

BENDING RESISTANCE TESTER

79-25 SERIES



TMI Bending Resistance Tester & Optional GraphMaster™ Software

Model 79-25 is a user-friendly microprocessor controlled instrument to determine the bending resistance of paper, paperboard, plastic film, medical tubing, and wire. Bending stiffness is a characteristic associated with the rigidity of a material. This property is related to the modulus of elasticity of the material's stiffness. Our Bending Tester was originally developed to produce a more concise, consistent measurement for the paper industry. This property is now used in a variety of industries including personal products, paper, flexible films, packaging and non-wovens.

Our two-point method secures the specimen into a pneumatic clamp and bends the sample up to 90° against a force transducer.

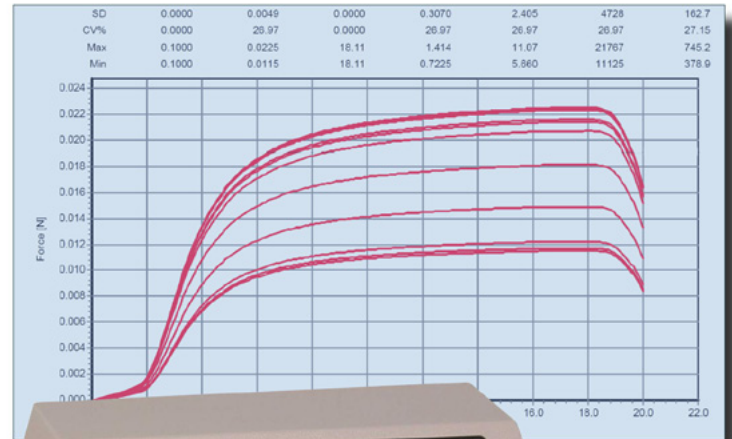
What makes our Bending Resistance instrument so unique is its versatility and accuracy. Bending forces are measured at selectable bending angles from 5.0 to 90°. The instrument is available with a 100 or 1000 gram precision load cell. The advanced data acquisition system senses forces down to 0.5g. Materials can range from 5 to 50mm in length, up to 2.5mm thick.

HARDWARE FEATURES

- Direct sample to load cell contact for accurate measurement
- Easy selection of test parameters from a comprehensive range through a setup menu
- Motorized test length setting
- Pneumatic clamps with fast release provide consistent clamping pressures for fast, repeatable results
- Large, clear display showing peak value and angle
- Load cells are fitted with overload protection
- Direct data output via RS-232 to printer or optional GraphMaster™ analysis software
- Calculates Taber Stiffness, Youngs Modulus, Gurley Stiffness units.
- Can be directly calibrated to traceable national standards

BENEFITS

- Very flexible for performing different types of tests and for different standards.
- Pre-certified weights and sample cutter options
- Ability to add special formulas to meet unique bending stiffness requirements"
- Competitive advantages for accuracy and usability
- Motorized testing and pneumatic clamping eliminates operator influence



^ Optional GraphMaster Software

Optional Sample v Cutter

^ 79-25 Tester

The 79-25 can perform five tests: Score Bend, Score Perforation, Break Force, Taber Stiffness, Bending Resistance, and Spring Back.

GRAPHMASTER™ FEATURES

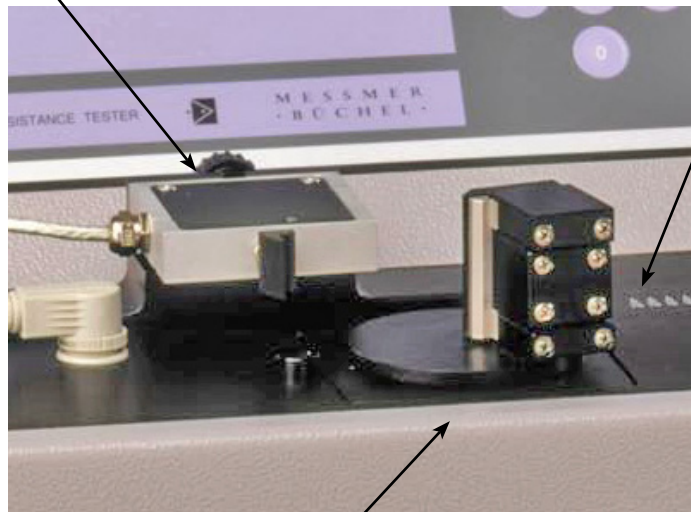
- One click on the Database feature allows the operator to select a favorite format to save critical test information using Microsoft® compatible programs such as Clipboard®, Excel® or other standard file types
- The software automatically captures, graphs and reports force, position and time during a testing sequence.
- A library of calculations is available to report commonly used test results based on international standards
- GraphMaster™ test reports include single and multiple test curves, sample information and statistics
- GraphMaster™ software includes a language database of 8 languages to select; additional languages can be easily added by request

OPERATION DETAILS

The Bending Resistance Tester is an important property designed to determine the force required to deflect a material through a defined angle at a defined bending length. The testing sequence is completely automatic. When the pneumatic clamp is closed the clamp begins to turn at a slow speed until the sample contacts the load cell and a positive force is recorded. At this point, the instrument zeros the measuring electronics and starts to record force, angle and time. The test clamp turns at 5 degrees per second to the selected angle and then returns to the home position. Immediately after the test is finished, the peak angle is displayed and the pneumatic clamp will open. Optional GraphMaster software will also record force, angle and time has the capability to provide a real-time test curve during the measurement for additional analysis and review.

Adjustable bending angles from 5.0 to 90 degrees and a selection of 2 load cells are available: 10 Newton (1000g) or 1000 mN (100 grams) making it possible to evaluate a limitless range of materials and substrates.

Automatic positioning of selectable test lengths: 5, 10, 25 and 50 mm, (0.2, 0.4, 1.0, and 2.0 inches)



Pneumatic sample clamp allows increased productivity and reproducibility. Samples are handled as little as possible. Air pressure provides a consistent clamp force. At the initiation of a test, the sample slowly turns at 2 degrees/sec. As soon as pressure is detected the motor pauses, records the new start position. After zeroing the load cell, it continues with the test sequence, moving the clamp 5 degrees /second

COMPETITIVE BENDING RESISTANCE TESTERS COMPARED TO THE TMI GROUP 79-25

Competitive instruments require careful sample placement into a set of mechanical grips. Sample mishandling can create inconsistent results. With TMI's 79-25, a test specimen is placed into a pneumatic clamp. An air activated clamp provides consistent, repeatable, clamping pressure improving overall accuracy of the test result. Other models which measure bending resistance report a proprietary unit which correlates to a stiffness index. Our instrument can still present test results as an index. In addition, Model 79-25 reports bending resistance results as force values and the instrument can be calibrated traceable standards.

Model 79-25 Bending Resistance tester is designed to meet a variety of standards including TAPPI T-556 and ISO 2493. Competitive instruments required two passes (a measurement to the left and then to the right) and calculate an average force value. Model 79-25 only requires one pass to complete a measurement bending the specimen in one direction. This not only is an improvement of the accuracy of the test result, it also cuts the test time in half. Model 79-25 can perform five tests; Score Bend, Score Perforation Break Force, Taber Stiffness, Bending Resistance, and Spring Back.

Field1 5 user definable fields
 Field2 are provided to allow
 Field3 report comments and
 Field4 searchable database
 Field5 archiving & reporting
 Date Test 2/8/2011
 Time Test 6:47:33 PM

Bending Angle 20 °
 Bending Length 50 mm

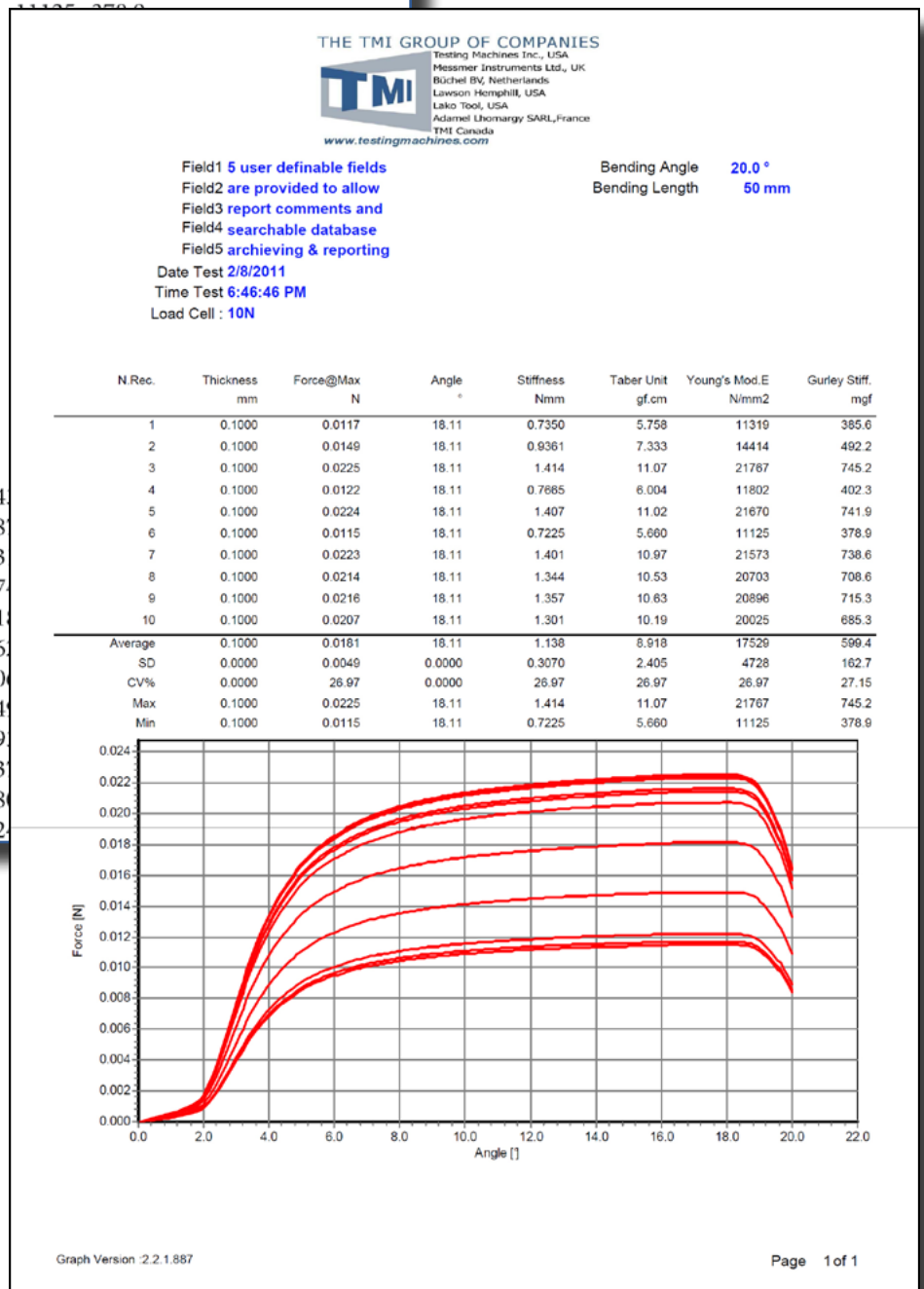
N.	Thickness [mm]	Force@Max [N]	Angle [°]	Stiffness [Nmm]
Taber Unit [gf.cm]	Young's Mod.E [N/mm2]	Gurley Stiff. [mgf]		
1	0.1	0.0117 18.11 0.735 5.758 11319	385.6	
2	0.1	0.0149 18.11 0.9361 7.333 14414	492.2	
3	0.1	0.0225 18.11 1.414 11.07 21767	745.2	
4	0.1	0.0122 18.11 0.7665 6.004 11802	402.3	
5	0.1	0.0224 18.11 1.407 11.02 21670	741.9	
6	0.1	0.0115 18.11 0.7225 5.66 11125	378.9	
7	0.1	0.0223 18.11 1.401 10.97 21573	738.6	
8	0.1	0.0214 18.11 1.344 10.53 20703	708.6	
9	0.1	0.0216 18.11 1.357 10.63 20896	715.3	
10	0.1	0.0207 18.11 1.3 10.19 20025	685.3	

Average	0.1	0.0181 18.11 1.138		
SD	0	0.0049 0 0.307 2.405		
CV%	0	26.97 0 26.97 26.97		
Max	0.1	0.0225 18.11 1.414 11.07		
Min	0.1	0.0115 18.11 0.7225 5.66		

N. Curve	Force	Angle	Time
N	°	sec	
1	0	0	0
1	1.48E-05	0.102805445	0.0024
1	4.55E-05	0.207876574	0.0048
1	7.71E-05	0.311068215	0.0073
1	9.45E-05	0.408235194	0.0097
1	0.000123426	0.495543636	0.0121
1	0.0001442	0.575682232	0.0146
1	0.000163062	0.648325081	0.0170
1	0.000186231	0.713146281	0.0194
1	0.000217345	0.808499639	0.0219
1	0.000248004	0.903195383	0.0243
1	0.000278829	0.997477472	0.0268
1	0.000310442	1.091589861	0.0292

< Raw Data Outputs

✓ Prepared reports show descriptive data, test data, and graphed data — generated using the optional Graphmaster™ materials testing software.



SPECIFICATIONS

Model	79-25-00 Series
Measuring units	Mn, Nmm, Taber
Ranges	0- 1000 mN or 0-10 mN (Please specify)
Min. force sensitivity	0.5mN with 1000mN load cell
Accuracy	+/- 1%
Specimen Width Bend Angle	Up to 38 mm, 4 mm opening 5.0 – 90.0 degrees (selectable in 0.1 steps)
Accuracy	± 0.1 degree
Speed	5°/second
Bending length	Motorized setting with 6 automatic stops
Bending positions	5mm - 10mm - 15mm - 20mm - 25mm and 50mm.
Clamp	Pneumatic operated , 38mm wide with 4mm gap.
Electronic Output	GraphMaster™ compatible RS232 serial data output with 9 pin, printer output and optional analog signal output
Electrical	120 V/60 Hz or 220V/50 Hz
Air connection:	6mm OD plastic hose

Dimensions: Length : 490 mm Width : 425 mm Height : 260 mm Weight : ± 20 kg

Tests Performed	Score Bend Score Perforation Break Force Taber Stiffness Bending Resistance Spring Back.
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OPTIONAL ACCESSORIES

Certified dead weight set to meet ISO requirements
Sample Cutter
Load cell in 1 Newton or 10 Newton (Please specify)
GraphMaster Software
Analog signal output (use for X-Y recorder)

INCLUDED ACCESSORIES

Clear plastic table for dead weight calibration

STANDARDS

ISO 2493
AS/NZ 1301-4535
BS 3748
DIN 53121
SCAN P29
TAPPI T556
Can be directly calibrated to traceable national standards

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