AUSTRALIAN STANDARD
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BENDTSEN AIR PERMEANCE OF PAPER AND BOARD

This method describes the procedure to be used when measuring the air permeance of paper and board by means of the Bendtsen air permeance tester. The result is expressed in μm/(Pa.s), but there is not exact correlation with results by other test methods based on a similar principle.

The test piece is clamped between the jaws of the air permeance head and compressed air, at a pressure controlled by a manostat weight, is applied to the face of the test piece. Because the pressure at the test piece can vary with air flow rate, this Standard prescribes that the pressure nominally supplied by each manostat weight be correct at an air flow of 100 mL/min. The flow of air escaping through the test piece is indicated on one of the flow meters (Note 6.1). The flow meters are checked by measuring the air flow rate when a specially calibrated capillary tube is connected in place of the air permeance head.

1. APPARATUS

1.1 Bendtsen air permeance/roughness tester, fitted with variable area flow meters for the ranges 5 to 150, 50 to 500, and in some cases 300 to 3000 mL/min, and changeover cocks for selecting the desired range and for selecting between the air permeance and roughness heads. Other flow measuring systems may be used providing it can be demonstrated that the system gives the same results as the variable area flow meters about which this Standard is written. Included with the instrument are three interchangeable manostat weights, which are used to ensure constant air supply pressures of either 0.74 ±0.01, 1.47 ±0.02, or 2.20 ±0.03 kPa at the measuring point and are identified by that number. It has been demonstrated that the accuracy of instruments must be regularly monitored (Reference 7.1). High rates of 'wear' encountered with new floats make it imperative to check the flow meters of all new Bendtsen roughness and air permeance testers during initial use.

A set of glass capillaries, as described in Appendix C, shall be used to verify the flow meters. Because of the highly specialized nature of the work required to adjust the rotameter tubes, calibration of them must be done by properly qualified technicians.

1.2 Sensing head of 10 cm^2 area. An alternate head of 5 cm^2 area should be available, but its use is restricted (Note 6.2).

1.3 Air compressor, complete with filter, to supply an oil and dirt free air flow. Means of stabilizing the air flow must be provided, a length of airline either by itself or in combination with an equalizing flask being suitable. Unstable readings may be due to surges in air flow and this fault can usually be rectified by adjusting the rate of air flow.

Place the compressor in a suitable position where no vibration will be transmitted from it to the instrument. Vibration gives rise to errors.

1.4 Flat rigid plastic plate, at least 1.5 mm thick, or its equivalent, for checking for air leaks in the system.

2. SAMPLE PREPARATION

2.1 Condition the sample according to AS 1301.414 in the standard atmosphere prescribed in AS 1301.415, and conduct the testing in the same atmosphere.

2.2 From the sample select at least 10 test pieces which are undamaged, free from rare manufacturing defects, and at least 75 mm square.

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