

## Filter papers

### Raw materials and manufacture

For production of the high quality MN filter papers we use cotton linters, refined pulp with a high level of  $\alpha$ -cellulose as well as glass fibres. Cotton linters are short-fibred seed hairs from cotton seeds, which cannot be used for textile purposes, but which are highly suitable for the manufacture of soft and absorbent filter papers.

In addition to cotton linters we use mainly pulp, which is obtained by chemical treatment of plant materials, e.g. coniferous or deciduous wood.

At MACHEREY-NAGEL only the most experienced paper specialists select the raw materials in order to ensure the continuously high quality of our filter papers.

For the manufacturing of MN glass fibre filters we use staple fibres made from borosilicate glass (exception: paper from quartz fibres). With a diameter of 0.5–1.5  $\mu\text{m}$  these glass fibres are considerably thinner than cellulose fibres. One of the most important features of glass fibre filters is their resistance to almost all chemicals (exception e.g. hydrogen fluoride).



### Important technical parameters of filter papers

Parameter	Description
Ash content/ residue on ignition	The ash content is determined in accordance with DIN 54370: 10 g filter paper are weighed after ignition in a platinum crucible at 800 °C. Results are expressed as % of original paper weight.
Dry bursting strength	For determination of the dry bursting strength the paper is clamped over a rubber diaphragm with an area of 10 cm <sup>2</sup> . The strain on the paper is then increased by applying an increasing air pressure, until the paper bursts. The dry bursting strength in accordance with DIN 53113 is stated in KPa.
Tensile strength	For determination of the tensile strength a paper strip (measuring 180 x 15 mm) is subjected to vertical strain by applying increasing weight. The force expended at the moment of tearing represents the tensile strength. Results are expressed in N/15 mm.
Thickness	The thickness of a paper is measured with a touch pressure device. Especially for soft and creped papers it is important that the touch pressure is not too high. Otherwise the papers are compressed and a falsely low thickness is obtained.
Filtration speed	For determination of the filtration speed in accordance with DIN 53137 the duration of flow of 10 mL distilled water through a quadrant-folded, freely suspended filter circle of 12.5 cm diameter is measured. Results are expressed in seconds.
Basis weight	The basis weight is determined for a sample of 10 x 10 cm. It is measured in g/m <sup>2</sup> .
Gurley test	The Gurley test measures the time required for filtration of 100 mL air at a water column pressure of 31 mm. The sample has an area of ¼ sq. inch.
Wet strength	The wet strength of a paper is a measure for the mechanical stability of a paper in a wet or moist condition. For example, it can be determined as the tensile strength or the bursting strength (see above).
Pore size	The retention efficiency of a filter paper is influenced by several factors. Since filter papers are deep-bed filters, one usually refers to a mean particle retention.
Capillary rise according to Klemm	The capillary rise according to Klemm indicates how far a strip of filter paper is moistened in 10 min when vertically dipped with one end into distilled water (20 °C).
Particle retention	Particle retention refers to the efficiency of filter papers in retaining certain precipitates. It is characterised by the permeability of the paper for precipitates of iron(III) oxyhydrate, lead sulfate, calcium oxalate and barium sulfate.