CONCRETE TEST

Concrete structures are far more than a mixture of sand, gravel and cement left to harden and set to the desired shape. Considerable care and knowledge are required to produce quality concrete.

Our comprehensive range of testing equipment satisfies all EN, ASTM and other National Standards.

Contents

CONCRETE TESTING

Testing systems

for determining the mechanical properties of concrete

For over 50 years, our compression testing equipment has been meticulously designed to help you deliver the most accurate and reliable testing results possible.

Today, these high-quality, intuitive testing solutions play a pivotal role in the creation of safe, compliant yet cost-effective engineering infrastructure.

AUTO Our latest range of products is the outcome of our continuous innovation policy and investment in R&D. **All models are now automatic**, including the entry-level Wizard Auto, delivering total certainty of testing accuracy and strict conformity to International Standards.

Traceability and **ease of integration** in the laboratory system are also improved, as we have implemented dedicated functions and packages that raises compression machines performance up to a completely new level of provable testing accuracy and superior laboratory efficiency.

The **vast range** of **products** offers multiple models to suit all budgets, and each model's performance always exceeds the users' expectations. The rich selection of **accessories** and **upgrading options** make the package extremely flexible and easily expandable to suit every need.

Selection Criteria

Basic components can be identified in:

POWER AND CONTROL SYSTEM (PCS)

We offer three automatic model variants which differ, dependent upon the technical level, complexity and type of test that is being performed:

WIZARD AUTO
Standard automatic Quality Control compression testers

PILOT PRO
more sophisticated and flexible automatic PCS for compression and flexure testing

AUTOMAX PRO
advanced automatic versatile testing system

These models are mainly dedicated to routine failure tests (compression, flexure and indirect tensile).

Our range is completed by Automax Pro-M and Automax Multitest models, allowing the performance of more advanced test methods beyond the classic compression tests, as:

- The determination of the Modulus of Elasticity and Poisson Ratio
- The execution of tests under displacement and strain control particularly important for FRC Fiber Reinforced Concrete characterization

AUTOMAX PRO M
Compact-Line compression machines featuring touch-screen display

AUTOMAX MULTITEST
stand-alone computerized control console

All versions feature high speed pumps that will close the daylight above the specimen at the fastest speed on the market allowing a very high throughput of samples.

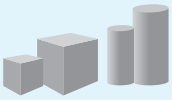
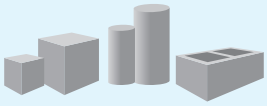
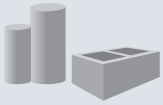
In addition PILOT Pro and AUTOMAX product ranges can be completed with Link-LAB Connectivity packages, WEBCARE remote assistance service and i-Lab cloud Services. See page 178.

LinK-LAB LABORATORY CONNECTIVITY PACKAGE
WEBCARE REMOTE ASSISTANCE SERVICES
i-LAB CLOUD SERVICES

FRAME

The frame of the compression testers is characterized by the:

- Testing Standards (e.g. ASTM/AASHTO or EN)
- The shape and dimensions of specimens (e.g. cylinders, cubes or blocks)
- Capacity which depend on the expected strength of the testing material

		CAPACITY for further guidance please visit our web site	Wizard Auto	Pilot Pro	Automax Pro
Strict Conformance to	Sample Types	kN	Model	Model	Model
cen EUROPEAN NORM EN	Cubes & Cylinders 	2000	50-C46W0x	50-C46P0x	50-C46F0x
		3000	50-C56W0x	50-C56P0x	50-C56F0x
		4000	-	50-C68P0x	50-C68F0x
		5000	-	50-C78P0x	50-C78F0x
	Cubes, Cylinders & Blocks 	2000	50-C47W0x	50-C47P0x	50-C47F0x
		3000	50-C57W0x	50-C57P0x	50-C57F0x
		4000	-	50-C69P0x	50-C69F0x
		5000	-	50-C79P0x	50-C79F0x
ASTM INTERNATIONAL	Cylinders 	1500	50-A12W0x	50-A12P0x	-
		2000	50-A22W0x	50-A22P0x	50-A42F0x
		3000	50-A32W0x	50-A32P0x	50-A52F0x
	Blocks 	2000	-	50-A29Px	-
		3000	-	50-A39P0x	-
	Blocks & Cylinders 	2000	-	50-A29P0x+50-A29/CYL	-
		3000	-	50-A39P0x+50-A29/CYL	-
GENERAL	Cubes & Cylinders 	1500	50-C13W0x	50-C13P0x	-
		2000	50-C23W0x	50-C23P0x	-
		3000	50-C34W0x	50-C34P0x	-
	Cubes, Cylinders & Blocks 	2000	50-C25W0x	50-C25P0x	-
		3000	50-C35W0x	50-C35P0x	-

MACHINE CLASS All models are supplied in Class 1 to EN 12390-4 (corresponding to ASTM E74 Class A) starting from the 10% of the full range as standard, but with a special calibration procedure identified by the code 50-C0050/CAL, we can grant Class 1 starting from 1% of the full range

Automatic compression testers

50

As already specified in the introduction, all our compression machines, even the entry level compression testers WIZARD AUTO, are **automatic**.

The load rate is applied and controlled automatically with a number of very important advantages synthesized below which obviously applies to all other automatic compression testers.

BENEFITS OF CONTROLS AUTOMATIC TESTERS

No human error
Extremely limited opportunity for operator errors, improving accuracy of results and repeatability

Easy to use
Easy to use, even for operators with limited expertise

Comforming to Standards
The machine automatically performs the test at correct test speed. Conformance to Standards can be easily proven

Improved performance (high speed pump)
High speed pumps that will close the daylight above the specimen at the fastest speed allowing a very high throughput of tests

Noise reduction Operation Comfort
Operator comfort due to remarkable noise reduction

Energy saving
Energy saving, energy consumption reduced by 50%

Power and Control Systems

WIZARD AUTO

Standard automatic Quality Control Power and Control System

Hydraulic

- Max pressure 700 bar
- Power 750 W
- Dual stage pump: low pressure/ high delivery for fast piston approach and high pressure/low delivery for loading.
- AC motor fitted with inverter device featuring high efficiency, reduction of power consumption and silent operation.
- Second frame optional facility using valve selector.

Hardware

- Two 16 bit analog channels for load sensors
- Wide graphic display 128 x 80 pixel
- Sampling rate 50 Hz
- Internal memory
- RS 232 port for data download (including load/time graph points) to PC in ASCII format
- Integrated printer as optional. See accessories

Firmware

- Real time display of load and stress
- Automatic application of the selected load rate
- Execution of loading ramps with the possibility to manually increase or decrease the test speed during the test
- Peak detection and saving
- Language selection
- Multi-coefficient linearization of the calibration curve for better accuracy at low loads
- Multiple units: Lbf / Ton / kN.

FEATURES and ADVANTAGES

» Two analog channels for load sensors

» Wide graphic display 128 x 80 pixel

» Graphic printer available as option

» AC motor fitted with VDF inverter technology: high efficiency, low consumption, silent operation

» Dual stage pump for fast approach and automatic switch to high pressure for loading

» Second frame optional facility

Power and Control Systems

PILOT PRO

Sophisticated and flexible automatic PCS for compression and flexure testing

Hydraulic

- Dual-stage pump: centrifugal low pressure for fast approach automatically switches to radial multi-piston high pressure for loading
- DC motor, 720W, 50-60Hz
- Maximum working pressure 700 bar
- Load/unload valve
- Second/third frame selection valve available as option (see page196)
- Load/unload electrovalve available as option with active second (included) and third/fourth (optional) frame control via display/PC. See page 196
- ES Energy Saving technology to reduce the power consumption and enable silent operation

Hardware

- 524,000 points high-resolution/ stability analog channels
- 3 channels for load sensors
- Control frequency 100 Hz
- Sampling frequency 100 Hz
- 5.1", 800 x 480 pixel, 16 M colors, icon-driven touchscreen graphic display, showing data and plots
- Unlimited storage capacity for test data on internal 8 GB SD card
- USB port for test data storage on external USB Memory stick
- Ethernet port for PC / Internet / network communication
- Optional integrated graphic printer including Load-Time plot
- RS 232 port for data downloading in ASCII format
- Wi-Fi or GSM module available as option

FEATURES and ADVANTAGES

» Large graphic color 5.1" display, 800 x 480 pixel

» Dual user interface via console display or PC with Datamanager software

» Networkability for connection to a wide range of web services (see page178)

» LinK-LAB integration package for connection with bar code readers, balances, calipers, etc. See page 178

» Variable speed permanent magnet DC motor for superior performances at low load rates and low load value compared to the AC motors with inverter.

» Soft platen-to-specimen contact for better accurate speed control from the very beginning of the ramp

» High speed pump: will close the daylight above the specimen at the fastest speed for a very high throughput of samples

» Second and third frame connection optional facility. See upgrading options page 196

» ASTM C39 full conformity (initial pause for specimen alignment, double load rate option, height/ diameter correction factor, final calculation of effective load rate applied, peak sensitivity in %)

» Oversampling function increasing the sampling rate when specimen is approaching the failure for better identification of peak value

» Graphic printer available as option. See upgrading options page 198

Firmware

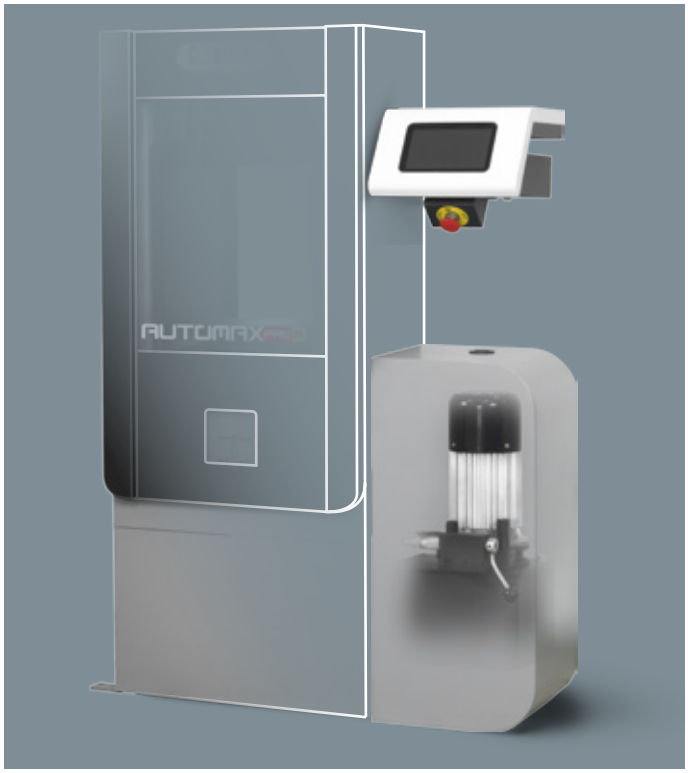
- Execution of compression, flexure, indirect tensile, ACV tests in automatic mode with load rate controlled by a closed-loop PID system
- Execution of loading ramps with the possibility to manually increase or decrease the test speed during the test
- Possibility to reach at controlled speed a load target and to keep a steady loading phase
- Simultaneous display of load, specific load, actual load rate, load/time graph
- Download data to internal printer (optional) or to PC via RS 232 port or to USB memory stick
- Multi-coefficient linearization of the calibration curve for better accuracy at low loads thus avoiding the use of a second pressure transducer
- Recording facility for up to 10 test profiles for each channel including: type of test (e.g. compression, flexural, indirect tensile), specimen size and shape, load rate, test standard and other general information. Each one of the recorded test profiles can be recalled automatically to save time
- Improved PID algorithm and Multi PID selection. Up to 3 different PID settings can be tuned for a variety of materials (ACV, flexure, compression with neoprene pads, etc.)
- Compatible with the newly released Datamanager software, tailored for construction material testing laboratories, for real time data acquisition, display and management
- Peripheral devices integration and web services available as option (see page 178)
- Automatic load measurement verification procedure, by connecting suitable load cells and our digital readout unit to PC
- Language selection (including Cyrillic and Chinese)
- Unit selection (kN, ton, lbf)
- USB port for firmware upgrade and safe backup of the original configuration data (PID, calibration, etc.), in case of loss and/or data corruption. The restore of the machine to the factory settings is easy avoiding the need of any technical support.

3000 kN Pilot Pro EN automatic compression machine controlling double chamber cement frame 300/15 kN capacity.

Power and Control Systems

AUTOMAX PRO

Advanced automatic versatile testing system



Hydraulic

- Dual-stage pump: centrifugal low pressure for fast approach automatically switches to radial multi-piston high pressure for loading
- DC motor, 720W, 50-60Hz
- Maximum working pressure 700 bar
- Load/unload electrovalve for test execution via display/PC and automatic stop at specimen failure
- Active control of up to 4 frames by selection via display/PC (third and fourth frame as option). See accessories.
- ES Energy Saving technology to reduce the power consumption and enable silent operation
- Flow-sharing technology to perform loading and unloading cycles (for Automax Pro-M only)

Hardware

- 524,000 points high-resolution/ stability analog channels
- 6 channels to be factory configured:
  - 2 channels for load sensors
  - 2 channels for load or displacement/strain sensors (for Automax Pro-M only)
  - 2 channels for displacement/strain sensors (for Automax Pro-M only)
- Control frequency 250 Hz
- Sampling frequency 250 Hz
- 7", 800 x 480 pixel, 16 M colors, icon-driven capacitative sensing touchscreen graphic display
- Unlimited storage capacity for test data on internal 8 GB SD card
- USB port for test data storage on external USB memory stick
- Ethernet port for PC / Internet / network communication
- Optional integrated graphic printer including Load-Time plot
- RS 232 port for data downloading in ASCII format
- Wi-Fi or GSM module available as option

FEATURES and ADVANTAGES

» Large 7" graphic color display, 800 x 480 pixel

» Dual user interface via console display or PC with Datamanager software

» Networkability for connection to a wide range of web services (see page 178)

» LinK-LAB integration package for connection with bar code readers, balances, calipers, etc. See page 179

» Variable speed permanent magnet DC motor for superior performances at low load rates and low load value

» Soft platen-to-specimen contact for better accurate speed control from the very beginning of the ramp

» High speed pump: will close the daylight above the specimen at the fastest speed for a very high throughput of samples

» Active control of up to 4 frames by selection via display/PC (3rd and 4th frame as option). See upgrading options page 197

» ASTM C39 full conformity (initial pause for specimen alignment, double load rate option, height/ diameter correction factor, final calculation of effective load rate applied, peak sensitivity in %)

» Oversampling function increasing the sampling rate when specimen is approaching the failure for better identification of peak value

» Also suitable to perform steel tensile testing with the dedicated frame. See dedicated box in the next page.

» **AUTOMAX PRO-M** version to perform advanced test methods:

- loading/unloading cycles at controlled rate for the **DETERMINATION OF THE ELASTIC MODULUS**
- **DISPLACEMENT CONTROLLED TESTS** on FRC (Fiber Reinforced Concrete), shotcrete, etc.

Firmware

- Execution of compression, flexure, indirect tensile, ACV tests in automatic mode with load rate controlled by a closed-loop PID system
- Execution of loading ramps with the possibility to manually increase or decrease the test speed during the test
- Possibility to reach at controlled speed a load target and to keep a steady loading phase
- Simultaneous display of load, specific load, actual load rate, load/time graph and load/displacement or load/strain graphs (for Automax Pro-M only)
- Zoom option on the test graph
- Saving of the specimen failure type (to EN or ASTM) in the test results
- Download data to internal printer (optional) or to PC via RS 232 port or to USB memory stick
- Ethernet port for PC / network communication
- Multi-coefficient linearization of the calibration curve for better accuracy at low loads thus avoiding the use of a second pressure transducer
- Recording facility for up to 10 test profiles for each channel including: type of test (e.g. compression, flexural, indirect tensile), specimen size and shape, load rate, test standard and other general information. Each one of the recorded test profiles can be recalled automatically to save time
- Improved PID algorithm and Multi PID selection. Up to 3 different PID settings can be tuned for a variety of materials (ACV, flexure, compression with neoprene pads, etc.)
- Compatible with the newly released Datamanager software, tailored for construction material testing laboratories, for real time data acquisition, display and management
- Peripheral devices integration and web services available as option (see page 178)
- Automatic load measurement verification procedure, by connecting suitable load cells and our digital readout unit to PC
- Language selection (including Cyrillic and Chinese)
- Unit selection (kN, ton, lbf)
- USB port for firmware upgrade and safe backup of the original configuration data (PID, calibration, etc.), in case of loss and/or data corruption. The restore of the machine to the factory settings is easy avoiding the need of any technical support.

FIRMWARE UPGRADE TO PERFORM STEEL TENSILE TESTING

AUTOMAX PRO Power and Control System can be upgraded to perform steel tensile testing controlling the suitable frame with accessories (extensometers to be factory calibrated). The upgrade can be factory installed at time of order or subsequently with remote technical support.

50-FW/UTS
Firmware upgrade for the automatic tensile test execution under load/stress and grips separation closed loop PID control.

Software package for steel tensile testing is available for PC remote control and complete data elaboration.
See **82-SW/UTS** on page 307

3000 kN Automax Pro EN automatic compression machine controlling three additional frames: 15 kN for cement prisms flexure testing, 200 kN for concrete beams flexure testing and 500 kN for steel rebars tensile testing.

Power and Control Systems

AUTOMAX PRO M

Advanced automatic versatile testing system with option for deformability determination

50

AUTOMAX PRO-M Power Control System fitted with superior hydraulic package allows, in addition to standard failure tests, to perform advanced tests as, for example, the Determination of the Modulus of Elasticity and the Characterizations of Fiber Reinforced Concrete under displacement-controlled tests.

All AUTOMAX PRO models are also available in the higher specification Pro-M version. Once you have selected the model of your choice, just add the following item to the machine's code:

50-C50/PROM
Enhancement of Automax Pro electronic and hydraulic system to AUTOMAX PRO-M specifications.

50-C50/PROM does not include the dedicated firmware packages that must be purchased separately. Firmware packages can be ordered post-delivery. Installation can easily be carried out remotely by our technical support team.

50-FW/EM
Firmware package to perform the Modulus of Elasticity with an AUTOMAX PRO-M compression tester

***Important note**: This test shall be performed by using a compression frame and specific accessories. See page 208.*

Software package for Elastic Modulus determination is available for PC remote control and complete data elaboration.
See **82-SW/EM** on page 176

Elastic modulus determination with Automax Pro-M 3000kN EN compression machine, upgraded with 50-FW/EM.

50-FW/DC
Firmware package to perform displacement-controlled tests with an AUTOMAX PRO-M compression tester

***Important** note: These tests shall be performed using a flexural frame, with specific accessories. See page 210*

Software package for displacement-controlled tests is available for PC remote control and complete data elaboration.
See **82-SW/DC** on page 176

Beam deflection test on FRC concrete to ASTM C1609

CMOD test performed on the 200 kN flexure frame C1511/FR controlled by the AUTOMAX PRO-M system upgraded with 50-FW/DC.

AUTOMAX MULTITEST

Automatic computerized control console

MODULAR. EXPANDABLE.VERSATILE.

Automax product range is at last completed by Automax Multitest stand-alone computerized control console.

Suitable for any kind of test

The system is supplied complete with the Datamanager software package for standard failure tests including compression, flexural and indirect tensile test plus three additional software packages are available for:

- Modulus of Elasticity and Poisson Ratio determinations
- Tensile test on steel rebars
- Displacement controlled tests

Suitable for any type of sample

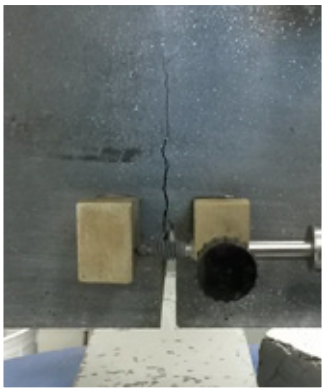
The console can be connected up to 4 frames ranging from 15 kN up to 5000 kN in compression and 500 kN in tension.

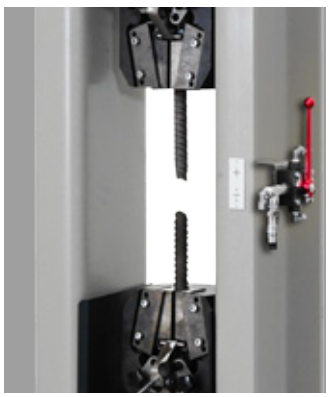
Suitable for any budget

The system can be upgraded in step-by-step investments and, by adding suitable testing frames, accessories and dedicated software packages, the system can cover all your future testing needs, including demanding displacement-controlled tests.

Suitable for any user

4 easy-to-use software packages available, each one tailored for a specific test method, guiding the operator through all the test phases





FEATURES and ADVANTAGES

» Test cycle with closed loop PID control automatically performed by pressing the start button via PC

» DC-driven variable speed pump for silent operation, energy saving and highly accurate drop-by-drop oil flow for precise control during complex tests

» 500 Hz high control frequency for optimum oil pressure adjustment during critical tests

» Double frame control, expandable to four, with active frame selection via software. See upgrading options at page 197

» Soft platen-to-specimen contact and smooth load rate control from every beginning of the ramp

» Networkability for connection to a wide range of web services (see page 178)

» LinK-LAB integration package for connection with bar code readers, balances, calipers, etc. See page 179

» 14 channels available to connect several types of sensors

To get more info visit
www.controls-group.com
or link directly to the QRCode

Power and Control Systems

AUTOMAX MULTITEST

Automatic computerized control console

Ordering Information

50-C20M82
Automax Multitest stand-alone power and control console for the control of up to 2 (expandable to 4) testing frames. PC included.
230 V, 50-60 Hz, 1 ph.

50-C20M84
Same as above but 110 V, 60 Hz, 1 ph.

Hydraulics

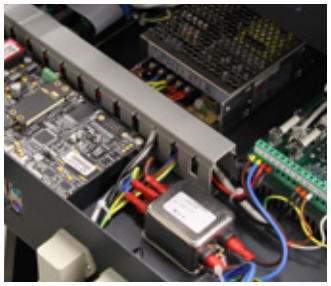
- Dual stage pump: centrifugal low pressure for fast approach and automatic switching to radial multi-piston high pressure for loading
- DC motor 720 W, 50-60 Hz
- Maximum working pressure 700 bar
- Third and fourth frame option, active frame selection by software
- Flow-sharing technology to perform loading and unloading cycles
- ES Energy Saving technology to reduce power consumption and silent operation

PC and Software

- Remote control of the complete system (Console and Frame) for automatic test execution
- Real time and deferred management of tests data and results, either in numeric and in graphic format
- Active frame selection via software
- Printing and saving of customized test reports both for single and batch tests in Excel format
- Multi-language software, customizable with a further local language (only Latin characters)
- The PC may be connected to the digital readout unit mod. 82-P0801/E and the suitable load cells in order to perform automatic load measurement verification procedure including data acquisition and printing of traceable calibration certificates
- Remote technical assistance/diagnostics via Internet
- **DATAMANAGER** software (included) for compression, flexural, splitting, ACV tests to EN and ASTM standards (see page 192)

Hardware

- 131.000 points effective resolution
- High frequency closed-loop PID control
- Control frequency 500 Hz
- Sampling rate 500 Hz
- 4 channels for load sensors (pressure transducers and load cells)
- 6 channels to measure strain values with transducers (LVDT, magnetostrictive, potentiometetric)
- 4 channels for strain measurement with strain gauges
- Memorization of the calibration curve enables sensors to be connected and used immediately
- Digital linearization of the calibration curve (multi-coefficient)



Detail of electronics positioned in the sliding drawer of Automax Multitest Console

The following software packages are available on request:

82-SW/EM
E-Module software package for determination of young Modulus and Poisson's ratio on concrete, cement, rocks allowing:

- User-defined test cycles and step programmable sequences
- Real time display of stress/time, stress/axial strain and stress/lateral strain diagrams
- Automatic verification of sample centring and sensor functioning, as per Standards requirements
- Automatic calculation of test results as per Standards requirements

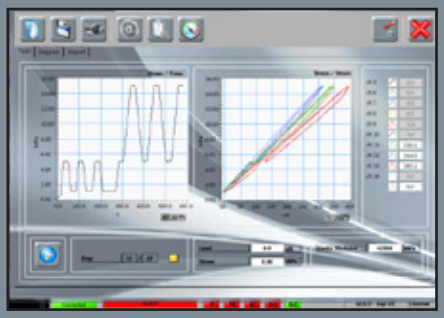
82-SW/UTS
UTS software package for steel tensile testing allowing:

- load/stress control
- crosshead separation control
- simultaneous display of: stress/elongation [mm], stress/time; stress/elongation [%] and elongation [mm]/time, with possibility to display multi diagrams
- elaboration of tension test results: ReH, ReL or Rp, final elongation, etc. in conformity to EN ISO 6892-1 (method B) and EN 15630-1 (for steel rebars)

82-SW/DC
D-Control software package for displacement controlled tests allowing:

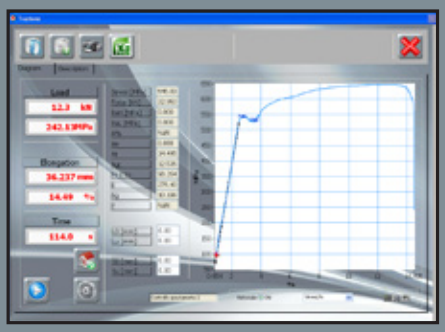
- 8 test pre-set testing procedures according to EN 14651, 14488-3, 14488-5, UNI 11039-2, ASTM C1550, C1609, C947, UNE 83515
- Automatic calculation of test results according to the above Standards
- Customizable test procedure allowing desired loading history
- Possibility to change in real time the test parameters: target load/displacement, control variable, test speed
- Data saving rate 250/sec

Automax Multitest can control up to 4 frames, in this example: double chamber 300/15kN frame for cement testing with Datamanager software package (included), 350 kN flexure frame for kerbs testing with Datamanager software (included) and a 3000kN EN compression frame for Elastic Modulus test with 82-SW/EM software package



Screenshot of 82-SW/EM software showing elastic modulus test performed according to customized sequence of steps to fulfil any test procedure

AUTOMAX Multitest 50-C20M82 controlling: Flexural frame for FRC testing with 82-SW/DC software package, Compression frame for Elastic Modulus determination with 82-SW/EM software package and Tensile frame for steel rebars testing with 82-SW/UTS software package.



Screenshot of 82-SW/UTS software for tensile tests on steel rebar

AUTOMAX Multitest 50-C20M82 controlling a Duplex 350 kN flexural frame for FRC testing with 82-SW/DC software package

Screenshot of 82-SW/DC software to perform tests under displacement control for FRC characterization

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LinK-LAB
LABORATORY CONNECTIVITY PACKAGE

The innovative new approach from CONTROLS now allows PILOT Pro, AUTOMAX PRO and AUTOMAX Multitest to be a fully integrated and "connected" part of your laboratory infrastructure with the ability to seamlessly take inputs from any number of ancillary measuring systems and devices to further increase efficiency and eliminate transposing errors.


DEVICE INTEGRATION


RESULTS EXPORT


VIDEO RECORDING

Seamless device integration

Compatible direct-input devices include dimensional measuring stations, calipers, weighing systems, ID barcode readers and video cameras (Enterprise version only). Direct acquisition provides a tidier operation eliminating the possibility for data transposition errors.

The new K-LAB laboratory peripheral devices integration package is available in two versions:

K-LAB Local
available for systems that operate stand-alone using the controller only without a PC.

K-LAB Enterprise
is available for new and existing systems controlled by PC via Datamanager Software.

For more info please ask our technical department.

Automatic test results export

Both versions allow direct acquisition, according to the device/s connected, of sample weight, dimensions, identification number and test execution video recording (Enterprise version only).

These data, along with all the relevant test results, are collected and available for:

- Direct use in several formats such as txt, excel, pdf, access (Enterprise version) or txt (Local version)
- Raw data export to the Laboratory Information Management System (LIMS) or laboratory/ corporate ERP system
- Full data integration with Prolab.Q Laboratory Information Management System or similar

Call us to discuss your needs and a consultation with our integrations team.

WEBCARE
REMOTE ASSISTANCE SERVICES

Industry 4.0 ready, CONTROLS machines open a whole new ecosystem of connectivity, networkability, transparency and efficiency.


SYSTEM SUPPORT


ALWAYS UP-TO-DATE


EFFORTLESS UPGRADES

Efficient remote assistance and support

The new systems benefit from enhanced remote assistance and support. Our product and engineering specialists can directly inspect and work on your testing system to help you with configurations and system tuning in order to provide more rapid diagnostics ensuring you experience the minimum down-time.

Always up-to-date

You can always be up-to-date with the latest firmware releases and functions. Have access to newly released test applications complying with the most recent international Standards. Thanks to remote backup and storage of machine settings, your systems can be easily restored to archived settings without fuss.

i-LAB
CLOUD SERVICES


DATA SHARING


SCREEN MIRRORING

Instantaneous availability and data sharing

Cloud storage of raw test data to be viewed and consulted by 3rd party engineers, clients, head-office and branches alike.
Extreme care and protection for your data and systems is assured through the adoption of industry best practice and digital authentication.

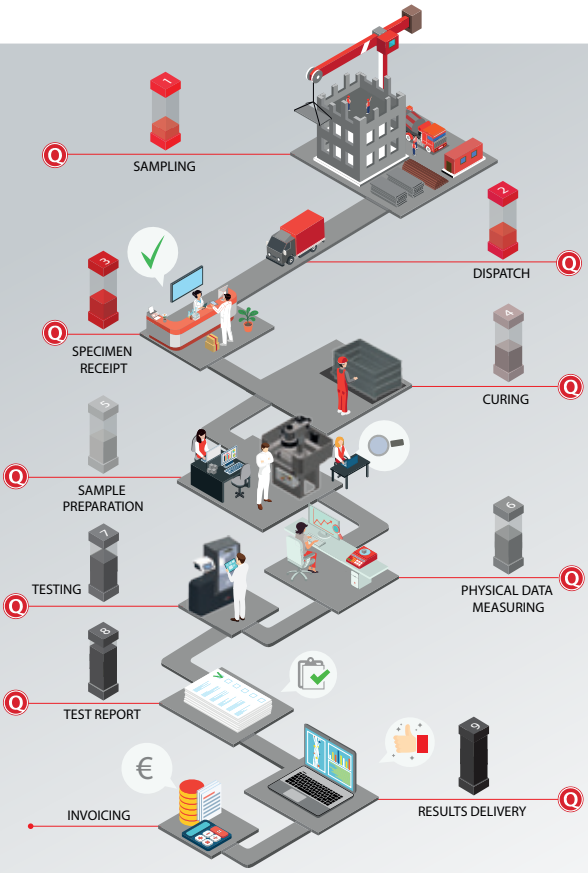
Screen mirroring testing transparency

Screen mirroring function is available to display on any compatible device (tablet, smartphone, PC) real time plotting of load vs time graph and test results.
Customers can watch the test execution in real time and achieve genuine transparency.

ProLab Q

Prolab.Q is the new-generation LIMS system (Laboratory Information Management System) providing the complete management of testing laboratories of all sizes. It allows active interface with laboratories instruments, management of processes and full traceability of the entire specimen's life – from its acceptance to the emission of the test certificate.

Prolab.Q can be used in WEB mode without any plug-in providing real-time reporting, traceability, compliance, audit trails and test certificate security, through a browser Internet.



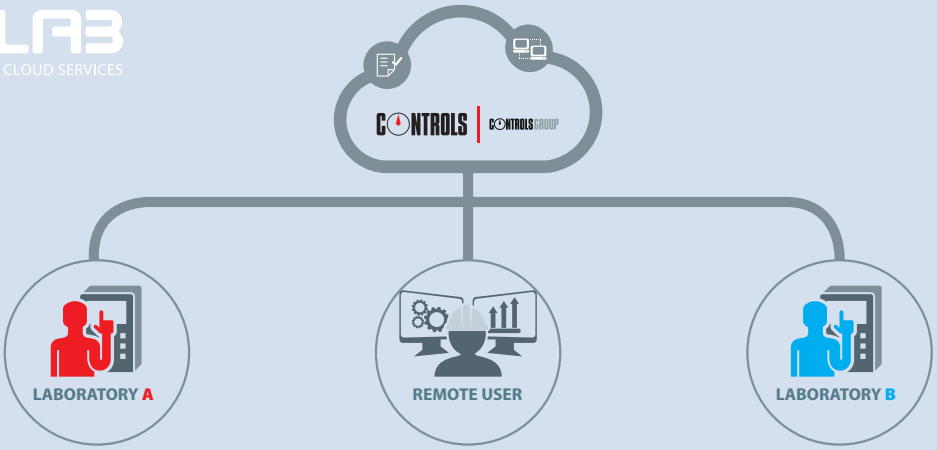
Test video recording

Record your test execution to deliver provable results to your customers.

Effortless upgrades through remote connectivity

In line with the growth and demands of your laboratory, CONTROLS new compression testing systems can grow with you. Easily add new firmware packages to your Automax Pro-M system to increase testing capabilities. To make it even easier, our specialist engineers will perform the upgrades for you, online!

i-LAB CLOUD SERVICES



Compression testing frames

COMPACTline

THE INTEGRATED COMPACT-LINE DESIGN

Combining a single testing frame with PCS results in the integrated COMPACT-Line version of compression machine where the PCS is attached to the side of the frame.

The stand-alone frames are also available for connection to Advanced Control consoles and they are supplied complete with pressure transducer and connection kit.

The reference codes are listed in the second line of the tables.

EN COMPRESSION FRAMES FOR CUBES AND CYLINDERS TO EN 12390-4 AND BLOCKS TO EN 772-1

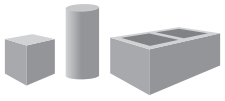
FEATURES

- High stiffness, four column, rigid welded steel construction
- EN heavy duty spherical seat in oil bath which allows free alignment at the initial contact with the specimen.
- Tested for stability with traceable certificate for load transfer verification.

50-C46xxx, C56xxx

50-C47xxx, C57xxx

50-C68xxxx, C78xxx



Frames physical specifications

Machine series 50-	C46xxx	C47xxx	C56xxx	C57xxx	C68xxx	C69xxx	C78xxx	C79xxx
Frame only 50-	C46Z00	C47Z00	C56Z00	C57Z00	C68Z00	C69Z00	C78Z00	C79Z00
Cap. kN	2000		3000		4000		5000	
For cubes up to mm Cylinders up to mm Blocks std.	200 160x320 -	200 160x320 Std	200 160x320 -	200 160x320 Std	300 250x500 -	300 150x300 Std	300 250x500 -	300 150x300 Std
Ram travel mm	50							
Max vertical daylight mm(1)	350				520	310	520	310
Horizontal daylight mm	350		370		425		425	
Platen dim. mm	Dia. 300	310 x 510 X 50(2)	Dia. 300	310 x 510 X 50(2)	305 x 305	310x510 X90	305 x 305	310x510 X90
Platen hardness HRC	53	55.5	53	55.5	53	55.5	53	55.5
Platen flatness mm	0.03	0.05	0.03	0.05	0.03	0.05	0.03	0.05

(1) To be adjusted with distance pieces conforming to the specimen size.

(2) Models fitted with 310 x 510 x 90 mm also available on request.

All stand-alone frames are fitted with front door, rear fragment guard and pedestal. The pedestal is not included in the relevant Compact-Line compression machines and have to be ordered separately.
See machine accessories page 194

Models 50-C69xxx and C79xxx, also include the Explosion proof test kit comprising: safety cable securing the upper platen to the frame, metallic perforated fragment guard and bottom platen anti-fall safety system. See page 198

The relevant compression testers are shown on page 182 to 185

ASTM COMPRESSION FRAMES FOR CYLINDERS TO ASTM C39, AASHTO T22 AND BLOCKS TO ASTM C140

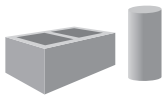
FEATURES

» Rigid welded steel construction.

» Spherical seat allows free alignment at the initial contact with the specimen.

50-A22xxx, A32xxx *50-A29xxx, A39xxx*

Frames physical specifications



Machine series 50-	A12xxx	A22xxx	A32xxx	A29xxx	A39xxx	A29xxx+ A29/CYL	A39xxx+ A29/CYL	A42xxx	A52xxx
Frame only 50-	A22Z00 A22Z10	A22Z00 A22Z10	A32Z00 A32Z10	A29Z00 A29Z10	A39Z00 A39Z10	A29Z00 A29Z10+ A29/CYL	A39Z00 A39Z10+ A29/CYL	A42Z00 A42Z10	A52Z00 A52Z10
Cap. kN klbf	1500 330	2000 450	3000 660	2000 450	3000 660	2000 450	3000 660	2000 450	3000 660
For Cyl up to mm Cyl up to in Blocks	160x320 6"x12" -			- - Std.		160x320 6"x12" Std.		160x320 6"x12" -	
Ram travel mm	50								
Max. vertical daylight [1], mm in	380 15"	380 15"		300 11.8"		410 16.14"		405 15.94"	
Horizontal daylight, mm in	265 10.4"	340 13.4"	370 14.6"	370 14.6"	370 14.6"	370 14.6"	370 14.6"	350 13.8"	370 14.6"
Platen dim mm in	Dia. 165 6.5"			310x410x90		Dia. 165 6.5"			
Platen hardness HRC	55								
Platen flatness mm	0.02			0.05		0.02			

(1) To be adjusted with distance pieces (or slotted distance pieces for A39xxx frame) conforming to the specimen size. See page 194
The relevant compression testers are shown on page 186 to 189

GENERAL UTILITY COMPRESSION FRAMES FOR CUBES, CYLINDERS AND BLOCKS.

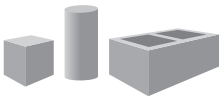
FEATURES

» Rigid welded steel construction.

» Spherical seat allows free alignment at the initial contact with the specimen.

50-C13xxx *50- C23xxx, C34xxx* *50-C25xxx, C35xxx*

Frames physical specifications



Machine series 50-	C13xxx	C23xxx	C34xxx	C25xxx	C35xxx
Frame only 50-	C13Z00	C23Z00	C34Z00	C25Z00	C35Z00
Cap. kN	1500	2000	3000	2000	3000
For Cubes up to mm Cyl. up to Blocks	150 160x320 -	150 160x320 -	200 160x320 -	200 160x320 Std.	200 160x320 Std.
Ram travel mm	50				
Max. vertical daylight, mm [1]	350*	350*	350*	350*	350*
Horizontal daylight, mm	265	340	370	340	370
Platen dim mm	Dia. 220	Dia. 220	Dia. 300	310 x 510 x 50	
Platen hardness HRC	55			55	
Platen flatness mm	0.03			0.05	

(1) *To be adjusted with distance pieces conforming to the specimen size. See page 194*

*The vertical daylight can be increased of 20 mm by the accessory 50-C50/CYL for testing cylinders with capping. See test accessories

The relevant compression testers are shown on page 190 to 191

▸ EN COMPACTline Compression testers for cubes and cylinders

▸ EN 12390-4 ▸ 2000 ▸ 3000 ▸ 4000 ▸ 5000 kN

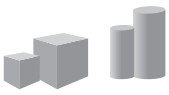
WIZARD AUTO

Standard automatic Quality Control compression testers

STANDARD

▸ EN 12390-4

▸ 2000 ▸ 3000 kN



50-C46W02
Wizard Auto Automatic Compact Line EN Compression tester, 2000 kN cap. For cubes up to 200 mm and cylinders up to 160 x 320 mm.
230 V, 50-60 Hz, 1ph

50-C56W02
Wizard Auto Automatic Compact Line EN Compression tester, 3000 kN cap. For cubes up to 200 mm and cylinders up to 160 x 320 mm.
230 V, 50-60 Hz, 1ph

PILOT PRO

Sophisticated and flexible automatic compression testers

STANDARD

▸ EN 12390-4

▸ 2000 ▸ 3000 kN

50-C46P02
Pilot Pro Automatic Compact Line EN compression tester, 2000 kN cap. For cubes up to 200 mm and cylinders up to 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

50-C56P02
Pilot Pro Automatic Compact Line EN compression tester, 3000 kN cap. For cubes up to 200 mm and cylinders up to 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

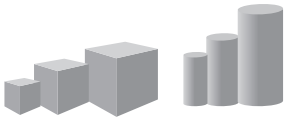
PILOT PRO

Sophisticated and flexible automatic compression testers

STANDARD

▸ EN 12390-4

▸ 4000 ▸ 5000 kN



50-C68P02
Pilot Pro Automatic Compact Line EN compression tester, 4000 kN cap. For cubes up to 300 mm and cylinders up to 250 x 500 mm.
230 V, 50-60 Hz, 1 ph.

50-C78P02
Pilot Pro Automatic Compact Line EN compression tester, 5000 kN cap. For cubes up to 300 mm and cylinders up to 250 x 500 mm.
230 V, 50-60 Hz, 1 ph.

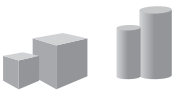
AUTOMAX PRO

Advanced automatic versatile testing system

STANDARD

▸ EN 12390-4

▸ 2000 ▸ 3000 kN



50-C46F02
Automax Pro Automatic Compact Line EN compression tester, 2000 kN cap. For cubes up to 200 mm and cylinders up to 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

50-C56F02
Automax Pro Automatic Compact Line EN compression tester, 3000 kN cap. For cubes up to 200 mm and cylinders up to 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

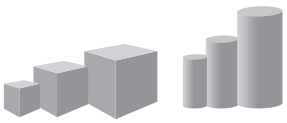
WIZARD AUTO | PILOT PRO | AUTOMAX PRO | AUTOMAX PRO M

AUTOMAX PRO

Advanced automatic versatile testing system

STANDARD

- EN 12390-4
- **4000** - **5000** kN



50-C68F02
Automax Pro Automatic Compact Line EN compression tester, 4000 kN cap. For cubes up to 300 mm and cylinders up to 250 x 500 mm.
230 V, 50-60 Hz, 1 ph.

50-C78F02
Automax Pro Automatic Compact Line EN compression tester, 5000 kN cap. For cubes up to 300 mm and cylinders up to 250 x 500 mm.
230 V, 50-60 Hz, 1 ph.

Frame and Compression Platens

See physical specifications table on page 180

WIZARD Auto Power and Control System

Full specifications on page 169

PILOT Pro Power and Control System

Full specifications on page 170

AUTOMAX Pro Power and Control System

Full specifications on page 172

AUTOMAX Pro-M Power and Control System

50-C50/PROM
Enhancement of Automax Pro electronic and hydraulic system to AUTOMAX PRO-M specifications.

Full specifications on page 174

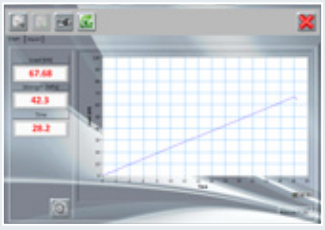
Safety Features

Max. pressure valve to avoid machine overloading, piston travel limit switch, emergency stop button, front door and rear flexible fragment guard.

Machine accessories and special performances for all models

- Distance pieces to reduce the vertical daylight. See page 194
- Frame pedestal. See page 194

- DATAMANAGER PC software. See page 192 (Not compatible with WIZARD Auto)



Test accessories

- Splitting tensile test device. See page 200

- Compression device on cement samples. See page 201
- Flexural test device on concrete beams. See page 201

Connectivity packages. For PILOT Pro and AUTOMAX Pro only. See page 178

- LinK-LAB laboratory peripheral integration package
- Web services

Upgrading options

- Additional testing frame/s connection. See page 196
- Printer installation. See page 198
- Special calibration procedure. See page 199
- Certified platen hardness. See page 199
- Fragment guard lock switch. See page 199

Explosion proof test kit. See page 198

Upgrading kit comprising: safety cables securing the upper platen to the frame, metallic perforated fragment guard and bottom platen anti-fall safety system.
50-C59/EK Explosion proof test kit for C56xxx series
50-C69/EK Explosion proof test kit for C68xxx and C78xxx
50-C59/EK2 Explosion proof test kit for C56Fxx series

Note: *for testing high strength / explosive failure specimens we strongly recommend the use of distance pieces complete with threaded centring pin.*
See page 194

Dimensions (mm, lxdxh) and weights (50-)

C46Wxx_895x450x1115, 680 kg
C46Pxxx_895x450x1115, 680 kg
C46Fxx_930x420x1530, 740 kg
C56Wxx_985x605x1115, 740 kg
C56Pxx_985x605x1190, 1040 kg
C56Fxx_1020x475x1550, 1105 kg
C68Pxx_1090x570x1555, 2000 kg
C68Fxx_1090x570x1555, 2000 kg
C78Pxx_1090x570x1555, 2000 kg
C78Fxx_1090x570x1555, 2000 kg

Other voltages

For 110V, 60 Hz versions change last code number from 2 to 4.
Example: 50-C46W04, C56P04, C68F04

▸ EN COMPACTline Compression testers for cubes, cylinders and blocks

▸ EN 12390-4 ▸ EN 772-1 ▸ 2000 ▸ 3000 ▸ 4000 ▸ 5000 kN

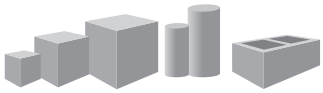
WIZARD AUTO

Standard automatic Quality Control compression testers

STANDARD

▸ EN 12390-4 ▸ EN 772-1

▸ 2000 ▸ 3000 kN



50-C47W02
Wizard Auto Automatic Compact Line EN compression tester, 2000 kN cap. For cubes up to 300 mm, cylinders up to 160 x 320 mm and blocks.
230 V, 50-60 Hz, 1 ph.

50-C57W02
Wizard Auto Automatic Compact Line EN compression tester, 3000 kN cap. For cubes up to 300 mm, cylinders up to 160 x 320 mm and blocks.
230 V, 50-60 Hz, 1 ph.

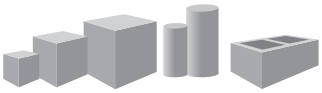
PILOT PRO

Sophisticated and flexible automatic compression testers

STANDARD

▸ EN 12390-4 ▸ EN 772-1

▸ 2000 ▸ 3000 kN



50-C47P02
Pilot Pro Automatic Compact Line EN compression tester, 2000 kN cap. For cubes up to 300 mm, cylinders up to 160 x 320 mm and blocks.
230 V, 50-60 Hz, 1 ph.

50-C57P02
Pilot Pro Automatic Compact Line EN compression tester, 3000 kN cap. For cubes up to 300 mm, cylinders up to 160 x 320 mm and blocks.
230 V, 50-60 Hz, 1 ph.

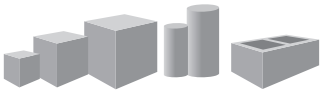
PILOT PRO

Sophisticated and flexible automatic compression testers

STANDARD

▸ EN 12390-4 ▸ EN 772-1

▸ 4000 ▸ 5000 kN



50-C69P02
Pilot Pro Automatic Compact Line EN compression tester, 4000 kN cap. For cubes up to 300 mm, cylinders up to 150 x 300 mm and blocks.
230 V, 50-60 Hz, 1 ph.

50-C79P02
Pilot Pro Automatic Compact Line EN compression tester, 5000 kN cap. For cubes up to 300 mm, cylinders up to 150 x 300 mm and blocks.
230 V, 50-60 Hz, 1 ph.

N.B. *4000 kN and 5000 kN machines for blocks testing feature Premium Heavy-Duty spherical seat with increased bearing area and rectangular platens with 90 mm thickness in order to minimize platens deflection during the test.*

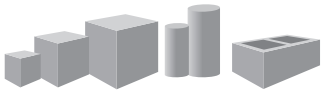
AUTOMAX PRO

Advanced automatic versatile testing system

STANDARD

▸ EN 12390-4 ▸ EN 772-1

▸ 2000 ▸ 3000 kN



50-C47F02
Automax Pro Automatic Compact Line EN compression tester, 2000 kN cap. For cubes up to 300 mm, cylinders up to 160 x 320 mm and blocks.
230 V, 50-60 Hz, 1 ph.

50-C57F02
Automax Pro Automatic Compact Line EN compression tester, 3000 kN cap. For cubes up to 300 mm, cylinders up to 160 x 320 mm and blocks.
230 V, 50-60 Hz, 1 ph.

WIZARD AUTO | PILOT PRO | AUTOMAX PRO | AUTOMAX PRO m

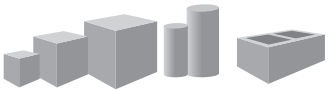
AUTOMAX PRO

Advanced automatic versatile testing system

STANDARD

▸ EN 12390-4 ▸ EN 772-1

▸ **4000** ▸ **5000** kN



50-C69F02
Automax Pro Automatic Compact Line EN compression tester, 4000 kN cap. For cubes up to 300 mm, cylinders up to 150 x 300 mm and blocks.
230 V, 50-60 Hz, 1 ph.

50-C79F02
Automax Pro Automatic Compact Line EN compression tester, 5000 kN cap. For cubes up to 300 mm, cylinders up to 150 x 300 mm and blocks.
230 V, 50-60 Hz, 1 ph.

N.B. *4000 kN and 5000 kN machines for blocks testing feature Premium Heavy-Duty spherical seat with increased bearing area and rectangular platens with 90 mm thickness in order to minimize platens deflection during the test.*

Frame and Compression Platens

See physical specifications table on page 180

WIZARD Auto Power and Control System

Full specifications on page 169

PILOT Pro Power and Control System

Full specifications on page 170

AUTOMAX Pro Power and Control System

Full specifications on page 172

AUTOMAX Pro-M Power and Control System

50-C50/PROM
Enhancement of Automax Pro electronic and hydraulic system to AUTOMAX PRO-M specifications.

Full specifications on page 174

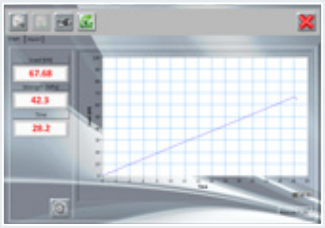
Safety Features

Max. pressure valve to avoid machine overloading, piston travel limit switch, emergency stop button, front door and rear flexible fragment guard.

Machine accessories and special performances for all models

- Distance pieces to reduce the vertical daylight. See page 194
- Frame pedestal. See page 194
- Lifting device for bottom platen. See page 194

- DATAMANAGER PC software. See page 192 (Not compatible with WIZARD Auto)



Test accessories

- Splitting tensile test device. See page 200
- Compression device on cement samples. See page 201

- Flexural test device on concrete beams. See page 201

Connectivity packages. For PILOT Pro and AUTOMAX PRO only. See page 178

- LinK-LAB laboratory peripheral integration package
- Web services

Upgrading options

- Additional testing frame/s connection. See page 196
- Printer installation. See page 198
- Special calibration procedure. See page 199
- Certified platen hardness. See page 199
- Fragment guard lock switch. See page 199

Explosion proof test kit. See page 198

Upgrading kit comprehending: safety cables securing the upper platen to the frame, metallic perforated fragment guard and bottom platen anti-fall safety system.

This test kit is included in the EN compression testers 4000 kN and 5000 kN cap. for testing cubes, cylinders and blocks, models 50-C69xxx and 50-C79xxx.

50-C59/EK1 Explosion proof test kit for C57xxx series

Note: *for testing high strength / explosive failure specimens we strongly recommend the use of distance pieces complete with threaded centring pin. See page 194*

Dimensions (mm, lxdxh) and weights (50-)

C47Wxx_950x605x1115, 730 kg
C47Pxx_895x605x1115, 740 kg
C47Fxx_930x605x1115, 790 kg
C57Wxx_1035x640x1190, 1100kg
C57Pxx_985x640x1190, 1105 kg
C57Fxx_1020x640x1550, 1160 kg
C69Pxx_1090x690x1495, 2190 kg
C69Fxx_1090x690x1495, 2255 kg
C79Pxx_1090x690x1495, 2190 kg
C79Pxx_1090x690x1495, 2255 kg

Other voltages

For 110V, 60 Hz versions change last code number from 2 to 4.
Example: 50-C47W04, C57P04, C69F04

▸ ASTM COMPACTline Compression testers for cylinders

▸ ASTM C39 ▸ AASHTO T22 ▸ 1100 ▸ 1500 ▸ 2000 ▸ 3000 kN ▸ 250 ▸ 330 ▸ 450 ▸ 660 klbf

WIZARD AUTO

Standard automatic Quality Control compression testers

STANDARD

▸ ASTM C39 ▸ AASHTO T22

▸ 1100 ▸ 1500 kN ▸ 250 ▸ 330 klbf

50-A12W22
WIZARD Auto Automatic Compact-Line compression tester 1100 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A12W32
As above but calibrated in lbf, 250 klbf.
110 V, 60 Hz, 1 ph.

50-A12W02
WIZARD Auto Automatic Compact-Line compression tester 1500 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A12W14
As above but calibrated in lbf, 330 klbf.
110 V, 60 Hz, 1 ph.

WIZARD AUTO

Standard automatic Quality Control compression testers

STANDARD

▸ ASTM C39 ▸ AASHTO T22

▸ 2000 ▸ 3000 kN ▸ 450 ▸ 660 klbf

50-A22W02
WIZARD Auto Automatic Compact-Line compression tester 2000 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A22W14
As above but calibrated in lbf, 450 klbf.
110 V, 60 Hz, 1 ph.

50-A32W02
WIZARD Auto Automatic Compact-Line compression tester 3000 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A32W14
As above but calibrated in lbf, 660 klbf.
110 V, 60 Hz, 1 ph.

PILOT PRO

Sophisticated and flexible automatic compression testers

STANDARD

▸ ASTM C39 ▸ AASHTO T22

▸ 1500 kN ▸ 330 klbf

50-A12P02
PILOT Pro Automatic Compact-Line compression tester 1500 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A12P14
As above but calibrated in lbf, 330 klbf.
110 V, 60 Hz, 1 ph.

PILOT PRO

Sophisticated and flexible automatic compression testers

STANDARD

▸ ASTM C39 ▸ AASHTO T22

▸ 2000 ▸ 3000 kN ▸ 450 ▸ 660 klbf

50-A22P02
PILOT Pro Automatic Compact-Line compression tester 2000 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A22P14
As above but calibrated in lbf, 450 klbf.
110 V, 60 Hz, 1 ph.

50-A32P02
PILOT Pro Automatic Compact-Line compression tester 3000 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A32P14
As above but calibrated in lbf, 660 klbf.
110 V, 60 Hz, 1 ph.

WIZARD AUTO | PILOT PRO | AUTOMAX PRO | AUTOMAX PRO M

AUTOMAX PRO

Advanced automatic versatile testing system

STANDARD

▸ ASTM C39 ▸ AASHTO T22

▸ 2000 ▸ 3000 kN ▸ 450 ▸ 660 klbf

50-A42F02
AUTOMAX Pro Automatic Compact-Line compression tester 2000 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A42F14
As above but calibrated in lbf, 450 klbf.
110 V, 60 Hz, 1 ph.

50-A52F02
AUTOMAX Pro Automatic Compact-Line compression tester 3000 kN cap., for cylinders up to dia. 160 x 320 mm (6" x 12").
230 V, 50-60 Hz, 1 ph.

50-A52F14
As above but calibrated in lbf, 660 klbf.
110 V, 60 Hz, 1 ph.

Frame and Compression Platens
See physical specifications table on page 181

WIZARD Auto Power and Control System
Full specifications on page 169

PILOT Pro Power and Control System
Full specifications on page 170

AUTOMAX Pro Power and Control System
Full specifications on page 172

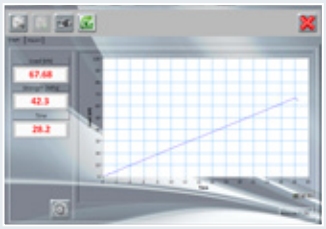
AUTOMAX Pro-M Power and Control System

50-C50/PROM
Enhancement of Automax Pro electronic and hydraulic system to AUTOMAX PRO-M specifications.
Full specifications on page 174

Safety Features
Max. pressure valve to avoid machine overloading, piston travel limit switch, emergency stop button, front and rear flexible fragment guard.

Machine accessories and special performances for all models

- Distance pieces to reduce the vertical daylight. See page 194
- Frame pedestal. See page 194
- DATAMANAGER PC software. See page 192 (Not compatible with WIZARD Auto)



Test accessories

- Splitting tensile test device. See page 200

- Compression device on cement samples. See page 201

- Flexural test device on concrete beams. See page 201

- Capping pads and retainers. See page 237

- Sulphur capping equipment. See page 236

Connectivity packages. For PILOT Pro and AUTOMAX Pro only. See page 178

- LinK-LAB laboratory peripheral integration package
- Web services

Calibration in lbf units
These machines can be calibrated in lbf unit. For the codes change second last code number from 0 to 1

Upgrading options

50-A50/UP
Upgrading of the compression machine model A12xxx, A22xxx and A32xxx by supplying a dia.250x40mm bottom platen with threaded hole, instead of standard bottom platen dia.165x30mm. To be used with distance pieces having threaded centering pin. See page 194

- Additional testing frame/s connection. See page 196
- Printer installation. See page 198
- Rigid front door. See page 198
- Special calibration procedure. See page 199
- Certified platen hardness. See page 199
- Fragment guard lock switch. See page 199

Dimensions (mm, lxdxh) and weights (50-)
A12Wxx_810x425x1085, 285 kg
A22Wxx_865x440x1090, 500 kg
A32Wxx_805x450x1160, 710 kg
A12Pxx_760x370x1085, 290 kg
A22Pxx_835x440x1090, 500 kg
A32Pxx_765x450x1160, 710 kg
C42Fxx_930x420x1530, 740 kg
C52Fxx_1020x475x1550, 1105 kg

Other voltages
For 110V, 60 Hz versions change last code number from 2 to 4.
Example: 50-A12W04, A22P14, A42F04

▸ ASTM COMPACTline Compression testers for cylinders and blocks

▸ ASTM C39 ▸ ASTM C140 ▸ AASHTO T22 ▸ 2000 ▸ 3000 kN ▸ 450 ▸ 660 klbf

Special features of these ASTM block testing machines

» Premium heavy-duty spherical seat with increased bearing area and rectangular platens 310x410x90 mm (12.2"x16.1"x3.5") for testing blocks according to ASTM C140

» Upper platen and spherical seat are mounted on an axial screw assembly allowing easy adjustment of vertical clearance using slotted distance pieces.

» This model fully complies with the ASTM C140 which specifies the minimum platen thickness related to the spherical seat bearing area and the specimen dimensions to avoid platen deflection during the test.

» Innovative upgrading kit to easily switch the spherical seat assembly for testing cylinders to ASTM C39, resulting a multi-testing unit!

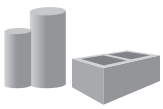
PILOT PRO

Sophisticated and flexible automatic compression testers

STANDARD

▸ ASTM C39 ▸ ASTM C40 ▸ AASHTO T22

▸ 2000 ▸ 3000 kN ▸ 450 ▸ 660 klbf



50-A29P02
PILOT Pro Automatic Compact-Line ASTM compression tester, 2000 kN cap., for blocks up to 200 x 200 x 400 mm (8" x 8" x 16") WxHxL.
230 V, 50-60 Hz, 1 ph.

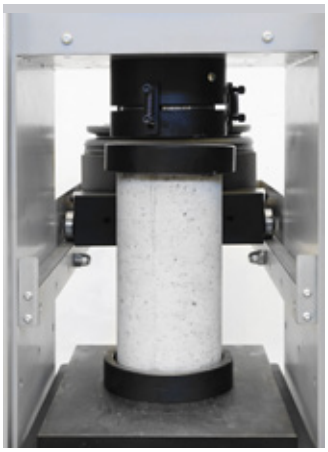
50-A29P14
As above but calibrated in lbf, 450 klbf.
110 V, 60 Hz, 1 ph.

50-A39P02
PILOT Pro Automatic Compact-Line ASTM compression tester, 3000 kN cap., for blocks up to to 200 x 200 x 400 mm (8" x 8" x 16") WxHxL.
230 V, 50-60 Hz, 1 ph.

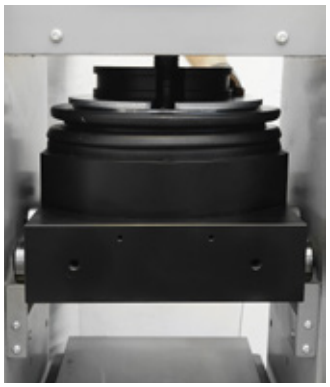
50-A39P14
As above but calibrated in lbf, 660 klbf.
110 V, 60 Hz, 1 ph.

Detail of axial screw assembly

Detail of the upper block platen and spherical seat sliding off by solid rail system



Detail of the machine fitted with the conversion set 50-A29/CYL to test cylinders



Detail of the sliding off operation of the upper platen and spherical seat

PILOT PRO

Frame and Compression Platens

See physical specifications table on page 181

PILOT Pro Power and Control System

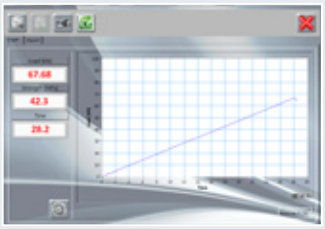
Full specifications on page 170

Safety Features

Max. pressure valve to avoid machine overloading, piston travel limit switch, emergency stop button, front and rear flexible fragment guard.

Machine accessories and special performances for ASTM block testers

- Frame pedestal. See page 194
- DATAMANAGER PC software. See page 192 (Not compatible with WIZARD Auto)



Slotted distance pieces to adjust the vertical daylight, to suit the size of the specimen

65-L1000/100B
Slotted distance piece dia. 195 x 100 mm

65-L1000/68B
Slotted distance piece dia. 195 x 68 mm

65-L1000/50B
Slotted distance piece dia. 195 x 50 mm

65-L1000/40B
Slotted distance piece dia. 195 x 40 mm

Test accessories

- Splitting tensile test device. See page 200

- Compression device on cement samples. See page 201
- Flexural test device on concrete beams. See page 201

- Capping pads and retainers. See page 237

- Sulphur capping equipment. See page 236

Connectivity packages For PILOT Pro only See page 178

- LinK-LAB laboratory peripheral integration package
- Web services

Calibration in lbf units

These machines can be calibrated in lbf unit. For the codes change second last code number from 0 to 1

Upgrading options

- Additional testing frame/s connection. See page 196
- Printer installation. See page 198
- Rigid front door. See page 198
- Special calibration procedure. See page 199
- Certified platen hardness. See page 199
- Fragment guard lock switch. See page 199

Conversion set to test cylinders up to 6" x12" to ASTM C39

50-A29/CYL
Kit comprising:

- spherical seat and upper compression platen dia. 165mm (6.5")
- system for easy removal and repositioning of the upper block spherical assembly

Dimensions (mm, lxdxh) and weights

50-A29xxx and A39xxx, 800x520x1760, 975 kg

Other voltages

For 110V, 60 Hz versions change last code number from 2 to 4.
Example: 50-A39P04

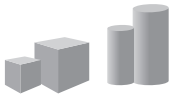
▸ General Utility COMPACTline Compression testers for cubes, cylinders and blocks

▸ 1500 ▸ 2000 ▸ 3000 kN

WIZARD AUTO

Standard automatic Quality Control compression testers

▸ 1500 ▸ 2000 ▸ 3000 kN



50-C13W02
WIZARD Auto Automatic Compact-Line General Utility compression tester, 1500 kN cap., for cubes up to 150 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50 Hz, 1 ph.

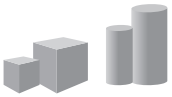
50-C23W02
WIZARD Auto Automatic Compact-Line General Utility compression tester, 2000 kN cap., for cubes up to 150 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50 Hz, 1 ph.

50-C34W02
As above but 3000 kN cap., for cubes up to 200 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50 Hz, 1 ph.

PILOT PRO

Sophisticated and flexible automatic compression testers

▸ 1500 ▸ 2000 ▸ 3000 kN



50-C13P02
PILOT Pro Automatic Compact-Line General Utility compression tester, 1500 kN cap., for cubes up to 150 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

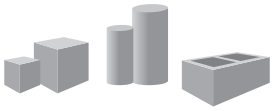
50-C23P02
PILOT Pro Automatic Compact-Line General Utility compression tester, 2000 kN cap., for cubes up to 150 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

50-C34P02
As above but 3000 kN cap., for cubes up to 200 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

WIZARD AUTO

Entry-level automatic compression testers

▸ 2000 ▸ 3000 kN



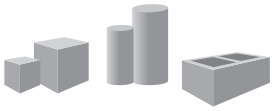
50-C25W02
WIZARD Auto Automatic Compact- Line General Utility compression tester, 2000 kN cap., for blocks, cubes up to 200 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50 Hz, 1 ph.

50-C35W02
WIZARD Auto Automatic Compact- Line General Utility compression tester, 3000 kN cap., for blocks, cubes up to 200 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50 Hz, 1 ph.

PILOT PRO

Sophisticated and flexible automatic compression testers

▸ 2000 ▸ 3000 kN



50-C25P02
PILOT Pro Automatic Compact-Line General Utility compression tester, 2000 kN cap., for blocks, cubes up to 200 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

50-C35P02
PILOT Pro Automatic Compact-Line General Utility compression tester, 3000 kN cap., for blocks, cubes up to 200 mm and cylinders up to dia. 160 x 320 mm.
230 V, 50-60 Hz, 1 ph.

WIZARD AUTO | PILOT PRO

Frame and Compression Platens

See physical specifications table on page 181

WIZARD Auto Power and Control System

Full specifications on page 169

PILOT Pro Power and Control System

Full specifications on page 170

Safety Features

Max. pressure valve to avoid machine overloading, piston travel limit switch, emergency stop button, front and rear flexible fragment guard.

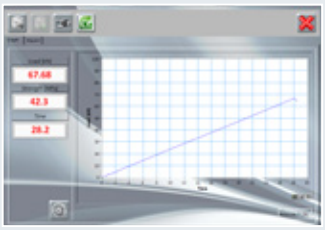
Machine accessories and special performances for all models

- Distance pieces to reduce the vertical daylight. See page 194
- Frame pedestal. See page 194

- Lifting device for bottom platen. See page 194

Lifting device for bottom platen

- DATAMANAGER PC software. See page192 (Not compatible with WIZARD Auto)



50-C50/CYL

Lower compression platen dia.165 x 30 mm for testing capped cylinders dia.150 x 300 mm (6"x12"). Resulting compression machine vertical clearance is increased by 20 mm.

Test accessories

- Splitting tensile test device. See page 200
- Compression device on cement samples. See page 201

- Flexural test device on concrete beams. See page 201
- Capping pads and retainers. See page 237
- Sulphur capping equipment. See page 236

Connectivity packages. For PILOT Pro only. See page 178

- LinK-LAB laboratory peripheral integration package
- Web services

Upgrading options

- Additional testing frame/s connection. See page 196
- Printer installation. See page198
- Special calibration procedure. See page 199
- Certified platen hardness. See page 199
- Rigid front door. See page 198
- Fragment guard lock switch. See page 199

Dimensions (mm, lxdxh) and weights (50-)

C13Wxx_810x425x1085, 305 kg
C23Wxx_835x440x1090, 525 kg
C34Wxx_805x450x1160, 755 kg
C25Wxx_835x555x1090, 610 kg
C35Wxx_805x600x1160, 815 kg
C13Pxx_760x370x1085, 315 kg
C23Pxx_785x420x1090, 530 kg
C34Pxx_755x450x1160, 760 kg
C25Pxx_785x555x1090, 620 kg
C35Pxx_765x600x1160, 820 kg

Other voltages

For 110V, 60 Hz versions change last code number from 2 to 4.
Example: 50-C13W04, C23P04, C35P04.

Sulphur capping equipment

DATAMANAGER
Universal PC testing software

STANDARD

▸ EN 1338 ▸ EN 1339 ▸ EN 1340 ▸ EN 12390-3 ▸ ASTM C39 ▸ EN 12390-6 ▸ ASTM C496 ▸ ASTM C109 ▸ EN 12390-5 ▸ ASTM C78 ▸ ASTM C293 ▸ ASTM C348 ▸ EN 196-1

The 82-SW/DM is new, intuitive, smart DATAMANAGER software. Very easy to use, and complete with many functions, it's totally flexible and open to network communications. It's compatible with PILOT Pro and AUTOMAX Pro PCS and included in more sophisticated systems such as AUTOMAX Multitest console.

It allows real time acquisition and management of all test data and remote control of the machine.

This software provides the data acquisition in real time throughout the test execution up to the specimen failure. All readings are displayed both as graphical and numerical format and stress vs time plot is traced out in real time. The advanced functions for database management provide an easy navigation of all saved data.

The resulting test certificate is customizable and includes all descriptive information, test results and stress vs. time diagram. The conformity to standards of test execution is therefore proven.

AUTOMATIC FORCE VERIFICATION PROCEDURE

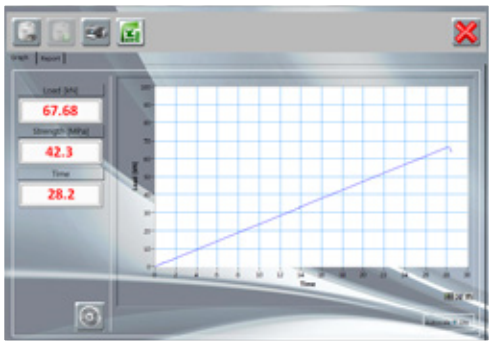
In addition, by connecting the PC to our digital readout unit (82-P0801/E or 82-P0804/E) and suitable load cells, it is possible to perform an automatic load measurement verification procedure, including data acquisition and printing of traceable calibration certificates, using the software.
See page 411

Control console directly connected via software to our digital readout unit and load cell to perform automatic force verification procedure.

82-SW/DM

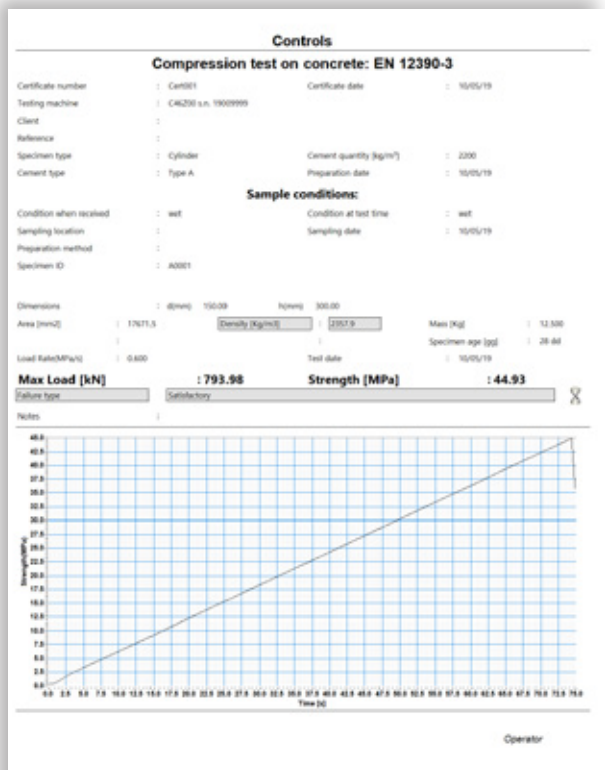
New DATAMANAGER PC software compatible with PILOT Pro and AUTOMAX Pro compression machines and SMART-Line and Automax Multitest control consoles. Suitable for remote control of the system, data acquisition, processing and filing, as well as printout of customized test certificates.
LAN cable for PC connection included.

Test report menu



82-SW/DM Test execution display

Calibration menu

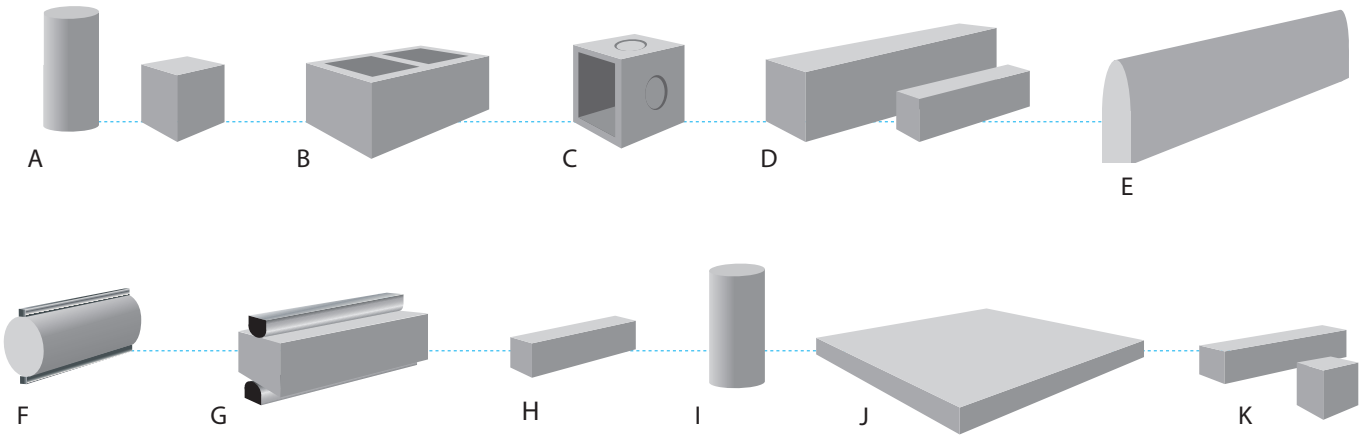

Controls
Compression test on concrete: EN 12390-3
Sample conditions:
Max Load [kN] : 793.98
Strength [MPa] : 44.93
Operator

DATAMANAGER Software example of single test report

DATAMANAGER 82-SW/DM

For compression, flexural, indirect tensile testing on concrete, cement and similar

Standard	Test	Specimen
EN 12390-3	Compressive strength of concrete test specimens	A
EN 772-1 ASTM C140, C1314	Compressive strength of masonry units	B
EN 1917	Unreinforced concrete, manholes and inspection chambers, compressive strength	C
EN 12390-5	Flexural strength of concrete test specimens	D
EN 1340	Flexural test on concrete kerb units	E
EN 12390-6	Tensile splitting test on concrete test specimens	F
EN 1338	Indirect tensile test on concrete paving blocks	G
EN 196-1	Compression and flexural strength of cement specimens	H
ASTM C39 AASHTO T22	Compressive strength of cylindrical concrete specimens	I
ASTM C78	Flexural strength of concrete using third-point loading	D
ASTM C293	Flexural strength of concrete using center-point loading	D
ASTM C496	Splitting tensile strength of cylindrical concrete specimens	F
EN 1339	Flexural test on concrete flagstones	J
ASTM C109 ASTM C348	Compression and flexural strength of cement specimens	K



Machines accessories

FRAME PEDESTALS

All the pedestals in the range are made of steel and designed to make use of the compression machine, providing easy specimen loading and machine control.

50-C49/B, 50-C59/B

50-A19/B, 50-C29/B, 50-C39/B

50-A19/B
Pedestal for frames and testing machines model 50-C92xxx, 50-A12xxx and 50-C13xxx. Dimensions: 660x370x400(h) mm

50-C29/B
Pedestal for frames and testing machines model 50-C23xxx, 50-C25xxx and 50-A22xxx
Dimensions: 620x420x400(h) mm

50-C39/B
Pedestal for frames and testing machines model 50-C34xxx, 50-C35xxx and 50-A32xxx
Dimensions: 670x400x400(h) mm

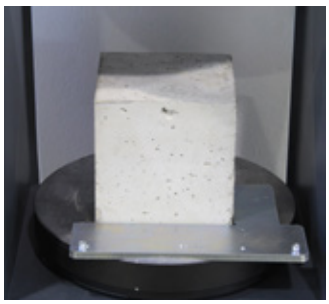
50-C49/B
Pedestal for frames and testing machines model 50-C46xxx and 50-C47xxx
Dimensions: 650x310x425(h) mm

50-C59/B
Pedestal for frames and testing machines model, 50-C56xxx and 50-C57xxx
Dimensions: 740x370x375(h) mm

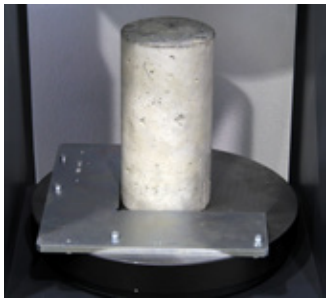
50-A29/B
Pedestal for frame and testing machine models 50-A29xxx and 50-A39xxx
Dimensions: 670x630x200(h) mm

CENTERING DEVICES FOR SPECIMENS

50-C0050/CTR2
Centering device for 100 mm, 150mm, 160 mm and 200mm dia/ side specimens suitable for frames and compression machines fitted with round platens 300 mm dia.



50-C0050/CTR2



50-C0050/CTR2

50-C0050/CTR3
Same as above but for machines with round platens 220 mm dia.

50-C0050/CTR4
Same as above but for machines with square platens 305x305 mm.

LIFTING ASSEMBLY FOR BLOCK TESTING PLATENS

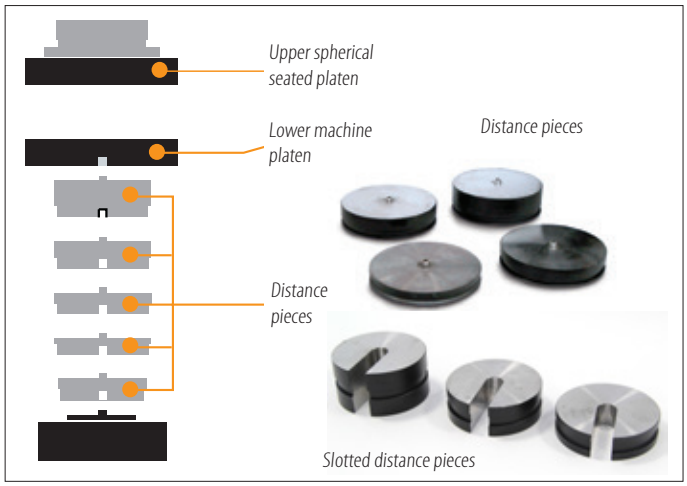
This accessory is used for easier placement of distance pieces which can be used, when necessary, to reduce the vertical clearance of the machines/ frames. Two models are available:

50-C9060/A
Lifting device for bottom block platen for easier placement pieces compatible platen size 310 x 510 x 50 mm thickness. Weight: 19 kg

50-C9060/B
Same as above but for platen size 310 x 510 x 90 mm thickness. Weight: 18 kg

DISTANCE PIECES TO ADJUST THE VERTICAL DAYLIGHT

Made of steel and used to reduce the vertical daylight of the compression machine depending on the size of the specimen and considering that, in general, the maximum piston travel is 50 mm. The following schematic and table are a suitable application guide to help you in the selection of required distance pieces.



Distant pieces dia. 200 mm

50-C9080*
Distance piece dia. 200x30 mm.
Weight 7,3 kg

50-C9082*
Distance piece dia. 200x50 mm.
Weight 12,3 kg

50-C9083*
Distance piece dia. 200x68 mm.
Weight 16,7 kg

50-C9084
Distance piece dia. 96x158 mm.
Weight 9 kg

50-C9086*
Distance piece dia. 200x100 mm.
Weight 25 kg

50-C9087
Distance piece dia. 96x130mm.
Weight 8 kg

**These distance pieces are also available with threaded centering pin and are identified by suffix /P (e.g. C9080/P). This version of distance pieces features a threaded centering pin and it is recommended for testing high strength/ explosive failure*

In case of use of these distance pieces the compression machine/frame shall be upgraded with the following code:

50-C908x/P

50-Q0050/P6
Upgrading of the 50-C46xxx and 50-C56xxx series compression frames with lower compression platen with threaded hole.

See also "Explosion proof test kit" on page 198

Distant pieces dia. 165 mm

65-L1000/20
Distance piece dia. 165x20 mm.
Weight 3,2 kg

65-L1000/30*
Distance piece dia. 165x30 mm.
Weight 4,7 kg

65-L1000/40*
Distance piece dia. 165x40 mm.
Weight 6,4 kg

65-L1000/68*
Distance piece dia. 165x68 mm.
Weight 10,5 kg

**These distance pieces are also available with threaded centering pin and are identified by suffix /xxP (e.g. 65-L1000/68P). This version of distance pieces features a threaded centering pin and it is recommended for testing high strength/ explosive failure. The bottom compression platen to be used along these distance pieces is:*

65-L1000/P
Lower compression platen dia. 165 x 30 mm with threaded hole complete with threaded centering pin.

DISTANCE PIECES SELECTION GUIDE

The following schematic and table are a suitable application guide to help you in the selection of required distance pieces.

How to select distance pieces

When selecting distance pieces, all possible combinations of tests and specimen sizes should be considered.
The total vertical space that needs to be filled by distance pieces can be calculated using: (v - h) - 10 mm
Where:
v = Maximum vertical clearance of the machine (mm)
h = Specimen height (mm)
10 mm = typical free vertical space to be left after specimen positioning

For example:

v= 350 mm
h = 150 mm
Vertical space to be filled = (v-h) - 10 mm = (350 -150)-10 = 190 mm (approx.)

Standards	Machine and frames	Vertical daylight approx. mm	Cylinders* 4" x 8", 100 x 200 mm	Cylinders* 6" x 12", 150 x 300 mm	Cube 100 mm	Cube 150 mm	Cube 200 mm	Cube 300 mm	Blocks 300 x 500 x 200 mm (W x D x H)
	50-		Qty Code	Qty Code	Qty Code	Qty Code	Qty Code	Qty Code	Qty Code
ASTM	A12xxx A22xxx A32xxx	380	1x C9084 1x L1000/20	1x L1000/40 1x L1000/30	1x C9084 2x L1000/40 1x L1000/30	-	-	-	-
	A42xxx A52xxx	405	1x C9084 1x L1000/30	3x L1000/30	1x C9084 3x L1000/30 1x L1000/40				
GENERAL UTILITY	C13xxx C23xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	-	-	-
	C25xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	2x C9083	1x C9080	2x C9083
	C34xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	1x C9082 2x C9083	-	-
	C35xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	2x C9083	1x C9080	2x C9083
EN	C46xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	2x C9083	-	-
	C47xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	2x C9083	1x C9080	2x C9083
	C56xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	2x C9083	-	-
	C57xxx	350	2x C9083	1x C9080	2x C9082 2x C9083	1x C9082 2x C9083	2x C9083	1x C9080	2x C9083
	C68xxx C78xxx	520	1x C9083 2x C9086 1x C9082	1x C9083 1x C9086 1x C9082	1x C9083 1x C9086 1x C9082	1x C9083 3x C9086	1x C9083 2x C9086 1x C9082	1x C9083 1x C9086 1x C9082	-

**The suggested distance pieces refer to grinded cylinders.*

Upgrading options

ADDITIONAL FRAME/S CONNECTION

WIZARD AUTO

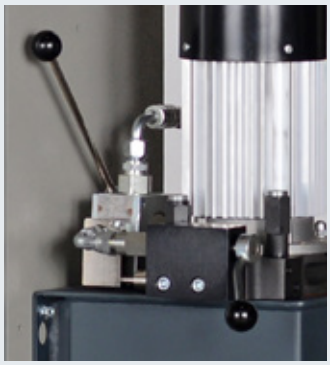
Second frame connection

The WIZARD Auto System can be upgraded with a hydraulic valve selector for controlling (not simultaneously) a second frame.

50-C10W/2F
Two-way valve for WIZARD Auto System to control a second frame.

Note: *when connecting a low capacity frame (i.e. flexural or cement) pressure regulator 65-L1400/X5 may be necessary. Please ask our technical department.*

Wizard Auto controlling two frames



Detail of 50-C10W/2F

ADDITIONAL FRAME/S CONNECTION

PILOT PRO

Second and third frame connection

The PILOT Pro System can be upgraded with a hydraulic valve selector for controlling (not simultaneously) a second and third frame.

Note: *when connecting a low capacity frame (i.e. flexural or cement) pressure regulator 65-L1400/X5 may be necessary. Please ask our technical department.*

50-C10C/2F
Two-way valve for PILOT Pro System to control a second frame.

50-C10C/3F
Three-way valve for PILOT Pro System to control a second and third frame.

PILOT Pro EN 2000 kN Automatic compression tester 50-C46P02 with 50-C10C/3F three-way valve controlling a double testing chamber 300/15 kN cement frame 50-L28Z10 with accessories

Automatic load/unload and frame selection

The Pilot Pro PCS can also be upgraded on request with ON/OFF electro-valve enabling automatic loading/unloading and including the output for the connection of a second frame.

Additional electrovalve can be added to connect up to 3 frames.

Note: *when connecting a low capacity frame (i.e. flexural or cement) pressure regulator 65-L1400/X5 may be necessary. Please ask our technical department.*

50-C10P/2F
Upgrade of PILOT Pro PCS with load/unload electrovalve including second frame connection for active control via display/PC

50-C10D/3F
Electrovalve for third frame connection. To be used with 50-C10P/2F upgrade.

50-C10P/2F upgraded with third electrovalve 50-C10D/3F

ADDITIONAL FRAME/S CONNECTION

AUTOMAX PRO AUTOMAX MULTITEST AUTOMAX PRO M

Third and fourth frame connection

The AUTOMAX Pro System, which can control two frames as standard, can be upgraded with a hydraulic valve for controlling (not simultaneously) a third and fourth frame.

Note: *when connecting a low capacity frame (i.e. flexural or cement) pressure regulator 65-L1400/X5 may be necessary. Please ask our technical department.*

50-C10D/3F
Electrovalve for third frame connection.

50-C20E/4F
Electrovalve for fourth frame connection. To be used with 50-C10D/3F.

AUTOMAX fitted with 50-C10D/3F and 50-C20E/4F valves for connection and control of a third and fourth frame

AUTOMAX Pro EN Automatic compression tester 50-C56F02, upgraded with 50-C10D/3F, controlling a second cement compression frame 65-L18Z10 and a third flexural frame 50-C1501/FR with accessories

AUTOMAX Pro EN Automatic compression tester 50-C56F02, upgraded with 50-C10D/3F and 50-C20E/4F, controlling a double chamber 50-L28Z10 cement compression / flexural frame and a fourth flexural frame 50-C1711/FR with accessories

AUTOMAX Pro ASTM Automatic compression tester 50-A52F02, upgraded with 50-C10D/3F, controlling a second flexural frame 50-C1701/FR and a third tensile frame 70-S12Z00

Upgrading options

SERIAL PRINTER INSTALLATION

WIZARD Auto, PILOT Pro and AUTOMAX Pro PCS systems can be upgraded incorporating a serial printer in the rear panel having the following specifications:

- Very quiet printing
- High speed: 50mm/sec
- High resolution: 200 dpi= 8 dots/mm
- Supports text and graphic printing
- Easy maintenance with self-diagnostics
- Paper width: 58 mm

The printer allows test results (including load/time plot for PILOT Pro and AUTOMAX Pro) to be printed at the end of the test.

50-Q60W/PR
Installation of a serial printer on the WIZARD Auto control panel

50-Q60P/PR
Installation of a serial printer on the PILOT Pro and AUTOMAX Pro control panel

RIGID FRONT DOOR

As alternative to the flexible fragment guard in the ASTM and general utility frames.

50-A19/FG
Rigid front door for 50-A12xxx and 50-C13xxx frames

50-C29/FG
Rigid front door for 50-C23xxx and A22xxx frames

50-C25/FG
Rigid front door for 50-C25xxx frames

50-C39/FG
Rigid front door for 50-C34xxx and A32xxx frames

50-C35/FG
Rigid front door for 50-C35xxx frames

50-A29/FG
Rigid front door for 50-A29xxx and 50-A39xxx frames

EXPLOSION PROOF TEST KIT

All EN testers and frames series 50-C56xxx, 50-C57xxx, C68xxx and C78xxx, can be fitted with a special test kit comprising safety cables to secure the upper platen to the frame, bottom platen anti-fall safety system and metallic grid fragment guard. This kit is essential, for safety operation, when testing high strength specimens with explosive behavior.

50-C59/EK
Explosion proof test kit for 50-C56xxx series

50-C59/EK1
Explosion proof test kit for C57xxx series

50-C59/EK2
Explosion proof test kit for C56Fxx series

50-C69/EK
Explosion proof test kit for 50-C68xxx and 50-C78xxx series

This test kit is however included in the EN compression testers 4000 kN and 5000 kN cap. for testing cubes, cylinders and blocks, models 50-C69xxx and 50-C79xxx.

Safety cable to secure the upper platen to the frame

Bottom platen connected by centring threaded pin to the distance pieces/piston head

Metallic grid fragment guard

Distance pieces with handles (see page 194)

SPECIAL CALIBRATION PROCEDURES

STANDARD

▸ EN 12390-4 ▸ ASTM E74

These procedures can be applied to Concrete, Cement and Flexural testing machines fitted with WIZARD Auto, PILOT Pro, AUTOMAX Pro and AUTOMAX Multitest testing systems.

The special calibrations are useful to extend the Class 1 load measurement accuracy in the lower part of the scale. It is suggested when other test methods (flexure, indirect tensile) or low strength material testing shall be performed in the compression machine. To be specified at the time of order.

50-C0050/CAL
Special calibration of load digital readout unit assuring class 1 from 1% of testing machine full scale (maximum load). Suitable for:
- All testers from 1500 to 5000 kN cap.
- All cement testers 300 and 600 kN cap.
- All flexural testing frames fitted with load cell

50-C0050/CAL5
Special calibration of load digital readout unit assuring class 1 from 5% of testing machine full scale (maximum load). Suitable for:
- All cement double chamber frames for 15 kN cap.
- All flexural testing frames fitted with pressure transducers

50-C0050/1CAL
Special calibration of load digital readout unit assuring class 1 from 0.5 kN. Available only for 300kN and 500 kN capacity PILOT Pro or AUTOMAX Pro PCS systems.

PLATEN SURFACE HARDNESS CERTIFICATE

STANDARD

▸ EN 12390-4 ▸ ASTM C39
▸ ASTM C109 ▸ ASTM C349
▸ EN 196-1 ▸ ASTM D2664
▸ ASTM D2938 ▸ ASTM D7012

These Standards prescribe a minimum surface hardness depending on the type of test to be performed. When required, the hardness verification is performed with certified instruments.

50-C0050/HRD2
Supply of the compression machine/ frame complete with traceable certificate of hardness -55 HRC- of testing platens surfaces 165 mm. dia.

50-C0050/HRD3
Same as above for 220 mm dia. platens, 55 HRC.

50-C0050/HRD4
Same as above for 300 mm dia. platens, 53 HRC.

50-C0050/HRD5
Same as above for square platens 40 x 40 mm, 60 HRC.

50-C0050/HRD6
Same as above for square 305 x 305 mm platens, 53 HRC.

50-C0050/HRD7
Same as above for rectangular platens 510 x 310 x 50 mm, HRC 55.5.

50-C0050/HRD9
Same as above for platens dia. 300 x 50 mm, for rock testing to ASTM D7012, 58 HRC (to be ordered along 50-Q0050/HRD).

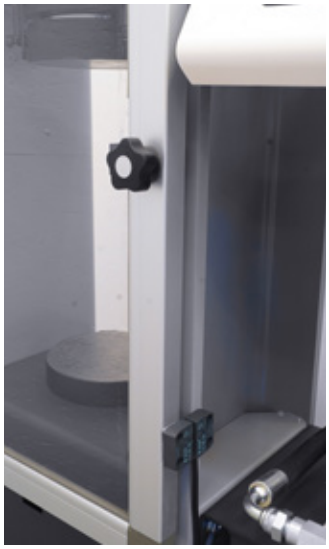
50-C0050/HRD10
Same as above for rectangular platens 510 x 310 x 90 mm, 55.5 HRC.

65-L0050/HRD
Same as above for cement machines/ frames model 65-Lxxxxx, 60 HRC.

FRAGMENT GUARD LOCK SWITCH

Prevents test execution with the safety guard open

50-C50/P1
For WIZARD Auto, PILOT Pro and AUTOMAX Pro PCS.



50-C50/P1

Test Accessories

SPLITTING TENSILE TEST DEVICES

STANDARD

▸ EN 1338 ▸ EN 12390-6 ▸ ASTM C496

Two column steel frame with self-centering specimen holder and upper load beam suspended with springs for free adjustment on the specimen. The columns can be regulated in height to adjust the internal vertical daylight between upper and lower bearers. The devices can be easily placed on the lower platen of the compression tester using suitable distance pieces to adjust the vertical daylight. The device has to be completed with the packing strips to be inserted between the specimen and the load beams.

Model	50-C9000/C	50-C9000/A	50-C9070/C	50-C9070/A
Samples	Cylinders up to dia. 160x320 mm	Cylinders up to dia. 250x500 mm	Paving blocks up to 160 mm width	Paving blocks up to 320 mm width
Max. height*	370 mm	395 mm	370 mm	370 mm
Overall dimensions, width/length	250/335	345/525	250/335	420/335
Max vertical daylight mm	225	257	225	225
Max columns regulation mm	110	N.A.	110	110
Min vertical daylight mm	115	N.A.	65**	65**
Max travel mm	45	45	45	45
Max horiz. daylight mm	170	255	170	330
Bearers length mm	330	525	330	330
Weight approx. kg	32 kg	65 kg	33 kg	50 kg
Packing strips,	50-C9002 to EN 50-C9002/A to ASTM	50-C9001/A	50-C9002	50-C9002

** Remove the bottom compression platen to host the jig or adjust remaining vertical daylight with suitable distance pieces (see Machine Accessories).*
*** With 50mm distance piece included.*

50-C9070/C

50-C9000/A

50-C9000/C fitted in the compression machine

FLEXURAL TEST DEVICE FOR CONCRETE BEAMS

STANDARD

EN 12390-5 ▸ ASTM C78
ASTM C293 ▸ AASHTO T97

50-C9010/C

Flexure testing accessory for center and third point test on concrete beams. Total height: 370 mm when adjusted for 150 mm beams and 320 mm for 100 mm beams. The devices can be easily placed on the compression tester by removing the bottom platen or by using suitable distance pieces to adjust the vertical daylight.

- Max vertical daylight: 155mm (total height: 370mm)
- Min vertical daylight: 45mm (total height: 260mm)
- Max travel: 45mm
- Rollers: dia.25mm x 160mm
- Distance between upper rollers: 100mm or 150mm or single roller
- Distance between lower rollers: 300mm or 450mm
- Weight approx.: 41 kg
- Total width: 255 mm
- Total length: 620 mm
- Total height: 370mm

50-C9010/C fitted in the compression machine

50-C9010/CA

Same as above but with:
- distance between upper rollers: 4" or 6" or single roller
- distance between lower rollers: 12" or 18"

50-C9010/C

COMPRESSION DEVICES FOR CEMENT AND MORTARS

STANDARD

ASTM C109 ▸ EN 196

Robust frame fitted with an upper platen with spherical seat that moves vertically sustained by a spring. The apparatus can be placed and centered directly on the lower machine platen. The 50-C9030 and 50-C9030/H, conforming to EN 196 are designed to test portions of 40x40x160 prisms broken in flexure, while the 50-C9032 and 50-C9032/H, conforming to ASTM C109, fitted with compression platens 75 mm dia., and a vertical daylight of 53 mm are used to test 50mm/2" cubes and other little samples as, for example, microcores.

Vertical daylight of compression machine has to be adjusted by using suitable distance pieces. See Machine Accessories

Weight approx.: 8 kg

50-C9030
Compression device to test portions of 40x40x160 prisms broken in flexure to EN 196-. Total height 195mm.

50-C9030/C
Same as above but complete with traceable hardness certificate for compression platens

50-C9030/H
Compression device to test portions of 40x40x160 prisms broken in flexure to EN 196-1. High stiffness model.
Total height 225mm.

50-C9030/HC
Same as above but complete with traceable hardness certificate for compression platens

50-C9032
Compression device to test 50 mm and 2" mortar cubes to ASTM C109.
Total height 195mm.

50-C9032/C
Same as above but complete with traceable hardness certificate for compression platens

50-C9032/H
Compression device to test 50mm (2") cubes to ASTM C109. High stiffness model.
Total height 225mm.

50-C9032/HC
Same as above but complete with traceable hardness certificate for compression platens

50-C9030/H

50-C9032/H

50-C9030

50-C9032

Stand-alone Automatic Control Consoles for retrofitting

SMARTline

50

PILOT Pro and AUTOMAX Pro automatic and super automatic Power and Control Systems are also available in a stand-alone configuration that can be cost-effectively used to update any make of testers fitted with old pressure gauges or less reliable electronic readout unit and power pumps with manual flow control.

SMARTline PILOT PRO

50-C10P02
PILOT Pro SMART line, Automatic control console. 230 V, 50-60 Hz, 1 ph.

50-C10P04
Same as above but 110 V, 60 Hz, 1 ph.

SMARTline AUTOMAX PRO

50-C10F02
AUTOMAX Pro SMART line, Automatic control console. 230 V, 50-60 Hz, 1 ph.

50-C10F04
Same as above but 110 V, 60 Hz, 1 ph.

PILOT Pro and Automax Pro overall dimensions and weights:
-1292 x 350 x 450 mm (H x W x D)
- 80 kg. approx.

Technical specifications of PILOT Pro and AUTOMAX Pro units and their superior performances are fully described from page 170 to 172.

Wizard Auto PCS for machines retrofit

WIZARD AUTO

This Power and Control System can be cost-effectively used to retrofit and update old testers to be transformed in a modern automatic compression tester. Both hydraulic system and digital interface have to be fitted laterally to the testing frame (lateral wall-mounting bracket included).

The hydraulic system consists essentially in a dual stage pump and AC motor fitted with inverter device featuring high efficiency, reduction of power consumption and silent operation.

The digital interface features two 16 bit analog channels for load sensors, wide graphic display 128 x 80 pixel for real time view of load and stress and automatic application of the selected load rate.

For complete information and Technical specifications see page 169

50-Q90W02
Wizard Auto Automatic Power and Control System including dual stage pump with AC motor with inverter and digital interface.
230 V, 50-60 Hz, 1 ph.

50-Q90W04
Same as above but 110V, 60 Hz, 1 ph.

***Important note**:*
All the above systems (PILOT Pro, AUTOMAX Pro and WIZARD Auto), have to be completed with hydraulic rubber hose, pressure transducer and connection cable. Suitable models are proposed below.

82-P0700
Pressure transducer, 0-700 bar.

82-P0349/ELT
Pressure transducer connecting cable

82-Q0200
Hydraulic rubber hose 1.6m length

For complete information and Technical specifications see page 414

Flexural and transverse testing frames

We offer a wide range of flexural frames, that are controlled by our Power and Control Systems PILOT Pro or AUTOMAX Pro, or by computerized control console AUTOMAX Multitest. Collectively, this range satisfies all requirements, from the standard flexural tests on concrete beams, to the more complex tests under displacement and strain control on FRC (Fiber Reinforced Concrete), Shotcrete for tunnelling and other structural specimens reinforced with carbon fiber fabrics or similar.

STANDARD

▸ EN 1339 ▸ EN 1340 ▸ EN 12390-5 ▸ ASTM C78 ▸ ASTM C293 ▸ EN 14488-5 ▸ ASTM C1609 ▸ ASTM C1018

50-C0920/FR

BEAM FLEXURE FRAME

150 kN capacity, complete with loading rollers for 3 and 4 points flexure testing on concrete beams conforming to EN 12390-5, ASTM C78 and ASTM C293. Includes pressure transducer and connection kit for separate control console.

Accessories

50-C0920/B
Frame pedestal, 455x465x 615 mm (W x L x H), Weight 23 kg.

50-C0920/1
Compression platens dia.165x30mm

50-C0920/2
Piston travel limit switch

Max. load cap.	150 kN / 33 klbf
Max. vertical clearance	158 mm / 6.2"
Horizontal clearance	185 mm / 7.3"
Roller size	dia. 40 x 160 mm / dia. 1.6 x 6.3"
Distance between upper rollers	adjustable from 100 to 200 mm or 4" to 6" for 3- and 4- points loading
Distance between lower rollers	300 or 450 mm and 12" or 18"
Piston travel	75 mm / 3"
Overall dimensions w/o pedestal	455 x 560 x 960 mm / 18 x 22 x 38"
Total weight	170 kg / 374 lb

The same frame is available in Compact-Line version controlled by Wizard Auto PCS. Please visit our website for more information.

HIGH STIFFNESS "PORTAL" FRAMES, 200 AND 350 KN CAP.

Available in two versions:

Simplex, for parallel testing mode (see page 204).

Duplex, for parallel and orthogonal testing mode (see page 204).

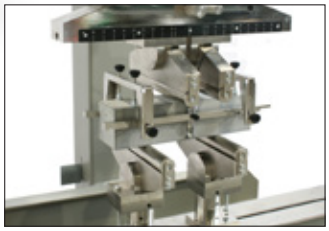
These high stiffness flexural frames have been especially designed for displacement-controlled testing on advanced construction materials, e.g. Fiber Reinforced Concrete (FRC) and sprayed concrete.

SIMPLEX versions, 200 and 350 kN

DUPLEX versions, 200 and 350 kN
Detailed information on page…

UNIVERSAL, OPEN STRUCTURE FRAME 300 KN CAP.

The "C" shaped open structure allows an easy and practical front loading of the specimen but, during the test, the structure is closed by a vertical rod hydraulically clamped and tensioned to compensate frame deformation during the test thus ensuring high rigidity.



To get more info visit
www.controls-group.com
or link directly to the QRCode

High stiffness Simplex and Duplex "PORTAL" flexural frames, 200 and 350 kN cap.

STANDARD

▸ EN 1339 ▸ EN 1340 ▸ EN 12390-5 ▸ ASTM C78 ▸ ASTM C293 ▸ EN 14488-5 ▸ EN 14651 ▸ ASTM C1609 ▸ ASTM C1550

These high stiffness flexural frames have been especially designed for displacement-controlled testing on advanced construction materials, e.g. Fiber Reinforced Concrete (FRC) and sprayed concrete. These tests are significantly affected by the actual frame stiffness therefore the relevant international Standards state stiffness requirements which are satisfied by these new models (200 kN/mm).

This remarkable result comes from the frame sections, but it is also derived from the particular layout which keeps the specimen aligned (parallel testing mode) with the frame crossbeams maximizing structural rigidity. Bearers not included. See accessories page 206

50-C1511/FR with bearers 50-C1500/1 for testing concrete beams up to 650mm length in parallel mode

50-C1511/FR with bearers 50-C1500/1 for testing concrete beams up to 650mm length in parallel mode

50-C1711/FR with bearers 50-C1500/1

50-C1701/FR with bearers 50-C1700/1 during CMOD test: FRC beam is kept parallel to the frame for maximum stiffness

FEATURES and BENEFITS

» 200 and 350 kN cap.

» High stiffness: 200 kN/mm

» SIMPLEX, small footprint solution for testing specimens up to 650mm (850mm for 350 kN model) length in parallel testing mode

» DUPLEX, dual testing mode, parallel for maximum stiffness and orthogonal for tests on specimens longer than 650mm (850mm for 350 kN model)

» Horizontal daylight of all models suitable for large specimens such as slab, flagstones, beams and kerbs up to 650mm (850mm for 350 kN model) length

» Load measurement by pressure transducer or load cell (recommended for FRC testing)

» Piston return by counterweights

» Complete with piston travel limit switch and connection kit to the control console

50-C1510/FR
200 kN cap. SIMPLEX high rigidity flexural frame, complete with pressure transducer and connection kit for separate control console. Rollers not included. Includes distance to reduce the daylight by: 50mm and 100mm

50-C1511/FR
Same as above but fitted with load cell.

50-C1500/FR
200 kN cap. DUPLEX high rigidity flexural frame, complete with pressure transducer and connection kit for separate control console. Rollers not included. Includes distance to reduce the daylight by: 50mm and 100mm

50-C1501/FR
Same as above but fitted with load cell.

50-C1711/FR
350 kN cap. SIMPLEX high rigidity flexural frame, complete with load cell and connection kit for separate control console. Rollers not included. Includes distance to reduce the daylight by 50mm, 80mm, 100mm, 130mm, 150mm and 180mm.

50-C1701/FR
350 kN cap. DUPLEX high rigidity flexural frame, complete with load cell, upper beam for rollers support and connection kit for separate control console. Rollers not included. Includes distance to reduce the daylight by: 50mm, 100mm and 150mm.

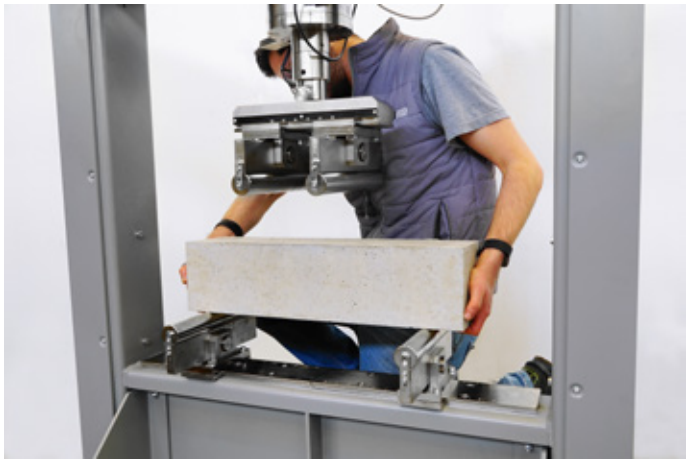
Technical specifications

Models 50-	Simplex C1510/FR C1511/FR(1)	Duplex C1500/FR C1501/FR(1)	Simplex C1711/FR(1)	Duplex C1701/FR(1)
Max capacity kN	200	200	350	350
Horizontal clearance, mm	720	720	900	900
Max. vertical clearance, mm*, with -50-C1500/1 (4 points) -50-C1500/1 (3 points) -50-C1700/1 (3 and 4 points)	 210 304 -	 210 304 -	 335 430 -	 - - 260
Distance between upper rollers, adjustable, mm	From 100 to 200 or single roller	From 100 to 200 or single roller	From 100 to 200 or single roller	From 100 to 500 or single roller
Distance between lower rollers- Parallel testing mode, adjustable mm,	From 150 to 600	From 150 to 600	From 150 to 800	From 150 to 800
Distance between lower rollers- Orthogonal testing mode, adjustable mm,	-	550 to 1000	-	From 850 to1500
Piston travel, mm	130	130	130	130
Overall dimensions (l x w x h) mm	1000 x 500 x 1250	1000 x 1100 x 1250	1150 x 600 x 1550	1150 x 1600 x 1550
Weight approx., kg	260	280	385	520

**The vertical daylight can be reduced using suitable distance pieces.*
(1) Models with load cell. The other models are fitted with pressure transducer.

Accessories

See next page



SIMPLEX models feature direct operator's access to the frame allowing easy frontal loading and positioning of specimens or heavy test accessories

High stiffness Simplex and Duplex "PORTAL" flexural frames, 200 and 350 kN cap.

STANDARD

▸ EN 1339 ▸ EN 1340 ▸ EN 12390-5 ▸ ASTM C78 ▸ ASTM C293 ▸ EN 14488-5 ▸ EN 14651 ▸ ASTM C1609 ▸ ASTM C1550

Accessories common to all models

50-C1500/2
Set of one upper and two lower roller assembly for testing paving flags to EN 1339.
Bearers dimensions: 40 mm dia. x 620 mm long

50-C1500/3
Swivel jointed loading pad for testing kerbs, conforming to EN 1340. To be used with support bearers of 50-C1500/2.

50-C1500/6
Accessory for testing sprayed concrete slab to EN 14488-5. Including supporting square base and spherically seated loading element. To be completed with displacement transducers 50-C1500/9 and 50-C1500/8.

50-C1500/7
Set of lower platen and upper platen spherically seated, 165 mm dia., for compression tests on small and low strength specimens.

50-C1500/8
Displacement transducer 50 mm travel for reading displacement of sprayed concrete slab center under concentrated load.

50-C1500/9
100 mm displacement transducer for measuring the piston travel. Complete with attachments.

50-C1500/5
Auxiliary testing frame for the measurement of deflection of FRC beams to EN 14488-3, 14651, ASTM C1609.

C1500/10
Accessory for testing to EN 14651 concrete beams under deflection control. To be used along with jig 50-C1500/5

50-C1500/50
Distance piece 50 mm thickness

50-C1500/80
Distance piece 80 mm thickness

Accessories for 50-C15xx/FR and 50-C1711/FR models

50-C1500/1
Upper and lower roller assembly (including ball seating upper beam for rollers' support) for center and third point flexure test. Bearers dimensions: 30 mm dia. x 210 mm long

50-C1500/11
Same as above but 30 mm dia x 310 mm length.

50-C1500/4
Upper roller assembly (including ball seating upper beam for rollers' support) for third point and center point flexure test, including two rollers 210 mm x 40 mm diameter. To be used with support bearers of 50-C1500/2

50-C1500/12
Same as above but 40 mm dia. x 310 mm bearers

50-C1500/R
Rulers with graduation in inches for 50-C15xx/FR

50-C1700/R1
Rulers with graduation in inches for 50-C1711/FR

Accessories for 50-C1701/FR model

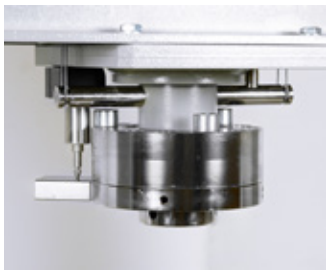
50-C1700/1
Upper and lower rollers for center and third point testing flexure test. Rollers dimensions: 30 mm dia. x 310 mm long

50-C1700/4
Upper loading rollers for third and center point flexure test, including two loading rollers 310 mm x 40 mm dia. To be used with support bearers of 50-C1500/2

50-C1700/R2
Rulers with graduation in inches for 50-C1701/FR

Accessories for 50-C17xx/FR models

50-C1700/7
Accessory for testing sprayed concrete slab to ASTM C1550. Comprises: supporting square base and spherically seated loading element.



Detail of load cell and piston travel displacement transducer 50-C1500/9

50-C1501/FR with compression platens 50-C1500/7

50-C1701/FR with 50-C1500/2 lower rollers and 50-C1500/3 loading pad for kerbs testing to EN 1340

50-C1511/FR with bearers 50-C1500/1, auxiliary frame 50-C1500/5 and two LVDT transducers 82-P0331/C for flexural test on FRC beam to ASTM C1609

50-C1511/FR with 50-C1500/2 rollers for flagstone testing to EN 1339

50-C1711/FR with C1700/7 and C1500/8 for round slab testing to ASTM C1550

50-C1701/FR with C1500/6 and C1500/8 for square slab testing to EN 14488-5

AUTOMAX PRO M AUTOMAX MULTITEST

Main applications and Test accessories

This range of systems, when connected to the appropriate frame and accessory, can perform the followin tests:

COMPRESSION AND FLEXURAL TESTS. All relevant accessories are shown and described on page 200 and 201

DETERMINATION OF MODULUS OF ELASTICITY. All relevant accessories are described below

TESTS UNDER DISPLACEMENT AND STRAIN CONTROL. All relevant accessories are described on page 210 and 211

DETERMINATION OF MODULUS OF ELASTICITY

STANDARD

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

An important test determination is the elastic deformability of concrete and mortar under load before first cracking, which can be: longitudinal (Young's modulus) and transverse (Poisson's modulus). The specimen has to be submitted to a sequence of loading and unloading cycles under controlled load/unload rate. The testing system shall control the oil flow with precise increments and decrements and measure longitudinal and transverse deformation.

The test can be performed with different methods:

55-C0222/G
Electronic universal Compressometer-Extensometer

Aluminium and steel structure incorporating a high precision inductive transducer. Three units are generally recommended for axial deformation measurement. They can be easily applied to the specimen by a pair of elastic bands supplied as standard.

BENEFITS

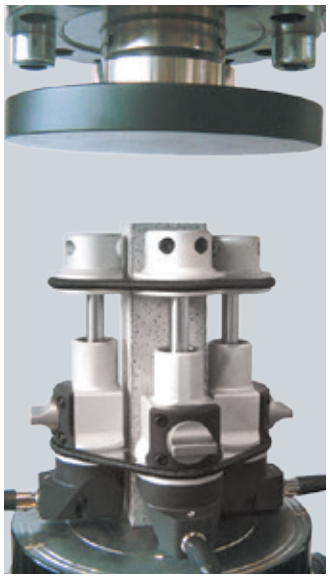
- » Ideal for axial deformation measurement
- » High sensitivity: 0.02 micron
- » Suitable for various sample size: cylinders up to dia. 160 x 320 mm, cubes up to 200 mm, prisms 40 x 40 x 160 mm etc.
- » Easy and quick application to the specimen
- » Gauge length: adjustable from 50 to 160 mm
- » Minimal axial dimension: 150 mm

55-C0222/G
Electronic universal compressometer-extensometer for cylinders, prisms and cubes. Complete with distance piece for small specimens, template for gauge length and pair of elastic bands to hold the meter to the specimen.

55-C0222/GA
Same as above but with template for adjusting the gauge length in inches

Three compressometer-extensometers 55-C0222/G fitted to a cylindrical specimen during compression stage.

Three compressometer-extensometers 55-C0222/G fitted to a concrete beam

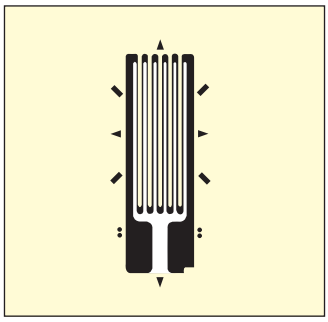


Three compressometer-extensometers 55-C0222/G fitted to a mortar prism 40 x 40 x 160 mm

55-C0222/G
Compressometer-extensometer set

Strain gauges

Provide a very accurate electrical signal, strictly proportional to the strain of the specimen submitted to load, for determining the Elastic Modulus and strength characteristics. They can be applied to the specimen surface by a special Adhesive-Catalyst agent and other accessories all included in the 82-P0399/C Strain gauge application kit.



Determination of Elastic Modulus using surface- mounted Strain gauges

Technical specification and ordering information

Strain gauge Models 82-	P0390	P0391	P0392	P0393	P0396
Grid width mm	0.9	1.2	2.3	1	1
Gauge length mm	10	20	30	60	120
Resistance ohm	120	120	120	120	120
Bridge	¼	¼	¼	¼	¼
No. of gauges per package	10	10	10	10	10

82-P0399/C
Strain gauge application kit including: conditioner, neutralizer, acetone, tweezer, adhesive with catalyst agent, 100 m of bipolar cable, solder, soldering iron, scalpels, scissors, duct tape, sellotape, sandpaper and carrying case.

82-P0398
Compensation device for up to 4 Wheatstone bridges with ¼ or ½ bridge setup

82-P0399/1
Connecting terminals, 50 pairs sheet

82-P0399/C

82-P0398

Axial-circumferential compression devices

STANDARD ▸ ASTM C469

The compressometer / extensometer for static Modulus of Elasticity and Poisson's Ratio to ASTM C469 is a device for measuring the longitudinal strain and corresponding diametrical strain of dia.150 x 300 mm (6" x 12") and dia.100 x 200 mm (4" x 8") concrete cylinders, or cores, subjected to axial loading.

55-C0221/E
Axial-circumferential compression device complete with two high precision displacement transducer, LDT type, 10mm travel x 0.001 mm resolution. Suitable for dia.150 x 300 mm (6" x 12") cylinders.

55-C0221/F
Same as above but for dia.100 x 200 mm (4" x 8") cylinders.

55-C0221/E1
Same as 55-C0221/E but for axial determination only.

55-C0221/F1
Same as 55-C0221/F but for axial determination only.

55-C0221/E

55-C0221/F

We can also provide a digital model to be used along with testing systems not designed for direct acquisition of deformation values.

55-C0221/D
Axial-circumferential compression device complete with 2 digital gauges 25x0,001 mm with output for PC connection (special cable required 82-D1261/LINK).

Note: the dial gauge fitted on the 55-C0221/D device can be connected to the PC by using D1261/LINK cable in order to download displacement readings. By pushing a button on the cable, the current reading will be automatically stored in an Excel cell or Notepad row. Readings will be not acquired continuously, but just when pushing the button.

AUTOMAX PRO M AUTOMAX MULTITEST Main applications and accessories

Tests under displacement and strain control

These tests are mainly performed to determine the ductility of special construction materials which are used for their superior capacity of deformation after first cracking. This applies, in particular, to the following materials: FRC (Fiber Reinforced Concrete), Shotcrete, Structural specimens reinforced with carbon fiber fabrics or similar.
The above tests always include two phases:
Hardening: Load applied to the specimen is gradually increased in order to produce a constant rate of deformation (for example the deflection rate of a beam) up to the peak load value and first cracking.
Softening: Load applied to the specimen is gradually decreased in order to maintain the same rate of deformation of the hardening phase. The test is completed when the datum level of deformation is achieved by the specimen.
The typical test result is the area below the Stress-Strain diagram. The higher is the value of this area, the higher is the deformation capacity of the tested material.
The testing system must have very fast reaction time and extremely accurate oil flow regulation, if not, at the end of the hardening phase, facing the typical instability of the following stage, it is possible to lose the control of the test producing an early specimen failure and losing the test results (Stress-Strain diagram is partially lost and subtended area is not measurable).
The capacity of our systems to perfectly fulfill the stringent requirements requested for deformation/strain-controlled tests has been obtained after years of research and cooperation with the academic world and are outlined by the vast international references.
To properly carry out the softening phase, all these tests must be per-

MEASUREMENT OF BEAM DEFLECTION AND TOUGHNESS:

STANDARD

▸ EN 14488-3 ▸ ASTM C1609
▸ ASTM C1018

This test is performed to assess the flexural performance and the residual resistance characteristics of Fiber Reinforced Concrete (FRC) and shotcrete beams. The complete set includes an auxiliary frame for proper positioning of two high precision displacement transducers on both sides of the specimen.

Typical configuration of a complete test set

Should include:

- AUTOMAX Multitest console or AUTOMAX Pro-M compression tester
- SIMPLEX or DUPLEX frames 50-C15x1/FR or C17x1/FR

With:

50-C1500/9
100 mm piston travel displacement transducer

50-C1500/5
Auxiliary testing frame for the measurement of deflection of beams

82-P0331/C
High accuracy displacement transducer 10mm travel (2 PCs needed)

50-C1500/1
Upper and lower rollers dia.30x210mm

Or as alternative:

50-C1700/1
Upper and lower rollers dia.30x310mm (for C1701/FR only)

Beam deflection test to ASTM C1609 including two high precision LVDT displacement transducers and auxiliary frame

MEASUREMENT OF CRACK OPENING (CMOD/CTOD)

STANDARD

▸ EN 14651 ▸ UNI 11039-2

This is performed for determining the Crack Mouth Opening Displacement (CMOD) conforming to EN 14651. The transducer has to be positioned over the notch sawn previously into the test beam.

Typical configuration of a complete test set

Should include:

- AUTOMAX Multitest console or AUTOMAX Pro-M compression tester
- SIMPLEX or DUPLEX frames 50-C15x1/FR or C17x1/FR

With:

50-C1500/9
100 mm piston travel displacement transducer

82-P0331/E
High precision displacement transducer to measure Crack Tip Opening Displacement (CTOD) and Crack Mouth Opening Displacement (CMOD)

NOTE: *for CTOD testing to UNI 11039-2 three transducers 82-P0331/E are required, one for bottom and two for sides positioning.*

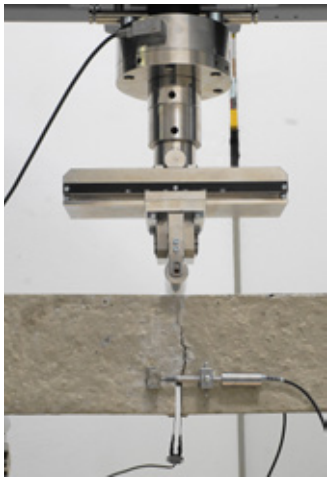
82-P0331/E1
Fixing jigs 20 pcs for bottom transducer positioning

82-P0331/E2
Fixing jigs 20 pcs for side transducer positioning

50-C1500/1
upper and lower rollers dia.30x210mm

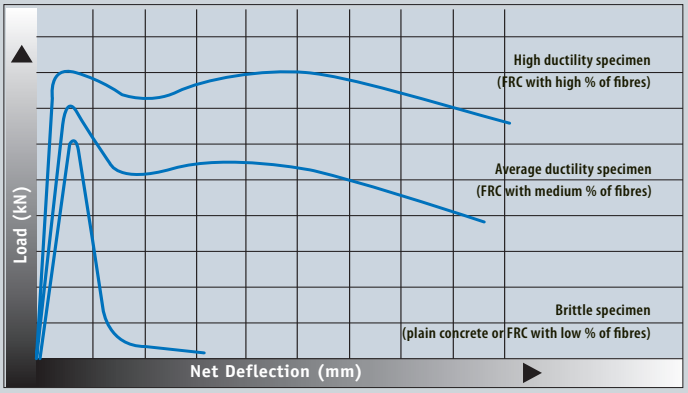
Or as alternative:

50-C1700/1
upper and lower rollers dia.30x310mm (for C1701/FR only)



CMOD test to EN 14651 with CTOD measurement

Clip gauge transducer for CMOD test (82-P0331/E)



formed under displacement control, with a suitable flexural frame having proper stiffness and capacity as, for instance, our models 200 kN and 350 kN -SIMPLEX and DUPLEX- fitted with load cell (see page 204) and suitable control systems as our model AUTOMAX Multitest and Automax Pro-M (see page 172 to 176).

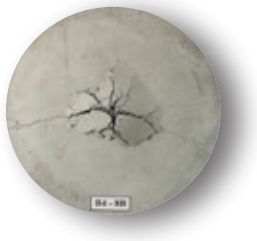
Typical diagram of a FRC beam subjected to flexure test. The absorbed energy is the area under the load/deflection curve. The use of fibers in the concrete mix increases its capacity to absorb energy and hence its ductility.

ENERGY ABSORPTION TEST ON SLABS:

STANDARD

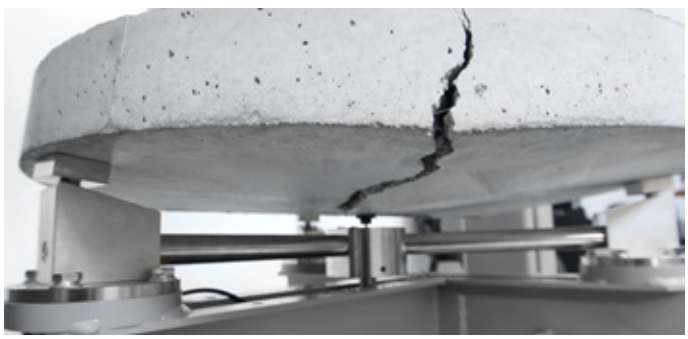
▸ ASTM C1550 ▸ EN 14488-5

This test is performed to assess flexural performance and residual resistance characteristics of fiber reinforced concrete (FRC) and shotcrete slabs. It can be carried out on square or round slabs according to EN standard or ASTM standard.



Round concrete slabs, 800 mm dia., subjected to concentrated load test to ASTM C1550

Slab testing to ASTM C1550 in 350kN SIMPLEX flexure frame 50-C1711/FR



Typical configuration of a complete test set to ASTM C1550

Should include:

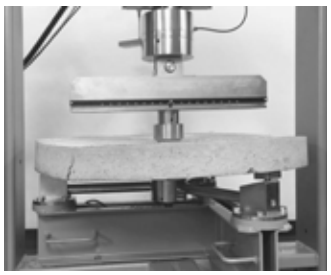
- AUTOMAX Multitest console or AUTOMAX Pro-M compression tester
- SIMPLEX or DUPLEX frames 50-C17x1/FR

With:

50-C1700/7
Round lower support frame for FRC round slabs, 800 mm dia. x 75 mm thickness, complete with upper element for concentrated load. Conforming to ASTM C1550.

50-C1500/9
100 mm piston travel displacement transducer

50-C1700/8
60 mm central slab deflection displacement transducer



Typical configuration of a complete test set to EN 14448-5

Should include:

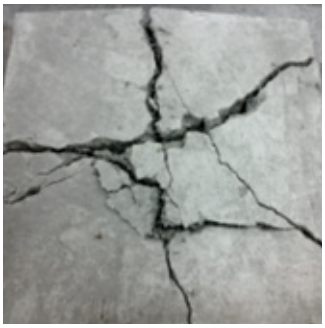
- AUTOMAX Multitest console or AUTOMAX Pro-M compression tester
- SIMPLEX or DUPLEX frames 50-C15x1/FR or C17x1/FR

With:

50-C1500/6
Auxiliary testing frame for energy absorption test on sprayed concrete specimens 600 x 600 x 100 mm, including supporting square base and loading element. Conforming to EN 14488-5.

50-C1500/9
100 mm piston travel displacement transducer

50-C1500/8
50 mm central slab deflection displacement transducer



Square concrete slabs, 600x600 mm, subjected to concentrated load test to EN 14488-5

Testing FRC square slab to EN 14488-5 on 350 kN DUPLEX flexure frame 50-C1701/FR

Sampling tools

STANDARD
- EN 12350-1

54-C0100
Stainless steel scoop.
125 mm diameter x 250 mm long,
5 kg capacity, ideal for taking samples of concrete.
Weight: 1.1 kg (approx.)

54-C0100

Slump cone test sets

STANDARD
- EN 12350-2
- ASTM C143
- AASHTO T119
- BS 1881:102
- NF P18-305

The slump cone is also known as Abrams cone, after the inventor. We produce various cone sets, including models 54-C0149/B and 54-C0150/C which are particularly suitable for site inspection, being handy, easily transportable and supplied with housing for all parts.

All cones are seamless and robust. Cones and components can also be purchased separately - see Accessories and spares.

Weight of each set: 8 kg approx.

54-C0149/B
54-C0150/C

Ordering information

54-C0149/B
Portable slump cone test set comprising steel cone, metal base with clamps, measuring bridge and graduated tamping rod.

54-C0150/C
Portable slump cone test set comprising stainless steel cone, metal base with clamps, measuring bridge and graduated tamping rod.

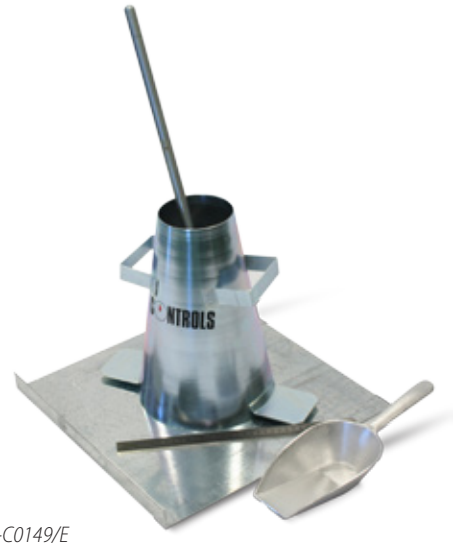
54-C0149/E
Slump cone test set comprising steel cone, metal base plate, tamping rod, steel rule and scoop.

54-C0150
Slump cone test set comprising stainless steel cone, metal base with clamps, tamping rod, measuring column, cone funnel and scoop.

54-C0149/B, 54-C0150/C carrying position

54-C0149/B, 54-C0150/C during use. The handle raises up over specimen and slump is measured using the tamping rod which is engraved with 1 cm graduations.

54-C0150



54-C0149/E

Accessories and spares

54-C0149/A
Slump cone, corrosion-resistant sheet steel, 100 mm top diameter, 200 mm base diameter x 300 mm height. Weight:2 kg approx.

54-C0150/A
Slump cone, stainless steel. Dimensions as above.

54-C0149/P
Plastic slump cone. Weight:0.7 kg.

54-C0140
Tamping rod, 16 mm diameter x 600 mm length.

54-C0140/1
BS Tamping rod 25x25x280 mm

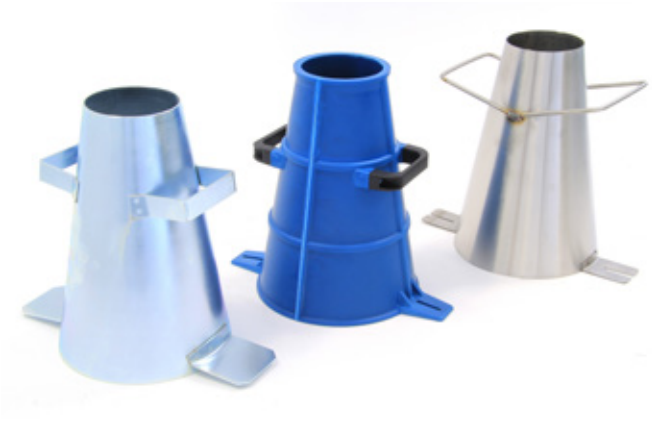
54-C0140/3
ASTM C157 Tamping rod, 10 mm diameter x 250 mm.

54-C0140/A
Graduated tamping rod, 16 mm diameter x 600 mm length.

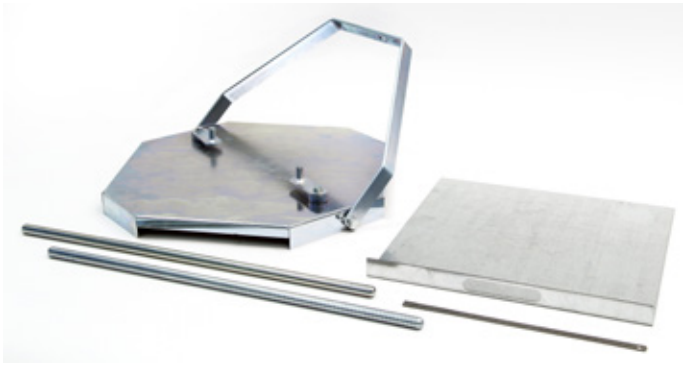
54-C0149/5
Steel rule, 300 mm length.

54-C0149/3
Metal base plate, 400 x 400 mm.

54-C0149/B1
Base plate with clamps and measuring bridge for 54-C0149/B and 54-C0150/C sets.



54-C0149/A, 54-C0149/P, 54-C0150/A



54-C0140, 54-C0140/A, 54-C0149/B1, 54-C0149/3, 54-C149/5

54-C0151/A

Flow table test

STANDARD
- EN 12350-5

54-C0151/A
CONCRETE FLOW TABLE

This apparatus consists of a double wooden table, steel cone and wooden tamping rod. The table, measuring 700 x 700 mm, is hinged at one side and the upper part is covered with an engraved metal plate 2 mm thick. The steel cone has a top diameter of 130 mm, a base diameter of 200 mm and is 200 mm high. All metal parts are protected against corrosion.

Weight: 30 kg approx.

Spare parts

54-C0151/1
Flow cone, 130/200 mm diameter x 200 mm high.

54-C0151/2
Wooden tamping rod.

Vebe test

STANDARD

▸ EN 12350-3 ▸ ASTM C1170
▸ ASTM C1176

VEBE CONSISTOMETERS

The Vebe test is used to measure the consistency of stiff to extremely dry concrete. Consistency is determined by measuring the time required for a given mass of concrete to consolidate when subjected to vibration in a cylindrical mould. The small vibrating table of the test apparatus operates at a fixed amplitude and frequency.

Three versions are available:

- **54-C0195/E** conforming to EN 12350-E
- **54-C0195/C** conforming to ASTM C1170 and ASTM C1176 (using the accessory 54-C0195/C2)
- **54-C0195/D** conforming to ASTM C1176

The operating principle is identical in all versions; the units only differ from one another in the shape of the container and the swivel arm with surcharge weight. The 50 lb (22.7 kg) surcharge weight, which is part of the 54-C0195/C unit (conforming to ASTM C1170-Procedure A), can be replaced with the 27.5 lb (12,5 kg) sliding weight (conforming to ASTM C1170-Procedure B) or with the 20 lb (9 kg) sliding weight in order to conform to ASTM C1176 (see Accessories). The apparatus is also available supplied with the 20lb (9kg) surcharge weight to conform directly to ASTM C1176.

Ordering information

54-C0195/E
Vebe consistometer, conforming to EN 12350-3. 230 V, 50 Hz, 1 ph.
Overall dimensions: 260 x 380 x 700 (h) mm Weight: 72 kg (approx.)

54-C0195/EY
As above but 220 V, 60 Hz, 1 ph.

54-C0195/EZ
As above but 110 V, 60 Hz, 1 ph.

54-C0195/C
Vebe consistometer, conforming to ASTM C1170. 220 V, 50 Hz, 1 ph.
Overall dimensions: 531 x 431 x 970 (h) mm. Weight: 90 kg (approx.)

54-C0195/CY
As above but 220 V, 60 Hz, 1 ph.

54-C0195/CZ
As above but 110 V, 60 Hz, 1 ph.

54-C0195/D
Vebe consistometer, conforming to ASTM C1176.
220 V, 50 Hz, 1 ph.
Overall dimensions: 531 x 431 x 940 (h) mm Weight: 80 kg (approx.)

54-C0195/DY
As above but 220 V, 60 Hz, 1 ph.

54-C0195/DZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

54-C0195/C1
27.5 lb (12.5 kg) sliding weight to ASTM C1170-Procedure B.

54-C0195/C2
20 lb (9 kg) sliding weight and mould diameter 150x300 mm to make 54-C0195/C compliant with ASTM C1176.

Degree of compactibility

STANDARD

▸ EN 12350-4

54-C0146
WALTZ CONTAINER

Waltz container, consisting of a metal box 200 x 200 x 400 mm.
Weight: 5 kg (approx.)

86-D1619
Trowel 90 x 115 x 165 mm to EN 12350-4

54-C0146

54-C0195/E

54-C0195/C

54-C0195/D

Compacting factor

STANDARD
- BS 1881:103

54-C0155
COMPACTING FACTOR APPARATUS

This apparatus consists of two conical hoppers with a hinged

54-C0155

trap door attached to the lower end of each one, allowing the concrete sample to flow freely into the cylindrical mould beneath them. The hoppers and mould are mounted on a rigid steel frame and can be easily removed for cleaning.
The whole apparatus is protected against corrosion.
Weight: 50 kg (approx.)

Accessories

54-C0140
Tamping rod, 16 mm diameter x 600 mm length.

Workability of concrete: NF method

STANDARD
- NF P18-452

54-C0152
CONCRETE WORKABILITY METER

This test method has particular application for concretes containing chemical admixtures and is used to verify the homogeneity of concrete in relation to its workability or plasticity.
The apparatus consists of a metal box divided into two parts and fitted with an electrical vibrator system. During operation the concrete is poured into the first section of the box and then the dividing plate is removed. The vibrator is immediately switched on and the time taken for the concrete to spread uniformly across the whole box is recorded.
Overall dimensions:
800 x 400 x 400 mm
Weight: 30 kg (approx.)
230V, 50 Hz, 1 ph.

54-C0152

Flow of concrete: k-slump method

STANDARD
- ASTM D1362

54-C0144
K-SLUMP TESTER

This device is used to determine the workability and degree of compaction of fresh concrete after being placed in the forms. It can be used for in-situ measurements or inside test moulds and forms. Results can be correlated against the slump test.
The operation is very simple: the tester is inserted into the concrete up to the level of the disc; after 60 seconds, a measuring rod is lowered onto the surface of the concrete and the K-slump value is read directly from a scale.
The calibrated hollow tube has a diameter of 20 mm.
Total length: 300 mm
Weight: 500 g (approx.)

54-C0144

Bleeding of concrete

STANDARD
- EN 480-4

This test method is used to determine the relative quantity of mixing water that will bleed from a sample of freshly mixed concrete having aggregates with 50mm max size.
The apparatus consists of a rigid cylindrical stainless steel vessel of inside diameter of 250 mm and inside height of 280 mm complete with a removable lid.
Internal diameter 255 +/- 5mm x 280 +/- 5mm inside height.Complete with stainless steel cover.
Weight: 9 kg approx.

54-C0168/B
Stainless steel cylindrical container for bleeding test to EN 480-4, approx. 14 liters capacity.

Accessories

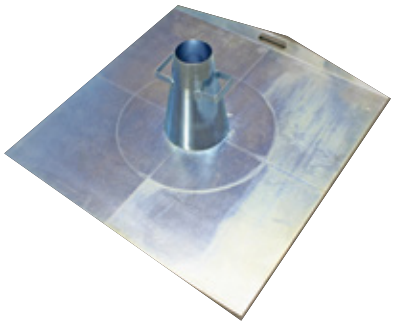
54-C0168/B1
Flat rounded steel float with a diameter of (100 ± 10) mm

SCC (Self-Compacting Concrete) apparatus

STANDARD
- EN 12350-8
- EN 12350-9
- EN12350-10
- EN 12350-11
- EN 12350-12

SLUMP-FLOW TEST

STANDARD
- EN 12350-8



54-C0149/D with 54-C0149/20

This test is performed to determine the slump flow and t500 time for self-compacting concrete. The test is performed with the slump cone and a steel plate and is only suitable for aggregates with a maximum particle size of less than 40 mm.
The SCC slump cone, made from corrosion-resistant sheet steel, has a top diameter of 100 mm, a base diameter of 200 mm and is 300 mm high.
Weight: 2 kg (approx.)

The steel plate, 900 x 900 mm, has circles of 210 and 500 mm diameter engraved on its surface.
Weight: 10 kg (approx.)

54-C0149/D
Slump cone.

54-C0149/20
Steel plate, 900 x 900 mm, with engraved circles.

V-FUNNEL TEST

STANDARD
- EN 12350-9

This test is for determining the V-funnel flow time. It is not suitable for aggregates with particle sizes exceeding 20 mm.
The apparatus consists of a stainless steel V-shaped funnel fitted with a watertight sliding gate and supported by a frame to assure the top funnel is kept horizontal.

54-C0147
V-Funnel apparatus.
Overall dimensions: 570 x 300 x 920 (h) mm
Weight: 6 kg (approx.)

54-C0147

L-BOX TEST

STANDARD
- EN 12350-10

The test is for determining the passing ratio of self-compacting concrete.

The apparatus consists of an L-shaped stainless steel box and is supplied complete with filling hopper.

54-C0147/B
L-Box apparatus
Overall dimensions: 700 x 200 x 600 mm
Weight: 18 kg (approx.)

54-C0147/B

SIEVE SEGREGATION TEST

STANDARD
- EN 12350-11

54-C0147/F

This test is performed to determine the sieve segregation resistance of self-compacting concrete. The method is not applicable for concrete containing fibers or lightweight aggregates.
The test set includes a 300 mm diameter perforated plate test sieve with 5 mm apertures, a receiver and an 11 L capacity plastic bucket.

54-C0147/F
Sieve segregation test set.
Weight: 3 kg (approx.)

J-RING TEST

STANDARD
- EN 12350-12

This test is performed to determine the passing ability (measured by the blocking step), flow spread and t500 flow time of self-compacting concrete. The parameters are measured as the concrete flows through the J-Ring, which consists of a stainless steel crown with sixteen (54-C0147/C) or twelve (54-C0147/C1) 18 mm diameter bars. A slump cone and steel plate test are also required to perform the test - see Accessories.

54-C0147/C

54-C0147/C
J-Ring apparatus (Narrow Gap)
Weight: 10 kg (approx.)

54-C0147/C1
J-Ring apparatus (Wide Gap)
Weight: 10 kg (approx.)

Accessories

54-C0149/D
Slump cone.

54-C0149/20
Steel plate, 900 x 900 mm, with engraved circles.

54-C0147/C with 54-C0149/D and 54-C0149/20

Analysis of freshly mixed concrete: LCPC French method

JOISEL APPARATUS

54-C0153

This apparatus basically consists of three sieves which are placed one inside the other and is designed for separating concrete into its various components of cement, sand and aggregates. The test procedure simply involves the weighing of the sample before and after washing.

54-C0153
Joisel apparatus.
Overall dimensions: 140 mm diameter x 220 mm height.
Weight: 1.5 kg (approx.)

Density of fresh concrete

UNIT WEIGHT MEASURES

STANDARD
- EN 12350-6

Several versions of unit weight measure are avaiable including the 54-C0167/1, 10 L model which strictly conforms to the EN 12350-6 standards, having dimensions of 200 mm diameter x 320 mm height, a 4 mm thick wall with a machined rim and a base internal radius of 20 mm. Other models 54-C0166/2 to 54-C0169 have internal dimensions conforming to ASTM C29 and ASTM C138.

All models are made from corrosion-resistant sheet steel.

54-C0166 to 54-C0169

54-C0167/1

Water testing

STANDARD
- EN 1008 - EN 206 - DIN 4030

54

54-D1866/A
WATER TEST SET FOR CONCRETE MIXING WATER

A carrying case containing a reagent kit for performing:
- Carbonate hardness determination
- Ammonium determination
- Total hardness determination
- Colorimetric pH determination
- Sulphate test
- Magnesium test
- Chloride test
- Carbon dioxide test

Case dimensions: 500 x 420 x 135 mm
Weight: 3.4 kg (approx.)

54-D1866/A

Technical specifications

Product code 54-	C0167/1*	C0166/2	C0166/1	C0166	C0167	C0168	C0169
Capacity, liters	10	2	3	5	10	14	28
Int. dimensions, mm (dia.xh)	200 x 320	154 x 111	154 x 165	188 x 180	213 x 281	234 x 320	347 x 299
Max. size of aggregates, mm	50	-	12.5	12.5	25	37.5	75
Weight, kg (approx.)	8	2	3	4	6	9	13

* Conforming to EN 12350-6

ADVANCED SERIES

Workability of no-slump concrete

54-C20C02

STANDARD

- NT Build 427, (Scandinavian NORDTEST method)

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

SERIES GALILEO

GYRATORY COMPACTORS FOR CEMENT AND CONCRETE

This method, very popular in Scandinavia, is used for mix design and quality control mainly in concrete products plants, where low workable and zero slump concrete is used (for such products as hollow-core slabs, tubes and paving blocks).

The method is used for: mix design simulating selected production processes specimen preparation for strength test (fresh and cured) research of mix related phenomena (workability, curing time, admixtures etc.).

Compaction is achieved by the simultaneous application of a low-static compression and a shearing action, which results in the motion of the centre-line of the test piece, which generates a conical surface of revolution while the ends of the test piece remain approximately perpendicular to the axis of the conical surface.

The machine is equipped with 100 mm diameter mould with stripping accessory and processes in real time the evolution of sample density versus the number of cycles and plots the compaction curve.

It's possible to upgrade the machine in order to measure the Shear during compaction (software is required). Shear is a measuring parameter useful for a deeper selection/ dosage and tuning of no-slump concrete components. For instance, a very small change in water and plasticizer can shift notably the positioning of max shear value along the compaction curve. Increase of water and plasticizer generally shift the max shear value toward the first gyratory cycles; instead the decrease of water and plasticizer shift the max shear toward the end of compaction.

Main FEATURES

» Ideal for mix design of the various types of No-Slump Concrete mixtures requested for production of: paving blocks, concrete paving slabs, rolled compaction concrete, masonry blocks, curbstones, roofing tiles, sewage pipes, hollow core slabs, structural members, extruded fresh concrete elements, concrete road construction with slip form paving finishers, in general directly stripped products.

» Conform to Scandinavian standard NT BUILD 427 - Concrete, fresh: Compactability with IC-tester (intensive compaction tester).

Ordering information

54-C20C02
Galileo Concrete fully Electromechanical Gyratory Compactor. Includes 100mm dia. mould and manual extruder.
220 V, 50-60 Hz, 1ph.

54-C20C04
Same as above but 110V, 60 Hz, 1ph.

Accessories

54-C20C02/SW
PC Software

54-C0252/C1
Indirect tensile tester for compacted fresh concrete. Portable device fitted with 600 N load cell.
Weight 30 kg approx.

Upgrading options

54-C20C02/UP1
Shear measurement system.

54-C20C02/UP2
Integrated electromechanical extruder.

Spare parts

54-C20C02/1
Cylinder mould, 100 mm dia., complete with top and bottom plates

- » Load cell fitted directly on the vertical actuator for accurate load measurement and feedback control
- » User defined axial stress and speed of rotation
- » Easy control using the integrated 7" colour touch-screen control panel or connected PC.

Setting time by penetration

54-C0143
CONCRETE MORTAR PENETROMETER

STANDARD
▸ ASTM C403 ▸ AASHTO T197 ▸ UNI 7123

This apparatus consists of a spring-loaded device which is graduated from 1 to 100 daN, supplied complete with a set of needle points with surface areas of 650, 325, 160, 65, 32, and 16 mm^2. A sliding ring indicates the load reached. Supplied complete with carrying case.

Weight: 5 kg (approx.)

54-C0143

54-C0145
CONCRETE POCKET PENETROMETER

Force-measuring device with stainless steel plunger, 32.3 mm^2 (1/20 sq in) surface area, graduated from 0 to 5 MPa.

Weight: 0.3 kg (approx.)

54-C0145

54-C0148
CONCRETE POCKET PENETROMETER, DIAL MODEL

This dial model has a stainless steel plunger with a surface area of 32.3 mm^2 (1/20 sq. in.) and a 57 mm diameter dial with a dual scale: 0-5 MPa and 0-700 psi. The readings remain locked in position until released by pressing a button. The calibration can be easily verified using an ordinary balance.

Weight: 0.2 kg (approx.)

54-C0148

MAIN FEATURES

- » Gives instant field or laboratory estimate of concrete condition
- » Large dial with scale readable in both MPa and psi.
- » Readings locked in position until release button is pressed

Air entrainment meters

STANDARD
▸ EN 12350-7 ▸ ASTM C231 ▸ AASHTO T152

The air content of fresh concrete is a very important parameter for evaluating the behavior of concrete when exposed to weathering and for verifying variations in air content due to the use of chemical additives to increase the workability. The EN and ASTM standards describe test methods using two different apparatus: the water column type (e.g. our model 54-C0170/L) and the pressure gauge type (e.g. our models 54-C0170/F and 54-C0170/D), which have the following advantages over the water column type:

- quick action clamping system
- unaffected by changes in barometric pressure
- direct pressure gauge readings.

54-C0170/L
Air entrainment meter, water column type, 5 l capacity, complete with hand pump, tamping rod, calibration apparatus and carrying case.

54-C0170/D
Air entrainment meter, pressure gauge type, 8 l capacity, incorporating hand pump, complete with calibration cylinder.

54-C0170/F
Air entrainment meter, pressure gauge type, 7 l capacity, incorporating hand pump, complete with tamping rod, calibration cylinder and carrying case.

Accessories

54-C0170/D1
Filling ring for 54-C0170/D.

54-C0170/L
Shown to the right of the device is the calibration cylinder apparatus which is essential for adjustment to site barometric pressure

54-C0170/D

54-C0170/F

Technical specifications

Product code	54-C0170/L	54-C0170/F	54-C0170/D
Capacity, liters	5	7	8
Air content range, %	0 -10%	0 -15%	0 -10%
Graduations	0.1%	0.1% up to 6%; 0.2% from 6 to 8%; 0.5% from 8 to 15%	0.1% up to 8%; 0.5% over 8%
Weight, kg (approx.)	14	10	12

Concrete mixers

STANDARD
- EN 12390-2

PAN-TYPE MIXERS

Specially selected for preparing concrete specimens and samples in the laboratory and on site. These forced mixers have a vertical axle and an oil bath gearbox. Discharge is manually controlled for easy unloading of the mixer into a suitable container or wheelbarrow.

Models 54-C0199/11 and 54-C0199/20 can be completed with optional wheels and drawbar - see Accessories.

The 54-C0199/9A model is supplied complete with wheels, drawbar and additional interchangeable mixing paddle, particularly suitable for low-slump concrete.

54-C0199/11 complete with accessory 54-C0199/R1: 4" wheels and drawbar

54-C0199/20 complete with accessory 54-C0199/R1: 4" wheels and drawbar

Technical specifications

Product code	54-C0199/9A 54-C0199/9AY 54-C0199/9AZ	54-C0199/11 54-C0199/11Z	54-C0199/20 54-C0199/20Z
Pan capacity, L	130	200	300
Mixing capacity, L	90	100 -120	160 - 200
Power, kW	2	4	5.5
Overall dimensions, mm (w x d x h)	850 x 800 x 1250	1100 x 850 x 1200	1250 x 1200 x 1300
Weight, kg (approx.)	100	260	340

54-C0199/9A Supplied complete with wheels and drawbar

Ordering information

54-C0199/9A
Pan-type mixer. Pan capacity 130 L, mixing capacity 90 L, complete with wheels, drawbar and additional interchangeable mixing paddle. Power 2 kW. 230 V, 50 Hz, 1 ph.

54-C0199/9AY
As above but 220 V, 60 Hz, 1 ph.

54-C0199/9AZ
As above but 110 V, 60 Hz, 1 ph.

54-C0199/11
Pan-type mixer, 200 L pan capacity, 110 L mixing capacity. 380 - 400 V, 50 Hz, 3 ph.

54-C0199/11Z
As above but 220 V, 60 Hz, 3 ph.

54-C0199/20
Pan-type mixer 300 L pan capacity, 200 L mixing capacity. 380 - 400 V, 50 Hz, 3 ph.

54-C0199/20Z
As above but 220 V, 60 Hz, 3 ph.

Accessories

54-C0199/R1
Wheels, 4" size, and drawbar for 54-C0199/11 and 54-C0199/20 mixers.

54-C0199/9A
Detail of the additional mixing paddle (included), particularly suitable for low slump concrete.

54-C0196/2
DRUM-TYPE MIXER

This model is a lightweight but sturdy concrete mixer with a drum capacity of 115 liters and a mixing capacity of 75 liters. It is particularly suitable for field use, to prepare low to medium strength concrete.

130 L capacity. 220 V, 50 Hz, 1 ph.
Power rating: 370 W
Overall dimensions:
1200 x 700 x 1300 mm (l x d x h)
Weight: 60 kg (approx.)

54-C0196/2

ADVANCED SERIES

Adiabatic concrete calorimeter

54-C2010/A

This is one of the many **ADVANCED** products of CONTROLS Group range.

To get more information visit **www.controls-group.com** or link directly to the QRCode

Adiabatic concrete calorimeter

STANDARD ▸ EN 12390-15

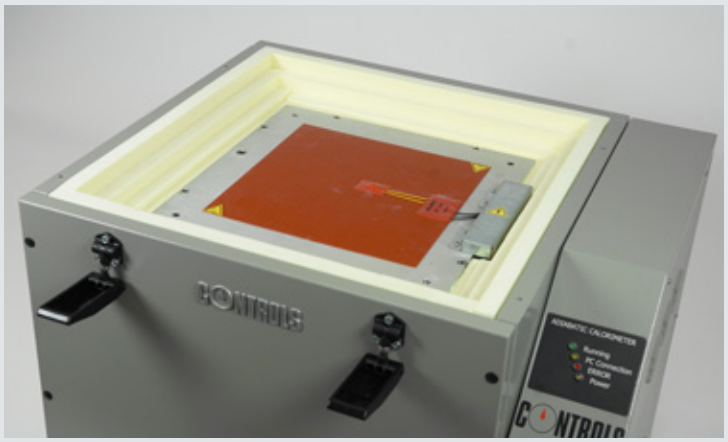
When concrete is curing and hardening, the hydration reaction of cement develops a large amount of heat with an increase in temperature. The temperature rise accelerates hardening of cement, however, if it is not properly dissipated, it can cause the arise of tensile stresses inside the concrete structure with the consequent appearance of cracks and reduction of mechanical properties. This effect is encountered particularly in massive concrete castings, due to the limited heat dispersion, leading the behavior closer to adiabatic conditions.

The isothermal and semi-adiabatic testing methods are consequently less representative and most commonly used for mortars and cement pastes, basically to compare the behavior of different types of cements.

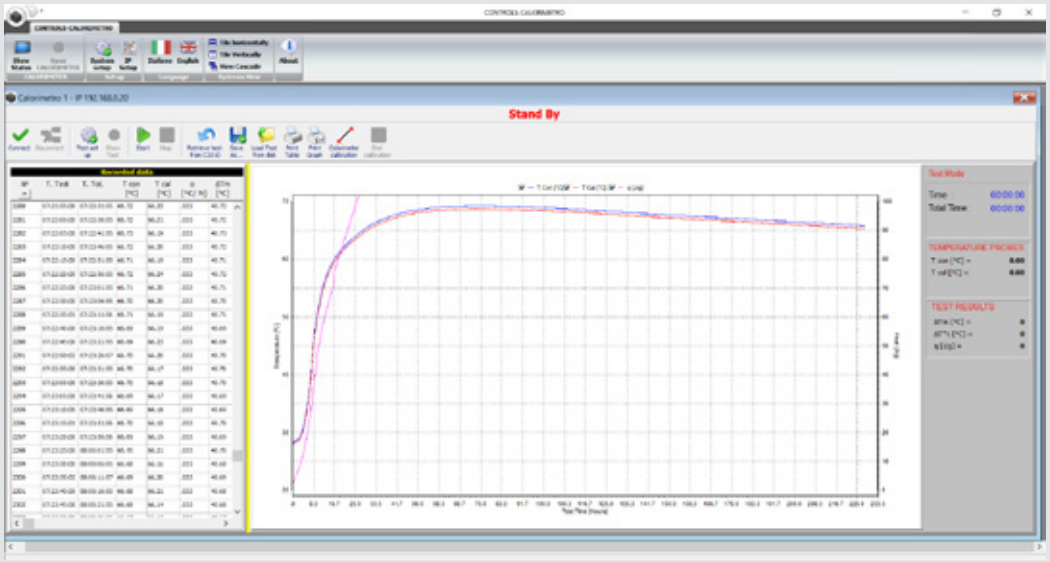
The adiabatic method is the only method allowing correct evaluation of the heating process inside massive concrete works.

In the late 1980s, in partnership with the main research laboratories, CONTROLS Group developed the first industrial adiabatic concrete calorimeter, having been limited to prototype versions in research centers previously.

Nowadays the equipment has been completely renewed with the latest technologies, including new electronics and PC software, ensuring high levels of testing accuracy.



Inside view



Temperature vs time graph displayed in real time during the test

Working principle

A fresh 150 mm cubic sample is positioned in a calorimeter cell ensuring adiabatic conditions by avoiding heat exchange with the environment. Since this condition cannot be obtained in practice in a passive system (no insulating material is infinitely non-conductive) the temperature of the room surrounding the specimen is forced to be equal (or slightly lower by max 0.5°C) to the temperature of the sample during the whole test.

The equipment consists of:

- external insulating enclosure
- calorimeter cell
- two platinum PT 100 temperature sensors measuring sample and cell temperatures
- 150mm polystyrene cubic mould
- calorimeter cell conditioning system controlled by a PID closed loop system
- PC software (PC not included)

Ordering information

54-C2010/A

Computerized concrete calorimeter for the determination of the heat of hydration to EN 12390-15.
Comprises: calorimeter cell with enclosure, temperature sensors, conditioning system, PID closed loop control system, PC software (PC not included).
110-230V, 50-60HZ, 1Ph.

Accessories

82-P8000/PC

High specifications desktop PC with LCD monitor. Operating system: MS Windows pre-installed. Top brand model fully covered by international warranty and serviced by global after sales network. 110-240 V, 50-60 Hz, 1 Ph

50-C2010/A1

Spare 150mm polystyrene cubic mould

Cube and beam moulds

We supply a range of cube moulds, from traditional cast iron versions conforming to EN 12390-1 standards that are ideal for laboratory use, to plastic models that are very practical for field use and ideal for production control.

Cast iron models 55-C0100/M10 and 55-C0100/M15 can be supplied, on request, with a certificate of compliance which states that the individual mould has been verified using certified instruments. For ordering, add the suffix 'C' to the relevant product code (e.g. 55-C0100/M10C).

CAST IRON CUBE MOULDS

STANDARD

▸ EN 12390-1 ▸ BS 1881:108

Two-part cast iron cube moulds to EN 12390-1

High-precision; fast and easy sample release, maintenance and re-assembly.

55-C0100/M15

55-C0100/M10
Two-part cast iron single cube mould, 100 mm. Weight: 8.5 kg approx.

55-C0100/M15
Two-part cast iron single cube mould, 150 mm. Weight: 18 kg approx.

Four-part cast iron cube moulds

55-C0100/M10L
Four-part cast iron cube mould, 100 mm. Weight: 8 kg approx.

55-C0100/M15L
Four-part cast iron cube mould, 150 mm. Weight: 17 kg approx.

55-C0100/M10L

55-C0100/M15L

Steel large-size cube moulds

55-C0100/M20
Four-part steel single cube mould, 200 mm. Weight: 29.5 kg.

55-C0100/M30
Four-part steel single cube mould, 300 mm. Weight: 98 kg.

55-C0100/M20

PLASTIC CUBE MOULDS

These moulds are manufactured in one piece from a robust plastic which is resistant to shock and abrasion. Ideal for field use, the specimen is ejected from the mould using compressed air and only a simple cleaning and oiling is required before the mould is ready to use again.

Specifications

Three sizes are available: 100, 150 and 200 mm. The 100 and 150 mm size are also available in a two-gang version. All models are supplied complete with bottom stopper and plastic sheet. The 150 mm version includes a polystyrene cover for safe transportation and thermal protection.

Ordering information

55-C0100/P10
Plastic single cube mould, 100 mm. Weight. 0.57 kg approx.

55-C0100/P102
Plastic two-gang cube mould, 100 mm. Weight: 1 kg approx.

55-C0100/P15
Kubo 15 plastic cube mould,150 mm, with polystyrene cover, base sheet and stopper. Weight: 1.4 kg approx.

55-C0100/P156
Kubo 15 plastic cube moulds, 150 mm, with polystyrene cover, base sheet and stopper. Pack of 6. Weight: 9 kg approx.

55-C0100/P152 and 55-C0100/P102

55-C0100/P20, 55-C0100/P15 and 55-C0100/P10

55-C0100/P15 Kubo 15, 150 mm plastic cube mould. Supplied complete with polystyrene cover (for safe transportation and thermal protection), base sheet and stopper.

55-C0100/P156 Six piece package of KUBO 15 plastic moulds for 150 mm specimens. All moulds are supplied complete with a polystyrene cover, base sheet and stopper.

55-C0100/P152
Plastic two-gang mould, 150 mm. Weight: 1.9 kg.

55-C0100/P20
Plastic single cube mould, 200 mm. Weight: 2.4 kg approx.

55-C0100/P15A
Hard plastic split cube mould, 150 mm. Weight: 2.7 kg approx.

Spare parts

55-C0100/P15S
Spare stopper for 100 mm and 150 mm plastic cube moulds. 100 pcs.

55-C0100/P15W
Spare cover for Kubo15 moulds. 20 pcs.

55-C0100/P10K
Spare base sheet for 100 mm plastic cube moulds. 50 pcs.

55-C0100/P15K
Same as above, but for Kubo15 moulds.

EXTRA LIGHT PLASTIC CUBE MOULDS

55-C0100/P156L
150 mm plastic cube moulds complete with stopper. 6 pieces package. Weight 6 kg approx.

55-C0100/P156L
Detail of plastic cube mould

Accessories

55-C0140
Tamping rod, 16 mm diameter x 600 mm length.

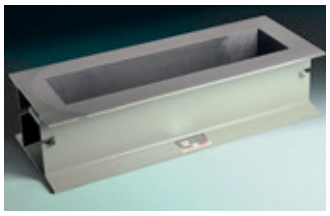
55-C0140/1
Tamping bar, 25 mm square x 380 mm length.

55-C0140/3
Tamping rod, 10 mm diameter x 250 mm length.

55-C0140/2
Steel straight edge.

55-C0119/5
Specimen mould spanner.

55-C0139/A
Mould oil, 10 kg can.



55-C0100/MB15

BEAM MOULDS

Steel beam moulds

These moulds comprise a structural steel channel with a base plate insert. All internal parts are totally machined.

55-C0100/MB10
Steel beam mould, 100 x 100 x 400 mm. Weight: 17.5 kg approx.

55-C0100/MB11
Steel beam mould, 100 x 100 x 500 mm. Weight: 17.5 kg

55-C0100/MB15
Steel beam mould, 150 x 150 x 600 mm. Weight: 33.5 kg approx.

55-C0100/MB16
Steel beam mould 150 x 150 x 750 mm. Weight: 44.5 kg

Plastic beam moulds

55-C0100/PB10
Plastic beam mould, 100 x 100 x 400 mm. Weight 2 kg

55-C0100/PB11
Plastic beam mould, 100 x 100 x 500 mm. Weight: 2 kg.

55-C0100/PB15
Plastic beam mould, 150 x 150 x 600 mm. Weight: 2.6 kg.

55-C0100/PB11 and 55-C0100/PB15

MAIN FEATURES

- » Precise and economical
- » Metal bottom and rims for long life
- » Easy sample release
- » Easy to handle
- » Ideal for site use

55-C0100/P15A

IDENTIFICATION LABELS

Our identification labels, made from PVC and 100 x 60 mm in size, are used for writing sample identification data. The corners can be folded for immersion in the fresh concrete specimen.

55-C0100/ID
Identification labels for concrete specimens. Pack of 100.

55-C0100/ID Identification labels

Cylinder moulds

The models we produce range from traditional steel versions that conform to EN, ASTM and AASHTO standards, to the split and one-piece plastic models which are very practical for field use and ideal for production control.

STEEL CYLINDER MOULDS

STANDARD

▸ EN 12390-1 ▸ ASTM C39
▸ AASHTO T23 ▸ AASHTO T126

55-C0100/MC10
Steel cylinder mould, 100 mm diameter x 200 mm height. Weight: 5.5 kg.

55-C0100/MC15
Steel cylinder mould, 150 mm diameter x 300 mm height. Weight: 10 kg

55-C0100/MCIN
Steel cylinder mould, 6 in. diameter x 12 in. height. Weight: 17 kg.

55-C0100/MC16
Steel cylinder mould, 160 mm diameter x320 mm Weight: 18 kg.

55-C0100/MC25
Steel cylinder mould, 250 mm diameter x 500 mm height. Weight: 80 kg.

STEEL SPLIT CYLINDER MOULDS

Practical and easily transportable, with lateral hinges that allow full opening.

55-C0100/MC15A
Steel split cylinder mould, 150 mm diameter x 300 mm height. Weight: 8.5 kg.

55-C0100/MC16A
Steel split cylinder mould, 160 mm diameter x 320 mm height. Weight: 11 kg.

HARD PLASTIC SPLIT CYLINDER MOULDS

Main features

-Precise and economical
-Metal bottom and rims for long life
-Easy sample release
-Easy to handle
-Ideal for site use

55-C0100/PC10A
Hard plastic split cylinder mould, 100 mm diameter x 200 mm height. Weight: 0.9 kg approx.

55-C0100/PC15A
Hard plastic split cylinder mould, 150 mm diameter x 300 mm height. Weight: 1.7 kg approx.

PLASTIC ONE-PIECE CYLINDER MOULDS

55-C0100/PC10
Plastic cylinder mould, 100 mm diameter x 200 mm height. Weight: 1 kg approx.

55-C0100/PC15
Plastic cylinder mould, 150 mm diameter x 300 mm height. Weight: 1.9 kg approx.

55-C0100/PC16
Plastic cylinder mould, 160 mm diameter x 320 mm height. Weight: 1.9 kg approx.

Specimen verification

STANDARD

- EN 12390-1

These instruments are used for the assessment of flatness, perpendicularity and straightness of test specimen and moulds as specified by EN 12390-1. They are available, on request, with certificates of calibration issued by a competent authority such as NAMAS, ACCREDIA, Cofrac etc.

Ordering information

82-C0106/1
Go/no go gauges for 100 mm cube moulds.

82-C0106/2
Go/no go gauges for 150 mm cube moulds.

82-C0107/1
Engineer's square, 150 mm.

82-C0108/1
Straight edge, 300 mm.

82-C0109/1
Digital Vernier caliper, 155 mm.

82-C0110/1
Set of 13 feeler strips, 90 mm length. Thickness from 0.03 to 0.5 mm.

82-C0106/1, 82-C0107/1, 82-C0108/1, 82-C0109/1 and 82-C0110/1

Flatness verification using straight edge 82-C0108/1 and set of feeler strips 82-C0110/1

Verification of a cube mould with Go/No go gauges

Verification of diameter using Digital Vernier caliper 82-C0109/1

Straightness verification using straight edge 82-C0108/1 and set of feeler strips 82-C0110/1

Concrete specimen compaction

Robustly manufactured to operate with minimum noise levels, these tables operate at 3000 vibrations per minute at 50 Hz or 3600 at 60 Hz and have retaining edges to avoid the moulds from falling from the table. All models can be completed with a clamping device and pedal switch (see Accessories).

VIBRATING TABLES

STANDARD

- EN 12390-2

Ordering information

55-C0158/A
Vibrating table, 630 x 400 mm, with retaining edges. 230 V, 50 Hz, 1 ph.

55-C0158/AY
As above but 230 V, 60 Hz, 1 ph.

55-C0158/AZ
As above but 110 V, 60 Hz, 1 ph.

55-C0158/B
Vibrating table, 830 x 830 mm, with retaining edges. 230 V, 50 Hz, 1 ph.

55-C0158/BY
As above but 230 V, 60 Hz, 1 ph.

55-C0158/BZ
As above but 110 V, 60 Hz, 1 ph.

55-C0158/C
Vibrating table, 1250 x 700 mm, with retaining edges. 230 V, 50 Hz, 1 ph.

55-C0158/CY
As above but 230 V, 60 Hz, 1 ph.

55-C0158/CZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

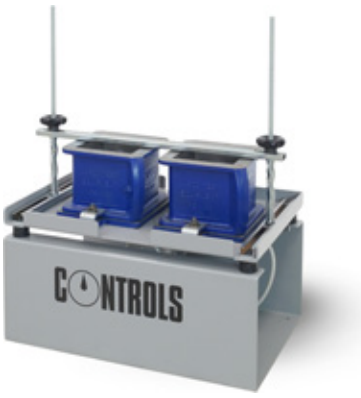
C55-C0158/A1
Clamping device for 55-C0158/Ax. Weight: 3 kg.

55-C1058/B1
Clamping device for 55-C0158/Bx. Weight: 8 kg.

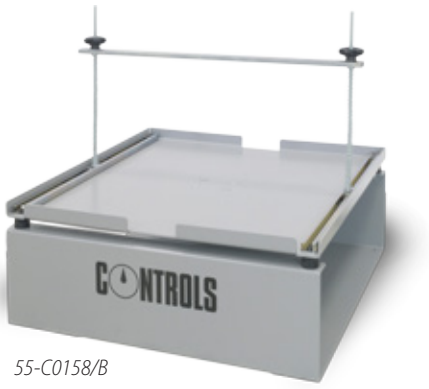
55-C0158/C1
Clamping device for 55-C0158/Cx. Weight: 8 kg.

55-C0158/P
Waterproof pedal switch for vibrating tables.

55-C0158/TIME
Control panel with 1-minute timer for vibrating tables. To be wall positioned.



55-C0158/A with 55-C0158/A1 clamping device, 55-C0158/P Waterproof pedal switch and two 150 mm cube moulds



55-C0158/B

Specifications

Product code	55-C0158/A 55-C0158/AY 55-C0158/AZ	55-C0158/B 55-C0158/BY 55-C0158/BZ	55-C0158/C 55-C0158/CY 55-C0158/CZ
Dimensions, mm	630 x 400	830 x 830	1250 x 700
Vibrations/min (50 Hz) (60 Hz)	3000 3600	3000 3600	3000 3600
Power, W	180	180	2 x 180
Weight, kg (approx.)	33	69	91

55-C0158/TIME

PORTABLE VIBRATING TABLE

Practical, easy to use and transport, the powerful 3000 rev/min, 230V motor, combined with the frame made of hot galvanized steel ensures low noise levels, which allows for extended use and reliability over time. It's compatible with all CONTROLS cubic and cylindrical moulds.

- Power supply: 230 V AC
- Power: 22 W
- Vibrations: 3000 rpm
- Overall dimensions: 425 x 320 x 210 mm
- Weight approx.: 20 kg

55-C0157/C
Portable vibrating table for up to two 150 mm cubical moulds. 230 V, 50 Hz, 1 ph.

55-C0157/C

VIBRATING PLATE

Light and portable and capable of being powered by a car lighter socket, this machine is ideal for field use. It is suitable for vibrating plastic cube moulds up to 150 mm and cylinder moulds up to 160 mm diameter x 320 mm and is supplied complete with an elastic cord to secure the mould to the plate.

Specifications

- Voltage: 12 V DC for connection to a vehicle's cigarette lighter or to a standard 12 V battery
- Permanent magnet motor 12 V, 3000 rpm, 30 W
- Dimensions: 250 x 250 x 200 mm (w x d x h)
- Weight: 10 kg (approx.)

Ordering information

55-C0157/B
Universal vibrating plate, 12 V DC.

POKER VIBRATORS

STANDARD

- EN 12390-2
- ASTM C31
- ASTM C192
- AASHTO T23
- AASHTO T126

This apparatus is ideal for the internal compaction of concrete specimens both in the laboratory and on site. It makes a good alternative to the traditional tamping bar, especially when there are a large number of specimens to be compacted.

Three versions are available: electric, petrol and battery powered.

Ordering information

55-C0162/E
Electric poker vibrator, 12,000 vibrations/minute. 230 V, 50-60 Hz, 1 ph.

55-C0163/C
Petrol poker vibrator, 12,000 vibrations/minute.

55-C0162/BT
Battery operated poker vibrator, 13000 vibrations/minute. 18 V, 3 Ah

55-C0163/C

Specifications

Product code	55-C0162/E	55-C0163/C	55-C0162/BT
Fuel type	Electricity	Petrol	Battery 18 V
Poker dimensions, mm (dia. x l)	25 x 250	25 x 250	25 x 250
Flexible shaft length, mm	2000	2000	800
Vibrations/min	12000	12000	13000
Power, W	2300	2900	3,0 Ah
Weight, kg (approx.)	8	35	3

55-C0162/E

55-C0157/B with 55-C0100/P15 and 55-C0100/PC15

55-C0162/BT

Concrete curing tanks

STANDARD
▸ EN 12390-2 ▸ ASTM C31
▸ ASTM C192 ▸ AASHTO T23

We produce two series of tanks, both of which are suitable for all applications and satisfy the requirements of the relevant Standards.

Large zinc-plated steel tank, model 55-C0191

Large capacity, designed for curing concrete cubes and cylinders. The temperature can be set and maintained at the required value using one of the following heating systems:
- Thermostatic analog heating system 55-C0191/10
- Thermostatic digital heating system 55-C0191/11

See Accessories.
The tanks are supplied complete with a metal base grid for supporting specimens. Upper racks suitable for holding a second layer of concrete cubes are available on request (55-C0191/3), along with a metal cover (55-C0191/12). A maximum of 8 upper racks can be used in each tank; each rack is capable of holding four 150 mm cube specimens. See Accessories.

Heavy plastic tanks, models 55-C0193/A and 55-C0193/R

Ideal for site laboratories, supplied complete with a robust metal internal base to hold concrete specimens without distorting. The temperature can be set and maintained at the required value using one of the following heating systems:
- Thermostatic analog heating system 55-C0193/5
- Thermostatic digital heating system 55-C0193/6

The tanks can be completed with plastic covers: 55-C0193/A1 (for 55-C0193/A) or 55-C0193/R1 (for 55-C0193/R) - see Accessories.

All models of tank can be used with the Submersible circulator pump 55-C0191/5, to obtain better water temperature uniformity - see Accessories.

Technical specifications

Product code	55-C0191	55-C0193/A	55-C0193/R
Description	Plated steel curing tank	Heavy plastic curing tank	Heavy plastic curing tank with drain valve
Internal dimensions, mm	1500 x 740 x 780	1040 x 1040 x 605	1100 x 710 x 690
External dimensions, mm	1550 x 805 x 820	1130 x 1130 x 760	1200 x 800 x 850
Capacity, l	1000	650	550
Specimen capacity* (no. of 150 mm cubes)	64 (with racks)	36	24
Weight, kg (approx.)	110	30	30
Accessories			
Analog immersion heater	55-C0191/10 55-C0191/10Z**	55-C0193/5 55-C0193/5Z**	55-C0193/5R 55-C0193/5RZ**
Digital immersion heater	55-C0191/11 55-C0191/11Z**	55-C0193/6 55-C0193/6Z**	55-C0193/6R 55-C0193/6RZ**
Cover	55-C0191/12 (steel)	55-C0193/A1 (plastic)	55-C0193/R1 (plastic)
Submersible circulator pump	55-C0191/5 55-C0191/5Z**	55-C0191/5 55-C0191/5Z**	55-C0191/5 55-C0191/5Z**

**Conventionally we have specified 150 mm cube specimens but any other type or size are accepted, within the limits of the tank dimensions.*
***For 110 V, 60 Hz, 1 ph.*

Ordering information

55-C0191
Zinc-plated steel curing tank, 1000 liters capacity, complete with metal base specimen support grid.

55-C0193/A
Heavy plastic curing tank, 650 liters capacity, complete with metal base specimen support grid.

55-C0193/R
Heavy plastic curing tank, 550 liters capacity, complete with metal base specimen support grid and drain valve.

55-C0191 with eight 55-C0191/3 upper racks

55-C0193/A with 55-C0193/5, 55-C0191/5 and 55-C0193/A1

55-C0193/R

Accessories

Immersion heaters

Three analog and three digital versions of heater are available for each tank series. The heating circle is placed under the metal base rack so there is no interference or contact with the specimens.
110 V, 60 Hz versions are also available and are identified by the code suffix Z (eg. 55-C0191/10Z).
Weight: 1.7 kg approx. (all models)

55-C0193/5 and detail of 55-C0193/6

Analog versions

55-C0191/10
Thermostatic analog submersible heating system for 55-C0191, metal curing tank, 2000 W, 230 V, 50-60 Hz, 1 ph.

55-C0193/5
Thermostatic analog submersible heating system for 55-C0193/A plastic curing tank, 1500 W, 230 V, 50 - 60 Hz, 1 ph.

55-C0193/5R
Thermostatic analog submersible heating system for 55-C0193/R plastic curing tank, 1500 W, 230 V, 50 - 60 Hz, 1 ph.

Digital versions

55-C0191/11
Thermostatic digital submersible heating system for 55-C0191 zinc-plated metal curing tank, 2000 W, 230 V, 50 - 60 Hz, 1 ph.

55-C0193/6
Thermostatic digital submersible heating system for 55-C0193/A plastic curing tank, 1500 W, 230 V, 50-60 Hz, 1 ph.

55-C0193/6R
Thermostatic digital submersible heating system for 55-C0193/R plastic curing tank, 1500 W, 230 V, 50-60 Hz, 1 ph.

Submersible pump and covers

55-C0191/6
Submersible circulator pump, 230 V, 50-60 Hz, 1 ph. Weight:1 kg approx.

55-C0191/5Z
Same as above, but 110 V, 60 Hz, 1 ph.

55-C0191/12
Metal cover for metal tank 55-C0191. Weight:10 kg approx.

55-C0193/A1
Plastic cover for plastic tank 55-C0193/A. Weight:2 kg approx.

55-C0193/R1
Plastic cover for plastic tank 55-C0193/R. Weight:2 kg approx.

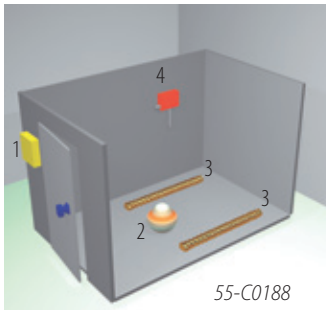
Specimen racks

55-C0191/5

55-C0191/3
Upper rack for metal curing tank 55-C0191.
A maximum of 8 racks will fit in a tank. Each rack can hold up to four 150 mm cubes.

Moist curing room kit

A room of about 150 m^3 can be easily converted for curing samples by installing a curing room humidifier, electric heaters, a humidity/temperature sensor and an electronic control panel. A typical layout of a moist curing room is shown in sketch.



55-C0188

1 Control panel 55-C0186
2 Vaporiser 55-C0188
3 Heaters 55-C0187
4 Humidity / temperature sensor 55-C0189/A

Ordering information

55-C0188
CURING ROOM HUMIDIFIER

Capable of humidifying curing rooms up to 150 m^3. Supplied complete with automatic level control for mains water connection.

Humidifying capacity: 0.5 L/h
Power: 40 W - 230 V, 50 Hz, 1ph
Dimensions: 360 mm diameter x 230 mm height
Weight: 3.5 kg (approx.)

55-C0187
ELECTRIC RESISTANCE HEATING ELEMENT

Finned type, made of copper.
Power: 750 W.
Dimensions: 1200 mm long x 36 mm diameter.
Weight: 1.8 kg (approx.)
Note: 2 heaters are required for a 150 m^3 room.

55-C0186
DIGITAL CONTROL PANEL

Includes humidity and temperature display, main switch and auxiliary contact for door open with pilot lamp.
Dimensions: 250 x 140 x 300 mm
Weight: 6.5 kg (approx.)

55-C0189/A
HUMIDITY AND TEMPERATURE PT 100 SENSOR

Working ranges:
Humidity: up to 100%
Temperature: -40 to +80°C
Dimensions: 120 x80 x 300 mm
Weight: 0.5 kg (approx.)

55-C0189/A

55-C0188

55-C0186

55-C0187

Accelerated concrete curing

This range of tanks is for curing concrete specimens under conditions intended to accelerate the development of strength. Three models are available:

- **55-C0194/D** for the ASTM C684 (Procedure A) warm water method and the BS 1881:112, 35-55°C hot water method
- **55-C0194/DV** for the steam method
- **55-C0194/E** which can perform all the methods covered by the above models (i.e. both the ASTM C684 and BS 1881:112 warm/hot water methods and the steam method)

55-C0194/D, 55-C0194/DV, 55-C0194/E

55-C0194/D
PROGRAMMABLE ACCELERATED CONCRETE CURING TANK

(Warm water method)

STANDARD

▸ ASTM C684 ▸ BS 1881:112

This special curing tank has been designed for hot water curing in accelerated strength concrete. The interior and exterior are made from stainless steel. The electronic programmer can control up to four test cycles with different thermal gradients and curing times, at defined temperature values, for a completely automatic curing cycle. The control panel includes a 24-column thermal printer.

55-C0194/DV
PROGRAMMABLE ACCELERATED CONCRETE CURING TANK

(Steam method)

This version is suitable for accelerated curing by steam method allowing programmable test cycles complete with controlled cooling ramps up to ambient temperature. The most popular application is in the pre-cast concrete industry for evaluating the final strength of the mixture.

Technical specifications

Product code	55-C0194/D 55-C0194/DZ	55-C0194/DV 55-C0194/DVZ	55-C0194/E 55-C0194/EZ
Conforming to standards	ASTM C684 BS 1881:112	-	ASTM C684 BS 1881:112
Method	warm/hot water	steam	warm/hot water and steam
Max. water temperature, °C	90	-	90
Max. steam temperature, °C	-	100	100
Temperature sensor	PT 100		
Heating system	Three 1500 W electric resistance heaters submerged in water		
Submersible circulation pump	-	-	yes
Cooling system	-	With mains water controlled by solenoid valve*	
Temperature control	By closed loop P.I.D. digital system		
Temperature curing cycle	Programmable: -Rising time up to the selected value -Maximum temperature holding time	Programmable: -Rising time up to the selected value -Maximum temperature holding time -Cooling time down to ambient temperature	
Power rating, W	4500		
Printer	24-column, included		
Overall dimensions, mm (w x d x h)	970 x 1000 x 920		
Weight, kg (approx.)	125		

**Note: cold water is supplied to the bottom of the tank in order it does not hit the specimens.*

55-C0194/E
PROGRAMMABLE ACCELERATED CONCRETE CURING TANK

(Warm/Hot water method and steam method)

STANDARD

▸ ASTM C684 ▸ BS 1881:112

This version is physically similar to the above unit 55-C0194/DV except for the water/steam temperature control and water circulating systems which are designed to perform both the warm/hot water method and the steam method.

In addition, the unit is fitted with water level sensors for automatic filling up of the tank (when used for hot water method)

Ordering information

55-C0194/D
Programmable accelerated concrete curing tank, warm/hot water method, to ASTM C684 and BS 1881:112, complete with printer. 380 V, 50 Hz, 3 ph.

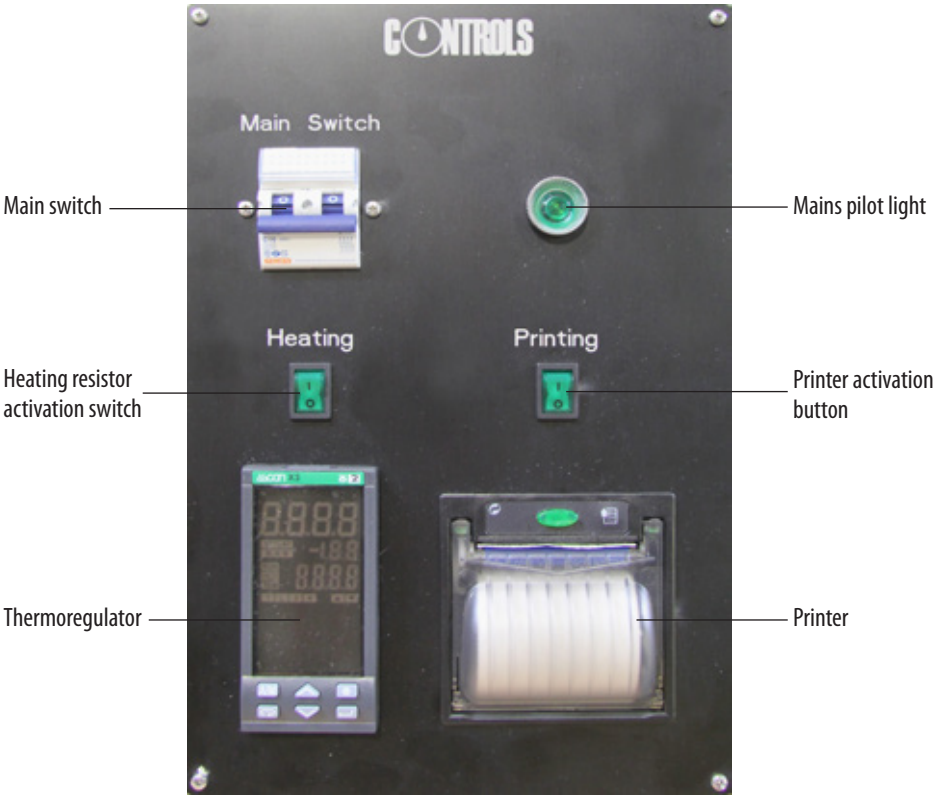
55-C0194/DZ
As above but 220 V, 60 Hz, 3 ph.

55-C0194/DV
Programmable accelerated concrete curing tank, steam method, complete with printer. 380 V, 50 Hz, 3 ph.

55-C0194/DVZ
As above but 220 V, 60 Hz, 3 ph.

55-C0194/E
Programmable accelerated concrete curing tank, warm/hot water method, to ASTM C684 and BS 1881:112, and steam method. Complete with printer. 380 V, 50 Hz, 3 ph.

55-C0194/EZ
As above but 220 V, 60 Hz, 3 ph.



Detail of control panel (55-CO194/D, 55-CO194/DV)

Detail of vent opening

Internal view with detail of base supporting grid

Specimen grinding machines

AUTOMATIC AND SEMI-AUTOMATIC SPECIMEN GRINDING MACHINE

55-C0201/B

STANDARD

▸ EN 12390-2 ▸ ASTM D4543

We offer two different models which have been developed to grind and polish concrete specimens but can also be used, equipped with the suitable accessory, for rock samples, natural stones, ceramic materials, blocks, etc.

The machine is supplied complete with safety chip guard that, when removed, automatically stops the machine, with coolant tank, motor pump and one set of abrasive sectors. Diamond grinding sectors are available on request (see accessories). The machine is supplied complete with clamping element for 100, 150 and 200 mm cubes.

Overall dimensions (w x d x h): 1200 x 1020 x 1640 mm
Weight approx. : 350 kg

Ordering Information

55-C0201/B
Automatic specimen grinding machine. 380 V, 50 Hz, 3 ph.

55-C0201/BZ
As above but 220 V, 60 Hz, 3 ph

55-C0201/C
Fully automatic specimen grinding machine with automatic radial displacement of the grinding head. 380 V, 50 Hz, 3 ph.

55-C0201/CZ
Same as above but 220 V, 50 Hz, 3 ph

Accessories and spares

55-C0200/100
Clamping device for concrete cylinders from 50 to 100 mm diameter

55-C0200/160
Clamping device for concrete cylinders from 100 to 160 mm diameter

55-C0200/1002
Device for clamping one additional cylindrical specimen from 50 up to 100 mm diameter. It shall be used along with accessory 55-C0200/100

MAIN FEATURES

» Grinding wheel 330 mm diameter

» Maximum vertical clearance 350 mm

» Large base table for grinding contemporaneously up to four 100 mm cubes, or three 150 mm cubes, or two 200 mm cubes and concrete/tile blocks of various sizes

» For cylinders up to diameter 160x320 mm (see accessories)

» Automatic radial grinding (both models) with automatic head return (only for 55-C0201/C)

» Micrometric lowering of the grinding wheel by the top hand wheel

» Grinding wheel speed 1400 rpm

» Safety guard with door locking switch conforming to CE

» Complete with clamping elements for cubes

» Suitable for dry grinding procedure. See accessories

» Diamond impregnated sectors available as alternative to abrasive

» Ideal for surface preparation of rock samples using the accessory 45-D0534/B and 45-D0534/C

55-C0200/1602
Device for clamping one additional cylindrical specimen from 100 up to 160 mm diameter. It shall be used along with accessory 55-C0200/160

45-D0534/B
Core face preparation jig. For preparation of parallel and flat core faces. Consisting of a 4 place locking device capable of clamping core samples from 20 to 55 mm diameter. Weight approx.: 6 kg.

45-D0534/C
2 place core face preparation jig. For preparation of parallel and flat core faces of samples from 50 to 100 mm diameter. Weight approx.: 12 kg.

55-C0201/B2
Set of 10 diamond impregnated sectors. Weight approx.: 10 kg

55-C0201/B3
Accessory to connect an aspirator for drying grinding procedure. Aspirator not included.

55-C0201/B1
Spare set of 10 abrasive sectors.

45-D0534/C

45-D0534/B

55-C0201/B2

SPECIMEN GRINDING MACHINE

MAIN FEATURES

» Grinding wheel 180 mm diameter

» Maximum vertical clearance 340 mm

» For cylinders up to diameter 160x320 mm (see accessories)

» Micrometric lowering of the grinding wheel by the top hand wheel

» Grinding wheel speed 2800 rpm

» Complete with clamping elements for cubes

» Diamond impregnated sectors available as alternative to abrasive

» Ideal for surface preparation of rock samples using the accessory 45-D0534/B and 45-D0534/C

The machine is supplied complete with safety guard, coolant tank, motor pump and one set of abrasive sectors. Diamond grinding sectors are available on request (see accessories).

Dimensions (w x d x h): 1071 x 980 x 1050 mm
Weight approx. : 300 kg

Ordering Information

55-C0202
Specimen grinding machine with manual table displacement, grinding wheel 180 mm diameter
230 V, 50 Hz, 3 ph.

55-C0202/Y
Same as above but 220 V, 60 Hz, 1 ph

55-C0202/Z
Same as above but 110 V, 60 Hz, 1 ph

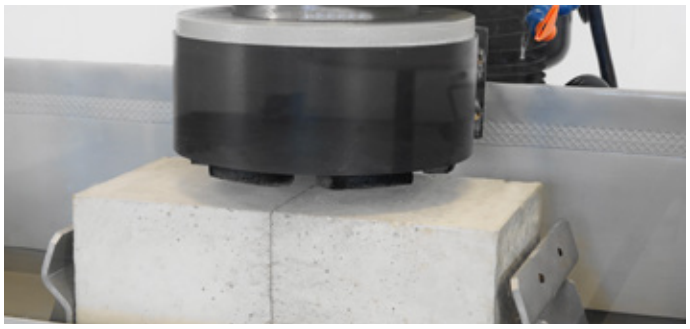
Accessories and spares

Same as listed for the 55-C0201/x model except for:

55-C0200/150C
Pair of lateral brackets suitable to lock cubes 100, 150 and 200 mm side

55-C0202/2
Set of 6 diamond impregnated sectors. Weight approx. 7 kg

55-C0202/1
Spare set of 6 abrasive sectors.



Cube grinding with 55-C0200/150C clamping device

Specimen cutting saw

This universal saw, complete with the suitable accessory, can be used to cut concrete, asphalt and rock cores, and irregular rock samples in order to obtain geometrically defined samples. It can be fit with 300 to 450 mm diameter blades. The head is adjustable in height. The tilting motor head permit cuts up to 45° inclination. The tank and the trolley are zinc plated to avoid corrosion. Complete with water pump for cooling the blade and double filtering system.

Cutting blade, and accessories to cut cores, asphalt, rock and other buiding materials, not included. See accessories.

55-C0210/D
Concrete, asphalt and masonry saw. 380 V, 50 Hz, 3 ph

55-C0210/DZ
Same as above but 220 V, 60 Hz, 3 ph

- Max. cutting height: 115 mm with 350 mm dia. blade and 165 mm with 450 mm dia. blade
- Power: 3 kW
- Overall dimensions (lxdxh): 1300x700x700 mm
- Weight approx.: 92 kg

55-C0210/D with 50-C0210/1 diamond blade and 50-C0210/5 V shaped support.

Accessories

55-C0211/1
Diamond blade, 350 mm diameter, for concrete

55-C0210/1
Diamond blade, 450 mm diameter, for concrete

55-C0210/2
Diamond blade, 450 mm diameter, for asphalt

55-C0210/5
V shaped support for cylinders and cores up to 160 mm diameter.
Weight approx.: 4 kg

Accessories for rock pieces (see page 103)

UNIVERSAL ADVANCED SAWS

Our line of Universal laboratory Saws, also include a high Performance model: MULTISAW. Developed in particular for Road laboratory, it can be profitably used, equipped with the suitable blade, for concrete and rock samples.

For complete information see page 353

Specimen preparation for compression testing

SULPHUR CAPPING EQUIPMENT

STANDARD

▸ EN 12390-3 ▸ ASTM C31 ▸ ASTM C192 ▸ ASTM C617 ▸ AASHTO T23 ▸ AASHTO T126

55-C0121/3, 55-C0121/21, 55-C0121/37, 55-C0121/5 and 55-D1403

When testing concrete cylinder specimens it is essential that the two ends are perfectly flat. This range of equipment allows the ends of various sizes of concrete cylinders or cores to be capped using a sulphur capping compound.

Cylinder cappers

Cappers are used to assure plane end surfaces perpendicular to the axis of the cylinder during the capping. The base and capping plates are machined from steel and the guide from cast aluminum or steel.

Cylinder carriers

A simple accessory for an easy handling of specimens, these are only available for specimens sized 150 x 300 mm (6 x 12 in.) and 160 x 320 mm.

Capping compound

The compound is a mixture of sulphur and mineral filler which gives a high finish and performance.

Melting pot

Used to melt the capping compound, the pot has a pilot lamp and an adjustable electronic thermo-regulator to set and maintain the temperature at the desired value. The unit is fully isolated conforming to CE requirements.
Capacity: 5 L (approx.)
Temperature range: from +30 to +150°C
Power: 700 W
Dimensions:
- internal: 200 mm diameter x 160 mm height
- external: 285 mm diameter x 275 mm height
- Weight: 2.7 kg (approx.)

Capping plate for concrete blocks

Used for capping concrete blocks with cement paste. This accurately machined plate is made from corrosion-resistant steel, measures 500 x 300 mm and is 20 mm thick.

Ordering information

Cylinder cappers

55-C0121/23
Vertical cylinder capper for specimens 100 x 200 mm(dia. x h). Weight: 7 kg approx.

55-C0121/21
Vertical cylinder capper for specimens 150 x 300 mm(dia. x h). Weight: 8 kg approx.

55-C0121/22
Vertical cylinder capper for specimens 160 x 320 mm(dia. x h). Weight: 8 kg approx.

55-C0121/22A
Vertical cylinder capper for specimens 160 x 320 mm(dia. x h), complete with ball tracks for a positive location of the specimen. Weight: 8 kg approx.

Universal capping frame

55-C0121/U
Universal cylinder capping frame for 100 and 150 mm diameter cylinders. Comprising a vertical support, mounted on a steel base and capping plates for the above specimens.
Weight: 13 kg approx.
Compatible capping plates having 75 mm and 160 mm diameter available on request.

Cylinder carriers

55-C0121/3
Cylinder carrier for specimens 150x 300 mm and 6 x12 in.(dia. x h).
Weight: 1.2 kg approx.
55-C0121/6
Cylinder carrier for specimens 160 x 320 mm. Weight: 1.2 kg

Capping compound

55-C0121/37
Ultra strong capping compound, 22.5 kg pack.

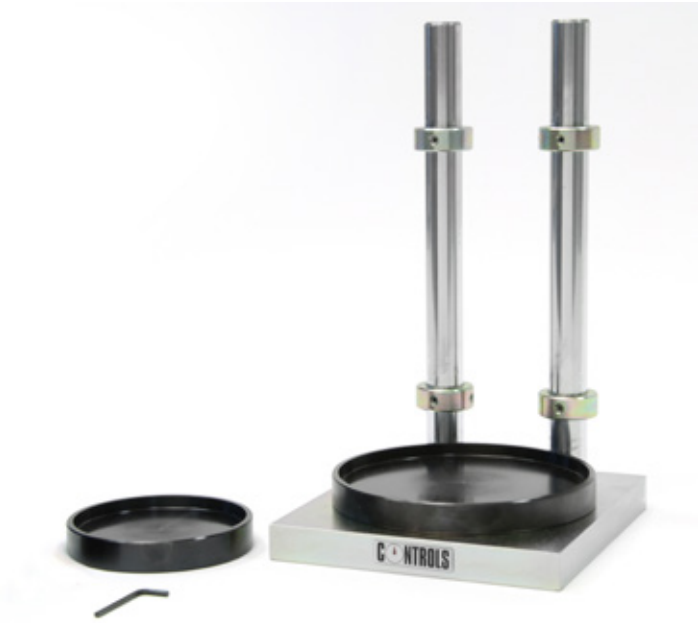
Melting pot and ladle

55-D1403
Melting pot, 5 L capacity, 700 W, 230 V, 50-60 Hz, 1 ph. Weight:2.7 kg approx.
55-D1403/Z
As above but 700 W, 110 V, 60 Hz, 1 ph.

55-C0121/5
Stainless steel ladle.

Capping plate

55-C0125
Steel capping plate, 500 x 300 mm, 20 mm thick. Weight: 30 kg approx.



55-C0121/U. Universal cylinder capping frame for 100, and 150 mm diameter cylinders.

55-C0121/22A

CAPPING SYSTEM USING UNBONDED CAPS

STANDARD

- ASTM C1231
- AASHTO T22
- AASHTO T851

This method is used as an alternative to the hot sulphur capping of concrete cylinder specimens. The system consists of two alloy steel cap retainers and two 13 mm thick neoprene pads which are in contact with the upper and lower concrete surfaces. The pads even out irregularities, distributing the test load uniformly to ensure reliable strength results. Pads can be re-used for many tests.

The total height of cap and retainers is 55 mm approx.

Ordering information

Capping retainers

55-C0122/A3
Capping retainers for 3 inch diameter concrete cylinders, set of 2.
Weight: 3 kg approx.

55-C0122/A4
Capping retainers for 4 inch diameter concrete cylinders, set of 2.
Weight: 5 kg approx.

55-C0122
Capping retainers for 150 mm (6 inch) diameter concrete cylinders, set of 2.
Weight: 8 kg approx.

55-C0122/B
Capping retainers for 160 mm diameter concrete cylinders, set of 2.
Weight: 9 kg approx.

Neoprene pads

55-C0122/A33
Neoprene pads for 3 inch diameter concrete cylinders, set of two.
Weight: 0.3 kg approx.

55-C0122/A44
Neoprene pads 70 shore A for 4 inch diameter concrete cylinders, set of two.
Weight: 0.4 kg approx.

55-C0122/2
Neoprene pads 60 shore A for 150 mm (6 inch) diameter concrete cylinders, set of two. Weight: 0.8 kg approx.

55-C0122/3
Neoprene pads 70 shore A for 150 mm (6 inch) diameter concrete cylinders, set of two.
Weight: 0.8 kg approx.

55-C0122/4
Neoprene pads 60 shore A for 160 mm diameter concrete cylinders, set of two.
Weight: 1.0 kg approx.

55-C0122. Retainers and 55-CO122/2 pads

Depth of penetration of water under pressure in concrete

55-C0246/6

MAIN FEATURES

» One to three or one to six specimens can be tested at the same time

» Complete with manometer to check the water pressure

» Complete with graduated burettes to measure the quantity of penetrated water in each specimen

» Suitable for cubes 150/200 mm, cylinders 150/160 mm diameter x 300/320 mm high, portions of beams with sides measuring 150/200 mm and 200 x 200 x 120 mm prisms.

55-C0246/3

STANDARD

▸ EN 12390-8

WATER PENETRATION APPARATUS

These apparatus are used to determine the depth that water under pressure penetrates into concrete specimens. The test is performed by clamping the specimen (cubical, cylindrical or prismatic) between two flanges with special circular gaskets. The water, under controlled pressure, is then applied to the surface of the concrete specimen. The penetration of water is measured, after the testing period, by breaking the specimen. The quantity of penetrated water can also be measured using the graduated burettes of the apparatus.

The apparatus consists of a robust steel frame with clamping system, incorporating a hydraulic circuit, valves and gauge to check the water pressure and graduated burettes (one per specimen) to measure the quantity of penetrated water.

The clamping system can accept cube or prismatic specimens with bases from 150 to 200 mm square and cylinders 150/160 mm diameter x 300/320 mm high.

Two models are available:
- **55-C0246/3** Three-bay model
- Overall dimensions: 1155 x 776 x 1515 mm (w x d x h)
- Weight: 120 kg (approx.)
- **55-C0246/6** Six-bay model
- Overall dimensions: 1155 x 886 x 1860 mm (w x d x h)
- Weight: 176 kg (approx.)

Both models are supplied complete with gaskets for 150 mm cube specimens.
The apparatus have to be fitted with a suitable air compressor with a maximum working pressure of 6 bar. See Accessories and spares.

Note: *Water penetration apparatus with certified water pressure gauge are also available on request.*
They are identified by the suffix C after the code. Example: 55-C0246/3C

Ordering information

55-C0246/3
Three-bay water-under-pressure penetration apparatus, complete with water pressure gauge, graduated burettes to measure the quantity of penetrated water and set of rubber gaskets for 150 mm cube.

55-C0246/6
Six-bay water-under-pressure penetration apparatus, complete with water pressure gauge, graduated burettes to measure the quantity of penetrated water and set of rubber gaskets for 150 mm cube.

Accessories and spares

55-C0246/2
Set of three rubber gaskets for 200 mm cubes or prisms.

55-C0246/5
Adapter to fit in one testing chamber specimens up to 320 mm high (e.g. cylinders up to 160 x 320 mm).

86-D2015
Laboratory air compressor, 8 bar maximum pressure, 50 L capacity. 230 V, 50 Hz, 1 ph. (For more information see page 433)
Pressure regulator not included.

55-C0246/4
Set of three spare rubber gaskets for 150 mm cubes.

Surface water absorption

STANDARD
▸ BS 1881:208 ▸ BS 1881:5

INITIAL SURFACE ABSORPTION APPARATUS (ISAT)

This apparatus is designed for assessing concrete surface absorption characteristics by measuring the flow rate of water per unit area into a concrete surface when subjected to a constant head of 200 mm. The unit consists of a capillary tube mounted on a scale, a water reservoir, and connecting tubes. They are all mounted on a stand for ease of use. Test cups are not included - see Accessories.

Weight: 1.4 kg (approx.)

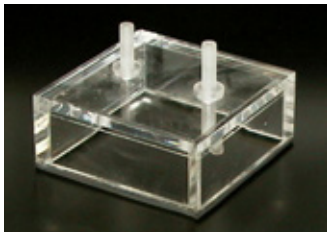
Ordering information

55-C0241/A
Initial surface absorption test apparatus (ISAT).

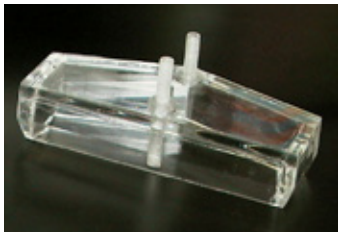
Accessories

55-C0241/1
Clear plastic cup.

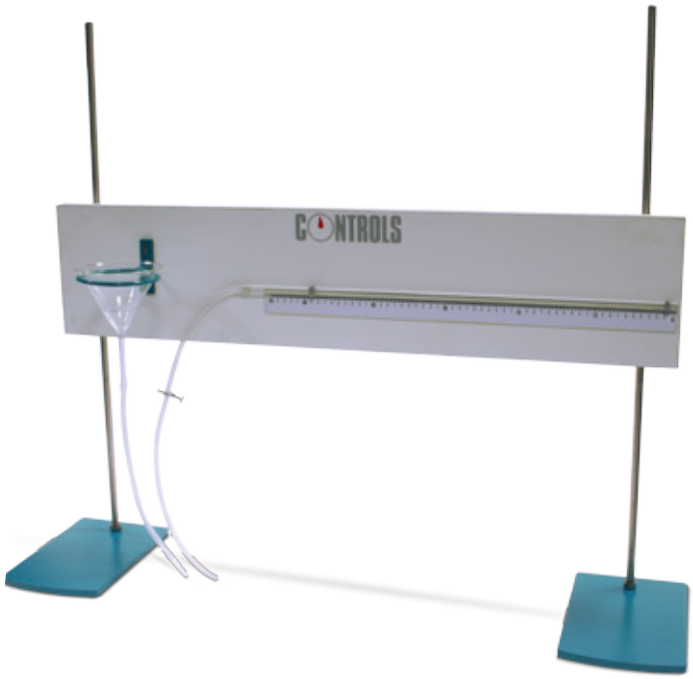
55-C0241/2
Clear plastic cup for vertical surfaces.



55-C0241/1



55-C0241/2



55-C0241/A

Density of hardened concrete

STANDARD
▸ EN 12390-7 ▸ EN 1097-6 ▸ BS 812 ▸ BS 1881:14 ▸ UNI 6394-2

SPECIFIC GRAVITY FRAME

This apparatus is a purpose-built robust frame designed to support an electronic balance for specific gravity determination of fresh and hardened concrete and aggregates. The lower part of the frame incorporates a moving platform which holds the water container, allowing test specimens to be weighed in both air and water.

The balance is not included and should be selected according to the weighing range required. Any type of electronic balance fitted with an under-bench weighing facility can be used. All our balances have this feature - our model 11-D0630/30, 30 kg capacity, 0.5 g resolution is ideal for this and other applications. See Accessories or, for other capacities, see page 9.

The frame has to be completed with the 11-D0612/A1 cradle for holding concrete specimens or Density baskets for testing aggregates (see page 156)

Overall dimensions:
400 x 650 x 1000 mm
Weight: 25.5 kg (approx.)

Ordering information

11-D0612/C
Specific gravity frame.

Accessories

11-D0630/30
Electronic top loading balance, 30 kg capacity, 0.5 g resolution.

11-D0612/A1
Cradle for holding specimens.

11-D0612/C with balance and cradle

Hydraulic shrinkage determination

STANDARD

▸ UNI 11307

(comparable to ASTM C426)

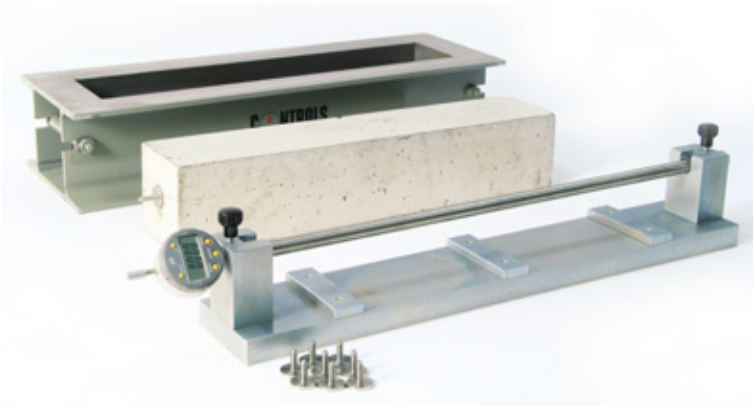
The UNI 11307 method is for determining the hydraulic axial shrinkage of concrete beams during hardening. According to this method, steel pins are glued onto the end surfaces of the specimen in order to measure the dimensional changes of the specimen, which is properly stored under-specified temperature and humidity conditions. The test is performed with the 55-C0100/MB11 beam mould and the shrinkage is measured by the 55-C0115/3D apparatus.

Ordering information

55-C0100/MB11
Beam mould, 100x100x500 mm. Weight:19 kg approx.

55-C0115/11
Steel pins for concrete shrinkage determination to UNI 11307. Pack of 10.

55-C0115/3D
Shrinkage measuring apparatus with reference bar and 12.5 x 0.001 mm digital gauge.
Weight: 14 kg approx.



55-C0100/MB11, 55-C0115/3D, 55-C0115/11

55-C0115/8, 55-C0115/81, 55-C0115/7, 55-C0115/71

Determination of restrained expansion of mortar and concrete

STANDARD

▸ UNI 8147 ▸ UNI 8148

Used for determining the restrained expansion of a concrete or mortar containing expansive agent. Made from steel, the apparatus comes complete with a rod and restrained end plates for each gang.

Two models are available:
- 55-C0115/7conforming to UNI 8148, 80 x 80 x 240 mm
- 55-C0115/8 conforming to UNI 8147, 50 x 50 x 250 mm

Ordering information

55-C0115/7
Three gang mould, 80 x 80 x 240 mm, conforming to UNI 8148. Weight:15 kg approx.

55-C0115/8
Three gang mould, 50x50x250 mm, conforming to UNI 8147. Weight: 10 kg approx.

Accessories

62-L0035/A
Digital length comparator, 12.5x0.001 mm.

62-L0034/8
Reference rod, 280 mm long.

Spare parts

55-C0115/71
Set of two end plates with rod for 55-C0115/7.

55-C0115/81
Set of two end plates with rod for 55-C0115/8.

62-L0035/A with reference rod. For more information and details see page 270

Creep test on concrete

STANDARD

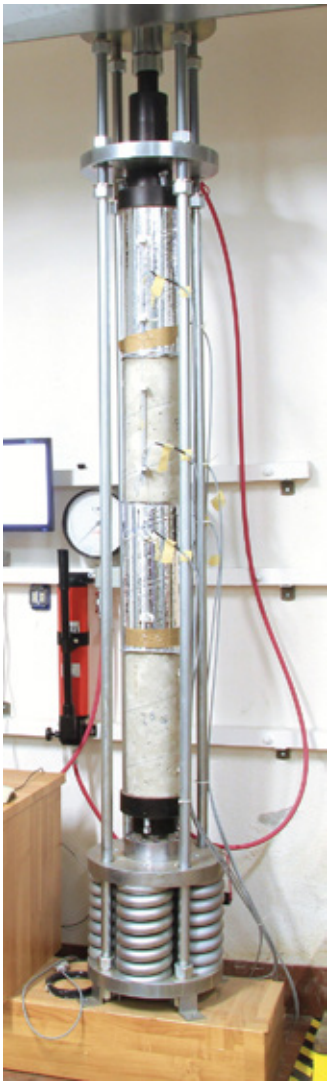
- ASTM C512

Load frame for creep test on concrete

This test is performed for measuring the shrinkage of cylindrical specimens under loads at different time intervals. The apparatus consists of a load frame designed to apply and maintain the required load on the specimen. The initial compression is applied by a portable hydraulic jack. The load maintaining element is a series of springs preloaded by the hydraulic jack.

The apparatus is supplied complete with hand pump, two 200 mm diameter precision gauges (one permanently connected, the other for loading) and a hydraulic jack.

The typical application of this apparatus is for research purposes. We are at your disposal for all information you may need.



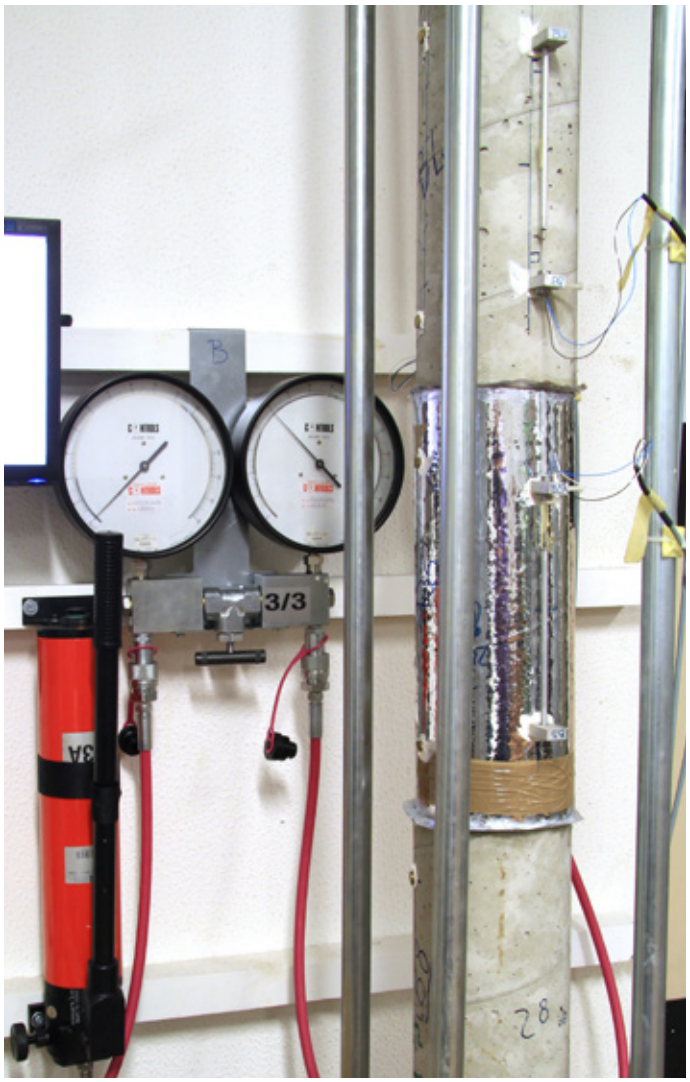
Technical specifications

- Maximum load: 300 kN
- Vertical testing space: 1650 mm
- Compression platens: 165 mm diameter. The upper platen is spherically seated.
- Hydraulic jack: 300 kN capacity
- Hand pump with precision Bourdon gauge 200 mm diameter
- Bourdon gauge 200 mm diameter permanently connected
- Frame dimensions: 450 mm diameter x 2680 mm height
- Weight: 300 kg (approx.)

Note: *Load frames with different vertical space are available on request.*

Ordering information

55-C0235/A
Load frame, 300 kN capacity, for creep tests on concrete.



Digital data acquisition and strain measurement system

Code	Description	Qty
82-P9008	DATALOG 8, 8 channels multipurpose data logger	1
82-P9008/ ELT	Set of 4 connecting cable	2
82-P9008/ SOF	Data aquisition software	1
82-P0398	Electrical compensation device	1
82-P0393 *	Strain gauges, 60mm lenght. Pack of 10.	1
82-P0399/C	Strain gauge application kit.	1
82-P0399/1	connecting terminals, 50 pairs	1
55-C0235/LC	Upgrade of the 55-C0235/A creep tester with a 300kN load cell for digital acquisition of the axial load	1 (as opt)

** Other strain gauge sizes available on request -see page 412*

55

Universal core drilling machine

This robust, versatile machine is ideal for site work where it is necessary to core at any angle. The extension columns (see Accessories) permit the corer to be secured within a maximum vertical or horizontal opening of 3850 mm. The rack feed (drilling excursion) is 1000 mm long.

The core bits, strap wrench and extension columns are not part of the machine and have to be ordered separately - see Accessories below and Core bits and accessories on next page. The listed core bits have a fixed standard coupling, assuring the best alignment, plus fast and easy fitting and disassembling.

Technical specifications

- Coring angle: 0 to 360°
- Rack feed: 1000 mm
- Shaft thread: UNC 1¼-7
- Power: 2200 W at 230 V; 1800 W at 110 V
- Full load speed: 670/1140/1580 rpm
- Coring diameter range: 20/160 mm
- Dimensions: 470 x 785 x 1630 mm approx.
- Weight: 80 kg approx.

Ordering information

83-C0301/D
Universal core drilling machine, three speed motor. 230 V, 50-60 Hz, 1 ph.

83-C0301/DZ
As above but 110 V, 60 Hz, 1 ph.

Accessories

83-C0301/1
Extension columns up to 3850 mm.

83-C0300/1
Extension rod, 228 mm long.

83-C0300/2
Strap wrench for fitting and removal of core bits.

83-C0301/D with 83-C0301/1 and core bit

Portable universal core drilling machine

The machine is composed of three main parts: an electric motor speed reducer, a light alloy base with wheels and adjustable feet, and a support column. These three parts can be easily assembled and disassembled for transportation.

The sliding motor bracket is mounted on rollers and ball bearings on the steel support column, which can be angled with respect to the base. The aluminium base can be easily secured on site using anchors, a suitable extension column, or by vacuum using the appropriate accessory (see Accessories). The machine can be used horizontally, at any angle, using the appropriate fixing method and making sure that the flushing water does not drop directly onto the motor.

For internal use we suggest the machine is fitted with a water collector system (see Accessories, 83-C0350/5 - Water collecting ring).

Core bits, strap wrench and extension column are not included and have to be ordered separately - see Core bits and accessories on next page.

Technical specifications

- Shaft thread: UNC 1¼-7
- Power: 2200 W at 230 V; 1800 W at 110 V
- Full load speed: 670/1140/1580 rpm
- Coring diameter range: 35/200 mm
- Dimensions: 451 x 290 x 860 mm approx.
- Weight: 36 kg approx.

Ordering information

83-C0350
Portable universal core drilling machine, three speed motor. 230 V, 50-60 Hz, 1 ph.

83-C0351
As above but 110 V, 60 Hz, 1 ph.

83-C0350 with core bit

Accessories

Vacuum system

83-C0350/1
Attachment kit for vacuum pump. Fits the opening in the centre of the base. Comprises: connection plate with gasket, vacuum gauge and base gasket. Vacuum pump not included - see 83-C0365.

83-C0365
Vacuum pump with reservoir.
230 V, 50-60 Hz, 1 ph.
Provides a vacuum for securing the base. To be used with the kit 83-C0350/1. Supplied complete with a very useful reservoir that maintains a suitable vacuum level for some time to avoid the machine falling or disconnecting from the wall if the power is interrupted.
Weight: 11.5 kg approx.

83-C0366
As above but 110 V, 60 Hz, 1 ph.

Water collector

83-C0350/5
Water collecting ring for core bits up to 150 mm diameter.
Confines waste water to the surface.
It has to be connected to a suitable electric pump.

Generator

86-D2250
Portable electric generator for universal core drilling machines. 230 V, 50 Hz, 1 Ph.

83-C0350

Strap wrench 83-C0300/2 and Core extractor 83-C0312/2

83-C0350 with 83-C0350/1, 83-C0365 and core bit

Core bits and accessories for all coring machines

All the bits are thin wall diamond type, with bronze welded sectors suitable for both concrete and asphalt. A fixed standard coupling assures the best alignment, plus fast and easy fitting and disassembly. The bit length is approximately 400 mm.
The core extractor is offered as an optional accessory and simplifies removal of the core sample from the hole.

83-C0300/1
Extension rod, 228 mm long.

83-C0300/2
Strap wrench for fitting and removal of core bits.

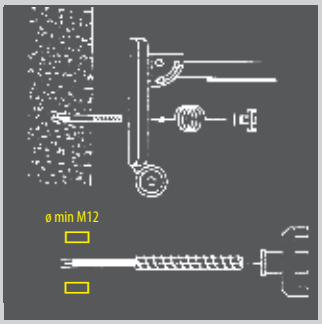
Portable water pressure tank

83-D2020
Portable water pressure tank, 10-15 L capacity.
Useful when tap water is not available.

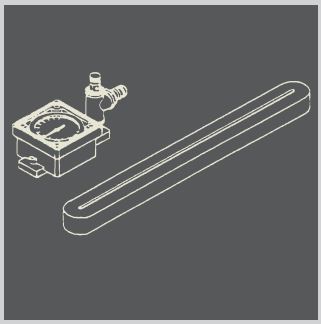
Core bit product code	To take core diameter (mm)	Weight (kg, approx.)	Suitable core extractor product code
83-C0320	50	2.2	83-C0310/2
83-C0321	75	2.8	83-C0311/2
83-C0322	100	3.7	83-C0312/2
83-C0323	150	5.4	83-C0313/2
83-C0324	200	7.5	83-C0314/2

83-C0322 and 83-C0323 Core bits with fixed standard coupling for the best alignment, plus fast and easy fitting and disassembling

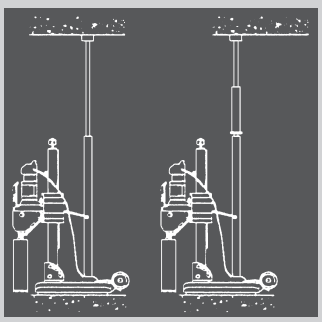
Fixing methods



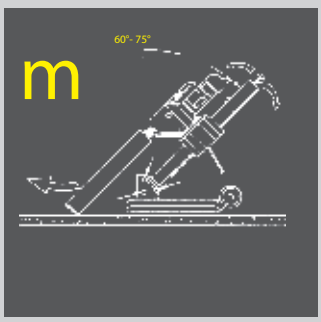
By anchor



By vacuum



By holding column



Tilting column mechanism

Concrete durability evaluation

The various problems that relate to the durability of concrete are assuming ever increasing importance due to their close relationship with the quality of the structure as a whole. The main problems associated with the durability of concrete are normally caused by the poor quality of the concrete itself. Knowledge of the degrading processes and the availability of materials and methods that can overcome them, permits the design of concrete that is both resistant and durable.

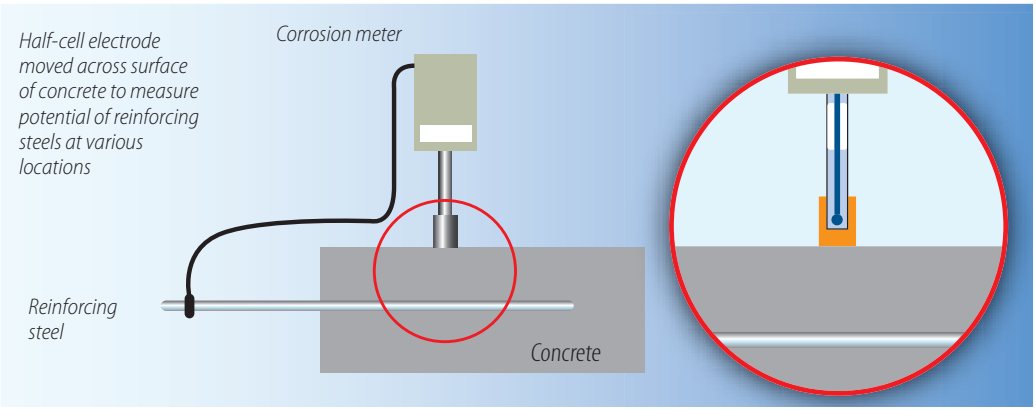
A complete range of instruments is available to measure the durability of concrete in response to the vast majority of requirements of operators in the construction industry. CONTROLS has specific knowledge and considerable first-hand experience in this field which can be made available to help in the analysis of test results.

58-E0065/A Complete system

58-E0065/A
COR MAP APPARATUS FOR REBAR CORROSION LOCATION (HALF-CELL METHOD)

STANDARD
▸ ASTM C876 ▸ BS 1881:201
▸ UNI 9535

Corrosion, which is an electrochemical process, occurs in concrete when oxygen and moisture are present. Measurements to detect them, made with the Cor Map apparatus using the half-cell method, can be plotted on a grid and lines of equipotential contours drawn, highlighting areas of possible corrosion activity.
The Cor Map apparatus is a simple and economical method for identifying areas of probable rebar corrosion in (for example): Bridge decks, Parking garages, Concrete piers and docks, Substructure, Tunnel lining and Foundations.



58-E0065/A Operating principle

The apparatus comprises:
- High impedance voltmeter
- Electrode extension
- Reference electrode including copper sulphate reservoir
- Container of copper sulphate (capacity 250 ml)
- Wetting agent reservoir (capacity 125 ml)
- Dispensing sponge
- Cable reel with 80 m of cable
- Carrying case
- Case dimensions: 50 x 420 x 190 mm (approx.) (reel packaged separately)
- Weight: 7.5 kg (approx.) (case + reel)

58-E0064
CHLORIDE CONTENT FIELD TEST SYSTEM

STANDARD
▸ ASTM C114 ▸ AASHTO T260

This test set, which relates to ASTM C114 and AASHTO T260, is used to determine the chloride ion concentration in concrete in order to identify the risk of chloride-induced reinforcement bar corrosion. The method involves performing an acid extraction on a representative drilled sample of concrete, which is then tested using an ion selective electrode. The potential is then compared with a calibration drawn up from a series of five known standard solutions supplied with the test kit.

The test set comprises:
- Electronic battery powered meter with microprocessor for direct conversion to percentage of chloride
- Chloride combination electrode with externally mounted temperature sensor, cable and connectors
- Bottle of electrode wetting agent
- Replacement pack of 12 jars each with 20 ml of extraction liquid and 5 jars of colored calibration liquid
- Carrying case and instruction manual
- Weight: 5 kg (approx.)

Spare parts

58-E0064/1
Pack of 12 jars of 20 ml extraction liquid and 5 jars of colored calibration liquid.

58-E0064 complete set

58-E0062/B
DIGITAL RESISTIVITY TEST SET TO ASSESS CORROSION CURRENTS IN CONCRETE

The electrical conductivity of concrete is an electrolytic process that takes place through the movement of ions in the cement matrix. This ionic movement will occur when contaminants such as chloride ions or carbon dioxide are introduced into the cement mortar matrix. A highly permeable concrete will have a high conductivity and low electrical resistance. Because resistivity is proportional to current flow, the measurement of the electrical resistance of concrete provides a measure of the possible rate of corrosion. Since carbonation seriously affects surface resistance, measurement on the concrete surface should be avoided. The resistivity meter, has two probes spaced 5cm (1.97 inches) apart which are placed in two holes drilled to a depth of 8mm (3/8 inch) and filled with conductive gel. The concrete resistivity is displayed on an LCD when the control switch is activated.

The system comprises:
- Electronic meter
- Probe
- 3 m cable with connectors
- 85 ml jar of conductive gel
- ¼" drill bit

Technical specifications
- Display: LCD with 4½" digits
- Resolution: ±0.1 KΩ·cm
- Battery: 9 Volt
- Range: 0.5 – 20 KΩ·cm
- Weight: 4 kg (complete with carrying case)

Main features
- Assesses damaging corrosion currents in concrete
- Economical and easy to use
- Direct digital readout of resistivity
- Measuring from two small holes avoids the problems and errors of surface measurements
- Used in conjunction with CorMap System 58-E0065/A (see page 244) to produce resistivity plots

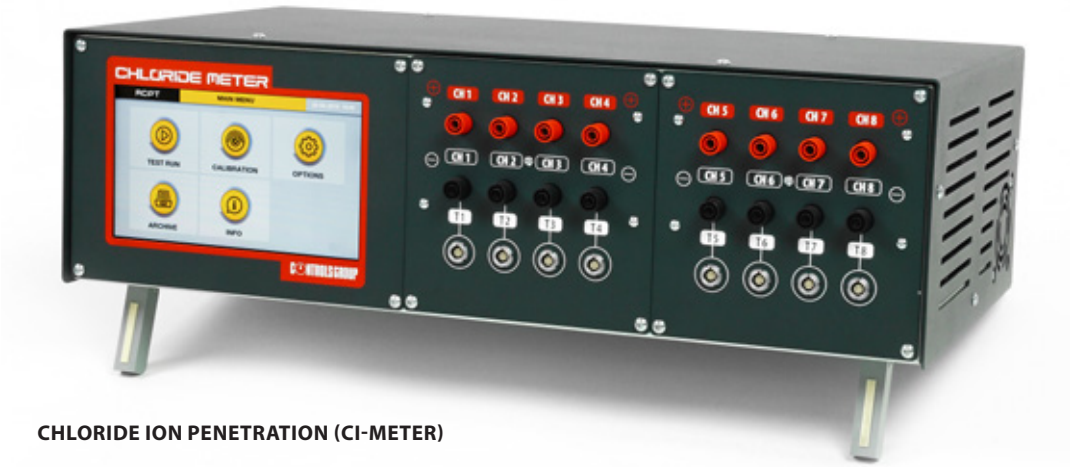
The following table correlates a range of resistivity values against the possible rate of corrosion of the reinforcement bars.

Resistivity level (KΩ·cm)	Possible corrosion rate of reinforcement rebars
<5	Very high
5 to 10	High
10 to 20	Moderate to low
>20	Insignificant

58-E0062/B

58-E0062/B complete set

Concrete durability evaluation



CHLORIDE ION PENETRATION (CI-METER)

STANDARD

▸ ASTM C1202 ▸ ASTM C 1760 ▸ AASHTO T277 ▸ NT BUILD 492

This test method allows concrete to be evaluated in terms of chloride permeability, this parameter is essential as it influences concrete durability.

The test is performed applying a voltage difference between the ends of a cylindrical specimen, one end is the negative and is immersed in a sodium chloride solution, the other is the positive and is in a sodium hydroxide solution.

Testing procedure to ASTM and AASHTO

While keeping 60 VDC difference between the specimen ends, current (Ampere) transmitted through the specimen is accurately measured over time calculating the total charge (Coulomb). This value relates to the specimen resistance to chloride ion penetration.

In accordance with the Standards indications, starting from the measured total charge, the instrument provides qualitative indications of the chloride ion penetrability level (from High to Negligible).

Two test cells are available depending on the specimen dimensions:

58-E5220/A1
Complete test cell to ASTM and AASHTO suitable for concrete specimen dia. 100 mm x 50 mm length. It includes 2 heads and cables, 1 temperature probe, 4 tie rods for cells tightening, 2 gaskets, 1 rigid plastic sleeve for hydraulic seal.

58-E5220/A2
Complete test cell to ASTM and AASHTO suitable for concrete specimen dia. 100 mm x 200 mm length. It includes 2 heads and cables, 1 temperature probe, 4 tie rods for cells tightening, 2 gaskets, 2 rigid plastic sleeves with 4 internal tie rods for hydraulic seal.

Testing procedure to NT BUILD 492

This test method requires to adjust the voltage difference starting from 30 VDC depending on the transmitted current.

The CI-METER allows continuous voltage adjustment from 5 to 70 VDC. Suggested voltages and test durations are pre-set in the instruments to drive the user to the correct test execution.

For this test method, the following kit is required:

58-E5220/A3
Migration set up kit to NT BUILD 492 for simultaneous testing of up to 3 specimens. It includes:
- Transparent plastic tank
- 3 specimen holders with stainless steel support, plastic spacers, electrodes (+ and -), perforated grids, stainless steel clamps, rubber sleeves, cables
- 3 temperature probes

Two CI-METER models are available:

58-E5214
for simultaneous test of up to 4 specimens
58-E5218
for simultaneous test of up to 8 specimens

Technical specifications

- 4 or 8 specimens simultaneous testing (see the models)
- Each channel is independent
- Programmable test duration
- Adjustable sampling rate (starting from 1 minute)
- Continuously variable voltage difference from 5 to 70 VDC independent for each channel. Voltage accuracy better than +/- 0.1V, resolution 0.1 V
- Continuous current measurement with accuracy +/- 0.1 mA, resolution 0.1 mA
- Continuous temperature measurement with PT100 probe, accuracy +/- 0.1°C, resolution 0.1°C
- Testing data displayed in numerical and graphical mode
- 7" color display with capacitive touchscreen
- 8 GB internal memory
- USB port for data export/storage on external memory (USB pen drive)
- LAN port for PC connection
- RS 232 serial port for PC or serial printer connection
- Friendly interface with pre-set test routines to the main Standards plus custom procedures
- Dimensions and weights:
  - Instrument: (l x w x h) 503 x 330 x 164 mm. 11.5 kg
  - Cell 58-E5220/A1: (l x w x h) 200 x 150 x 150 mm. 3.5 kg
  - Cell 58-E5220/A2: (l x w x h) 350 x 150 x 150 mm. 5 kg
  - Migration set up kit 58-E5220/A3: (l x w x h) 380x270x280 mm. 10 kg

Test cell for chloride ion penetration meter

Ordering information

58-E5214
4-channel chloride penetration meter. 110-230V, 50-60Hz, 1 ph

58-E5218
8-channel chloride penetration meter. 110-230V, 50-60Hz, 1 ph

Accessories

58-E5220/A1
Complete test cell to ASTM and AASHTO for CI meter for concrete specimen dia. 100 mm x 50 mm height.

58-E5220/A2
Complete test cell to ASTM and AASHTO for CI meter for concrete specimen dia. 100 mm x 200 mm height.

58-E5220/A3
Migration set up kit to NT BUILD 492 with 3-place rack suitable for simultaneous testing of up to 3 specimens

58-E0052/1
Vacuum system (see ASTM and NT BUILD) for specimen saturation with water. Comprises pump, air drying unit with silica gel, desiccator, glass vessel, stands and clamps. 230V, 50 Hz, 1 ph. Weight 40 kg (approx.)

58-E0052/1Z
Same as above but 110 V, 60 Hz, 1 ph.

58-E0031
OXYGEN PERMEAMETER (CEMBUREAU METHOD)

STANDARD
▸ UNI 11164

This method, which is applicable to cast and cored concrete specimens, concerns the determination of the permeability of concrete to oxygen, conforming to the Hagen-Poiseuille relationship.
The apparatus consists of:
- Permeability cell for specimens 150 mm diameter x 50 mm high
- Volumetric gas flow meter, soap bubble type (10 cc, 25 cc and 100 cc)
- High precision pressure regulator
- Digital readout unit and pressure transducer
- Stainless steel panel for wall-mounting plus connections
- Oxygen cylinder and pressure reducer not included

Specifications
Panel: 700 x 1100 x 120 mm (w x h x d), weight 14 kg.
Cell: 345 x 180 mm (dia. x h), weight 19 kg.

58-E0031 Detail of permeability cell

58-E0031

58-E0030
AIR AND WATER PERMEABILITY TEST SET (JOHN FIGG METHOD)

This method covers the determination of the susceptibility of concrete to chloride and carbonation penetration. The apparatus can be used for:

Internal (deep permeability) testing
A hole 10 mm diameter and 40 mm deep is drilled and plugged leaving a cylindrical test void 10 mm diameter by 20 mm high, situated 20 mm below the surface of the concrete. The time required for air and water to permeate through the test material to the void is used as an index to determine the quality of the concrete.

Air permeability testing
The air permeability test is always done first since moisture has a significant effect on permeability. Following the test procedure instructions, based on the vacuum technique, the instrument timer and manometer automatically show the time in seconds for the vacuum to rise from -55 kPa to 5 kPa. This time measurement is known as the Figg number for the air permeability of concrete.

Water permeability testing
After filling and forcing the water into the test cavity, the air is displaced out through the overflow tube. The instrument flow sensor and timer, following the test procedure, measure the time taken for the water meniscus to travel a distance of 50 mm. The time in seconds displayed on the meter is the Figg number for water permeability of concrete.

Surface permeability testing
Measurements are carried out at the surface by clamping a stainless steel chamber onto the smooth surface of the concrete. A measurement of the time required for related amounts of air and water to permeate through the concrete is used as an index of the surface conditions.

The apparatus comprises:
- Digital manometer
- Hand vacuum pump
- Water syringe
- Pack of 25 test plugs
- Cup grinding wheel
- Stainless steel surface chamber and clamping pliers, drill bits, anchors
- Carrying case and instruction manual

Specifications
- Power supply: standard 9 V battery
- Case dimensions: 430 x 300 x 150 mm
- Weight: 5.4 kg (approx.)

Spare parts
58-E0030/1
Pack of 25 test plugs.

58-E0030 complete set

BARTRACKER
Concrete durability evaluation

MAIN FEATURES

» Rebar location detection
» Rebar orientation detection
» Depth of cover measurement
» Cover thickness reading in millimeters or inches
» Large graphic display with backlight
» Multiple language menu structure
» Signal strength bar
» Interchangeable heads with LED and keypad
» User selectable bar range sizes and numbers
» Auto-size mode for quick bar diameter determination
» Orthogonal mode for bar diameter determination
» Other models of search head (narrow pitch search, deep cover search, borehole probe) available on order - see Accessories.
» RS 232 output to PC
» EDTS MS EXCEL link software
» Data logging
» Adjustable beep volume and earphone socket

REBAR DETECTION AND COVER-SIZE MEASUREMENT

STANDARD
▸ BS 1881:204

This apparatus is used to measure the thickness of concrete cover over steel reinforcement bars and metal pipes and can also identify the location, orientation and diameter of reinforcement bars (rebars). The basic unit can be completed with a number of optional probes for the various different determinations - see Accessories.

Description

The BARTRACKER, which uses the Pulse induction technique, features a rugged waterproof IP 65 case with probe storage for easy portability. The battery pack can be recharged inside or outside the gauge. The display screen shows you everything you need to know.
The gauge is supplied complete with:
- Main unit
- Standard search head to meet most measurement requirements for identifying 40 mm diameter bars at up to 95 mm depth (approx.) and 8 mm diameter bars at up to 70 mm depth (approx.). Sensing area 120 x 60 mm.
- PC cable
- Battery pack and charger
- Shoulder strap
- Earphone
- Carry case and instruction manual

***Important note**: Standard and optional search heads can be supplied with calibration certificates on request. See Accessories.*

Technical specifications

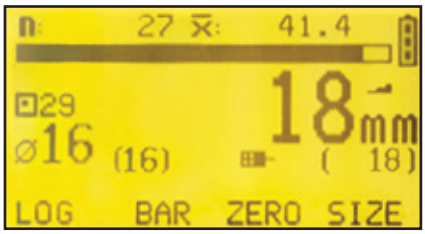
- Reinforcement bar diameter identification range:
- Metric: 5 – 50 mm diameter (21 selectable sizes)
- US bar numbers: #2-#18 bar sizes (16 selectable sizes)
- Rechargeable power supply:
- 7.4 V lithium ion battery pack providing up to 32 hours of continuous use (20 hours if backlight is on). Rechargeable in 4 hours either inside or outside the gauge using the external charger
- Maximum operating temperature: 50°C
- Main unit dimensions: 230 x 130 x 125 mm
- Main unit weight: 1.54 kg

Ordering information

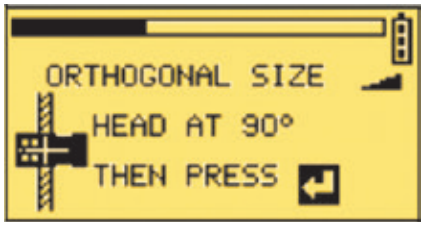
58-E6102
BARTRACKER covermeter complete with standard search head, carry case, gauge-to-PC transfer cable, battery pack and Euro battery charger.
100-240 V, 50-60 Hz, 1 ph.

Detail of extractable battery pack

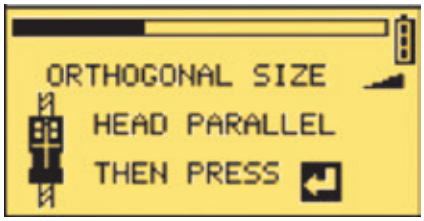
58-E6102



Example of display. This typical view of the cover display screen shows you all need to know. The easy to use menus, in multiple languages, enable you to access all the data you need while on site, without constantly referring to the instruction manual.



Orthogonal size function. Simply access the menu and then follow the clear on-screen instructions.



Orthogonal size function. When step 2 is complete, the bar size and depth cover will be shown.

Accessories

BARTRACKER 58-E6102 search heads and probes (optional)

58-E6100/1
Narrow pitch search head.
Accurately measures the cover thickness when the gaps between each of the rebars (pitch) are close together.
- Range: 40 mm diameter bars at up to 80 mm depth (approx.) and 8 mm diameter bars at up to 60 mm depth (approx.)
- Sensing area: 120 x 60 mm
- Dimensions: 155 x 88 x 42 mm

58-E6100/2
Deep cover search head.
The ideal search head for accurately measuring rebars that are deep within the structure.
- Range: 40 mm diameter bars at up to 180 mm depth (approx.) and 8 mm diameter bars at up to 160 mm depth (approx.)
- Sensing area: 160 x 80 mm
- Dimensions: 170 x 94 x 54 mm

58-E6100/3
Short borehole probe.
The solution for locating tendon ducts and multiple layers lying deep within the concrete.
- Measurement depth: 0-40 cm
- Approximate detection ranges: tendon ducts 70 mm/2.75" up to 90 mm/3.54"; reinforcement bars up to 60 mm/2.36"

58-E6100/4
Long borehole probe.
- Measurement depth: 0-100 cm
- Approximate detection ranges: tendon ducts 70 mm/2.75" up to 90 mm/3.54"; reinforcement bars up to 60 mm/2.36"

Traceable calibration certificates
(to be requested at time of ordering)

58-E6100/CAL1
Calibration certificate for BARTRACKER cover meter with standard search head.

58-E6100/CAL2
Calibration certificate for BARTRACKER cover meter with 58-E6100/1 narrow pitch search head.

58-E6100/CAL3
Calibration certificate for BARTRACKER cover meter with 58-E6100/2 deep cover search head.

58-E6100/CAL4
Calibration certificate for BARTRACKER cover meter with 58-E6100/3 short borehole probe.

58-E6100/CAL5
Calibration certificate for BARTRACKER cover meter with 58-E6100/4 long borehole probe.

58-E6100/10
Basic calibration block with 16 mm diameter.

58-E6100/11
Advanced calibration block featuring multi-spaced holes and 5 smooth re-bars, 300 mm length, diameter 8, 10, 12, 16 and 20 mm.

CARBONTEST®

Concrete durability evaluation

58-E0066
KIT FOR CARBONATION DEPTH DETERMINATION

STANDARD

▸ EN 13295 ▸ UNI 9944

MAIN FEATURES

» Innovative sampling design for measuring carbonation depth, based on the collection of powder.

» Easy sampling: requires only percussion drill, non-essential electrical power and water. Needless specific machinery, everything necessary is included in the kit.

» Especially light, handy and portable, it can be used by a single operator without recourse to specialized technical help.

» No risk to the structure. The hole made is 10 mm in diameter and it can be easily closed using the universal plaster for cement, included in the CARBONTEST® Kit.

» Large accessibility to the test space.

» A detailed and professional report is processed automatically by CARBONTEST® Software.

» CARBONTEST® Reports set up real time diagrams showing the spread of carbonation in order to estimate the working life of the structure.

» Efficient, it can manage depth of carbonation testing whilst cutting financial and physical resources down to a minimum.

» The kit includes picker, 25 test tubes, ruler, phenolphthalein solution, Pasteur54 pipette, cartridge of universal plaster, block of survey sheets and dedicated software.

58-E0023
WATER PENETRATION TEST SET DR CARSTENS METHOD

STANDARD

▸ EN 1323

For the determination of water permeability of building materials and prefabricated building parts. The test can be performed either horizontally or vertically. The test set consists of 3 vertical and 3 horizontal, water penetration test tubes, 250 ml washing bottle and 250 g of plasticine cement.

Case dimension: 420x280x90 mm
Weight approx.: 1.75 kg

58-E0058
DEEP SCANNING METAL LOCATOR

Finds rebar and metallic pipes, conduit, metal studs, junction boxes and metal framing up to 150 mm deep before drilling or remodeling. It scans through most non-metallic construction material, including solid concrete.

Dimensions: 251x109x63 mm

- Scans through solid concrete
- Pinpoints the location and depth of target
- Differentiates between steel rebar and copper pipe
- Eliminates guesswork, needless holes, broken drills and saw blades
- Essential tool for concrete contractors, remodelers, plumbers and electricians
- Position accuracy: Rebar/Copper pipe 14 mm dia. at a minimum grid spacing of 152 mm are located typically within 13 mm
- Depth: up to 152 ± 25 mm
- Size: 251x109x63 mm

58-E0032/B
SURFACE DAMPNESS DETERMINATION

Surveymaster SM. Protimeter

The Surveymaster is the industry standard moisture meter for surveying and investigating moisture in buildings. Two operation modes: search and measure, helping the user to distinguish sub-surface from surface moisture, essential information when trying to establish the extent and cause of a dampness problem. The actual moisture content of wood is shown on the digital display with the corresponding moisture condition shown on the accompanying scale of color-coded lights. This value can be used as reference to estimate the moisture content of other building materials or for comparisons of different moisture conditions.

The meter is supplied complete with:
- 127 mm insulated deep wall probes
- Moisture probe
- Calcheck WME mode calibration check
- 2 spare pins
- Pouch and instructions
- Wood species calibration table

- Range: 7% to 99% WME (Wood moisture equivalent)
- Display: 60 LEDs green (dry), yellow (at risk) and red (wet)
- Depth of moisture: Non-invasive up to 19 mm, Pin up to 12.7 mm
- Power: one 9 V 6F22R battery (included)
- Features: Audible tone. May be switched on/off by the user. Auto switch off. May be switched off, or set between one to three minutes, by the user.
- Dimensions: 175x30x48 mm
- Weight approx.: 100 g

58-E0063
CARBONATION TEST SET

STANDARD
- EN 13295

58-E0063

The carbonation test is a simple procedure for measuring the depth of carbonation through the surface of concrete. The test set consists of:
- 1 plastic wash bottle
- 1 depth gauge
- 1 liter of phenolphthalein solution

During the test, the broken or cored surface is sprayed with phenolphthalein solution to detect the loss of alkalinity associated with carbonation.
Weight: 0.9 kg (approx.)

Note: *the Microcore apparatus (code 58-C0299) described and shown on page 321, can be conveniently used to take small cores suitable to perform the carbonation test.*

58-E0035/C1

58-E0035/C
RESONANCE FREQUENCY METER

STANDARD
- EN 14146 • ASTM C666
- BS 1881:209 • NF P18-414
- UNI 9771

This meter is used for determining the longitudinal, transverse (flexural) and torsional resonant frequency of concrete and natural stone samples. Obtaining the resonant frequency permits determination of the Dynamic Modulus of Elasticity and the Damping coefficient, frequently used to determine degradation due to freezing and thawing cycles, for example.

The 58-E0035/C meter incorporates a PC card, a 7" color touchscreen monitor and multiple interfaces (1 x VGA, 1 x LAN and 2 x USB) that enable test data to be managed quickly and easily. The test procedure is easy to follow with the user-friendly displays.
The meter is supplied complete with RES-Lab software which allows the management of data with a PC and the production of test reports.

Technical specifications

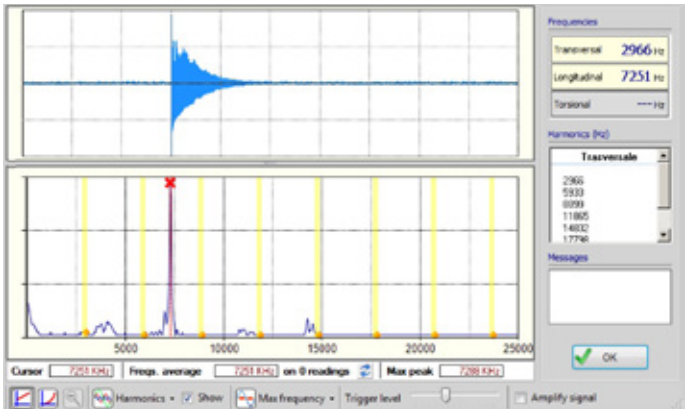
Acquisition
- Maximum sampling frequency: 100 kHz (Nyquist: 50 kHz)
- Frequency resolution: min. 12.2 Hz (0-50 kHz), max. 0.49 Hz (0-2kHz)
- Automatic adjustment of the sampling rate
- Accelerometer activation threshold

General
- Battery operated: 7.2 V, battery charger included
- Typical consumption: 900 mA
- Working temperature: 0 to 60°C
- Dimensions: 270 x 120 x 246 mm (w x h x d)
- Weight: 3 kg (approx.)

Accessories

58-E0035/C1
Specimen supporting bench:
- Distance between supports adjustable from 75 mm up to 260 mm
- Supports width: 250 mm
- Distance between columns: 180 mm
- Max sample height / diameter: 160 mm
- Dimensions: 300 x 240 x 245 mm (w x d x h)
- Weight: 1.4 kg (approx.)

58-E0035/C



Example of display

58-E0035/C with specimen

Concrete strength evaluation

The most commonly used non-destructive tests are the ones that provide an indication of the in-situ compressive strength of concrete.

These are normally well-known, simple tests, which have already been specified in many national standards. CONTROLS is able to provide equipment complying with the most frequently used of these standards.

58-C0181/DGT

MAIN FEATURES

» In-built test procedure conforming to EN 12504-2 and ASTM C805

» Possibility to create customized test procedures

» Storage capacity 2 Mb

» Saving, displaying and downloading data to PC via USB port

» PC software included

» Power supply: integrated rechargeable lithium ion battery 1600 mAh capacity

» Indication of the exact impact angle through internal triaxial inclinometer

» Multiple correlations between rebound value and compressive strength

» Programmable user defined algorithms

» Automatic conversion of rebound value to equivalent compression strength as N/mm², MPa, kg/cm², psi

» Calculation of averages and standard deviations; discard of outliers

» Automatic verification of conformity to Standards

» Battery life under continuous operation more than of 10 hours

CONCRETE TEST HAMMERS

STANDARD

▸ EN 12504-2 ▸ ASTM C805
▸ BS 1881-202 ▸ NF P18-417
▸ DIN 1048 ▸ UNI 9189

Concrete hammers are used to evaluate the surface hardness of concrete in order to estimate the strength in various parts of the structure.

Two versions are available:

- Digital user programmable model 58-C0181/DGT
- Standard model 50-C0181/C

58-C0181/DGT
USER PROGRAMMABLE DIGITAL CONCRETE HAMMER

The rebound hammers measure the rebound of an anvil impacting a plunger in contact with the concrete surface. In this advanced instrument the rebound value is calculated with an innovative technology taking into account the anvil speed before and after the impact.
The rebound value is a measure of the concrete surface hardness.

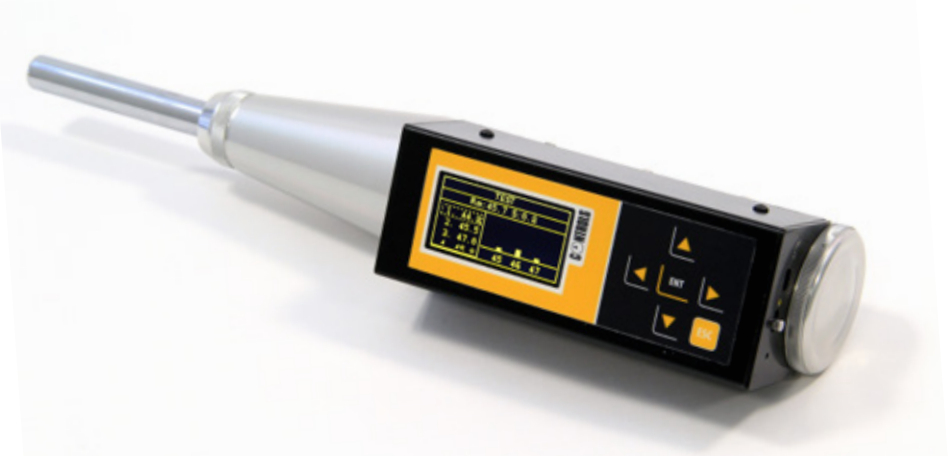
Advantages of this principle:

- higher accuracy and stability of the readings not affected by wear and tear
- setting of the impact angle no longer required
- easier calibration procedure

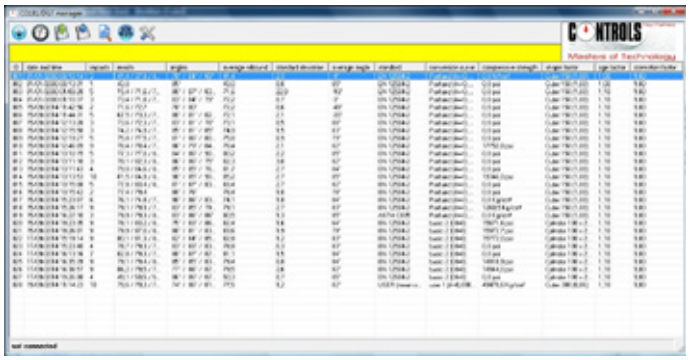
Technical specifications

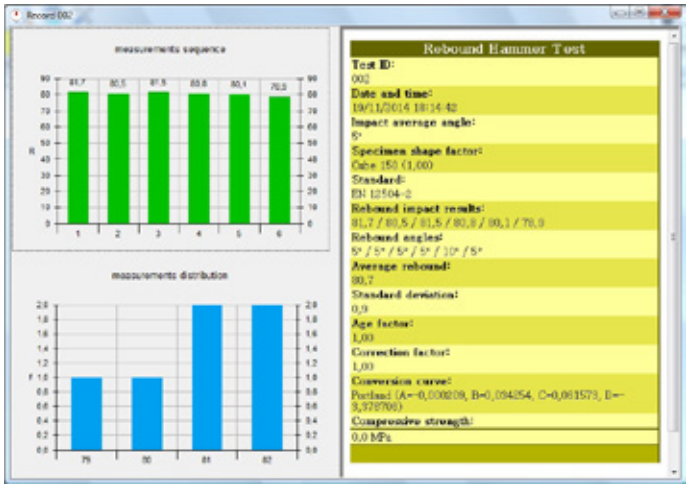
- impact energy: 2.207 Nm
- measuring range: from 10 to 130 N/mm²
- high-contrast graphic display 128 x 64 pixel and 6 soft keys membrane keyboard
- results are displayed as numerical and graphical format
- USB port
- case dimensions: 280 x 100 x 390 mm
- weight: 2 kg approx.

The instrument is supplied complete with: battery charger and cable; USB cable for PC connection; abrasive stone; user manual and carrying case.



Example of PC software screens





Example of screen display

58-C181/C

58-C0181/C
CONCRETE TEST HAMMER, STANDARD MODEL

Aluminum body, complete with carrying case, grinding stone and instruction manual.

- Impact energy 2.207 Nm
- Measurement range: 10 to 70 N/mm^2
- Weight approx.: 1.5 kg.

The above model is also available complete with traceable calibration certificate, code 58-C0181/C1

58-C0184
CALIBRATION ANVIL

Used for the periodic calibration of the concrete test hammer 58-C0181/C and 58-C0181/DGT. Made from special alloy steel.

- Dimensions: 150 mm dia. x 230 mm height.
- Weight approx.: 16 kg

58-C0184

Concrete durability evaluation

PULL-OFF TESTERS

STANDARD

▸ EN 1015-12 ▸ EN 1348 ▸ EN 1542 ▸ EN 13963 ▸ EN 14496 ▸ ISO 13007-2
▸ ISO 4624 ▸ ASTM D4541 ▸ ASTM C1583 ▸ ASTM D7522 ▸ ASTM D7234

This apparatus is mainly used to evaluate the bond strength of two layers of concrete or the adhesive strength of surface coatings (e.g. cement plaster, lime, wall plaster etc.) on its support.

Two versions are available:

58-C0215
Standard version

MAIN FEATURES

» Load capacity: 16 kN
» Readout unit: high precision load cell
» Working range: 0.25 to 16 kN
» Portable equipment for use in any location
» High resolution digital display unit 128x80 pixel
» Graphic indication of applied load rate
» Serial port for PC connection
» Battery operated, complete with AC adapter
» Dial indicator of ram position allowing an estimation of the brittle properties of the test sample
» Supplied complete with traceable calibration certificate
» Dimensions: 340x240x250 mm approx.

58-C0215/AUTO
Automatic motorized version

ADDITIONAL FEATURES of the 58-C0215/AUTO

» Motorized in-built hydraulic actuator
» PID closed-loop control of the load rate
» Graphic display of actual load, load rate, peak value, strength
» Load measurement with high accuracy strain gauge load cell
» Effective resolution: +/- 262000 divisions, corresponding to 0,0001 kN (0.1N)
» Working range: 0.16 kN to 16 kN
» Accuracy: Class 1 starting from 1 % of the full scale
» High resolution graphic display 128x80 pixels and 5 keys membrane keyboard
» Battery operated: internal rechargeable LiPo type battery 7.4 V, 2200 mAh.

Ordering information

58-C0215
Pull-Off/Bond strength digital tester. 16 kN capacity. Battery operated. Complete with AC adapter 110-240V, 50-60 Hz, 1ph

58-C0215/AUTO
Automatic motorized Pull-Off / Bond strength tester. 16 kN capacity. Battery operated. Complete with AC adapter. 110-240V, 50-60 Hz, 1ph

Accessories (for both models)

Bits and die

58-C0215/1
Drill bit with centering point to obtain 50 mm diameter test surface

58-C0215/2
Drill bit with centering point to obtain 20 mm diameter test surface

58-C0215/12
Metal ring (dinking die), 50 mm int. diameter, 25 mm high, for fresh plaster, to EN 1015-12.

Test discs and plate

58-C0215/4
Aluminum square plate 50 mm x 50 mm to EN 1348

58-C0215/5
Aluminum test disc 50 mm diameter x 20 mm thick

58-C0215/8
Aluminum test disc 20 mm diameter x 20 mm thick

58-C0215/3
Stainless steel test disc 50 mm diameter x 20 mm thick to EN 1015-12

Adhesive

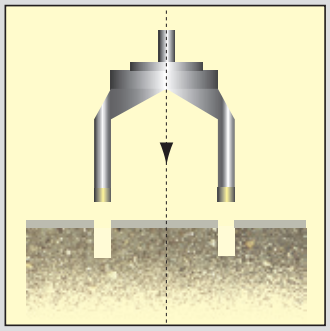
58-C0215/13
Adhesive, bicomponent: 2x15 ml binder and 2x15 ml hardener (4 vials)

Serial cable

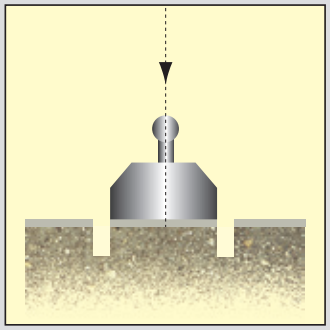
58-C0215/T2
Serial cable for PC connection. Requires a PC with RS232 serial port or RS232/USB adaptor (see our model 82-Q0800/3)

82-Q0800/TRM
D-Terminal software for the capture and storing of testing data ASCII format for PC downloading by the serial port RS232.

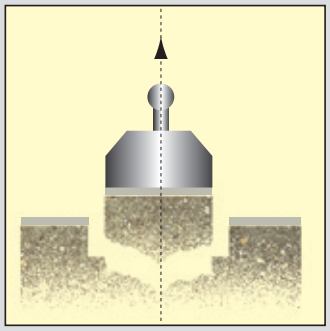
Operating principle



Using a drill, make a circular cut down to the base material, according to the dimensions of the discs, in order to exactly define the testing surface.



Stick a disc of the appropriate size onto the testing surface using a suitable adhesive.



Pull off the cut out section using the unit. The resulting pull-off force is shown in kN on the display.

Drill bits and metal discs

58-C0178
PULLOUT TEST APPARATUS

Used for determining the pullout strength of hardened concrete in test specimens or structures by measuring the force required to pull an embedded metal insert and the attached concrete fragment from a concrete mass.

The pullout test apparatus 58-C0178 is used for pre-embedded inserts in fresh concrete mass. It comprises a hydraulic jack 100 kN capacity, a precision measuring Bourdon gauge 150 mm diameter, bearing ring and 10 pullout inserts, all contained in a carrying case.

- Case dimensions: 740x300x255 mm
- Weight approx.: 21 kg

For embedded inserts after the concrete hardening, the kit model 58-C0178/3, that includes a professional electrical drill (230V, 50 Hz, 1 ph) with suitable power, SDS mandrel, 18mm drill bit for concrete, pack of 10 expanding plugs diameter 18mm x 80mm and manual air pump for dust cleaning.

- Case dimensions: 520x430x390 mm
- Weight approx.: 11 kg

Accessories and spares

58-C0178/3
Set of accessories for 58-C0178 pullout apparatus adopting test inserts suitable for installation after concrete hardening

58-C0178/2
Pullout inserts, 30 mm diameter Pack of 50 pieces

Complete pullout set includes test apparatus for pre-embedded inserts 58-C0178/3 and set of accessories for inserts installation after concrete hardening

Concrete strength evaluation

MICROCORE APPARATUS

STANDARD
▸ UNI 10766

The Microcore method is a proven technique for the non-destructive evaluation of concrete and masonry strength, taking 28 mm diameter cores which can then be used for compression tests. Taking the cores does not affect the integrity of the structure because of their small size, so the cored surface can be easily restored.

This technique can also be used for assessing the carbonation depth (with the appropriate reagents) and for masonry products to verify their physical condition or to evaluate compressive strength related to the direction of sampling.

The apparatus consists of the following parts:
- Electric drill
- Flanged guide assembly
- Two clamping pliers to fit the flanged guide assembly to the surface
- Diamond core bit, 28 mm inside diameter, 100 mm long
- Diamond core bit, 28 mm inside diameter, 200 mm long
- Set of accessories comprising 20 anchors, washers and drill bit
- Two carrying cases

Note: *to perform the test, if mains water is not available, a pressure water reservoir 10/15 liter capacity should be provided, such as our model 83-D2020. See Accessories.*

Specifications

1st case: 500 x 380 x 130 mm, weight 7.5 kg approx.
2nd case: 390 x 300 x 90 mm, weight 3.8 kg approx.

58-C0299

Important note about core preparation and compression:

The flatness of core ends is essential for obtaining reliable compression results so it is very important to make sure that the tolerance is within 0.01 mm. See 45-D0536/A, page .....
Furthermore the compression test should be performed with a suitable compression machine, taking into consideration that the maximum required load should be lower than 50 kN. Cement compression testers or small universal testers may be conveniently used.

Ordering information

58-C0299
Microcore apparatus complete set. 230 V, 50 Hz, 1 ph.

58-C0299/M
Microcore apparatus, mechanical parts only (same as 58-C0299 but without the electric drill).

Accessories and spares

83-D2020
Pressure water reservoir, 15 liter capacity.

83-D2020

58-C0299/1
Diamond core bit, 28 mm inside diameter x100 mm length.

58-C0299/2
Diamond core bit, 28 mm inside diameter x200 mm length.

Concrete quality and homogeneity evaluation

58-E4800
ULTRASONIC PULSE VELOCITY TESTER

STANDARD
▸ EN 12504-4 ▸ ASTM C597

The 58-E4800 UPV tester is used for quality control and inspection of concrete. It measures the transit time of ultrasonic pulses through concrete for inspection of new and old structures, slabs, columns, walls, fire damaged areas, precast and prestressed beams, cylinders and other concrete forms.

Combined with an oscilloscope can identify honeycombs, voids, cracks and other non homogeneous conditions in concrete.

58-E4800 in use. Although the direction in which the maximum energy is transmitted at right angle to the face of transmiting transducer, it is possible to detect pulses which have travelled through concrete in other directions: adjacent faces (semi-direct transmission) or same face (indirect or surface transmission).

MAIN FEATURES

» For the non-destructive evaluation of concrete homogeneity and determination of Dynamic Elastic Modulus

» Battery operated

» Large size digital display 128x64 pixel

» High price/quality ratio

- Microprocessor incorporated
- Battery operated by internal rechargeable battery pack (2400 MAh) and external charger
- 14 working hours using I Hz pulse rate
- RS 232 output for PC or printer
- Connectable to oscilloscope
- Transit time measurement from 0.1 to 1999.9 microseconds
- Pulse rate 1, 2, 5, 10 per second, selectable
- Resolution 0.1 microseconds
- Transmitter output 1200 V
- Frequency range 24 to 150 kHz
- Receiver imput impedance 1 MOhm
- Weight of the tester 0.5 kg, complete set 2.3 kg

Accessories

58-E0046/30
24 kHz transducer head (1 piece)

58-E0046/33
150 kHz transducer head (1 piece)

82-P0172/B
24 column serial printer, rechargeable battery operated. External battery charger and batteries included. 110-230 V, 50-60 Hz, 1 ph

82-P0172/1
Connecting cable for printer

Spares

58-E4800/P
Piezoelectric head for ultrasonic tester. Nominal frequency 50 kHz. Can be used either as receiver or trasmitter. Fitted with BNC connector for coaxial cable (not included).

58-E0046/2
Spare 2 m cable for testing probe connection

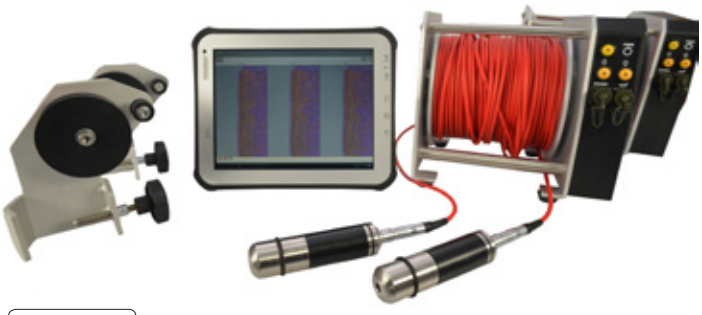
58-E0046/3
Coupling agent (contact paste) 250 cc bottle

58-E4800 complete set

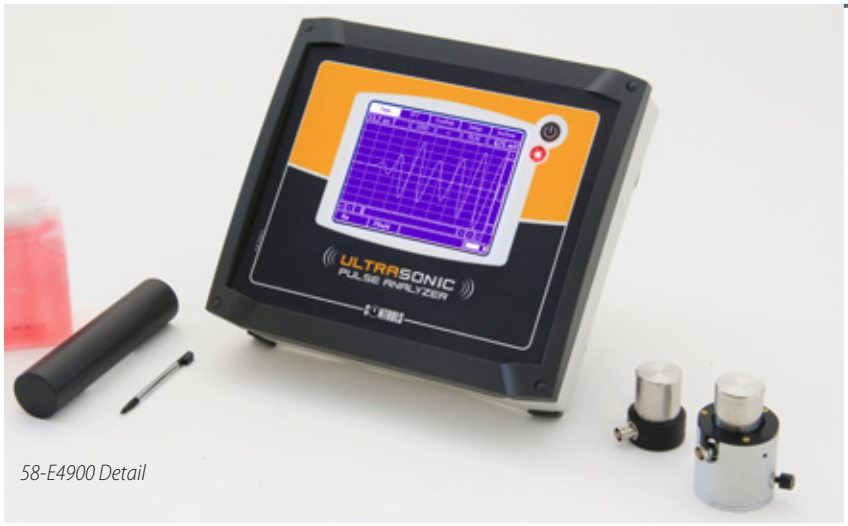
CROSS-HOLE INVESTIGATION ON FOUNDATION PILES

STANDARD
▸ ASTM D6760

We propose a wireless modular system. For complete information please visit our website.



Concrete quality and homogeneity evaluation



58-E4900 Detail

MAIN FEATURES

- » Digital scope, 2 MHz sampling rate, 12-bit resolution
- » Advanced picking algorithm providing the real arrival time of the pulse
- » Signal processing by FFT method (Fast Fourier Transform)
- » Assessment of concrete strength with combined method Ultrasonic velocity/Rebound index (SonReb)
- » 7 selectable pre-amplifier gains (impulse amplitude)
- » Data saved on memory card (2 GB=30000 tests)
- » 6" multifunctional touchscreen display
- » Strong carrying case included

58-E4900
ULTRASONIC PULSE ANALYZER

STANDARD
▸ EN 12504-4 ▸ ASTM C597

The ultrasonic tester 58-E4900 is used for measuring the velocity of ultrasonic pulses through a concrete section, providing information on cracks, voids and strength, and giving quick estimates of Dynamic Modulus of Elasticity on site or in the laboratory. It can also be used to estimate times for formwork striking. The pulse velocity can be combined with the rebound hammer value for the strength evaluation of concrete.

The analyzer comes in a sturdy, portable case and has a large backlit touchscreen display that makes use of the apparatus practical and easy.

Another tester for routine measurements is also available. See Ultrasonic pulse velocity tester, page 257.

The Ultrasonic pulse analyzer 58-E4900 is provided complete with dedicated spreadsheet allowing download and post-processing of the test data.

Technical specifications

- 2 MHz sampling rate with 12-bit resolution
- 8 selectable low-pass filter cut frequencies
- Advanced signal processing (Transit time, Wave shape, FFT, SonReb)
- Selectable pulse rate 1, 2, 5 per second
- Transmitter pulse 2500 V
- Transit time up to 16 ms with 0.1 µs resolution
- Slot for memory card to save data
- RS 232 and USB port for real time downloading to PC
- Battery powered by internal rechargeable battery pack (7.2 Ah) up to 9 working hours before recharging
- Dimensions: 264 x 233 x 83 mm(instrument only); 500 x 400 x 140 mm(carrying case)
- Weight: 2.6 kg(instrument only); 5 kg(complete outfit) (approx.)

Main applications

Standard UPV measurement with incorporated oscilloscope.

Conforming to EN 12504-4 and ASTM C597. The Dynamic Modulus of Elasticity can also be determined with this application as the meter features a very accurate measurement of the transit time.

Measurement of the Attenuation of the Transmitted Energy.

Very often the transit time alone is not enough to identify discontinuities and small areas of damage such as micro-cracking of concrete. With this technique however, these can be located well with proper processing of the acquired waveforms.

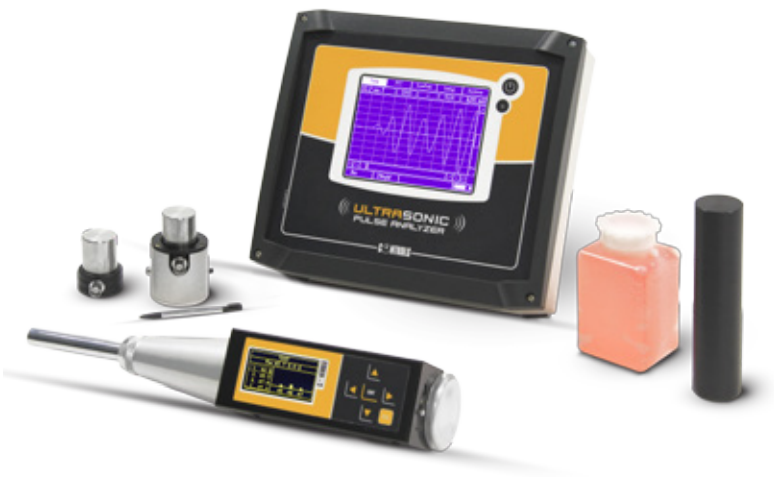
Frequency Spectrum Analysis by FFT Method (Fast Fourier Transform-Algorithm).

For determining the natural frequency of the ultrasonic pulse transmitted through the material. This determination is suitable for the examination of the pulse path and gives indications about possible cavities, delamination, multi-layer elements or other similar discontinuities.

Concrete Strength Evaluation combining the Rebound number and the UPV transit time.

It is possible to use our Digital concrete hammer (58-C0181/DGT) to obtain the average rebound number. This value can then be inserted into the dedicated menu of the UPV tester in order to combine a typical surface measurement with the deeper UPV transit time and obtain more reliable and extensive information.
Other applications include identifying and evaluating, for example, crack depth, honeycombing, and injection quality.

58-E4900 complete set



58-C0181/DGT Digital concrete hammer and 58-E4900 PULSONIC Ultrasonic pulse analyzer

Time menu for acquisition, display and storage of waves received

Ordering information

58-E4900
PULSONIC Ultrasonic pulse analyzer, standard outfit, comprising two 50 kHz testing heads (one of the two probes is fitted with a sampling button to select readings to be recorded), 2 m cables, calibration rod, bottle of contact paste and carrying case.

Accessories

Testing heads (probes)

The standard 50 kHz transmitter and receiver heads are supplied with the tester. Different heads are available with different nominal working frequencies of 25 and 150 kHz, which is the usual range for normal concrete. The higher one (150 kHz) is recommended for homogeneous concrete, the lower (25 kHz) for heterogeneous concrete. Model 58-E0046/5 special probes with exponential profile, are used for identification of minute cracks, air bubbles or material with low density. Two pieces are required. See table below.

Spare parts

58-E4800/P
Piezoelectric head for ultrasonic tester. Nominal frequency 50 kHz. Can be used either as receiver or transmitter. Fitted with BNC connector for coaxial cable (not included).

58-E4900/P
Piezoelectric head with sampling button for ultrasonic tester series 58-E4900. Nominal frequency 50 kHz. Fitted with BNC connector for coaxial cable (not included).

58-E0046/2
Spare 2 m cable for testing probe connection

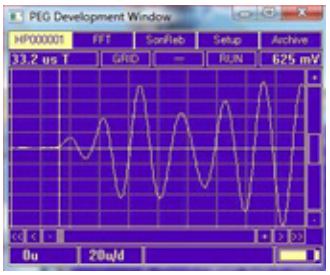
58-E0046/3
Coupling agent (contact paste), 250 cc bottle.

Concrete hammers

58-C0181/C
Concrete test hammer, classic model, aluminum case (see page 253).

58-C0181/DGT
Digital concrete test hammer (see page 252).

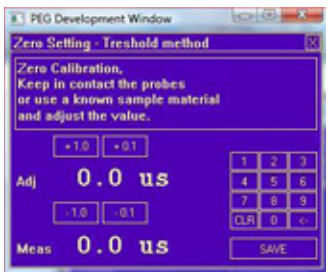
FFT menu for displaying Fast Fourier Transform of the signal



Menu for acquiring, showing and saving the received waveform

Setup menu for setting operative parameters

SonReb menu for evaluating the concrete strength combining the ultrasonic and concrete hammer measurements



Menu zero calibration

Testing heads (probes)

Product code	Nominal frequency (kHz)(approx.)	Dimensions
58-E0046/30	25	Dia. 50 x 74 mm
58-E0046/33	150	Dia. 50 x 52 mm
58-E0046/5	50	Dia. 7/50 x 82 mm (exponential profile)

Structural inspection and monitoring

MAIN FEATURES

» Digital gauge with 0.001 mm resolution

» Serial output for PC connection (using 82-D1261/LINK cable not included, see Accessories and spares)

» Complete set including double function bar for datum discs positioning and extensometer zeroing

58-C0230/30D complete set

MECHANICAL STRAIN GAUGES

STANDARD

▸ ASTM C426 ▸ BS 1881:206

This apparatus used for determining length changes was originally designed for use on concrete structures, but can also be conveniently used for any other type of structure including steel. The test set includes an extensometer with a 0.001 mm resolution digital gauge, double function standard and calibration bar, fifty datum discs, adhesive compound for datum discs and a carrying case.

Two models are available, with100 and 300 measuring bases.

Carrying case dimensions:
300 x 400 x 110 mm
Weight: 2.1 kg (approx.)

Ordering information

58-C0230/10D
Mechanical strain gauge for the measurement of length variation. Measuring base 100 mm x 5 mm range. Digital gauge, 0.001 mm resolution, output for PC connection (special cable required, see Accessories and spares).

58-C0230/30D
As above but measuring base 300 mm.

Accessories and spares

82-D1261/LINK
Serial cable for PC connection.

58-C0230/1
Datum discs. Pack of 50. Weight 100 g.

58-C0230/2
Tube of adhesive, 20 g.

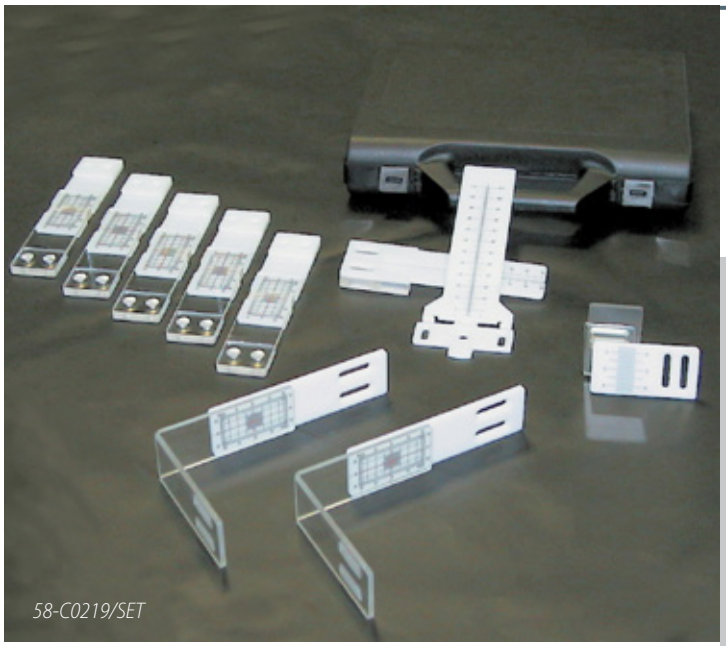
58-C0230/30D

58-C0218
CRACK MEASUREMENT MICROSCOPE

This is a high quality microscope designed for measuring crack widths in concrete members, masonry walls and other structures. The image is illuminated by the adjustable lamp unit and focused by turning a knob. The eyepiece scale can be turned through 360° to align with the direction of the crack or pitch under examination.

Technical specifications

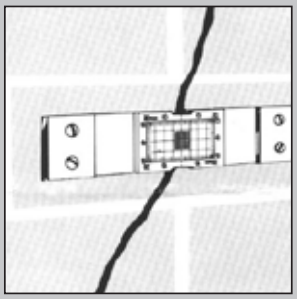
Magnification: 40x
Measuring range: 4 mm
Subdivision: 0.02 mm
Battery powered
Dimensions: 150 x 80 x 45 mm
Weight: 550 g (approx.)



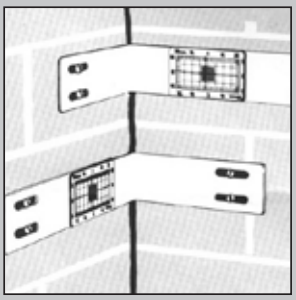
58-C0219/SET

MAIN FEATURES

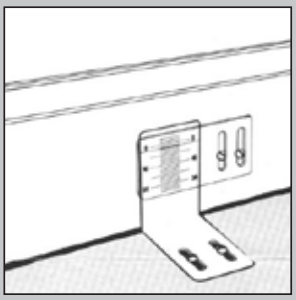
» Internal or external use
» Monitors the opening or closing of cracks with accuracy of 1 mm
» Crack record cards supplied with each gauge simplifying monitoring
» Capable of monitoring vertical as well as horizontal movement



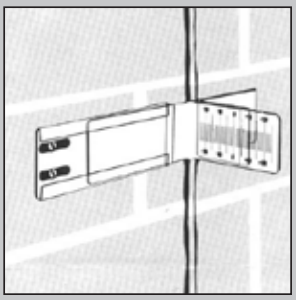
58-C0219/A1



58-C0219/B1



58-C0219/C1



58-C0219/D1

CRACK WIDTH GAUGES

Made from plastic, in four different versions for measuring the widths of cracks in walls, corners, floors and the difference of level between two surfaces. When purchased as a set, a carrying case is included.

Ordering information

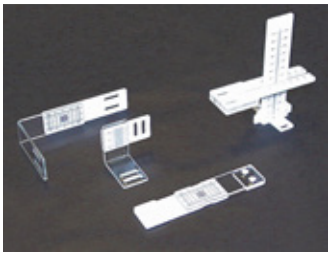
58-C0219/A1
Crack width gauge for walls. Pack of 5.

58-C0219/B1
Crack width gauge for corners.
Set of 2.

58-C0219/C1
Crack width gauge for floors.

58-C0219/D1
Crack width gauge for difference of level.

58-C0219/SET
Complete set of crack width gauges including 58-C0219/A1 (for walls), 58-C0219/B1 (for corners), 58-C0219/C1 (for floors), 58-C0219/D1 (for difference of level) and carrying case. Weight 0.5 kg approx.



58-C0219/A1, C0219/C1, C0219/B1 and C0219/D1

58-C0223
SWING-ARM DEFLECTOMETER

Used for determining the deflection of bridges, ceilings or any suspended structure.
Comprising: three swing arms with clamps for total orientation in any position; three 20 m wire coils; three 30 x 0.01 mm dial gauges; three plumb weights; one carrying case.
Weight: 3 kg (approx.)

Spare parts

58-C0224/1
20 m low thermal deformation steel wire.

Structural inspection and monitoring

FLAT JACKS

The in-situ stress, deformability and resistance characteristics of masonry can be determined by the flat jack method. The test is performed by making a cut to a uniform depth into the mortar courses and inserting the flat jack or a pair of jacks, which are then pressurized to the desired level.

There are two test configurations:
A single flat jack for stress determination;
Two flat jacks for deformability and resistance determination.

The flat jacks have to be pressurized and the strain measured using an analog or digital setup with the following equipment (see Accessories for details):

Analog measurement

- 58-D0568/A Hydraulic pump with gauge
- 58-D0567/RS Connecting hose (to connect the two jacks - for deformability and resistance determination only)
- 58-C0230/30D Mechanical strain gauge

Digital measurement

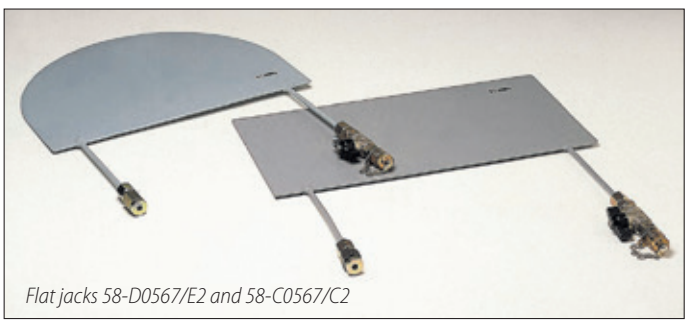
- 58-D0568 Hydraulic pump (without gauge)
- 82-P0050 Pressure transducer
- 82-P0349/ELT Connection cable for pressure transducer
- 58-D0567/RS Connecting hose (to connect the two jacks - for deformability and resistance determination only)
- 58-D0585 Electronic extensometer (one to three)
- 82-P9008/F DATALOG8, 8-channel battery operated data acquisition system (see page 416).

Note: *In order to conveniently fill the testing cut, sets of steel sheets of the same dimensions as the flat jack should be used. See Accessories.*

Weights:
58-D0567/C2, 58-C0567/C20
1.5 kg (approx.)
58-D0567/E2, 58-D0567/E20
1.5 kg (approx.)

Ordering information Flat Jacks

58-D0567/C2
Rectangular flat jack, 400 x 200 x 4.5 mm, 50 bar maximum working pressure.



Flat jacks 58-D0567/E2 and 58-C0567/C2

58-D0567/C20
As above but without valves.

58-D0567/E2
Semi-oval flat jack, 350 x 260 x 4.5 mm,
50 bar maximum working pressure.

58-D0567/E20
As above but without valves.

Accessories

Steel sheets to fill the testing cut
58-D0567/C11
Set of five rectangular steel sheets, 400x200 mm.

58-D0567/E11
Set of five semi-oval steel sheets, 350 x 260 mm.

For applying load

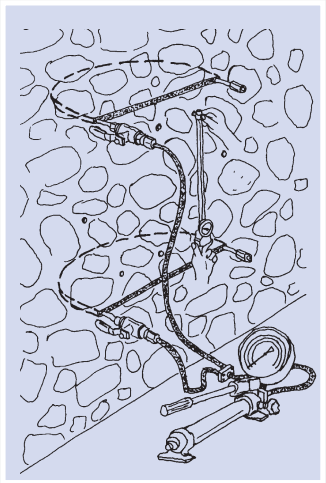
58-D0568/A
Hydraulic hand pump with pressure gauge, 0-100 bar scale. Complete with integral reservoir and 3 m of flexible hose. Weight 8 kg approx.

58-D0568
Hydraulic hand pump, without gauge, complete with integral reservoir and 3 m of flexible hose.

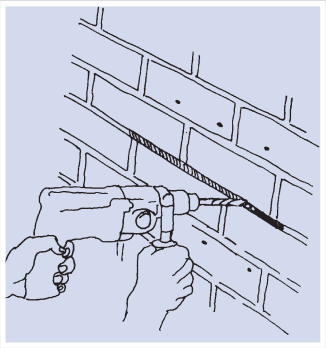
58-D0567/RS
Connecting hose to connect two jacks. (Only required for deformability and resistance determination.)

For strain measurement (analog configuration)

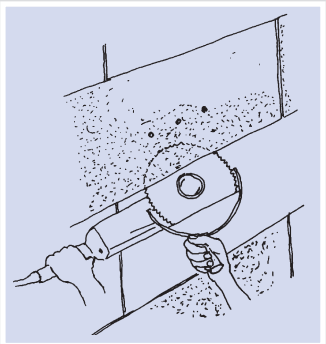
58-C0230/30D
Mechanical strain gauge for the measurement of length variation. Measuring base 300 mm x 5 mm range. Digital gauge, 0.001 mm resolution, output for PC connection (special cable required, see 82-D1261/LINK).



Typical application of two semi-oval flat jacks with mechanical strain gauge for determining the strength and deformability features



Preparation of slots for the flat jacks on a brickwork surface using a simple drill, overlapping holes and completing manually



Preparation of the cut for the semi-oval and circular segment flat jacks using a cutting saw.

For strain and load measurement (digital configuration)

58-D0585
Tubular electronic extensometer (one to three) consisting of a tubular telescopic frame fitted with an electronic displacement sensor. It has to be attached to the wall using normal anchor bolts. Suitable cable is necessary for connection to DATALOG8
Measuring range: 10 mm
Span: 300 mm
Linearity: 0.3%
Weight: 0.2 kg(approx.)

82-P0050
Pressure transducer, 0-50 bar.

82-P0349/ELT
Connection cable for connecting transducer to data logger.

58-D0568/4
Connecting coupling for pressure transducer.

58-D0568/A

82-P9008/F
DATALOG 8, 8 channels stand-alone multipurpose data logger battery operated with rigid carrying case suitable for use in the field.
Featuring:
- 5.7" touchscreen color graphic display
- Communication port: LAN / Ethernet
- Real resolution:131,000 points
- Data storage on removable USB pen drive
- Sampling rate: up to 10 readings per second per channel via USB (up to 500 readings per second per channel via LAN when connected to a PC)
- Excitation (VEXC): from 1 V to 10 V for each couple of channels (up to 4)
- Input signal : 0-10 V; 0-20 mA
- Battery operated: internal rechargeable sealed battery 12V, 7.2 Ah and built-in battery charger 110-230 V, 50-60 Hz, 1 ph. Power cable is included
- Dimensions approx lxdxh [mm]: 265x171x223
- Weight approx. [kg]: 6

82-P9008/ELT
Set of four cables for connecting load cells, pressure transducers, strain gauges, LDT / LVDT / potentiometric type displacement transducers to DATALOG 8 (82-P9008)
Note: *cables P9008/ELT are necessary in addition to 82-P0349/ELT*

Typical application with digital configuration composed with 3 electronic tubular transducers 58-D0585, pump assembly 58-D0568 fitted with pressure transducer 82-P0050, suitable cable P0349/ELT and DATALOG 8 82-P9008 for complete data acquisition.

82-P9008/SOF
DATACOMM 2

Data acquisition software
and LAN cable for PC connection of DATALOG 8 (82-P9008).
- Up to 8 data logger (total 64 channels) can be connected to a single PC creating a modular network (LAN hub is required)
- Free user setting of channel groups (nr. and type of channels)
- Numerical and graphical display of the readings
- Fully customizable multi-diagrams function including multi-channels plotted against the same axes and / or one channel plotted in relation to another
- Data export ASCII format
- Possibility to save and recall different calibration files allowing quick transducers swapping

DATALOG 8, 8 channels battery operated datalogger, in-built battery operated with rigid carrying case suitable for use on field. 5.7" touchscreen color graphic display

DIGITAL INSTRUMENTATION FOR TESTING STRUCTURES

We offer a complete range of instruments to measure the deflection of ceilings, bridges and any suspended structure using modern digital systems. For more detailed information please visit our website.

Digital instrumentation for deflection measurement of structures, complete system with 3 additional measurement elements