

C104-03N
SERVO RESEARCH

HIGH PERFORMANCE SERVO-PLUS SERVO STRAIN
STANDARDS: EN 14488-3, 14488-5, 14651 | ASTM C1609, C1018, C1550

Servo Research is the ultimate Matest control unit which combines the highly reactive Cyber-Plus Progress electronics together with a hydraulic system specifically designed to execute accuracy tests where the highest performances are required.

Its versatility and number of possibilities make this control unit the best choice for R&D activities and research laboratories, perfect to perform and play with test conditions not yet described by any standards.

Fully customizable test ramps
(with suitable accessories)

Firmware and software for FRC tests
already included

Performs tests in load, displacement
and strain rate control

Completely automatic,
no need of PID adjustments
during the test

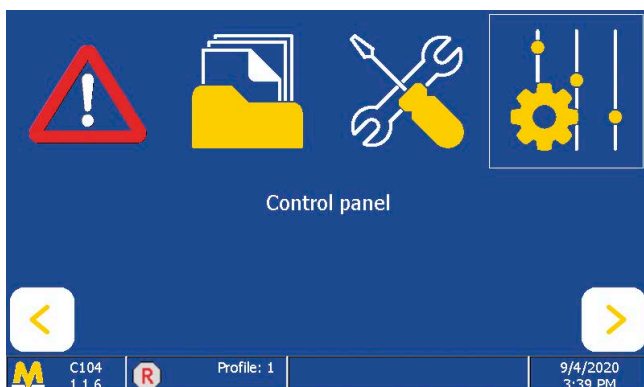
Proportional valve granting prompt
reaction for FRC tests

Fully automatic frames control
expandable to four with
electrovalves

Inverter device for decreasing
noise pollution, heating and
mechanical stress



INTERFACE WITH MODERN ICONS



Show active alarms
Errors or malfunctions



Test archive
Saved test data / results



System configuration
Channels, profiles and parameters setup

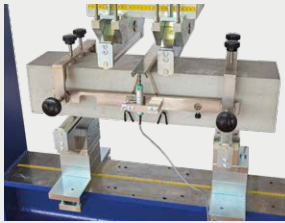


Control panel
Date, time, language and firmware configurations

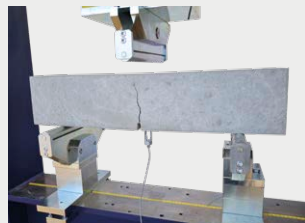
ADVANCED APPLICATIONS

In addition to the common and standard practices, **Servo Research** runs high reactivity tests like those on fiber reinforced concrete (Deflection, CMOD, CTOD, Energy Absorption, Post Failure Behaviour etc.) and **modulus of elasticity** on several types of materials, allowing customization of ramps and cycles (upgrade kit C125-03N) and displaying load, stress, displacement and strain related graphs.

All tests can be run through its compact-PC touch interface, making personal computer not mandatory. An external PC can however be connected (H009-01, order separately) to control all tests from remote.



Deflection (ASTM C1609)



CMOD (EN 14651)



Flexural toughness (ASTM C1550)



Elastic modulus



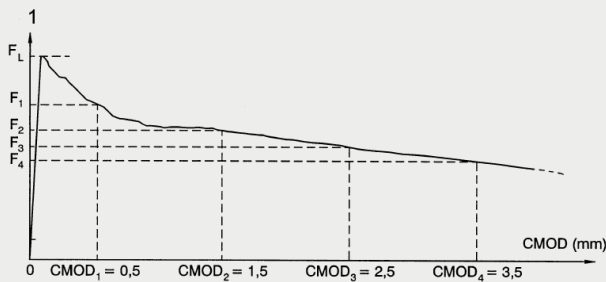
Triaxial tests

CASE STUDIES

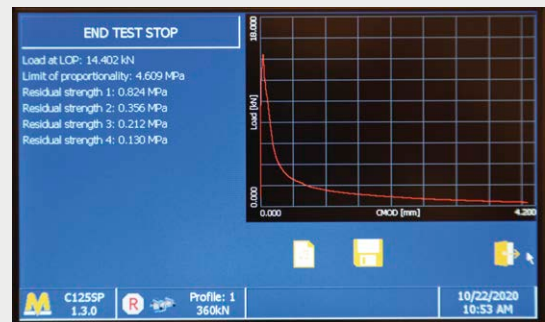
Samples: FRC beams 150x150x700 mm. Class C70/85 with flex value after 28 days 10.2 MPa and with 6 mm PP fibers.

CMOD according to EN 14651

Servo Research is capable of controlling text execution even at very low loads. Measured load at LOP less than 15kN and minimum residual strength is 0.130 MPa.



Typical behavior of synthetic fibers according to EN 14651



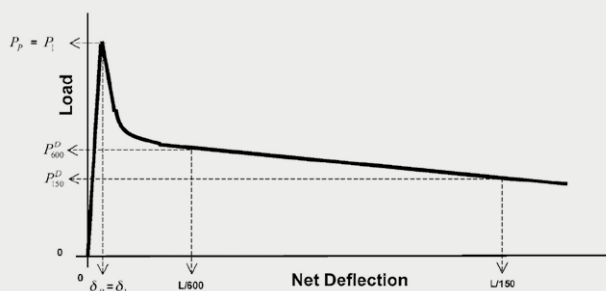
CMOD test results

Deflection according to ASTM C1609

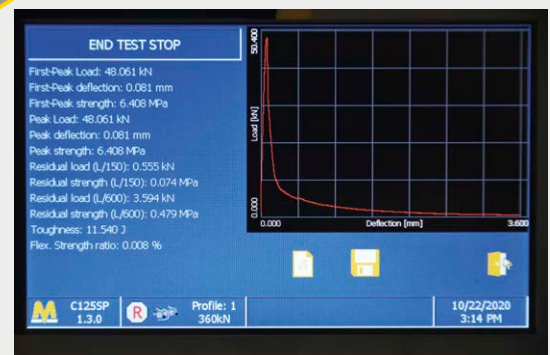
The superior control of our Servo Research allows the measurement of a residual load of 0.555 kN corresponding to 0.074 MPa with high stability and precision.



6 mm PP fibres



Typical behavior of synthetic fibers according to ASTM C1609



Deflection test results

HYDRAULIC SYSTEM SPECIFICATIONS

- Max hydraulic pressure: 700 bar
- 4 pistons pump granting oil supply up to 1.35 l/min
- Servo controlled proportional valve with high control frequency
- Inverter device
- Optional forced ventilation oil cooling system

HARDWARE AND FIRMWARE SPECIFICATIONS

- 16 channels, each one able to control the test and each one suitable to connect load sensors (load cells or pressure transducers), displacement transducers (potentiometric, full bridge, LVDT, magnetostrictive) and deformation transducers (extensometers, strain gauges)
- Each channel effective resolution 24-bit, 16'777'216 divisions
- Closed loop PID control
- Real time adjustment of PID parameters and pace rate during the test (on request)
- Control frequency up to 1 KHz
- Sampling frequency up to 2 kHz
- 7" LCD touch-screen

ANALOG INPUT CHANNELS

- Selectable power voltage for connection of load, displacement, deformation, LVDT, temperature (PT100, PT1000, NTC) transducers and strain gauges
- Data acquisition synchronized on all channels
- Calibration of the 16 channels in divisions (up to 40 steps), with polynomial function which allows the best approximation of readings accuracy over the whole test range

TEST EXECUTION

Compact PC for local control and software for remote control in order to perform the following tests:

- Compression, flexure and splitting
- Elastic modulus and Poisson's Ratio on rocks and concrete (add C125-03N)
- Triaxial test on rocks (add C125-03N and C104MLPP for lateral pressure)
- Toughness of FRC and energy absorption of sprayed concrete tests
- FRC tests: deflection, CMOD, CTOD and flexural test



C096F + C104-03N + C089F + E183F + C115N + C115N3

ACCESSORIES

C115N

AUTOMATIC ELECTROVALVE

Optional valve to be added to C104-03N for automatic selection of the second frame.

C115N3

AUTOMATIC ELECTROVALVE

Optional valve to be added to C104-03N for automatic selection of the third and fourth frame.

C125-03N

Upgrade kit for elastic modulus and Poisson's Ratio tests allowing pace rate control also when releasing the load.

H009-01

PERSONAL COMPUTER

Complete with LCD monitor, keyboard, mouse, connection cables, it is applicable with all the Matest testing machines equipped with digital display measuring system. The PC supply includes the installation and the setting up of the purchased Software.

C127N

ON-BOARD GRAPHIC PRINTER

On-board printer for digital models.

C128

BENCH LASER PRINTER

For the graphic and test certificate printing, applicable on all Matest testing machines with digital display measuring system. The connection is direct by parallel interface also without PC

ORDERING INFO

	FRC TESTS		FRC TESTS ELASTIC MODULUS TESTS	FRC TESTS ELASTIC MODULUS TESTS
			TRIAXIAL TEST	
	ASTM C1609	ASTM C1550	EN 12390-13, EN 13412,	EN 14580
	EN 11039-2		EN 13286-43	
	EN 14651		ASTM C469	ASTM D7012
	EN 14488-3		ISO 6784	
	EN 14488-5		UNI 6556	
			DIN 1048	
			BS 1888:121	ISRM
C104-03N	•	•	•	•
C115N			•	•
C125-03N			•	•
Flexural frames:				
C090-06CF 200 kN, basic model				
C095F 320 kN, advanced model	• (choose a frame)	• (choose a frame)	• (choose a frame)	• (choose a frame)
C096F 360 kN, advanced model				
Compression frames:				
C086, C087, C088, C089 series 2000 up to 5000 kN frames only (check p. 260 of general catalogue)			•	•
C104MLPP (lateral pressure)				•

- Notes:** All accessories for C104-03N must be installed in factory.
Specific accessories must be added basing on each test.
Other suitable compression frames can be connected on request, with the support of Matest product specialists.