

emco IBT

Internal Bond Tester

Method to determine the internal bond strength of single and multiply paper and paperboard by dynamic delaminating according to **TAPPI T569** and **ISO 16260 – Scott Bond method**

Measuring Device and Application



The **emco IBT Internal Bond Tester** realize a dynamic measuring principle to determine the internal bond strength of paper, board and compound materials. The significant influences of sample preparation and climatic conditions became consideration in the construction.

The examination of the internal resistance or bond strength of papers and multi-ply materials in the printing or converting processes is only relevant for evaluation by a dynamic measuring method.

Process Characteristics

- Simultaneous preparation of 5 samples (bonding, pressing, cutting)
- Electronically selectable clamping pressure and press time
- 4 measuring ranges from approx. 52.5 J/m^2 to 2100 J/m^2 (including Scott Bond low and high)
- Statistic functions (AVG – average value, DEV – standard deviation)
- Selective indication of measurements in: J/m^2 , ft-lb/sq.in. or mJ/sq.in.
- Monitoring and logging of the climatic conditions
- Transfer of measurement data and test parameters to PC
- Self-calibration
- Electronic check of the rest position of the pendulum
- Automatic pendulum test according to DIN 51 222

Construction and Operating Mode

The construction and the operating mode correspond to TAPPI Method T569 and ISO 16260. A material sample is fastened between a sample holder and an aluminium angle in such a way 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). Deviating angular surfaces are possible depending on the application. The adhesive surfaces are prepared under adjustable contact pressure and pressing time.

In the test sequence, the specimen carrier is pneumatically clamped and the pendulum magnetically released. When the pendulum strikes, the specimen is split over the 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 adapted to the respective strength level of the sample material.

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

Potential energy – traditional method

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

Kinetic energy – dynamic method

The change in the pendulum speed is measured before and after the test angle has been deducted 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 - 60 seconds (1 sec step size)
Dimensions (WxDxH):	500 mm x 400 mm x 520 mm
Weight:	approx. 35 kg
Power supply:	230 V AC ±10 %, 50 Hz 110 V AC ±10 %, 60 Hz
Compressed air:	6 bar, filtered, oil free by ISO 8573-1:2001 purity class 6-3-4

*) Technical changes are subject of emco GmbH.

Accessories – optional

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)
Scott Bond Check	Test equipment for inspection of Scott Bond low and high with emco Scott-Bond-Check
Sample Slitter:	emco PZS – Sample Cutting emco MSS – Multi Sample Slitter, width 25.4 mm (1.0")