



## ROUGHNESS AND POROSITY METER (Bendtsen method) BTD model

To quickly and accurately determine Roughness and Air Porosity on paper and cardboard by the Bendtsen method

---

**TECHLABSYSTEMS**

---

# ROUGHNESS AND AIR POROSITY METER LTD model

## APPLICABLE STANDARDS

ISO 5636 / 8791/2 – SCAN P21 – DIN 53108 / 53120 – BS 4421...

## GENERAL INFORMATION

**Smoothness** or its inverse **roughness** is a property that influences both the appearance and the functionality of the paper. From the point of view of paper printing, it refers to the perfection of a paper's surface and the degree to which its uniformity resembles the surface of flat glass. Paper is said to have a smooth or rough texture, meaning that the irregularities on its surface are small or large. In the paper industry, the quality of the paper's surface or smoothness is often referred to as finishing or satin.

Papers are very different in their relative smoothness, because smoothness depends on other properties of the paper. Short fibers produce a smoother paper than long fibers. The preparation of the pulp and the way in which the fibers are distributed as the paper is formed on the machine fabric, have a great influence on the formation and the smoothness or roughness.

**Bendtsen surface roughness** is calculated from the air flow at the contact surface between a flat surface (glass plate substrate), circular measurement head and a paper or cardboard sample resting on the glass plate.

The air passes through the space between the ground crown of the head and the contact surface of the paper or cardboard sample. Airflow, measured in ml / min, is a sample measurement of surface roughness.

**Air porosity** is defined as the ability of paper to allow a flow of air under pressure to pass through it. It is a property related to the structure of the paper that depends on the number, size, shape and distribution of the pores in a sheet

Paper is a very porous material, as can be seen from its low specific weight, compared to that of cellulose, its main component. The specific weight of paper, from 0.5 to 0.8 g/cm<sup>3</sup>, is considerably less than that of cellulose, of 1.5. Porosity can be defined as the ratio between the volume of the space occupied by air in a paper and its total volume.

The air content, in common papers is usually 50% and can reach up to 70%. This air is found in paper, in 3 ways:

1. Real pores that are openings through the sheet,
2. Superficial pores that are only connected to one of their surfaces
3. Holes that contain air inside the blade.

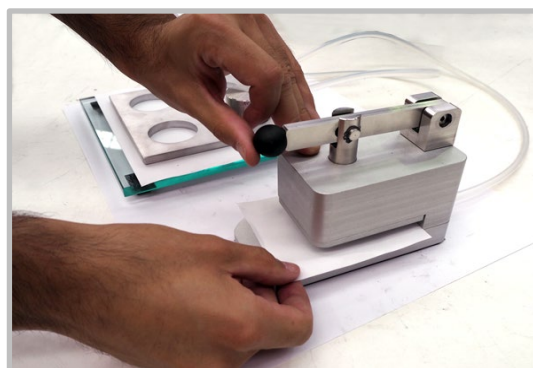
## MEASUREMENT DESCRIPTION

To perform **Bendtsen Roughness** measurements, the paper or cardboard sample is placed on a glass plate (supplied with the equipment), then the smoothness measurement head is carefully placed on the sample, after 4- 5 seconds the value can be read on the Touch Screen digital display

**The Bendtsen Porosity** measurement is measured as the air flow that passes through the sample through a surface of 10 cm<sup>2</sup>, to measure the porosity, the sample is placed in the test area of the porosity measurement head, we press the button closing the jaws and in the same way as in the Smoothness, we can read the Porosity on the Touch Screen digital display corresponding to the air flow that passes through the 10 cm<sup>2</sup> of the sample.



**Roughness Measurement**



**Porosity Measurement**

**NOTE:** The standard supply includes only the head for roughness measurements, the Porosity head is optional and is priced separately.

- Touch Screen digital display and USB data output port
- Easy to use
- Safety of use
- Robust design
- New design of the measuring head, longer life
- No pressure switch is necessary
- 10 cm<sup>2</sup> measuring area
- The flow rate measurement range is 0-5000 ml/minute

**OPCIONAL:**

- **Bendtsen type POROSITY Measuring Head** (Code 10007517)
- **Mini air compressor** (Code 10008123)
- **Air filter** (Code 10006913)  
(water condensation removal) to connect to a local compressed air network

**POWER SUPPLY:** 220 VAC single-phase 50/60Hz

**POWER:** 500 W

**FLOW RATE MEASUREMENT RANGE:** 0-5000 ml/min.

**TESTER DIMENSIONS:** 400x 400 x 250 mm (W x D X H)

**NET WEIGHT:** 25 Kg

**TRANSPORT PACKAGING DIMENSIONS:** 600 x 500 x 450 mm (W x D X H)

**GROSS WEIGHT APPROX.:** 45 Kg

**CONTENTS OF THE STANDARD SUPPLY:**

- \* Roughness and Air Porosity Meter Bendtsen Method model LTD
- \* Roughness measuring head and silicone tube for connection to the equipment
- \* Base glass to support paper samples
- \* Aluminum template for smoothing the paper sample with 4 head cavities