

# L&W Bursting Strength Tester

Lorentzen & Wettre Products | Paper testing



L&W Bursting Strength Tester measures bursting strength (according to Mullen) of paper, paper board, and corrugated board. Furthermore it also measures bursting energy absorption (BEA) and diaphragm-compensated bursting strength. Bursting strength is a traditional measure of paper strength and it is also a test requirement for corrugated board.

## Benefits

- Fast testing cycle for fast feedback to the production
- Auto-start, a photocell detects the presence of a sample and automatically initiates a measurement sequence, thus allowing hands-free operation
- Auto-cycling function permits the continuous cycling of the upper pressure foot to facilitate representative and continuous measurements
- Available with automatic test strip feeder

Measurements are simple to make with the Mullen-type L&W Bursting Strength Tester. There are two versions of the instrument; one for paper, and one for paper board and corrugated board.

## Fast automatic measurements

Measurement starts automatically once a test piece has been placed in the measuring gap. The clamping foot descends, and a bursting strength measurement is made. The sample is then quickly released and is ready for the next measurement at a new position. To maximize the sample measurement rate, the tester uses a minimum of time between the bursts, so that a series of 10 measurements can be done in less than 45 seconds.

The actual measuring time depends of course on the type of paper or paper board being tested. Three different test results can be reported after a single measurement; bursting strength standard, bursting strength compensated, and bursting energy absorption (BEA).

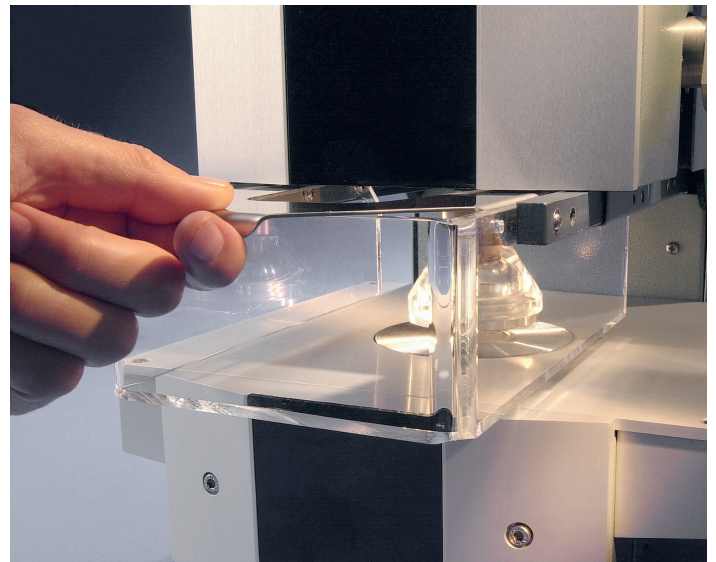
## Bursting strength can be compensated for the stiffness of the diaphragm

For low bursting strength levels, the stiffness of the diaphragm can account for a large portion of the bursting strength value. If desired, the device can also measure, calculate, and report effective bursting strength compensated from the effects of the diaphragm.

Measurement of Bursting Energy Absorption (BEA) is used to determine the energy absorption capability of a material. Strong, flexible paper has higher energy absorption values, while brittle, stiff paper has lower values. L&W Bursting Strength Tester calculates and reports BEA according to the SCAN P 24 standard (applies to paper version).



The operator environment can be customized and in-depth controlled via a connected PC (but a PC is not needed for ordinary operation).



Operator safety is important. Measurements cannot be carried out unless the finger guard is mounted. Clamping pressure may be as much as 600 kg (1340 lb).

### Function control

The ability to confirm that an instrument is properly set up is of outmost importance. That is why the tester allows important parameters such as diaphragm resistance and density to be automatically compared to a set of check values. Once the parameters are compared to the control values a report is generated, indicating the differences between measured parameter values and check values. Measurement results are shown on an easy-to-read display. Individual results and statistical information is reported on the built-in printer. The results can also be transferred to a PC.

### Automatic test strip feeding is more effective

Traditional methods for measuring bursting strength are time consuming for both laboratory technicians and mill staff. For this reason the L&W Bursting Strength Tester comes with a measurement function which both reduces the time an operator needs to spend at the instrument and gives a more reproducible measurement process.

With the new sample feeder function, all the technician needs to do is place the test strip on the measurement table, lower the measurement mechanism, and press the start button. The clamping foot descends, and a bursting strength measurement is taken. The sample is released quickly and automatically fed to the next measurement position. In this way, several measurements can be completed with minimum involvement from the operator, and the measurement results are more reliable.

### DEFINITIONS

#### Bursting strength:

Bursting strength is expressed as the maximum uniformly distributed pressure, applied at right angles to its surface, that a single sample piece can withstand under test conditions. The Burst index is the bursting strength divided by the grammage (ISO 2758-2001).

#### Bursting strength compensated:

The bursting strength value with the diaphragm resistance subtracted.

#### Bursting Energy Absorption (BEA):

The total work done per unit area of a paper or board when it is stretched to rupture. The bursting energy absorption is expressed in J/m<sup>2</sup>.

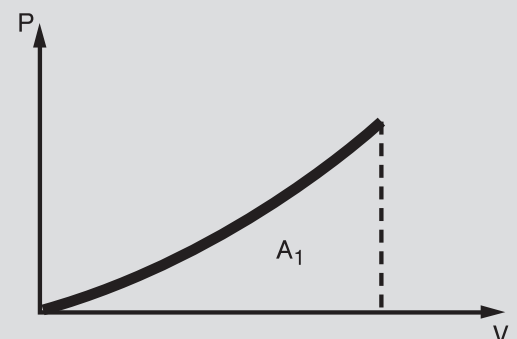
P = hydraulic pressure during measurement

V = volume acting on the test piece

$$BEA = A_1/a_2$$

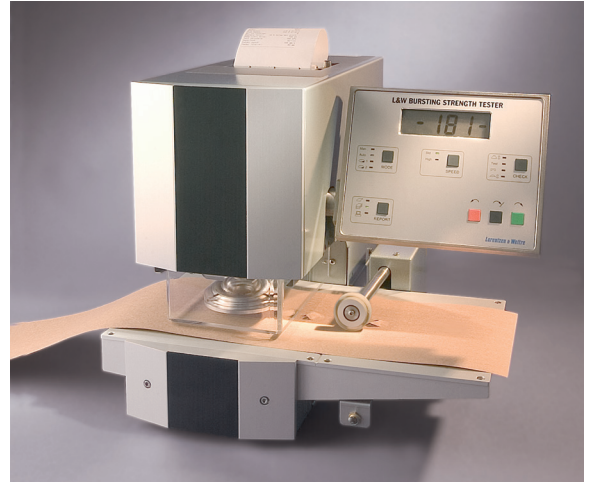
A<sub>1</sub> = area under the pressure/volume curve

a<sub>2</sub> = area of opening in the bursting strength tester





Accessories such as bulge height templates are supplied in a case.



With the sample feeder function, all the operator needs to do is place the test strip on the measurement table, lower the measurement mechanism, and press the start button.

**Technical specifications – L&W Bursting Strength Tester,  
code 180 (for paper)/181 (for board and corrugated board)**

Inclusive	Extra diaphragms, extra glycerol, equipment for bleeding, and refilling the hydraulic system, bulge height template, PC connection cable, PC program for settings and calibration via PC, paper rolls		
Measurement range	code 180: 50–2000 kPa, 7–300 psi, 0.51–20.4 kgf/cm <sup>2</sup> code 181: 250–6000 kPa, 36–900 psi, 2.55–61.2 kgf/cm <sup>2</sup>		
<b>Instrument</b>			
Display and printer	Four significant digits reported		
Pump flow	95 ± 5 ml/min (code 180), 170 ± 15 ml/min (code 181)		
Clamping force	Adjustable between 1000–6000 N (225–1350 lbf)		
Test piece	Thickness: max. 3 mm (0.12 in) (code 180) Thickness: max. 9 mm (0.35 in) (code 181) Step length: 48–500 (1,9–19,5 in) (code 180F) Step length: 63–500 (2,5–19,5 in) (code 181F)		
<b>Results</b>			
Measurement values	- bursting strength standard - bursting strength adjusted to compensate for the stiffness of the diaphragm - bursting energy absorption (BEA) (only for code 180)		
Statistics	- individual values - mean value - standard deviation - coefficient of variation - maximum and minimum values of the series		
<b>Connections</b>			
Data	RS232C - connectable to L&W Autoline Data Acquisition Workstation		
Printer	Parallel		
<b>Installation requirements</b>			
Power	120 W		
Instrument air	>0.5 MPa, (75 psi)		
<b>Dimensions</b>	0.5 × 0.5 × 0.5 m 20 × 20 × 20 in	<b>Volume</b>	0.34 m <sup>3</sup> 12 ft <sup>3</sup>
<b>Net weight</b>	45 kg 100 lb	<b>Gross weight</b>	65 kg 144 lb
<b>Applicable standards</b>			
<b>code 180:</b> ISO 2758, APPITA AS, 1301.403, ASTM D774, CPPA D.8, JIS 8112, SCAN P 24, TAPPI T 403			
<b>code 181:</b> ISO 2759, APPITA AS, 1301.438, FEFCO no. 4, SCAN, P 25, TAPPI T 807, T 810			

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