

Model 80-20 Scott Type Internal Bond Tester



iBond History

With the introduction of synthetic resins, early papermakers discovered the need to measure internal bonding strength of fibers in paper. In 1957, the first internal bond tester was developed for the paper industry for American Cyanamid to measure and improve fiber bonding strength. The Ibond tester was later commercialized by Precision Scientific for the pulp and paper industry. The current Internal Bond tester (Scott type) manufactured by TMI is based on the original design produced by Precision Scientific Co.

Although numerous mechanical improvements and safety features have been added to the TMI manufactured IBond tester such as automatic sample preparation system which includes pressing and cutting the individual specimens, calibration blocks for pendulum verification and magnetic pendulum release there are still many factors which influence test repeatability.

Factors Affecting Scott Internal Bond Test Results

Adhesive Strength of the Tape Different brands of tape used during sample preparation can increase or decrease the test result. A lower adhesive strength of the tape will absorb energy at impact when the pendulum strikes the Ibond angle and will produce a lower reading due to the energy lost at impact. 3M Brand 410 B tape is an example of a tape which complies to the TAPPI test method T 569 and ISO 16260.

Age of the Tape If the tape used to produce the Ibond test specimen has aged and lost adhesive strength, the test results may decrease. It is suggested to measure a 90-degree peel strength of the tape using a conventional tensile strength or peel testing device following ASTM D 3330. If the peel strength decreases over time, replace with new tape. Tape will begin to lose peel strength after 6 months. It may be necessary to measure and record the peel strength of new tape when it is purchased to insure peel strength is consistent with previously supplied tape.

Density of the Paper Ibond result data of high-density papers show greater variability than a low-density paper. This is due to the high fiber to fiber bonding strength producing results near the maximum measurement range of the instrument. Internal bond strength of low-density paper such as filter paper or recycled board will produce low Ibond numbers and better precision. Glassine paper which has a very smooth surface and high density will have higher bond strength values and increased test result variation.

Pendulum Range in Use Testing the same grade of paper using a higher or lower range pendulum will produce different test results. The data will report a higher reading when testing the same grade of paper using 15 J/m-sq pendulum vs a 10 J/m-sq pendulum. The energy produced by the pendulum in motion at impact on the test specimen influences the test result. For this reason, when comparing Ibond data using different testing instruments, make sure both instruments are using pendulums with the exact same measuring range.

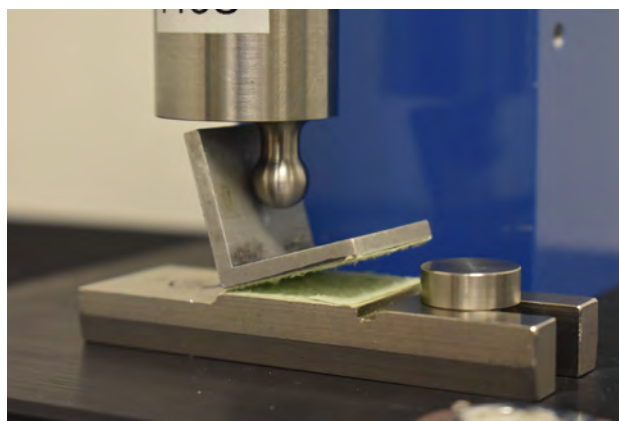
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Condition of the Test Anvils Ibond test anvils over time will age and the test surface where tape is applied will wear and get scratched. A rough or scratched surface will have less surface area and a lower adhesive bond to the metal anvil, this will result in lower Ibond strength. It is important to visually inspect test anvils and replace when needed.

Preparation of the Test Specimen Proper procedures are important to follow when preparing the test specimen for reproducible test results. Changes in compressive pressure and dwell time during the sample penetration phase can influence the test result. Avoid touching the surface of the paper with your fingers, wear gloves if possible. Proper positioning of the test specimen is necessary to ensure that the tape completely covers the paper.



Calibration blocks available for pendulum verification



Specimen separation at impact

Related Products



The TMI 80-30 Ibond Prep Station automatically presses and cuts test specimens to exact requirements providing significant improvements in testing precision.



TMI's 84-96 ZDT Tester measures the tensile strength of a specimen which is sandwiched and compressed between two adhesive tapes.