

emco IBT

Internal Bond Tester

Method for determining the internal bond strength of single- and multi-ply paper and paperboard by **dynamic** delamination according to **TAPPI T569** and **ISO 16260 – Scott Bond method**

Measuring device and application



The **emco IBT Internal Bond Tester** implements a **dynamic** measuring principle for determining the internal bond strength of paper, board and compound materials, while at the same time taking into account the significant influences of sample preparation and climatic effects.

Testing the internal resistance or bond strength of papers and multi-ply materials is only relevant for assessing the material behaviour in the printing process and further processing if a **dynamic** measuring method is used.

Process characteristics

- **Simultaneous preparation of 5 samples (bonding, pressing, cutting)**
- **Electronically selectable contact pressure and pressing time**
- **4 measuring ranges from approx. 52.5 J/m² to 2100 J/m² (including Scott Bond low and high)**
- **Optional display of measurement values in: J/m², ft-lb/sq.in. or mJ/sq.in.**
- **Integrated measurement value storage and database function**
- **Statistical functions (average value, standard deviation, Min and Max)**
- **Monitoring and documentation of climatic conditions**
- **Transfer of measurement data and test parameters to the PC**
- **Menu-guided device check (electronic checking of the pendulum's rest position, automatic pendulum test according to DIN 51 222, and self-calibration)**
- **New with touch display for easy user guidance**

Construction and mode of operation

The construction and mode of operation comply with TAPPI method T569 and ISO 16260. A material sample is fastened between a sample holder and an aluminium angle so that the sample is fixed on both sides with double-sided adhesive tape. The effective area is 25.4 mm x 25.4 mm (1 inch x 1 inch). Depending on the application, different angle surfaces are possible. The adhesive surfaces are prepared under adjustable contact pressure and pressing time.

During the test procedure, the sample holder is clamped pneumatically and the pendulum is released magnetically. Upon impact of the pendulum, the sample is split across its entire surface. The energy extracted from the pendulum correlates with the internal bond of the sample. By changing the pendulum weight, the working capacity of the pendulum can be adjusted to the respective strength of the sample material.

The energy expended for this purpose is measured using two methods:

Potential energy – traditional method

The pendulum deflection reached by the pendulum after deflection of the test angle is measured. The angle difference to the maximum deflection of the pendulum during an empty stroke (zero measurement) is a measure of the energy expended.

Kinetic energy – dynamic method

The change in pendulum speed is measured before and after the test angle is deflected, and the energy applied is determined from the difference.

Technical data

Measuring range:	4 measuring ranges – 210 J/m ² / 525 J/m ² / 1050 J/m ² / 2100 J/m ² (pendulum from approx. 0.25 J to 1.5 J working capacity)
Repeatability:	< ±2 %
Angular resolution:	0.04°
Sample dimension:	25.4 mm x 25.4 mm (1.0" x 1.0")
Number of samples:	5 pieces
Clamping pressure:	up to 1410 kPa (at 6 bar compressed air, 0.1 bar step size)
Press time:	1 - 300 seconds (1 sec step size possible)
Dimensions (WxDxH):	500 mm x 400 mm x 520 mm
Weight:	approx. 38 kg
Power supply:	INPUT: 100 V – 240 V AC; 1.1 A OUTPUT: 24 V DC 1.25 A
Compressed air:	6 bar, filtered, oil free by ISO 8573-1:2001 purity class 6-3-4

*) Technical changes are subject of emco GmbH.

Optional accessories

Measuring range extension MB4	Accessories for internal bond strength up to 4000 J/m ² with smaller measuring area (15 x 25.4 mm ²)
Internal Bond Pendulum Check	Test equipment for inspection of Scott Bond low and high with emco Internal Bond Pendulum Check
Cutting of Samples	emco PZS – Sample Cutting emco MSS – Multi Sample Slitter, width 25.4 mm (1.0")