water level is limited by a sensor.

Filling and drainage of water are regulated by a valve positioned on the bottom of both vessels.

Inner vessel volume is 150 l, while outer vessel volume is 170 l. Water temperature range is from 10 °C to 40 °C, demineralized water must be used.

Temperature stability: ± 2 °C

Water pressure range is from 0.2 to 5 bar.

Flooding system can be installed also in C313N already supplied if returned in Matest factory.

System must work with no organic compounds.

Outer vessel dimensions:

816x588x600 mm

Weight: 50 kg approx.



C313N + C313-05N



Control panel



Two stage filter

UNBONDED CAPPING PADS AND RETAINERS

STANDARDS: ASTM C1231 | AASHTO T22, T851

Used for compression tests on concrete cylinder specimens, as an alternative method to the sulphur capping and grinding machine. Two steel capping retainers are applied on the two flat surfaces of the cylinder.

Two neoprene pads are put between them, for a better load distribution.

The neoprene pads are available in two models:

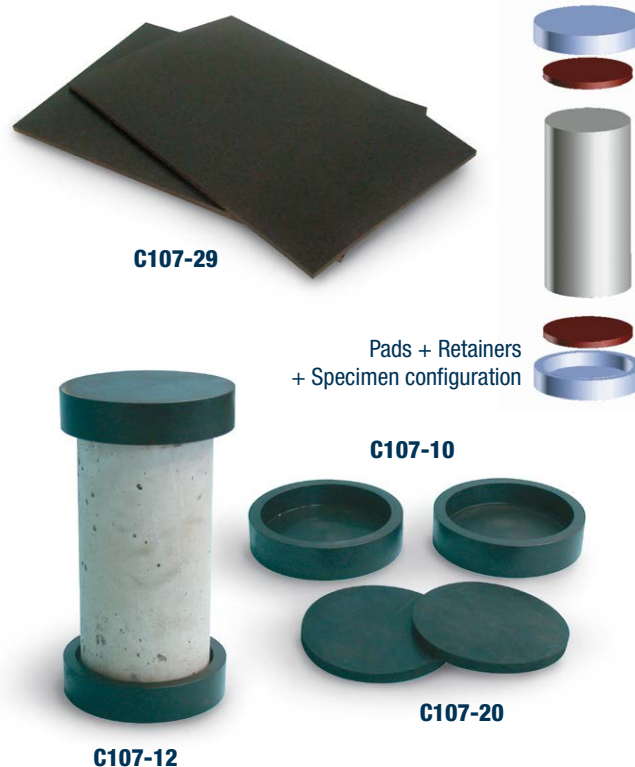
- 60 shore hardness pads for expected strength from 10 to 48 MPa
- 70 shore hardness pads for expected strength over 48 MPa

The system is not applicable for expected strength lower than 10 Mpa

The couple of retainers + neoprene pads have a total thickness of 46 mm. Therefore the testing chamber of the press must have more vertical clearance than the height of the specimen + 46 mm.

MODELS

- C107-09** CAPPING RETAINERS (couple) for Ø 100x200 mm cylinders.
- C107-10** CAPPING RETAINERS (couple) for Ø 150x300 mm and 6"x12" cylinders.
- C107-12** CAPPING RETAINERS (couple) for Ø 160x320 mm cylinders
- C107-18** NEOPRENE PADS (couple) 60 shore A for Ø 100x200 mm cylinders
- C107-19** NEOPRENE PADS (couple) 70 shore A for Ø 100x200 mm cylinders
- C107-20** NEOPRENE PADS (couple) 60 shore for Ø 150x300 mm and 6"x12" cylinders
- C107-21** NEOPRENE PADS (couple) 70 shore for Ø 150x300 mm and 6"x12" cylinders
- C107-25** NEOPRENE PADS (couple) 60 shore for Ø 160x320 mm cylinders
- C107-26** NEOPRENE PADS (couple) 70 shore for Ø 160x320 mm cylinders
- C107-29** NEOPRENE SHEET (couple) 60 shore A dimensions: 600x400x12 mm for test on blocks.



C312-02 CURING ROOM VAPORISER UP TO 500 M³

Same as mod. C311-01, but more powerful for rooms up to 500 cubic/metre capacity.

Supplied complete of **level regulator** with antioverflow, that allows the direct connection to the water net, for a continuous use of the vaporiser.

Power supply: 230V 1ph 50 Hz

Dimensions: Ø 420x350 mm

Weight: 8 kg approx.



C311-01 CURING ROOM VAPORISER UP TO 150 M³

Used to humidify curing rooms for concrete and mortar specimens. Max. room capacity: 150 cubic/metre.

Supplied complete of **level regulator** with antioverflow, that allows the direct connection to the water net, for a continuous use of the vaporiser.

Power supply: 230V 1ph 50 Hz

Dimensions: Ø 360x230 mm

Weight: 3.5 kg approx.

ACCESSORY FOR MOD. C311-01, C312-02

- C312-10** HUMIDISTAT to automatically control the room humidity, range 30...100 %

SPARE

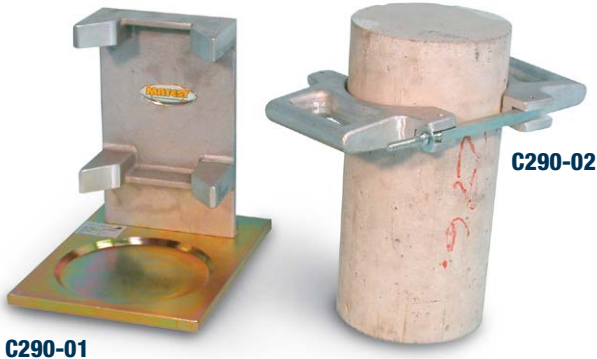
- C312-11** Level regulator, complete of antioverflow.

CYLINDER CAPPING EQUIPMENT

SULPHUR METHOD

STANDARDS: EN 12390-3 | ASTM C617, C31, C192 | AASHTO T23, T126 | NF P18-416

The above mentioned Specifications require that the two faces of the concrete core or cylinder specimen must be made perfectly flat and parallel, by using sulphur capping equipment.



C290-01

C290-02

CYLINDER CAPPERS

To obtain plane end surfaces perpendicular to the axis of the cylinder.

Model	Cylinder Ø x h	Weight kg
C290-01	150x300 mm, 6"x12"	6.3
C291-01	160x320 mm	6.2
C292-01	100x200 mm	4.4

C290-02

CYLINDER CARRIER, for Ø 150x300 mm, 160x320 mm and 6"x 12". For an easier handling of the specimens.

Weight: 1.4 kg

MELTING POT for capping compound.

Used to melt the sulphur capping compound. Complete with thermometer. Suitable also for general laboratory purposes.

AVAILABLE MODELS

C290-03 KIT MELTING POT, capacity: 4 litres. Inexpensive model. 230V 1ph 50/60Hz 1500W

A106 MELTING POT, capacity: 5 litres
Temperature range: +50 to +350 °C.
accuracy: ± 1.5 °C.
Complete with pilot lamp, fully isolated to CE Safety Directive. Internal dimensions: Ø 200x160 mm
230V 1ph 50-60Hz 800W.
Weight: 3 kg approx.



A106

C290-03 KIT

V186-01

C290-06

CAPPING COMPOUND, ultra strong flake type.

This compound is a mixture of sulphur and mineral filler; the compressive strength of 8000 - 9000 Psi is granted (at two hours) on a 2" cube specimen, as requested by ASTM C617 Standard.

On a Ø 150 mm cylinder the compressive strength is 16000 Psi.

Melting point is 115 to 143 °C. (ideal: 130 °C.)

Bag of 22.5 kg (50 lbs)

V186-01 LADLE, stainless steel made.



C290-06

OTHER MODELS

C294-01 VERTICAL CYLINDER CAPPER for Ø 250x500 mm

C294-02 CYLINDER CARRIER for Ø 250x500 mm

C294-05 VERTICAL CYLINDER CAPPER for Ø 60x120 mm



C294-05

C296

STEEL CAPPING PLATE, used for capping concrete blocks up to 500x300 mm. The plate surface is accurately machined.

Dimensions: 500x300x20 mm

Weight: 30 kg approx.



C296

C299
AUTOMATIC SPECIMEN GRINDING MACHINE

STANDARDS: EN 12390-2 | ASTM D4543 | UNI 6132

Designed to grind and polish concrete cube and cylinder specimens, blocks, natural stones, rocks, ceramic materials etc. Specimens are easily fixed to the table by proper locking stirrups (see accessories) allowing to grind at a time:

- n° 3 cube specimens 100 mm side, or
- n° 3 cube specimens 150 mm side, or
- n° 2 cube specimens 200 mm side, or
- n° 2 cylinder specimens Ø 100x200, 110x220, 150x300, 160x320 mm, or
- n° 1 block with max. dimensions 390x250 mm

The radial movement of the head is equipped with end of stroke system, granting the fully automatic displacement in both directions. The column is completely protected against the abrasive dust. The vertical lowering of the grinding head is achieved with infinitesimal adjustments by operating on the top handwheel having 0.05 mm graduations.

The machine, made from rugged plate, is supplied complete with control panel, coolant/decantation tank (by water and emulsifying oil), motor pump, set of abrasive sectors, safety chip guard that when removed, stops automatically the machine.

The standard supply **does not include** the locking stirrups and the diamond sectors (8 pieces) that must be ordered separately (see accessories).


C299 with **C300-06N** holding one 150 mm cube

MAIN FEATURES

- Designed for grinding concrete cube and cylinder specimens, blocks, natural stones, rocks etc.
- Simultaneous grinding of many specimens.
- Motorized radial displacement of the revolving abrasive head in both directions.
- Automatic movements of the head in both directions and controlled by travel limit switches.

NEEDED ACCESSORIES

C300-06N LOCKING STIRRUPS for cube specimens side 100, 150, 200 mm complete with distance piece 85 mm high.

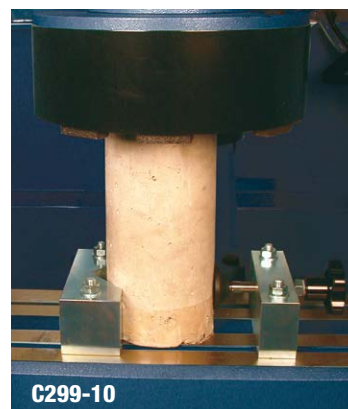
AS AN ALTERNATIVE

C299-10

FAST LOCKING DEVICE, for: cubes 150 and 200 mm; cylinders Ø 100 to 160 mm. Each device accepts only one specimen.

It is possible to grind at a time:

- 1 cube 200 mm;
- 2 cubes 150 mm;
- 2 cylinders.


C299-10

C300-02 DIAMOND GRINDING SECTOR (8 pieces required) **particularly recommended** because of their long duration and good grinding action.

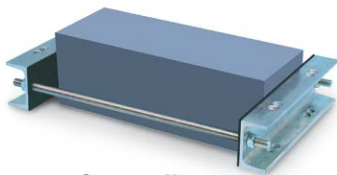

C300-02
TECHNICAL SPECIFICATIONS

Table dimensions: 775x280 mm (usefull: 750x235 mm)
 Grinding wheel Ø: 330 mm
 Vertical span width: min. 175 mm (95 mm with the distance piece) max. 380 mm
 Grinding height range: 95...380 mm
 Grinding head stroke: 215 mm
 Grinding wheel speed: 1400 rpm.

Power supply: 400V 3ph 50Hz 2700W
Dimensions: 1220x1080x1730 mm
Weight: 410 kg approx.

ACCESSORIES

- C300-03** LOCKING STIRRUPS for cylinder specimens \varnothing 100, 110, 150, 160 mm. They can be used only in conjunction with the C300-06N stirrups.
- C300-03SP** LOCKING STIRRUPS for cylinder specimens \varnothing 50 to 100 mm, minimum height 95 mm. They can be used only in conjunction with the C300-06N stirrups.
- C300-05N** LOCKING STIRRUPS for cube specimens side 50 mm to 70 mm. They must be used only in conjunction with the C300-06N stirrups.
- C300-07N** LOCKING STIRRUPS to grind blocks of different sizes, but with max. dimensions of 390x250 mm.



C300-07N

- C300-08** CORE FACE PREPARATION DEVICE
It prepares parallel and flat core faces or rock samples. The device accepts up to 4 core samples from \varnothing 20 to 55 mm and can be mounted on most grinding machines.

Weight: 7 kg approx



C300-05N



C300-08

- C300-09N** DEVICE to collect the produced powder during the drying grinding procedure. The device must be connected to an aspirator (not included).

The four collecting pipes have a max. extension of 3 meters (different extensions on request).

The terminal diameter of the device is: 160 mm

Weight: 15 kg approx.

- C300-01** ABRASIVE GRINDING SECTORS, spare, set of 8 pieces.



NEW

C300-09N



C299 with **C300-06N** holding 3 cubes 150 mm

C377 MICRO-CORING EQUIPMENT

STANDARD: UNI 10766

The extraction of a micro-core sample from a concrete structure or masonry is an extremely valid non-destructive method, as it allows analysis and accurate evaluations of the manufacture (compression resistance, ecc.) without causing any damages to the structure, considering the dimension of the hole that can be eventually clogged with mortar.

Micro-coring system is additionally valid and reliable if combined with ultrasonic tester and concrete hammer.

Micro-core extraction is easy and requires the presence of one operator only.

The equipment comprises:

- Suitable electric drill. 230V 1F 50Hz
- Flanged guide assembly
- Drilling mask
- Impregnated diamond bit for cores with \varnothing 28x100 mm
- Impregnated diamond bit for cores with \varnothing 28x200 mm
- 2 Self-blocking pincers to fit the flanged guide assembly to the surface

Set of accessories including: anchors, bits, wrenches, screws.
Carrying case.

Dimensions: 550x400x200 mm approx.

Weight: 10 kg approx.



C377

C377-05 TRIMMING/CUT-OFF MACHINE FOR CORES

Suitable to cut and trim cores to be prepared for compression tests, where the flatness of both surfaces is a basic condition to obtain correct results.

The equipment is made of stainless steel and aluminum and is supplied complete with diamond blade \varnothing 180 mm.

For this purpose it must be used the drill mod. C377-10 (enclosed into micro-coring equipment) and the water tank with foot pump mod. C377-01.



C377-05

Note:

The maximum values foreseen for compression tests on micro-cores are usually lower than 60 kN. Portable compression machine mod. C094N (see p. 323), or a cement compression tester (see p. 418) may be conveniently used.

Trimming of cores may be even obtained with the grinding machine mod. C299 + device mod. C300-08 (see p. 352)



C377-02

ACCESSORIES

C377-01 WATER TANK WITH FOOT PUMP, that leaves the hands of the operators free for coring

AS ALTERNATIVE:

C377-02 AIR-WATER PRESSURE TANK, 10 liters capacity

SPARES

C377-10 ELECTRIC DRILL, suitable for the microcoring purposes.

C377-15 DIAMOND BIT, \varnothing 28x100 mm

C377-16 DIAMOND BIT, \varnothing 28x200 mm

CORE DRILLING MACHINES LIGHTWEIGHT, PORTABLE

These drilling machines are extremely practical, lightweight and easy to use.

The base is from aluminium alloy, the steel column can be tilted up to 45°, the motor support is fixed on a saddle sliding on teflon runner granting high performances. The motor incorporates a water swivel to cool the diamond bit.

The machine is supplied complete, **except** for: diamond bit, spanner, core extractor (see accessories p. 357) to be ordered separately.

C318N

CORE DRILLING MACHINE, ELECTRIC MOTOR

Electric motor at three speeds: 530, 1280, 1780 rpm, with speed reducer, provided of multifunction electronic friction device and switch to CE Safety Directive.

The machine accepts bits diameters from 50 to 150 mm

Power supply: 230V 1ph 50-60Hz 2200W

Dimensions: 600x320x1020 mm

Weight: 24 kg approx.



C318N tilted

C318N

C324N

ELECTRIC CORE DRILLING MACHINE WITH VACUUM FACILITY

The frame and the electric motor are the same as mod. C318N.

The machine is supplied complete with lubricated vacuum pump and pressure accumulation reservoir, which is very useful because it maintains for some times a valid vacuum level also with electric blackout, by avoiding the fall or disconnection of the unit from the wall.

The pump is connected to the utility by means of a ball tap to which a vacuum gage is fitted, that constantly indicates the pressure inside the tank.

Coring angle: 0 to 360° under the condition that the surface is sufficiently flat, and not too porous, to allow the vacuum attachment.

Power supply: 230V 1ph 50-60Hz 2200W

Dimensions: 600x320x1020 mm + pump

Weight: 24 kg + pump 15 kg approx.



C324N

C332 PORTABLE ELECTRIC GENERATOR

To use with electrically driven machines where electrical power is not available. The generator is rated at 4000 Watt and supplies: 230V 1ph 50Hz.

Complete with tank, accessories.

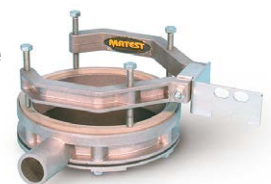
Weight: 60 kg approx.



C332

ACCESSORY

C318-10 WATER COLLECTING RING, confining waste water on the surface, for machine mod. C318N and C324N. It has to be connected to a suitable electric pump.



C318-10

CORE DRILLING MACHINES HIGH PERFORMANCE

These drilling machines are extremely robust, heavy duty, compact and reliable.

The sliding group is rectified in order to assure a very soft and accurate drilling movement.

The drilling excursion is 550 mm and the machine can drill cores up to 200 mm of diameter.

Built in water swivel to cool the diamond bit.

The robust steel base is equipped with wheels for easy site displacements, together with four levelling and stabilizing feet.

All working and moving parts are cadmium plated for rust protection.

The machine is supplied complete **except** for: diamond bit, core extractor and spanner (see accessories) which have to be ordered separately.

MODELS

C319 PAVEMENT CORE DRILLING MACHINE 5HP 4-STROKE PETROL ENGINE

This rugged, compact and portable machine with vertical screw feed, is used for pavement core sampling where it is not easy to get electrical power.

Petrol engine 5 HP power, 4-stroke Briggs & Stratton model.

Dimensions: 850x580x1230 mm

Weight: 135 kg approx.

MAIN FEATURES

- Original Briggs & Stratton motor.
- It can drill cores up to Ø 200 mm.
- Vertical rectified screw feed.
- Built in water swivel to cool the bit.
- Rugged, compact, wheels mounted.



C319-02

C319-02 PAVEMENT CORE DRILLING MACHINE 12.5 HP 4-STROKE PETROL ENGINE

Same as mod. C319, but activated by a petrol engine 12.5 HP power 4-stroke Briggs & Stratton model.

Weight: 150 kg approx.



C319

SPARES

C331 Petrol engine, for C319 machine 5 HP power, 4-stroke Briggs & Stratton model. Supplied complete with tank, accessories. Weight: 20 kg approx.

C331-02 Petrol engine for the C319-02 drilling machine. 12.5 HP power, 4-stroke Briggs & Stratton model. Supplied complete with tank, accessories. Weight: 25 kg approx.

C322 UNIVERSAL ELECTRIC CORE DRILLING MACHINE

Coring angle: 0 to 360°

The excursion group is rectified to assure a very soft and accurate drilling movement. The excursion is 550 mm.

Electric motor at three speeds: 670, 1140, 1580 rpm with speed reducer, provided of friction device and switch to CE Safety Directive.

The height of the vertical column is 1000 mm and is pre-built for extension column connection (accessory mod. C322-01).

Power supply: 230V 1ph 50-60Hz 2200W

Dimensions: 440x750x1300 mm

Weight: 85 kg approx.



C322

ACCESSORY

C322-01 EXTENSION COLUMN, 1000 mm long, to connect to mod. C322 for drillings over 1 metre from the ground.



SPARE

C330 Electric motor, for C318N, C322 and C324N
Power 2200 Watt, three speeds 670 - 1140 - 1580 rpm.
Complete with friction device and connection to coolant water supply. Double extremely safe isolation and switch to CE Safety Directive. Connection to hub 1 1/4".
Power supply: 230V 1ph 50-60Hz 2200W
Weight: 9 kg approx.

- C344** Strap wrench useful for unblocking any type of bit.
C344-01 Strap wrench useful for unblocking only the bits with backend screwed connector.
C345 Extension rod 300 mm. long (used for deep holes).

DIAMOND CORE DRILL BITS WITH BACKEND SCREWED CONNECTOR

Designed for making holes and getting cores from hard materials, like concrete, reinforced concrete, rocks, stones, bituminous materials. The diamond utilized for these bits is quality impregnated sinterized type.

The diamond segment is **9 mm high**. The 9 mm high segment is important for the bit life, because the diamond is about 85% of the bit value.

The coupling between the bit and the motor shaft is direct through the backend screwed connector.

This diamond bit model is suitable to drill both reinforced concrete and also bituminous materials.



C339-01...C339-05

Model	Outside Ø mm	Inside Ø mm	Bit length mm	Expander Coupling	Core Extractor
C339-01	57	50	450	no	C346
C339-02	82	75	450	no	C346-01
C339-03	108	100	450	no	C346-02
C339-04	160	152	450	no	C346-03
C339-05	210	200	500	no	C346-04

C348T SPECIMEN CUTTING MACHINE

with sliding supports.

The machine accepts blades up to \varnothing 400 mm

Useful cutting height: 130 mm

Dimensions of the sliding table: 460x400 mm

Blade rotation speed: 2800 rpm

Supplied **without** blade

(see accessories)

Power supply:

230V 1ph 50Hz 3Hp

Dimensions:

1185x660x1400 mm

Weight:

79 kg approx.



C348T

C350T SPECIMEN CUTTING MACHINE

Used to cut concrete specimens and any type of construction material like blocks, tiles, pipes, rock cores etc. The machine is equipped of an electro-pump for water cooling, pedal guide for vertical cutting, safety device against breakage of blade.

The machine accepts blades up to \varnothing 450 mm

Useful cutting height: 165 mm

Supplied **without** blade (see accessories)

Power supply: 400V 3ph 50Hz 4Hp

Dimensions: 1330x600x1370 mm

Weight: 128 kg approx.



C350T

C350-01T SPECIMEN CUTTING MACHINE

Identical to mod. C350T, but with:

Power supply: 230V 1ph 50Hz 3Hp

C349T SPECIMEN CUTTING MACHINE

Basically similar to mod. C350T, but it can accept blade having max. \varnothing 600 mm

Useful cutting height:

230 mm with blade \varnothing 600 mm

Power supply: 400V 3ph 50Hz 5.5Hp

C351 SPECIMEN BENCH CUTTING MACHINE

The machine accepts blades up to \varnothing 350 mm

Useful cutting height: 120 mm

Blade rotation speed: 3900 rpm

Supplied complete with abrasive blade \varnothing 350 mm

Power supply: 230V 1ph 50Hz 2000W

Dimensions: 560x460x390 mm

Weight: 20 kg approx.

ACCESSORIES

C350-12 DIAMOND BLADE \varnothing 450 mm, having long life for a faster and more precise cutting operation. Suitable for models C350T and C350-01T.

C350-13 DIAMOND BLADE, \varnothing 350 mm for mod. C351

C350-14 DIAMOND BLADE, \varnothing 400 mm for mod. C348T

C350-17 DIAMOND BLADE, \varnothing 600 mm for mod. C349T

C350-10 ABRASIVE BLADE \varnothing 350 mm for mod. C351

Note:

It is recommended to use the blade having the max. diameter accepted by the cutting machine.

C352

DEVICE FOR CYLINDERS AND CORES

To clamp and cut cylinders and cores diameter 100 to 160 mm.

The device is fixed to the table of the cutting machines mod. C348T, C350T, C350-01T, C349T. Weight 10 kg approx.

C352 SP

DEVICE FOR CORES, as above, but \varnothing 55 to 160 mm.

C353

DEVICE FOR IRREGULAR SHAPES

To clamp and to cut irregular shaped specimens, like rocks, stones etc. The device is fixed to the table of the cutting machine mod. C348T, C350T, C350-01T, C349T.

Weight: 5 kg approx



C351



C353

MECHANICAL STRAIN GAUGES

STANDARDS: ASTM C426 | BS 1881:206

Used to determine the strain (length changes) in concrete specimens and structures, rock strata, different parts of a structure, in remote areas and under adverse conditions, using a single instrument. Different models are available with analogic or digital gauge, 100, 200, 300 mm measuring length, depending on the standard length to be measured. The instrument can also be used for other structures like steel and wood.

The KIT comprises:

- Strain gauge (extensometer) complete with analogic or digital indicator 0.001 mm graduations (see available models)
 - Calibration bar used also to fix the datum disc on the structure.
 - 50 datum discs.
 - Adhesive compound for datum discs.
- The whole contained in carrying case.

MODELS with **analogic gauge** 0.001 mm graduations:

- C360 KIT** STRAIN GAUGE, 100 mm measuring length.
C360-01 KIT STRAIN GAUGE, 200 mm measuring length.
C361 KIT STRAIN GAUGE, 300 mm measuring length.
C361-01 STRAIN GAUGE, 600 mm measuring length.



C361 KIT



C363-01 KIT



C363 KIT

MODELS with **digital gauge**, battery feeded, with reading values in mm (sens. 0.001 mm) and in inch (sens. 0.0001"). Complete with battery and RS232 connector to PC.

- C363 KIT** STRAIN GAUGE, 300 mm measuring length.
C363-01 KIT STRAIN GAUGE, 100 mm measuring length.
C363-02 KIT STRAIN GAUGE, 200 mm measuring length.
C363-03 STRAIN GAUGE, 600 mm measuring length.

ACCESSORY for C363 serie models

- S382-13** SOFTWARE, complete with USB adaptor and connection cable to PC

SPARES

- C362-01** Datum disc (pack of 50)
C362-02 Adhesive compound.

C399 CRACK DETECTION MICROSCOPE

Used to measure crack width in concrete structures, by operating via an adjustable light source.

High definition unit, provided by power batteries, carrying case. The eyepiece scale can be turned through 360° to align with the direction of the crack under detection.

Measuring range:
4 mm and div. 0.02 mm.
Magnification: x35

Weight: 600 g



C399

FLAT JACKS - TESTS ON BRICKWORKS

- DETERMINATION OF RESISTANCE AND DEFORMATION UNDER LOAD
- EVALUATION OF TENSILE STRESS
- MEASUREMENT OF ELASTIC MODULUS AND BREAKING LOAD

The complete test is developed in two steps:

■ DETERMINATION OF STATIC LOAD (TENSILE STATUS)

One flat jack is used.

Two datum points are fixed across a mortar joint and the distance between the points is measured.

Successively a horizontal cut is carried out with the suitable tool (drill, cutting saw) level with the mortar layer, and it is measured the variation of the two datum points.

The flat jack must be introduced, it is pressurized in different growing phases and the variation between the datum points is measured, by determining the static load.

■ DETERMINATION OF DEFORMATION AND RESISTANCE (IN-SITU STRESS)

Two flat jacks are used.

It must be done a second cut, parallel to the first one, level with the mortar layer, having a distance of approximately 50 cm from the first cut. Another flat jack must be introduced.

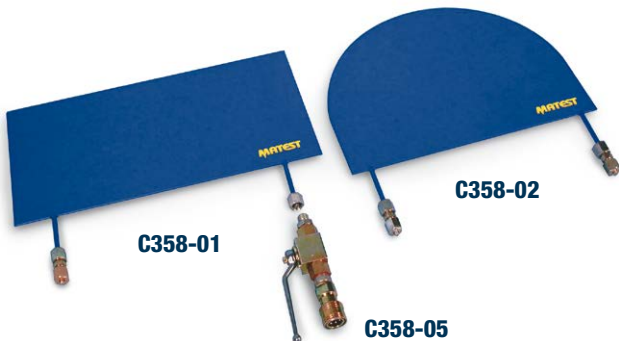
Three couples of datum points are placed on the brickwork portion between the two cuts.

Start to pressurize the two flat jacks at growing phases.

The variation of distances of the datum points at different pressure steps allows to delineate a strength-deformation curve, obtaining elastic modulus, Poisson and breaking point values.

C358-01

RECTANGULAR FLAT JACK high deformability, max. pressure 50 bar, dimensions 400x200x4 mm. Steel sheet 0.8 mm thick. Complete with nuts and groins.



C358-11

N° 6 STEEL SHEETS, dimensions 400x200 mm, three pieces 1 mm thick, three pieces 1.5 mm thick



C358-02

SEMI-OVAL FLAT JACK ad high deformability, max. pressure 50 bar, dimensions 350x260x4 mm. Steel sheet 0.8 mm thick. Complete with nuts and groins.

C358-12

N° 6 STEEL SHEETS, dimensions 350x260 mm, three pieces 1 mm thick, three pieces 1.5 mm thick.

C358-05

STOPCOCK (valve) high pressure complete with fittings, to close the oil flow in the jack and stop the pressure.

LOAD APPLICATION

C358-06 HYDRAULIC HAND PUMP, complete with integral reservoir with oil, to apply pressure to the jacks.

C358-15 Flexible rubber TUBE, 3 meters length, for the connection to one jack.

or:

C358-16 Flexible rubber DOUBLE TUBE, 2 and 3 meters length, for the connection to two jacks.

C358-08 MANOMETER high precision 0 - 60 bar range, with fast jack, to be fixed on the pump to read the applied pressure.



STRAIN MEASUREMENT

C361 KIT STRAIN GAUGE-EXTENSOMETER with mechanical strain gauge, 300 mm length

or:

C363 KIT STRAIN GAUGE-EXTENSOMETER with digital strain gauge, 300 mm length

Other strain gauge models with accessories described in detail at p. 359



C361 KIT

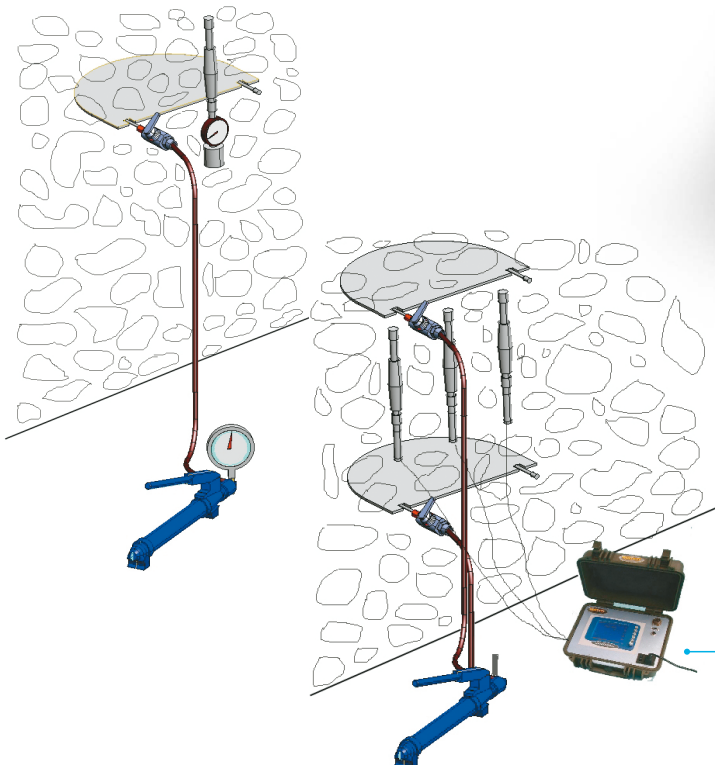
As alternative to the strain gauge, the data acquisition and processing system can be used, with the following equipment:

C358-21

ELECTRONIC EXTENSOMETER, supplied with linear displacement transducer having 10 mm stroke and 0.1% linearity, fitted in a tubular anodized aluminum frame, complete with electrical cable and connector .

Span: 300 mm

Weight: 300 g approx.



Application exemples

C358-23N

PRESSURE TRANSDUCER, 50 bar capacity, to be fitted to the hand pump (as alternative to the manometer).

Complete with fast jack to the pump, electrical cable and connector.

C405-15N

CYBER-PLUS 8 EVOLUTION TOUCH SCREEN

8 Channels acquisition and processing data system, 24 bit resolution. Electronic advanced technology, **colour touch screen** 1/4VGA, high graphic performances, the unit automatically performs test and data processing. A certificate can be printed through a printer (optional) directly connected to the unit through the USB port.

The Cyber-Plus is equipped with slots for external pendrive or SD card infinite memory supports, it can be directly connected to a PC. Contained in a practical and sturdy watertight carrying case, can be powered from an electrical network 90-270 V or use the internal battery and charger granting one full day on-site use.

Hardware technical details: see p. 18

S337-51

CALIBRATION process between the electronic extensometer or the pressure transducer to the data acquisition unit C405-15N



C405-15N

C358-21

TESTING OF HARDENED CONCRETE

HYDRAULIC SHRINKAGE DETERMINATION

To measure the axial and/or superficial dimensional shrinkage of concrete specimens during hardening process in a curing room.
STANDARDS: UNI 11307 | UNI 6555 (comparable to ASTM C426)

The specimen is prepared by a mould having dimensions 100x100x500 mm, with aggregates up to 30 mm max. diameter, and after housed in the measuring apparatus that determines the axial shrinkage.

The two UNI Standards require two different systems to prepare the specimen:

- The UNI 11307 requires reference pins to be stuck on the specimen.
- The UNI 6555 requires inserts fixed into the mould and let into the specimen.

EQUIPMENT ACCORDING TO UNI 11307:

C254-01

BEAM MOULD, steel made, to prepare a concrete specimen 100x100x500 mm

Weight: 23 kg approx.

C366-12

REFERENCE PIN, to be stuck in the intersection of the longitudinal axis of the specimen with its bases.

Pack of 10



C366-12

EQUIPMENT ACCORDING TO UNI 6555 (comparable to ASTM C426):

C365

SHRINKAGE MOULD, steel made, complete with inserts, to prepare a concrete beam specimen 100x100x500 mm

Weight: 23 kg approx.

C366-11

INSERTS, stainless steel, spares to C365 mould. Pack of 10

NEEDED ACCESSORIES, ACCORDING TO: UNI 11307 AND UNI 6555

C364 MEASURING APPARATUS, for 100x100x500 specimens, complete with reference bar, but **without** dial gauge to be ordered separately. **Weight:** 23 kg approx.

S375 DIAL GAUGE, 5 mm stroke by 0.001 mm sens.

AS AN ALTERNATIVE:

S376 DIAL GAUGE, 10 mm stroke by 0.01 mm sens.

AS AN ALTERNATIVE:

S382-01 DIGITAL GAUGE indicator, with readings in mm (sens. 0.001 mm) and in inch (sens. 0.0001"), battery feeded. Complete with battery and RS232 connector to PC.

S382-13 SOFTWARE for S382-01 gauge, complete with USB adaptor and connection cable to PC.



DETERMINATION OF RESTRAINED EXPANSION OF CONCRETE OR MORTAR SPECIMENS CONTAINING THE EXPANSIVE AGENT, AND THE EFFECT OF THE AGGREGATES ON THE DRYING SHRINKAGE OF CONCRETE

STANDARDS: UNI 8147 | UNI 8148

The mould, steel made, is supplied complete with 3 screwed rods and 6 restrained end plates.

MODELS

E114 THREE GANG PRISM MOULD, to produce 80x80x240 mm specimens. Weight: 15 kg approx.
STANDARD: UNI 8148

E114-02 Restrained end plate 80x80 mm; spare to E114 mould.

E115 THREE GANG PRISM MOULD, to produce 50x50x250 mm specimens. Weight: 10 kg approx.
STANDARD: UNI 8147

E115-02 Restrained end plate 50x50 mm; spare to E115 mould.

E115-01 Steel screwed rod 280 mm long; spare to E114 and E115 moulds.



ACCESSORIES

E078 KIT LENGTH COMPARATOR, with digital dial to measure linear variations.

Technical details and other models: see p. 397

E078-05 REFERENCE ROD, 280 mm long

C376N PULLOUT TEST APPARATUS

STANDARDS: EN 12504-3 | UNI 10157, UNI 9536, comparable to ASTM C900

Used to evaluate the concrete resistance as per the strength applied to extract a disc embedded into concrete.

The standard equipment comprises hydraulic extraction unit 100 kN capacity with pump, precision manometer 0-100 kN, bearing ring, 10 steel discs Ø 25 mm (EN 12504-3), carrying cases.

Weight: 18 kg approx.

ACCESSORIES

C376-01 INSERTS, 30 mm Ø (UNI 9536) to embed.
Pack of 25 pieces.

C376-03 DISCS, 25 mm Ø (EN 12504-3) to embed.
Pack of 25 pieces.

DETERMINATION OF POWER EXTRACTION THROUGH INSERTS POST INTRODUCED, WITH FORCED AND GEOMETRICAL EXPANSION

STANDARD: UNI 10157

It's used to determine the needed power to extract from a concrete element a metallic insert that is introduced in the element by perforation.

This extraction power it's used:

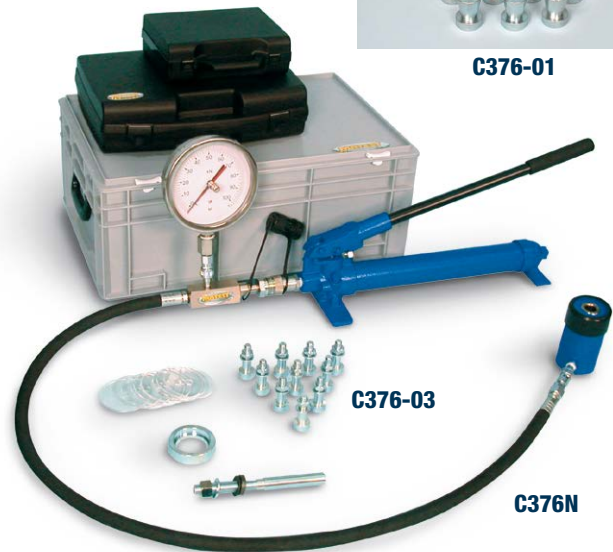
- To investigate on concrete mechanic proprieties in site.
- To estimate the in site concrete's compression resistance in a case of specific calibration curve.

The equipment is composed of:

- C376 N** Pullout test apparatus
- C376-10** Connecting rod furnished with bearing ring, to be used with the pull-out instrument to hook the C376-11 insert.
- C376-11** Geometric expansion pull-out insert dia. 18x80 mm. Pack of 10 inserts.
- C376-12** Hardened drill beat to perform a hole as required from UNI standard and to put in a insert.
- C376-13** Drill with SDS mandrin
- C376-14** Striker, to put a insert into the hole
- C376-15** Aspirant pump to clean the hole from detritus and dust



C376-01



C376-03

C376N

E142 DIGITAL PULL-OFF (BOND) STRENGTH TESTER

CAPACITY: 16 KN

STANDARDS: EN 1542, EN 1348, EN 1015-12, EN 13687-2
EN 13963, 14496 | NF P18-858 | BS 1881:207
ISO 4624

This dynamometer measures the adhesive force and the tensile strength of two layers of materials (concrete, facing plasters, mortars, building plasters, lime etc.) and is particularly suitable for applications concerning testing repairs of any structure where the bond strength between two layers is an essential factor.

Technical details, more accurate description and accessories: see p. 406



E142

E142-01 DIGITAL PULL-OFF (BOND) STRENGTH TESTER

CAPACITY: 0-5 KN

Identical to mod. E142 but with load cell and digital display range 0-5 kN for more accurate measurements on low strength values. Technical details: see p. 406

C374
MOISTURE METER - SURVEYMASTER

Used to measure the damp conditions in concrete structures, masonry, gypsum, both on surface and at depth with non-destructive method.

Measuring range: from 7.9% up to the nominal value of the 99% with $\pm 0.1\%$ accuracy.

Digital reading of values, audible alarm.

Battery operated.

Dimensions: 170x54x42 mm

Weight: 200 g approx.


C374
C374-06
AQUAMETER, UNIVERSAL MOISTURE METER

This pocket electronic instrument measures the quantity of water in various solid materials such as concrete, masonry, gypsum, brick, woods, mortars etc.

Using a high frequency capacitive sensor, a large volume of material (approx. 50x75x25mm) is sampled instantaneously.

Features:

- Direct read-out of moisture content; no charts or tables required
- Resolution: $\pm 0.1\%$
- Accuracy: $\pm 0.2\%$ at constant temperature
- Sensing field volume: approx. 90 cm³
- Program mode on concrete, masonry, gypsum, brick, most woods available for maximum accuracy, with special user calibrated mode and averaging function.
- No prongs, probes or holes to be drilled

Typical Applications:

- Locate leaking pipes in walls and floors
- Locate seeping water in basements and masonry tanks
- Check moisture level of materials before applying coatings or adhesives
- Curing condition of wood, stucco and other construction materials

Powered by: battery 9 V

Dimensions: 110x70x50 mm

Weight: 250 g approx.


C374-06
A028
CARBIDE METER FOR SURFACE DAMPNES

For the rapid and accurate determination of moisture content.

The sample is drilled or scraped from the surface and introduced into the bottle with the carbide reagent.

The meter is suitable for moisture tests on sand, aggregates, soil etc.

It is possible to vary the sample weight from 3 to 100 g for the complete reaction between sample and carbide with accurate moisture measurements from 0 to over 20%

The glass ampoule containing the calcium carbide is broken when the bottle is closed and shaken, granting better accuracy to the test.

The instrument comprises the testing bottle with manometer, small balance, 20 ampoules of reagent, accessories, case.

Dimensions: 520x340x140 mm

Weight: 6 kg approx.


A028
C375-02N
CARBONATION TEST

STANDARD: EN 13295

The test allows the measurement of the depth of carbonation through the surface of concrete.

The set consists of :

- phenolphthalein solution (1000 ml)
- demineralized water (5000 ml)
- depth measuring gauge
- two washing bottles 250 ml capacity

The surface of the concrete specimen under test is sprayed with phenolphthalein solution to detect the loss of alkalinity associated with carbonation. The risk of carbonation induced corrosion can be measured, if correlated with the concrete cover to reinforcement.

Weight: 6 kg approx.


C375-02N

C375-01 CHLORIDE FIELD TEST SYSTEM

STANDARD: AASHTO T260, Comparable to ASTM C114

The determination of the chloride ion concentration in concrete is essential in assessing the need for maintenance on, for example, bridge decks and parking structures. The test can also be used to ensure that materials used in new construction are free from potentially harmful chloride ion levels.

With this method, the concentration of acid soluble chlorides is measured. In most cases this is equivalent to total chloride concentration.

MAIN FEATURES

- Fast results within minutes at the site
- Low cost per sample compared to laboratory testing
- Accurate results are comparable to laboratory testing
- Covers wide range from 0.002% to 2% chloride by weight
- Automatic compensation for changes in ambient temperature
- Digital display for direct reading of lbs./cu.yd. and percentage of chloride by weight

The test system includes:

- Electronic meter, high impedance with temperature compensation and microprocessor for direct conversion to percentage of chloride. Battery powered.
- Chloride combination electrode with temperature sensor
- 12 jars each with 20 ml of extraction liquid
- 5 jars of coloured calibration liquid
- Scale for 3 g samples weighing, accessories, carrying case

Weight: 5 kg approx.

The equipment comprises: manual vacuum pump, digital pressure measuring system, stainless steel chamber for surface measurements, 25 silicone rubber plugs, clamping pliers, drill bits, anchors, accessories. The whole contained in carrying case.

Dimensions: 430x300x150 mm

Weight: 6 kg approx.

C375-10 KIT AIR AND WATER PERMEABILITY OF CONCRETE FIGG TECHNIQUE

The ingress of air and moisture into the concrete can cause corrosion of the steel reinforcement and lead to a deterioration in concrete strength.

Therefore, a measure of the ease of movement of liquids and gases through the surface layer of the concrete is a better method of assessing the soundness and expected life of concrete than strength alone.

Permeability is recognized as being the most important parameter in assessing concrete durability.

The depth test is performed by drilling a hole 10 mm diameter x 40 mm deep, and plugged with a silicone rubber plug.

A hypodermic needle is passed into the stopper; the water permeability test is performed by measuring the time of absorption needed by the water introduced into the void by pressure.

For the air permeability test, a vacuum pressure is created in the void, and the time needed to rise this pressure is measured.

Surface permeability tests can be carried out by clamping a stainless steel chamber on the smooth surface of the concrete.



C375-10 KIT



C375-01

SPARE

C375-11 Silicone rubber plugs. Pack of 25 pcs.

RAPID CHLORIDE PERMEABILITY OF CONCRETE

C378N CHLORIDE ION PENETRATION METER

STANDARDS: ASTM C1202, ASTM C1760 | AASHTO T277

Laboratory test device for the measurement of the resistance of the concrete against the penetration of chloride.

The measurement data can be used to estimate the chloride diffusion coefficient of concrete for the service life prediction and design of concrete structures as well as the durability-based quality control of concrete.



C378N

MAIN FEATURES

The following are unique features of this device:

- Stand alone operation.
- Easy-to-assemble.
- Accurate (± 0.1 mA)
- Flexible logging interval time (1 to 10 min)
- Automatic temperature control system.
- Four measurement channels.
- User-friendly PC software.
- Customizable setup.
- USB connection to computer.

Applications:

The device can be used for testing the durability of concrete exposed to chloride-contaminated environment including:

- Concrete ability to resist chloride ion penetration (ASTM C1202, AASHTO T277).
- Bulk electrical conductivity of concrete (ASTM C1760).
- Performance-based quality control of concrete.
- Estimation of chloride diffusion coefficient of concrete.
- Estimation of chloride migration coefficient of concrete
- Service life design of concrete structures.
- Estimation of the remaining life of concrete structures.

Compliance:

- The only instrument in the market that meets the specifications of ASTM and AASHTO Standard for sample cell.
 - Electrical safety certification mark for use in concrete laboratories.
- Supplied complete with set of test cells, temperature sensors, test cables, power cord, USB cable, communication software, user manual.

The METER is supplied complete with VACUUM PUMP + DESSICATOR and accessories to saturate the specimen with water (required by ASTM C1202).

Specifications:

Type	Value
Applied voltage (ASTM C1202 test)	60 \pm 0.1 V
Range of current measurement	0 - 500 mA \pm 0.1, \pm 0.2%
Temperature measurement range	0 - 100 +/- 1°C
Operating temperature	15°C - 45°C
Operating humidity	30% - 80%
Measurement channel	4
Short circuit protection system	Yes
Measurement display on LCD	Yes
Remaining time display on LCD	Yes
LCD display area	65 x 33 mm
Operating voltage:	100-240V 50-60Hz 1ph
Dimensions of device	280x240x104 mm
Weight	2 kg

C373-10N**CROSS HOLE ULTRASONIC SYSTEM - TWO CHANNELS, FOR DEEP FOUNDATIONS**

STANDARD: ASTM D6760-02

The Cross-hole Sonic Logging (CSL) method is used to perform high-resolution quality control on deep foundations.

The system uses an ultrasonic wave sent from an emitter to a receiver while both are pulled through water-filled access tubes embedded in the concrete. The measured arrival time and energy are directly related to concrete quality.

The control unit must be connected via USB standard to a regular notebook computer or Tablet PC (not included) on which, should be installed the software (included) for testing, analysis and real time reporting in 2 D Tomography.

Easy to use: the user-friendly software makes it possible to master the instrument in less than a day. No additional expensive training required. Powerful tomography features are available.

SPECIFICATIONS

- Housing: rugged, environment-proof, water-resistant housing.
- Temperature range: -25 to 60 °C (operating), -40 to 70 °C (storage).
- Transducers: dual-purpose transceivers, 50 kHz nominal, pressure-tested housing, Ø 25 mm
- Cables: detachable heavy-duty polyurethane wound on reel.
- Cable length: 50 m (100 m and 150 m cables are available upon request).
- Sampling rate: 500 kHz (2 µs resolution).
- Gain: 8 level automatic gain control (AGC).
- Depth meters: two 24-bit counters, <0.1% error.
- Pile measuring range: 1 to 145 m
- Tube spacing: up to 4 m in good concrete.
- Productivity: up to 3000 m/Day by a single operator.
- Memory storage: unlimited.
- PC minimum requirements: Windows 2000/XP, 300 MHz, 128 Mb, 800x600 resolution (not included).
- Reporting: arrival time, energy and wave speed curves, **waterfall** presentation, dual presentation, fuzzy-logic, tomography.
- The package includes: a computerized central unit, two ultrasonic transducers, two 50 m cable reels, two depth meter pulleys, cables and AC power adapter, and the software.
- Language: Multi-lingual user-interface and reporting.
- Power supply: internal rechargeable lithium ion battery (two days of typical use), external 100-240V AC (operation/charging).
- Dimensions: 430x325x105 mm (instrument only).
- Weight: 3.8 kg (instrument only).

ACCESSORIES

C373-12 TWO 100 m CABLE REELS (instead of 50 m standard ones)

C373-13 TWO 150 m CABLE REELS (instead of 50 m standard ones)

**C373-10N**

REBOUND CONCRETE TEST HAMMERS

STANDARDS: EN 12504: Part 2 | ASTM C805 | DIN 1048
 BS 1881:202 | NF P18-417

Designed to perform non-destructive tests on concrete structures, it gives an immediate indication of the compressive strength of the concrete using the calibration curve supplied with.

MODELS

C380 CONCRETE TEST HAMMER MADE IN MATEST

Spring impact energy 0.225 mkg. (2.207 Joule or Nm)
 Suitable for finished concrete structures and buildings having strength resistances from 10 to 70 N/sq.mm. **This concrete test hammer, entirely produced by Matest, has aluminium frame and thanks to its very accurate manufacture processing and selected components ensures high precision test results in the time. The top quality test hammer available on the market.**
 Supplied complete with calibration curve chart in N/mm² (Mpa) values, abrasive stone, carrying case.

Dimensions with the case: 330x100x100 mm

Weight: 2 kg



C380



C380 with case

C380-01 CONCRETE TEST HAMMER MADE IN MATEST

Exactly the same as mod. C380, but with calibration curve chart in Psl values as requested by ASTM Specifications.

C381 CONCRETE TEST HAMMER MADE IN MATEST

Similar to mod. C380, but with impact energy of 0.735 Joule (Nm).
 Ideal to test small sized, sensitive and thin walled materials.
 Suitable to test also rock core samples.



C381

C390 ANVIL

STANDARD: EN 12504:2

Used for the verification of the calibration of the concrete test hammers. Special steel alloy made.

Dimensions: Ø 150 by 320 mm.

Weight: 16 kg approx.

Note:

The EN 12504:2 Specification requires obligatory the use of the anvil for the hammer tests.

The Standard specifies:

- Before a sequence of tests on a concrete surface, take and record readings using the steel reference anvil and check to ensure that they are within the range recommended by the manufacturer. If they are not, clean and/or adjust the hammer.
- After tests, take readings using the steel anvil, record them and compare them with those taken prior to the test. If the results differ, clean and/or adjust the hammer and repeat the test.



C380

C390

ORIGINAL "SCHMIDT" TEST HAMMERS

C382

Standard model **N** for normal concrete casting.
 Impact energy 2.207 Nm

C383

NR model; same as C382 model, but having an automatic incorporated device recording on diagram the impact values

C383-01

Spare roll recording paper for C383 (pack of 5)



C383-10

C383-10 SILVER SCHMIDT

Digital concrete test hammer. Impact energy: 2.207 Nm.



C382



C383

C386N**DIGITAL CONCRETE TEST HAMMER WITH MICROPROCESSOR MADE IN MATEST**

STANDARDS: EN 12504:Part 2 | ASTM C805 | BS 1881:202 | NF P18-417 | DIN 1048 | UNI 9189

This digital concrete test hammer, microprocessor operated, entirely designed and manufactured by Matest with advanced technology, performs basic concrete testing with continuous automatic recording of all parameters in accordance with EN 12504-2 Specifications, register and process data and then transfer them to a PC

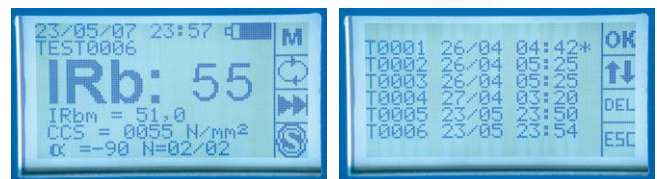
The unit consists of the standard mechanical model C380, but equipped with an electronic transducer that measures the rebound values and supplies automatically the results on a graphic display.

During test performing:

- Shows index value
- Shows average index value
- Allows to select measuring system in MpA or Psi
- Shows numbers of performed rebounds
- Shows date and time
- Identifies tested element
- Identifies automatically and shows rebound angle
- Shows battery life

MAIN FEATURES

- Possibility to store, display on graphic LCD 128x64 and download data to PC over 15000 tests
- Automatic statistical processing and readings
- Automatic conversion of rebound index to equivalent compression strength in psi, N/mm², kg/cm²
- High accuracy and resolution

**C386N** with case**C386N****TECHNICAL SPECIFICATIONS**

- Impact energy: 2.207 Joule (Nm)
- Measuring range: 10 - 120 N/mm²
- Interface: USB
- Power source: 6 rechargeable batteries AA NiMh 2400mA/hour
- Battery life: 60 hours with automatic shut down
- Operating temperature: -10°C +60°C

Supplied complete with data transfer software, data transfer USB cable, battery charger, abrasive stone, carrying case.

Dimensions with case: 330x180x120 mm

Weight: 3 kg

The digital Matest test hammer is suitable to be connected to the Ultrasonic Tester high performance mod. C372M (see p. 372) for combined ultrasonic and rebound tests with automatic data acquisition, processing and store of the results.

**C386N + C372M**

Note: The calibration anvil is the same (mod. C390) of the standard hammers.

C393
RESONANCE FREQUENCY METER - DETERMINATION OF THE CONCRETE RESONANT FREQUENCY

STANDARDS: ASTM C215, C666 | BS 1881:209 | NF P18-414 | UNI 9771

The unit measures the resonant frequencies of the three different modes of vibration:

- Longitudinal, transverse (flexural) and torsional.

From these, the following material characteristics, non destructively, can be calculated:

- young's modulus of elasticity,
- modulus of rigidity,
- poisson's ratio.

Available for specimen sizes up to 150 mm cross section dimension, and from 45 mm to 700 mm in length.

Automatic identification of the resonance frequency. Large easy to view display for data analysis of time domain and frequency spectrum signals.

Data can be stored and uploaded to a PC for further analysis and inclusion in report.

Fast and easy to use system.

The principle used in this meter is based upon the determination of the fundamental resonant frequency of vibration of a specimen generated by an impact and sensed by an accelerometer. The frequency spectrum is computed and displayed by the meter.

Durability of concrete:

The determination of flexural resonance is very important when studying the degradation of concrete under accelerated freezing and thawing cycles and aggressive environments on concrete specimens.

The advantages of resonance methods are:

- Test can be repeated over a very long period on the same specimen; the number of test specimens required is therefore greatly reduced.
- The results obtained with the resonance method on the same specimen are more reproducible than those obtained with non destructive tests and groups of specimens.

Specifications:

- Frequency range: 10 Hz to 20 kHz
- Sampling rate: 20 kHz or 40 kHz
- Accelerometer sensitivity: 9.60 mV/g (0.979 mV/ms²)
- Battery 12V, 4-10 hours continuous use.
- Display: 320 by 240; backlit for daylight use.
- Storage: 200 plus readings.
- Software: Windows compatible 9x/me 32 MB Ram.
- Impactors: set of 6 hardened steel balls.

The standard supply includes:

- electronic main unit.
- standard bench with its accessories.
- accelerometer with cable.
- hardened steel balls set.

Weight: 30 kg approx.


C393

C369N ULTRASONIC PULSE VELOCITY TESTER HIGH TECHNOLOGY

STANDARDS: EN 12504 part. 4 | ASTM C597 | BS 1881:203 | NF P18-418

The instrument gives data concerning the homogeneity of the concrete, by generating pulses of sound into the concrete and measuring the time the sound to travel from the transmitter probe to the receiver probe through the material. Furthermore it is possible to have indicative data of the strength of the concrete.

MAIN FEATURES

- Non-destructive test to determine cracks, voids, faults presence in concrete structures.
- LCD display 128x60 pixel.
- Battery operated rechargeable.
- Portable with anti-shock case.
- Supplied complete with calibrating cylinder and contact paste.

- Measuring range: 0 - 3000 μ s - accuracy \pm 0.1 μ s
- Selection of the ultrasonic pulse amplitude adjustable from 250 to 1000 V
- Measurement of the required time by the ultrasonic pulse to go through the tested material.
- Single or continuous acquisition mode with automatic or manual saving.
- Zero calibration with depuration of the time for the pulse to go through the probes.
- Calibration of a defined time value.
- Capacity of data acquisition, processing and filing of the test data up to 30.000 samples.
- Interface mini USB for PC connection.
- Two outlets for connection to the oscilloscope.
- Languages: English, French, German, Spanish, Italian.
- The use of the instrument is made easy because it is based on the user-friendly system.

The standard appliance includes:

- The instrument in basic configuration in a practical palmer container.
- Two 55kHz probes with connection cables.
- **Battery rechargeable pack** NiMh 4.8V > 2000m/A with low battery condition alarm.
- External feeder 230V and battery charger 12V 500m/A.

Case dimensions: 400x340x110mm

Weight: 2 kg approx.

ACCESSORIES

- C370-08** EXPONENTIAL TRANSMITTING/RECEIVING PROBES (couple), 55 kHz Nominal Frequency.
- C372-10** TRANSMITTING/RECEIVING PROBES (couple), 150 kHz Nominal Frequency, indicated for homogeneous, compact, high density concrete.
- C372-11** TRANSMITTING/RECEIVING PROBES (couple), 24 kHz Nominal Frequency, indicated for heterogeneous, low density concrete.
- C370-10** COUPLE OF CABLES (each 10 m long) to connect the probes to the tester. Used to test voluminous/large structures.



C369N



C369N with case

SPARES

- C370-02** Transmitting/receiving probes (couple), 55 kHz
- C370-06** Couple of cables (each 3.5 m long) to connect the probes to the tester.
- C370-07** Tube of grease to better coupling the probes to the material under test.

C372M
ULTRASONIC PULSE VELOCITY TESTER, HIGH PERFORMANCE

WITH MICROPROCESSOR FOR COMBINED ULTRASONIC AND REBOUND HAMMER DATA ACQUISITION AND PROCESSING

STANDARDS: EN 12504: part 4 | BS 1881:203 | ASTM C597 | NF P18-418

MAIN FEATURES

- Touch screen LCD display 800x480 pixel.
- Windows operating system like a standard PC.
- Flash memory 128Mb, expandable with SD card to illimited memory.
- Time measuring from 0 to 9999,9 μ S resolution.
- Possibility to combine the ultrasonic measurement with rebound index (SonRed method).

This is an instrument using the most modern technologies; it has a 7" WVGA colour touch screen, 128 MB, SD card, USB, working system Windows CE.

Ultrasonic tests:

The appliance allows measuring the ultrasonic impulse **speed** inside the material (by knowing the distance between the probes). It measures the **distance between the probes** (by knowing the speed of the ultrasonic impulse to go through the tested material). It measures the required **time** by the ultrasonic impulse to go through the tested material.

Young's modulus for soils is also measured (by knowing the distance between the probes, the density of the tested material and the shear-speed).

Young's modulus for concrete is measured by knowing the distance between the probes, the density of the tested material and the poisson ratio.

Calculation of the **crack depth**.

Zero calibration with depuration of the time for the impulse to go through the probes.

Calibration of a defined time value.

Infinite filing capacity of the test dates and the graph tracing of the tests on SD card or extractable and expandable.
 Possibility to use the instrument with two exponential probes, or with one standard probe and one exponential probe.
 Possibility to connect the instrument to internet for consultations or extractions, like a common PC.
 Visualization of the shape of the transmitting wave while it goes through the material checked, by transforming the instrument into a real oscilloscope.

Combined ultrasonic and rebound hammer determination (sonreb method):

The C372M ultrasonic tester houses an integral data logger for data acquisition, processing and store of rebound hammer values. The acquisition of the rebound values is performed with manual or automatic mode.

a) Manual mode:

Rebound values measured with a standard concrete hammer are manually input into the ultrasonic Tester.

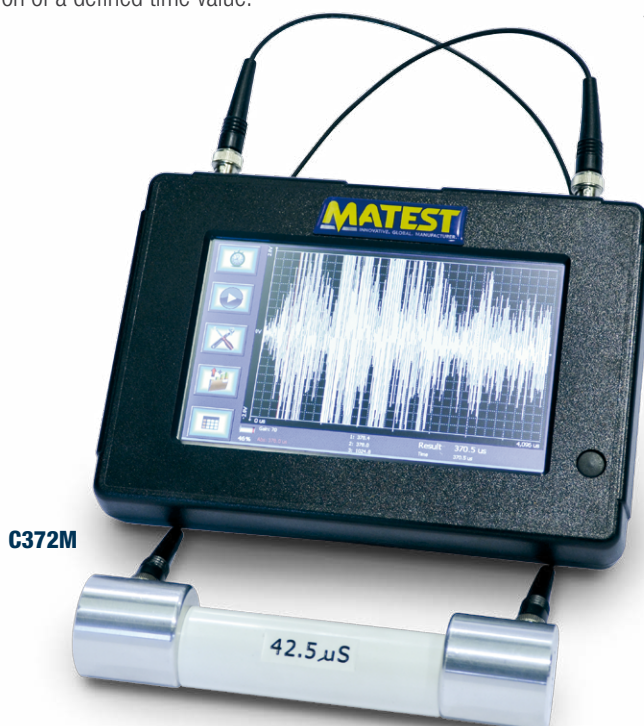
b) Automatic mode:

The digital Matest test hammer mod C386N is directly connected to the ultrasonic tester through a cable. The measured rebound values are automatically transmitted to the C372M tester.

The measures of the velocity of ultrasonic pulses and the rebound values, gives estimates of dynamic modulus of elasticity and Poisson's Ratio, and provides informations on possible voids, cracks and strength of the structure.

It is possible to evaluate the compressive strength of the concrete, useful to estimate formwork striking times.

The combined test allow to rectify different inaccuracies that are typical of the simple rebound hammer test, and obtaining estimates on the compressive strength of the concrete, that cannot be obtained with the ultrasonic test, granting high accuracy and reliability of the results.



The standard appliance includes:

- Instrument in basic configuration (ARM Cortex-AS 400MHz, 128 MB Flash Memory, 128 MB Ram) in a practical and elegant palmer container.
- Two 55 kHz probes with connecting cables.
- Calibrating cylinder and contact paste
- Strong anti shock case holding the instrument and the accessories.
- Battery pack Li-Ion 11.1V 3000mA.h
- External feeder 230V/24V and battery charger

Dimensions: 400x300x180 mm

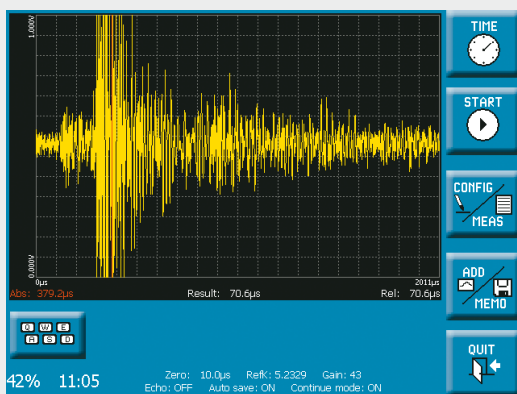
Weight: 3 kg approx.



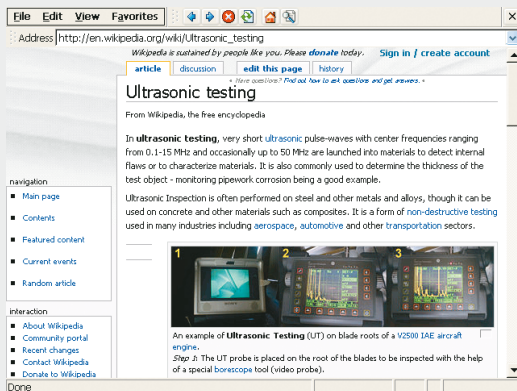
C372M + C368N



C372M with case



Display of graphic function



Display of internet function



Electronic card: detail

ACCESSORIES

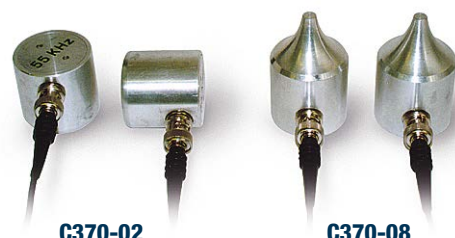
- C370-08** EXPONENTIAL TRANSMITTING/RECEIVING PROBES (couple), **55 kHz** Nominal Frequency.
- C372-10** TRANSMITTING/RECEIVING PROBES (couple), **150 kHz** Nominal Frequency, indicated for homogeneous, compact, high density concrete.
- C372-11** TRANSMITTING/RECEIVING PROBES (couple), **24 kHz** Nominal Frequency, indicated for heterogeneous, low density concrete.
- C370-09** COUPLE OF CABLES (each 10 m long) to connect the probes to the tester. Used to test voluminous/large structures.



C372-10

SPARES

- C370-02** Transmitting/receiving probes (couple), 55 kHz
- C370-04** Couple of cables (each 3.5 m long) to connect the probes to the tester.
- C370-07** Tube of grease to better coupling the probes to the material under test.



C370-02

C370-08

COVER TO REINFORCEMENT

For determining the presence, position, direction, depth and diameter of steel reinforcement bars in concrete structures.

STANDARDS: BS 1881:204 | DIN 1045

C403-01 PROFOSCOPE

Versatile, fully-integrated rebar detector and cover meter with a unique real-time rebar display allowing the user to actually **SEE** the location of the rebar beneath the concrete surface to a maximum deep of 180 mm.

This is coupled with rebar-proximity indicators and optical and acoustical locating aids. Rebar diameter can also be estimated within the specified testing range.

The Profoscope combines these unique features in a compact, light device that allows the user to operate this rebar detector with one hand making the task of locating rebars a simple and efficient process.

An intuitive user interface makes rebar detection easy.

MAIN FEATURES

- Visual indication of rebars in close proximity.
- Ability to identify the mid-point between rebars as well as the orientation of rebars.
- Optical and acoustical indication of rebar location and minimum cover alert.
- Neighboring bar correction.
- Cordless and single handed operation.
- Icon-based language independent menus.
- Start-up test kit allows user to familiarize with all functions in a comfortable environment, wasting no time on site.



C403-02 PROFOSCOPE+ (PLUS)

Same features of mod. C403-01, but additionally offers the innovative memory function for automatic data acquisition, by eliminating the manual measurements of a test series, saving time and unnecessary source of errors.



C396N PROFOMETER PM-600

This new generation Profometer Touchscreen unit offers real time control over the measurement procedure for the precise and non-destructive detection of rebar locations and measurement of the concrete cover and rebar diameters directly on site.

The instrument comes along with the Universal Probe with integrated spot probe for measurements in corners, limited spaces and congested rebar arrangements.

Deep measuring range: up to 175 mm

Measurement accuracy: from ± 1 to ± 4 mm

Screen: 7" color, 800x480 pixel.

Diameter accuracy measurement: ± 1 mm

Diameter measuring range: up to 63 mm

Weight: 1600 g



Note: Possibility to upgrade the Profometer C396N to Profometer Corrosion C411N for both corrosion and cover meter functions with the KIT below:

C411-01N UPGRADE KIT TO PROFOMETER CORROSION C411N

Interface box, rod electrode, cable coil l=25 m with clamp, DVD with software, documentation and carrying case.

Technical details: see C411N.



C411N PROFOMETER CORROSION

STANDARDS: ASTM C876, RILEM TC 154-EMC, DGZFP B3, SIA 2006, UNI 10174, JGJ/T 152, JSCE E 601

This instrument is the direct successor to the Canin and it is the most advanced corrosion detection device in the market. Consists in a non-destructive method to determine the corrosion of the reinforcement bars.

Same as C396N model, but with the accessories to detect corrosion and without the accessories to measure concrete cover and rebar location.

Supplied complete with rod electrode.

Memory:	internal 8 GB flash memory
Regional settings:	metric and imperial units and multi-language and timezone supported
Power input:	12 V \pm 25 % / 1.5 A
Battery:	3.6 V, 14 Ah
Battery lifetime:	> 8h (in standard operating mode)
Humidity:	< 95 % RH, non condensing
Operating temperature:	-10 °C to +50 °C
IP classification:	touchscreen IP54, universal probe IP67
Voltage measuring range:	-1000 to + 1000 mV
Voltage resolution:	1 mV
Impedance:	100 M Ω
Sampling rate:	900 Hz
Dimensions:	250x162x62 mm
Weight:	1600 g approx



C411N

Note: Possibility to upgrade the Profometer Corrosion C411N to Profometer PM-600 C396N for both corrosion and cover meter functions with the KIT below.

C396-01N UPGRADE KIT TO PROFOMETER CORROSION

Universal probe with ruggedized cart, probe cable 1.5 m, software upgrade to cover meter.

Technical details: see C396N.



C396-01N

C412-01 DIGITAL RESISTIVITY 2-PROBE ARRAY METER

Used for assessing the probable rate of corrosion in reinforcing bars with the electric resistivity measurement method.

A highly permeable concrete has a high conductivity with reduced electrical resistance. The knowledge of the electrical resistance of a concrete allows to measure the possible rate of corrosion of steel reinforced bars.

The test is simple to perform and requires only two 6.5 mm diameter holes drilled to a depth of 8 mm. Inject a small amount of conductive gel into each hole and insert the probes. The resistivity value is immediately displayed.

- Measuring range: 0.5 to 20 k Ω cm, with 0.1 k Ω resolution.
- 2-probe array spacing: 5 cm
- Display: LCD 4 ¼ digit
- Battery operated with 100 hours operating time

The instrument is supplied complete with drill bit, gel, template, accessories, carrying case.

Dimensions: 400x270x130 mm

Total weight: 4 kg



C412-01

C414 COR MAP-HALF CELL METHOD

STANDARDS: ASTM C876 | BS 1881:201 | UNI 9535

A simple method for identifying areas of probable rebar corrosion in concrete structures.

Detachable electrode extension pieces (41 cm long), facilitate measurements in hard to reach locations.

High impedance digital meter is designed for tough field conditions. Reference electrode, including copper sulphate reservoir.

Easy to use, supplied complete.



C414 complete set

C410 WINDSOR HP PROBE DIGITAL SYSTEM

STANDARDS: ASTM C803 | BS 1881:207 | ACI 347

To evaluate the compressive strength of concrete in place with the penetration method. Non destructive test. It is fast, accurate and simple to perform. The five-minute test does not weaken the structure. Comparison between test results using this method and destructive tests shows a variance normally within 3% from each other. The method requires a pistol-like device which is loaded with a small explosive charge and metal probe. The charge is precisely measured to give a consistent firing force. By pulling the trigger the probe is fired into the concrete.



C410

Standard equipment consist of:

- driven unit
- digital measuring unit with memory for data storage to PC unloading
- accessories and carrying case.

Probes and power charges **are not included** and must be ordered separately.

Dimensions:

500x400x200 mm

Weight: 16 kg approx.



C410 with case and accessories

ACCESSORIES

C410-01 SILVER PROBES used for high performance concrete with strength up to 17000 PSI (110 MPa). Complete with probes and power loads. Pack of 75 probe Kit.

C410-02 GOLDEN PROBES recommended for light weight concrete. Complete with probes and power loads. Pack of 75 probe kit.

C410-10N PENETRATION PIN RESISTANCE DETECTOR

PENETRATION RESISTANCE

STANDARD: ASTM C803

This portable instrument is used to measure the resistance of materials in situ for new or existing constructions. The operating principle which the instrument is based is the capacity to nail a pin into the surface of the material, since the penetration depth is inversely proportional to compressive strength is easy to determine the material resistance. The unit measures compression strength of concrete and mortar in situ with accuracy and speed. It is a safe tool that uses a mechanism equipped with a calibrated spring to insert a steel nail into the material to be investigated. The depth of penetration of the nail is measured and correlated with specific curves to the compression strength of the test material. The removable small section nail facilitates the use of the instrument and the correct execution of the test.

Penetration resistance: 800 ± 8 N

Shot power: 20 ± 1 mm

Digital measuring gauge: 20 ± 0.01 mm

Nail dimensions: 3.5 mm diameter, 40 mm long

Supplied complete with 20 penetration nails, a little pump, a tightening key, a load lever, a carrying case.

Dimensions: 420x310x150 mm

Weight: 8 kg approx.

SPARE

C410-11 Penetration nails (pack of 20pcs).



C410-10N

C403-10 DEEP SCANNING METAL DETECTOR UP TO 150 MM

This locator finds and scans, through solid concrete, steel rebars and metallic materials like pipes, electric cables, junction boxes, metal studs and frames up to 150mm deep.

It scans and differentiates steel rebars from other metallic materials like copper pipes.

It differentiates magnetic metals from non magnetic ones.

This detector is an essential device for building contractors, remodelers, electricians, plumbers.

Accuracy: rebars or pipes 14mm dia. with minimum grid space of 152mm are scanned within 13mm tolerance.

Depth: 152 ± 25 mm

N° 1 alkaline battery 9V (not included) for one year use.

Dimensions: 250x110x62 mm

Weight: 300 g approx.



C403-10



C405-10

C405-15N

C405-10 DEFLECTOMETER WITH TELESCOPIC TUBULAR DISPLACEMENT TRANSDUCER

Used to determine the deflection under known loads of bridges, ceilings or any suspended structure.

This instrument grants very accurate and reliable test results with data acquisition through Cyber-Plus 8 Evolution mod. C405-15N. One telescopic deflectometer consists of:

- Aluminium telescopic tubular anodized frame having 1700 mm minimum height and 6000 mm maximum extension.
- Linear potentiometric displacement transducer with spring system, fixed on the base of the telescopic tubular frame, with measurements in compression 50 mm stroke and 0.01 mm resolution.
- Tripod supporting the telescopic tubular displacement transducer.
- 10 m extension cable.
- Carrying case.

Weight: 6 kg approx.

Note: Three deflectometers are recommended to correctly perform a test.

C405-15N CYBER-PLUS 8 EVOLUTION



8 Channels acquisition and processing data system, 24 bit resolution. Electronic advanced technology, **colour touch screen** 1/4 VGA, high graphic performances, the unit automatically performs test and data processing. A certificate can be printed through a printer (optional) directly connected to the unit through the USB port. The Cyber-Plus is equipped with slots for external pendrive or SD card infinite memory supports, it can be directly connected to a PC. Contained in a practical and sturdy watertight carrying case, can be powered from an electrical network 90-270 V or use the internal battery and charger granting one full day on-site use. Hardware technical details: see p. 18

S337-51 CALIBRATION process of one deflectometer with the data acquisition unit C405-15N.



Example of use

CISTERNS FOR LOAD TESTS

Made with flexible polystyrene covered in PVC, they are used to load the structure so to measure its deflection. Supplied with connector, flexible pipe and spherical valve.

Available in different capacities:

Model	Capacity litres	Dimensions cm	Weight kg
C405-24	1000	240 x 145	10
C405-25	2500	280 x 240	16
C405-26	5000	400 x 240	25
C405-27	10000	490 x 340	40



C405-24

C405-30 LITRE-COUNTER, ELECTRONIC, FOR CISTERNS

It measures and displays the quantity of water.

Accuracy: $\pm 1\%$

Feeding. AAA standard batteries

Weight: 2 kg



C405-30

SPARE

C405-20 Chain, 10 m long, stainless steel, for measurements over 13 m.

DEFLECTOMETERS - SWING-ARM MODEL

Used to determine the deflection on bridges, ceilings or any suspended structure. Possibility to use the deflectometer in pressure or traction, and direct reading on the dial gauge.

Available in **one** or **three** sets, to be completed with dial gauges stroke from 10 to 50 mm.

One deflectometer set comprises:

Swing-arm with clamp for complete orientation in any position, inextensible wire coil 20 metres long, plumb weight, carrying case. Supplied **without** dial gauge to be ordered separately (see accessories).

MODELS

- C405N** N° 1 SET OF DEFLECTOMETER (without dial gauge)
C406N N° 3 SETS OF DEFLECTOMETERS (without dial gauges)

ACCESSORIES

- S376** DIAL GAUGE 10 mm stroke x 0.01 mm sens.
S377 DIAL GAUGE 25 mm stroke x 0.01 mm sens.
S378 DIAL GAUGE 30 mm stroke x 0.01 mm sens.
S379 DIAL GAUGE 50 mm stroke x 0.01 mm sens.
S383 DIGITAL GAUGE 25.4 mm x 0.001 mm sens.

ACCESSORY for S383

- S382-13** SOFTWARE with UBS adaptor and cable for PC connection.

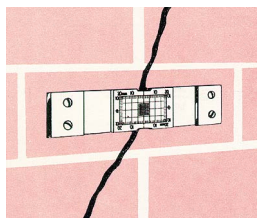
SPARE

- C407-02** Inextensible wire coil, 20 metres long

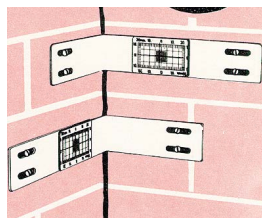


C406N + S376

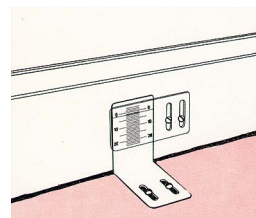
C405N + S377



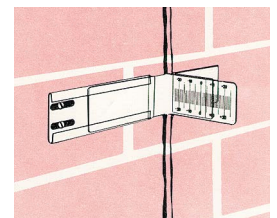
C408



C408-01



C408-02

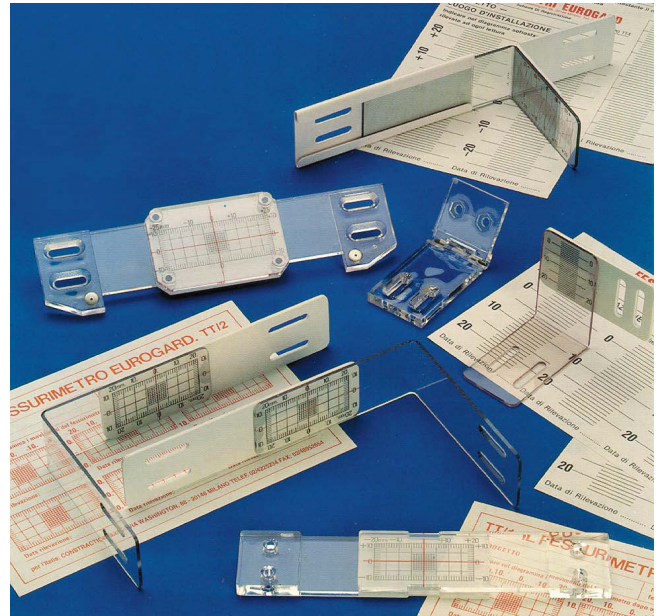


C408-03

CRACK WIDTH GAUGES

Used for monitoring, measuring and recording the crack width of a building structure.

Internal or external use, manufactured in vandal resistant polycarbonate, complete with crack record card each gauge to simplify monitoring, they are suitable for vertical and horizontal movement measurements.



C408...C408-03

MODELS

- C408** CRACK WIDTH GAUGE FOR WALLS, to monitor vertical and horizontal movements, also simultaneous, on a plane surface. Pack of 5 pieces.
- C408-01** CRACK WIDTH GAUGE FOR CORNERS, to monitor corner cracks with bidirectional movements, also simultaneous. Pack of 5 pieces.
- C408-02** CRACK WIDTH GAUGE FOR FLOORS, to monitor floor settlements to a wall, column etc. Pack of 5 pieces.
- C408-03** CRACK WIDTH GAUGE FOR DIFFERENCE IN LEVELS, to monitor the loss of levelness of any cracked surface. Pack of 5 pieces.

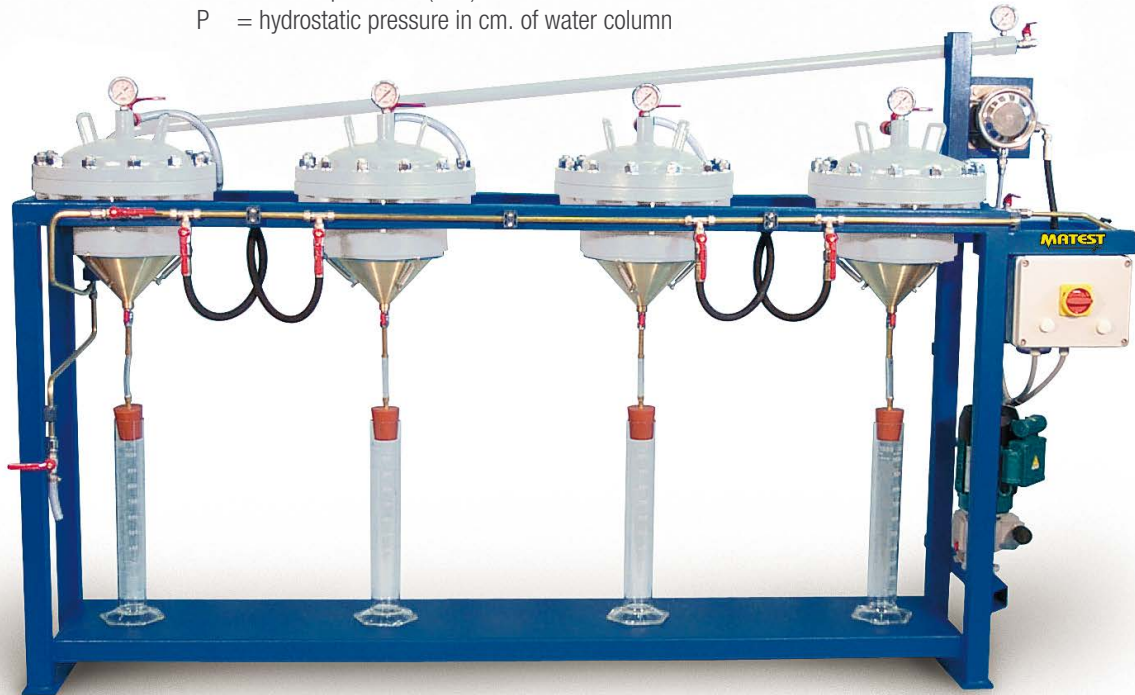
C430**AUTOMATIC CONCRETE WATER PERMEABILITY APPARATUS AT FOUR CELLS**

This fully automatic apparatus is designed to perform water permeability tests on cubic concrete specimens max 150 mm side and cylinder specimens max 160 mm diameter. The specimens are submitted to hydrostatic stress for a pre-set period. The water permeated through the test specimen is directly collected and measured into a graduated cylinder.

It is therefore possible to determine the permeability coefficient in cm/sec. (Darcy coefficient) by the following formula:

$$K = \frac{c \times h}{A \times t \times P}$$

where: c = permeated water in cm^3
 h = height of the specimen (cm)
 A = surface area of the specimen (sq. cm.)
 t = time to permeate (sec.)
 P = hydrostatic pressure in cm. of water column

**C430**

The equipment consists of a strong metallic frame holding four cells which are hot-galvanized for anti-corrosion protection.

Each cell includes a pressure control manometer.

A re-chargeable compensation plenum chamber is included as part of the test.

The pressure is adjustable from 0 to 30 bar and it is supplied by an automatic pump of variable supply, to achieve the most suitable installation for the specimen under test.

Water feed is direct from water inlet.

Seal pressure obtained through special and practical seal devices which maintain and simplify the use of the machine.

It is possible to use one or more cells together, and specimens also of different size (cubes/cylinders).

The specimen's sealing system is achieved through a practical and speedy, user-friendly device.

Supplied complete with four cells, four graduated cylinders, epoxy resin and accessories. The **sealing devices are not included** in the standard package and must be ordered separately.

Power supply: 230V 1ph 50Hz

Dimensions: 2500x500x1300 mm

Weight: 240 kg approx.

NEEDED ACCESSORIES

SEALING DEVICE, complete with rubber latex packing which is between the two hot-galvanized steel collars. Complete with bolts.

MODELS

C432-01 SEALING DEVICE FOR CUBES 100 mm side

C432-02 SEALING DEVICE FOR CUBES 150 mm side

C432-04 SEALING DEVICE FOR CYLINDERS Ø 100 mm

C432-05 SEALING DEVICE FOR CYLINDERS Ø 150 mm

C432-06 SEALING DEVICE FOR CYLINDERS Ø 160 mm

**C432-02****C432-05****SPARE**

C433 Epoxy resin, to isolate the lateral surfaces of the concrete specimen. Can of 5 kg

WATER IMPERMEABILITY TESTER

DETERMINATION OF PENETRATION'S DEPTH OF WATER UNDER PRESSURE.

STANDARDS: EN 12390-8 | DIN 1048

This apparatus is used to determine the depth of penetration of the water into the concrete

(impermeability) under known time and pressure.

The unit accepts concrete cubic, cylindrical or prismatic specimens having **max. dimensions** of 200x200x200 mm.

The specimen is put into the test chamber, clamped with **suitable flanges with central screw** and round gaskets.

A known water pressure is applied on the specimen's surface for a known time, as requested by Standard, using a suitable air compressor (see accessory) having at least 5 bar pressure.

A manometer checks constantly the applied water pressure.

The apparatus is supplied **complete with graduated burettes** fixed on the front panel.

The water penetrated is measured by breaking the specimen, or by reading the water permeated through the graduated burette.

Two models available: three place and six place version. The places can be used all-together at the same time, or one by one independently.



C435-01



C435

MODELS

C435

CONCRETE WATER IMPERMEABILITY APPARATUS, THREE PLACE, with water measurement burettes.

Dimensions: 1400x750x1700 mm

Weight: 280 kg approx.

C435SP

CONCRETE WATER IMPERMEABILITY APPARATUS, THREE PLACE, same as mod. C435, but having three separate pressure lines

C435-01

CONCRETE WATER IMPERMEABILITY APPARATUS, SIX PLACE, with water measurement burettes.

Dimensions: 1400x750x1850 mm

Weight: 430 kg approx.

C435-11

DUAL PRESSURE LINE to upgrade the apparatus mod. C435-01

ACCESSORIES

V206 AIR COMPRESSOR, 70 litres capacity.
230V 50Hz 1ph.

E138-11 TUBING and accessories to connect the impermeability apparatus to the air compressor.

OUR CLIENTS ARE OUR BEST ADVERTISEMENT.





MATEST

**SERVO
PLUS
EVOLUTION**

**CYBER
PLUS
EVOLUTION**