Modulus of Rupture (Bending Strength)

Modulus of Rupture Machines measure the flexural breaking load (Bending Strength) of sample bars / ceramic tiles up to 700mm square by applying a three point load to the test piece. The range of Bending Strength machines available cover uses in tableware, sanitaryware, porcelain and ceramic tile manufacturing plants.

Principle of Operation.
The sample piece is placed centrally across the two lower adjustable tension rods set a known distance apart. A third fixed tension rod, set exactly at the centre of the lower tension rods then is driven either up or down (depending on the model) against the sample. The test piece is subject to a three point strain. At the optimum point the test piece will snap, and the maximum finger on the dial gauge will remain at the maximum point. The Modulus of Rupture is then calculated using the standard formula $M = \frac{3PL}{2bd^2}$, where $P$ is the breaking load on the scale, $L$ is the distance between the lower tension rods on which the sample of breadth ($b$) and depth($d$) is supported. The Modulus of Rupture should be calculated by taking an average result from 10 test samples.

Mechanical Modulus of Rupture Machines. (left)
The rise and fall platform is driven by an electric motor, which delivers a constant speed of elevation to the lower platform. The dial gauge on the spring balance is fitted with a maximum finger which indicates the breaking point in kilograms.

This range of machines is suitable for tiles up to 40cm x 40cm

Specifications.
Powered by a 0.18kW motor, for 220/240V single phase supplies.

Product Code.
- 10 kg scale (x 50g) MOR/10
- 50kg scale (x 200g) MOR/50
- 25kg scale (x 100g) MOR/25
- 100kg scale (x 500g) MOR/100

Hydraulic Modulus of Rupture. (right)
The MOR/1-M/E is a manually operated hydraulic system, suitable for carrying out tests on samples with widths ranging from 40 to 300mm, and with a maximum thickness of 20 / 25mm.

Other characteristics:
- Strain gauge cells
- Digital reading with LED display, 5 digits, digit height 12.5mm. membrane keyboard
- Peak value storage (breaking load)
- Acoustic signal when full scale value is reached.
- Power supply: 230V, single phase, 50/60Hz.
- Overall dimensions: 45 x 45 x 70cm, Net weight: 82kg

Options / Catalogue numbers.
- Scale 0 – 50kg, reading 10g 01CI4556/B
- Scale 0 – 500kg, reading 100g 01CI4557/B
- Scale 0 – 1,000kg, reading 100g 01CI4558/B
Modulus of Rupture (Bending Strength)

Machines for Flexural Tests
Indispensable for producers of ceramic floor and wall tiles when checking production processes and finished products. Can also be used by producers of sanitaryware, tableware and technical porcelain; in research labs, in Technical and University labs, and wherever it is necessary to determine the flexural breaking load of a large number of different raw materials, broken down into sizes that can be positioned on the machines.

MOR/5-TS Series Electronic models
Standardized devices for determining the flexural breaking load and modulus of green, or dried, or fired ceramic tiles. In accordance to the UNI EN ISO 10545-4 norm.
Minimum tile size 10x10 cm.

General features:
- Breaking blade operated by an electro-mechanical system
- System for detecting applied load, by means of highly reliable strain gage cells
- Automatic testing cycle
- Automatic tareing
- Digital reading with wide touch screen display, in 5 languages (- I - GB - F - D - E -)
- Selectable measuring unit in Kg or Newton
- Automatic determination of the modulus of rupture in Kg/cm², or Newton/mm² and the breaking effort in Kg, or N.
- 30 reference sizes that can be stored
- Storage of the last 29 tests carried out.
- Descent velocity of the breaking blade adjustable by the control panel, with the possibility of automatically setting up the standardized increase load in accordance to the UNI EN ISO 10545-4 standard, and with display graphic indication.
- Fast approach and fast end of test return.
- Methacrylate frontal protection with safety microswitch
- Output: serial RS 232 C for connection to PC or printer
- Auxiliary output 230V max 4A
- Electric supply: 230V single-phase 50/60Hz
- Scale: 0,5—800 Kg with a reading of 0,01 Kg (10 g) across the full range. (Minimum breaking load that can be obtained, 0,5 Kg)

01CI1513 MOR/5-TS/65 model Suitable to make tests up to the size of 65x65 cm, Supplied with 65cm breaking blade and tile supports
The instrument is standardized up to the size of 65x65 cm. Overall dimensions: 108x85x78 cm, Net weight: 113 Kg

01CI1514/2 MOR/5-TS/95 model Suitable to make tests up to the size of 95x95 cm, Supplied with 60cm breaking blade and tile supports.
The instrument is standardized up to the size of 95x95 cm. Overall dimensions: 142x116x78 cm, Net weight: 183 Kg

01CI1515/2 MOR/5-TS/10 model Suitable to make tests up to the size of 105x125 cm, Supplied with 105cm breaking blade and tile supports.
The instrument is standardized up to the size of 105x125 cm. Overall dimensions: 172x126x78 cm, Net weight: 260 Kg

BLM SERIES (Breaking Load Machine)
The BLM series models are simplified versions of the MOR/5-TS with the following features removed:
- Digital reading with wide touch screen display, in 5 languages (- I - GB - F - D - E -)
- Automatic determination of the modulus of rupture in Kg/cm², or Newton/mm² and the breaking effort in Kg, or N.
- Descent velocity of the breaking blade adjustable by the control panel, with display graphic indication.
- 30 reference sizes that can be stored
- Storage of the last 29 tests carried out.

01CI1530 BLM/650 model Suitable to make tests up to the size of 65x65 cm, Overall dimensions: 102x85x78 cm, Net weight: 113 Kg

01CI1532 BLM/950 model Suitable to make tests up to the size of 95x95 cm, Overall dimensions: 116x136x78 cm, Net weight: 195 Kg