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# Filter Papers
# for the Laboratory and Industry

turning science into solutions


sartorius
QUARTZ MICROFIBER FILTERS, ø 45mm
Q3400--45------Q
0314 Q3400 285434

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# Filter Papers – An Introduction

High-grade filter papers are indispensable for routine work in laboratory and industrial applications. Sartorius supplies you with a broad range of filter papers for myriad filtration tasks and supports you in solving all your filtration challenges.

With this catalog, we invite you to familiarize yourself with our broad product range. Here, you will find typical examples intended to help you quickly select the filter paper that is right for your application.

**Our Product range covers:**

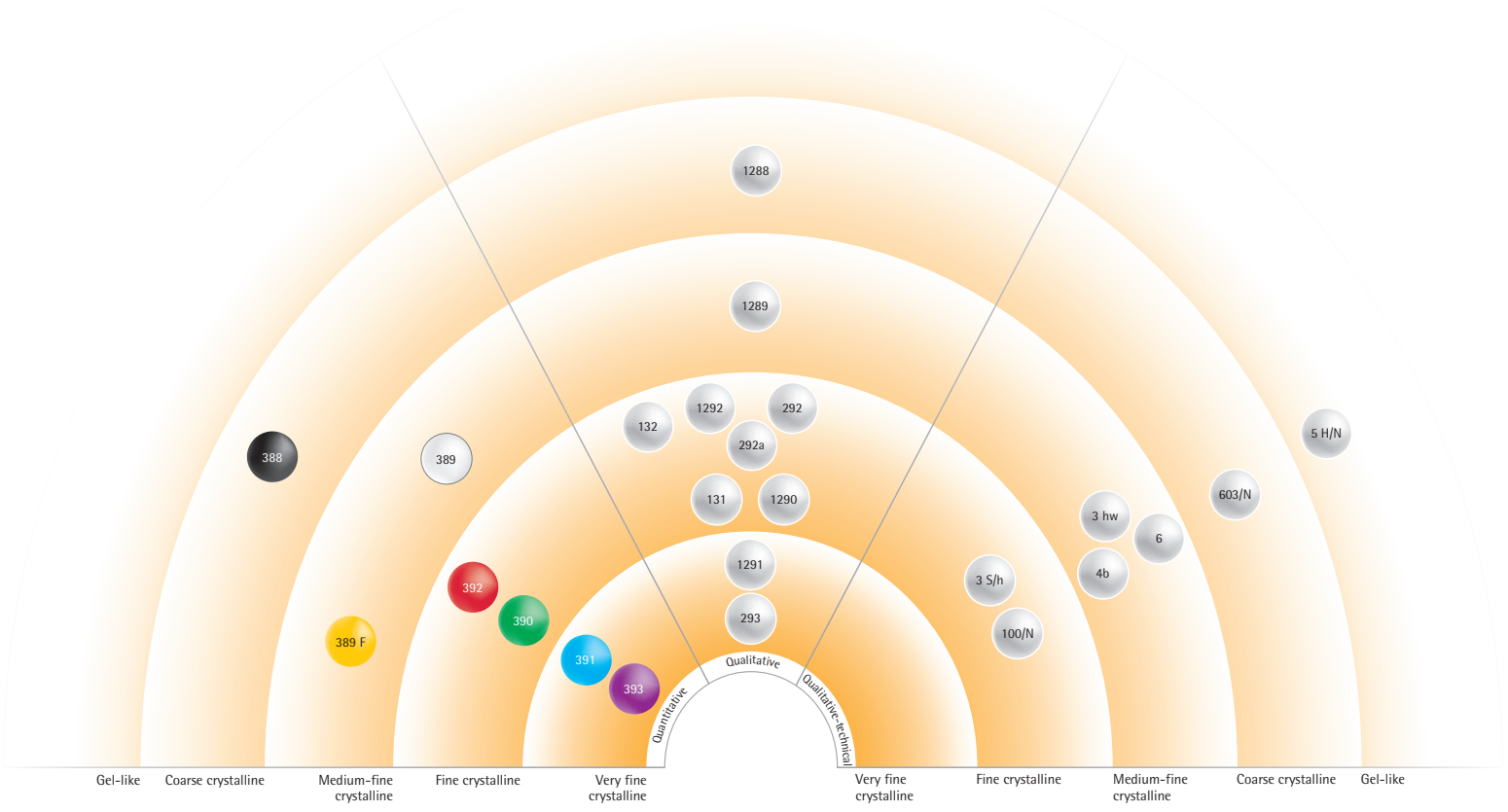
- Quantitative, qualitative filter papers
- Technical papers and boards
- Blotting and chromatography papers
- Glass and quartz microfiber filters
- And many other paper grades for special applications

**Quality Assurance and Quality Control**
Sartorius pays particular attention to continuous in-process quality control; additionally, regular checks and exact analyses of raw material and of each individual finished product assure constant high quality and product uniformity.

The paper mill meets the requirements set by the ISO 9001 quality management system and the ISO 14001 environmental management system.

**How Do Filter Papers Work?**
Filter papers are actually depth filters. Various parameters influence their effectiveness: Mechanical particulate retention, absorption, pH, surface properties, thickness and strength of the filter paper as well as the shape, density and quantity of particles to be retained. The precipitates deposited on the filter form a "cake layer", which – depending on its density – increasingly affects the progress of a filtration run and decisively affects the retention capability. For this reason, it is essential to select the right filter paper to ensure effective filtration. This choice also depends on the filtration method to be used, among other factors. In addition, the amount and properties of the medium to be filtered, the size of the particulate solids to be removed and the required degree of clarification are all decisive in making the right choice.

# Product Overview




## Quantitative Filter Papers

388 **Black dot**
Fast filtering, wide-pore, lose structure, ash-free, wet-strengthened

389 **White dot**
Medium fast filtering, medium- to wide-pore, ash-free, wet-strengthened

389 F **Yellow dot**
Medium fast filtering, medium- to wide-pore, low-fat content, ash-free, wet-strengthened

392 **Red dot**
Medium fast filtering, medium density ash-free, wet-strengthened

390 **Green dot**
Slow filtering, narrow-pore, dense, ash-free, wet-strengthened

391 **Blue dot**
Very slow filtering, fine-pore, very dense, ash-free, wet-strengthened

393 **Purple dot**
Very slow filtering, very fine-pore, very dense, ash-free, wet-strengthened

# Ash-free Filter Papers for Quantitative and Gravimetric Analyses

These filter papers are used for quantitative and gravimetric analyses as well as for pressure or vacuum filtration. They are made out of 100 % cotton linters with an α-cellulose content of > 98 % and are acid-washed to make the papers ashless and achieve high purity.

In gravimetric applications, the cake layer is calcined and the residue quantified. For quantitative analysis of the filtrate, the filter paper must not give off any foreign substances. This guarantees that no test results are falsified. That is why it is important that the filters are ash-free.

For some quantitative analyses, the cake layer has to be mechanically removed from the filter (for example, with a water jet or a spatula). The filter must be wet-strengthened so that it doesn't' break when the cake layer is removed.

## Application Examples

| Application | Grade |
|---|---|
| Determination of ash content | 388 |
| Gravimetric analysis of metals | 388 |
| Analysis of alkaline earth carbonates | 389 |
| Determining the fate content in natural raw materials | 389 F |
| Gravimetric analyses in power plants | 392 |
| Filtration of fine precipitates | 390 |
| Filtration of fine-grained precipitates | 391, 393 |
| Blaine Test for cement (EN 196-6:2010) | 392, 391 |

- Made of 100 % cotton linters
- Ash-free (Ash content ≤ 0,01 % according to DIN 54370)
- Wet-strengthened
- Color-coded box for easy selection
- Supplied in rolls, sheets, discs and folded filters

## Technical Specifications

| Grade | Weight ($g/m^2$)* | Thickness (mm)* | Particle retention (µm) | Filtration (s)* | Precipitates | Properties |
|---|---|---|---|---|---|---|
| 388 | 84 | 0.21 | 12 – 15 | 10 | Coarse crystalline | Wide-pore, lose structure, fast filtering |
| 389 | 84 | 0.19 | 8 – 12 | 20 | Medium-fine crystalline | Medium- to wide-pore, medium fast filtering |
| 389 F | 84 | 0.19 | 8 – 12 | 20 | Medium-fine crystalline | Medium- to wide-pore, medium fast filtering |
| 392 | 84 | 0.17 | 5 – 8 | 50 | Fine crystalline | Medium dense, medium fast filtering |
| 390 | 84 | 0.16 | 3 – 5 | 100 | Fine crystalline | Narrow-pore, dense, slow filtering |
| 391 | 84 | 0.15 | 2 – 3 | 180 | Very fine crystalline | Fine-pore, dense, very slow filtering |
| 393 | 100 | 0.17 | 1 | 300 | Very fine crystalline | Very fine-pore, very dense, very slow filtering |

* See test methods, page 35

## Ordering Information

**Filter Discs, 100 pieces**

| ∅ in mm | Grade 388 | Grade 389 | Grade 389 F | Grade 390 | Grade 391 | Grade 392 | Grade 393 |
|---|---|---|---|---|---|---|---|
| 55 | FT-3-101-055 | FT-3-102-055 | FT-3-112-055 | FT-3-103-055 | FT-3-104-055 | FT-3-105-055 | FT-3-127-055 |
| 70 | FT-3-101-070 | FT-3-102-070 | | FT-3-103-070 | FT-3-104-070 | FT-3-105-070 | FT-3-127-070 |
| 90 | FT-3-101-090 | FT-3-102-090 | FT-3-112-090 | FT-3-103-090 | FT-3-104-090 | FT-3-105-090 | FT-3-127-090 |
| 110 | FT-3-101-110 | FT-3-102-110 | FT-3-112-110 | FT-3-103-110 | FT-3-104-110 | FT-3-105-110 | FT-3-127-110 |
| 125 | FT-3-101-125 | FT-3-102-125 | FT-3-112-125 | FT-3-103-125 | FT-3-104-125 | FT-3-105-125 | FT-3-127-125 |
| 150 | FT-3-101-150 | FT-3-102-150 | FT-3-112-150 | FT-3-103-150 | FT-3-104-150 | FT-3-105-150 | FT-3-127-150 |
| 185 | FT-3-101-185 | FT-3-102-185 | FT-3-112-185 | FT-3-103-185 | FT-3-104-185 | FT-3-105-185 | FT-3-127-185 |
| 240 | FT-3-101-240 | FT-3-102-240 | | FT-3-103-240 | FT-3-104-240 | FT-3-105-240 | FT-3-127-240 |

**Folded Filters, 100 pieces**

| ∅ in mm | Grade 388 | Grade 389 | Grade 389 F | Grade 390 | Grade 391 | Grade 392 |
|---|---|---|---|---|---|---|
| 110 | FT-4-101-110 | FT-4-102-110 | | FT-4-103-110 | FT-4-104-110 | FT-4-105-110 |
| 125 | FT-4-101-125 | FT-4-102-125 | | FT-4-103-125 | FT-4-104-125 | FT-4-105-125 |
| 150 | FT-4-101-150 | FT-4-102-150 | | FT-4-103-150 | FT-4-104-150 | FT-4-105-150 |
| 185 | FT-4-101-185 | FT-4-102-185 | FT-4-112-185 | FT-4-103-185 | FT-4-104-185 | FT-4-105-185 |
| 240 | FT-4-101-240 | FT-4-102-240 | | | FT-4-104-240 | |

**Sheets in 580 × 580 mm, 100 pieces**

| Grade 388 | Grade 389 | Grade 390 | Grade 391 | Grade 392 | Grade 393 |
|---|---|---|---|---|---|
| FT-2-101-580580 | FT-2-102-580580 | FT-2-103-580580 | FT-2-104-580580 | FT-2-105-580580 | FT-2-127-580580 |

Other dimensions are available on request

# Wet-strengthened Filter Papers for Qualitative Analyses

These qualitative filter papers are essentially used for analytical purposes and routine analyses, whenever no gravimetric analyses are required. They are wet-strengthened and can be used for pressure and vacuum filtration. They are made of refined pulp and linters with an > 95% α-cellulose content, are very pure with an ash content ≤ 0.1%.

## Application Examples

| Application | Grade |
|---|---|
| Must analysis | 1288 |
| Routine filtration for malt analysis | 1289 |
| Rapid filtration of fine precipitates | 1292 |
| Analysis of coffee extracts | 1290 |
| Tannin solutions | 1291 |
| Clarification of wine | 293 |

- Made of refined pulp and cotton linters with an > 95% α-cellulose content,
- Ash content ≤ 0,1% according to DIN 54370
- Wet-strengthened
- Supplied in rolls, sheets, discs and folded filters

## Technical Specifications

| Grade | Weight ($g/m^2$)* | Thickness (mm)* | Particle retention (µm) | Filtration (s)* | Precipitates | Properties |
|---|---|---|---|---|---|---|
| 1288 | 84 | 0.21 | 12 – 15 | 10 | Coarse crystalline | Wide-pore, lose structure, fast filtering |
| 1289 | 84 | 0.21 | 8 – 12 | 20 | Medium-fine crystalline | Medium- to wide-pore, medium fast filtering |
| 1292 | 84 | 0.17 | 5 – 8 | 50 | Fine crystalline | Medium dense, medium fast filtering |
| 1290 | 84 | 0.15 | 3 – 5 | 100 | Fine crystalline | Narrow-pore, dense, slow filtering |
| 1291 | 84 | 0.15 | 2 – 3 | 180 | Very fine crystalline | Fine-pore, dense very slow filtering |
| 293 | 80 | 0.15 | 1 – 2 | 300 | Very fine crystalline | Very fine-pore, very dense very slow filtering |

* See test methods, page 35

## Ordering Information

**Filter Discs, 100 pieces**

| ∅ in mm | Grade 1288 | Grade 1289 | Grade 1290 | Grade 1291 | Grade 1292 | Grade 293 |
|---|---|---|---|---|---|---|
| 55 | FT-3-206-055 | FT-3-207-055 | FT-3-208-055 | FT-3-209-055 | FT-3-210-055 | FT-3-211-055 |
| 70 | FT-3-206-070 | FT-3-207-070 | FT-3-208-070 | FT-3-209-070 | FT-3-210-070 | FT-3-211-070 |
| 90 | FT-3-206-090 | FT-3-207-090 | FT-3-208-090 | FT-3-209-090 | FT-3-210-090 | FT-3-211-090 |
| 110 | FT-3-206-110 | FT-3-207-110 | FT-3-208-110 | FT-3-209-110 | FT-3-210-110 | FT-3-211-110 |
| 125 | FT-3-206-125 | FT-3-207-125 | FT-3-208-125 | FT-3-209-125 | FT-3-210-125 | FT-3-211-125 |
| 150 | FT-3-206-150 | FT-3-207-150 | FT-3-208-150 | FT-3-209-150 | FT-3-210-150 | FT-3-211-150 |
| 185 | FT-3-206-185 | FT-3-207-185 | FT-3-208-185 | FT-3-209-185 | FT-3-210-185 | FT-3-211-185 |
| 240 | FT-3-206-240 | FT-3-207-240 | FT-3-208-240 | FT-3-209-240 | FT-3-210-240 | |

**Folded Filters, 100 pieces**

| ∅ in mm | Grade 1288 | Grade 1289 | Grade 1290 | Grade 1291 | Grade 1292 | Grade 293 |
|---|---|---|---|---|---|---|
| 110 | FT-4-206-110 | FT-4-207-110 | FT-4-208-110 | FT-4-209-110 | FT-4-210-110 | |
| 125 | FT-4-206-125 | FT-4-207-125 | FT-4-208-125 | FT-4-209-125 | FT-4-210-125 | FT-4-211-125 |
| 150 | FT-4-206-150 | FT-4-207-150 | FT-4-208-150 | FT-4-209-150 | FT-4-210-150 | FT-4-211-150 |
| 185 | FT-4-206-185 | FT-4-207-185 | FT-4-208-185 | FT-4-209-185 | FT-4-210-185 | FT-4-210-185 |
| 240 | FT-4-206-240 | FT-4-207-240 | FT-4-208-240 | FT-4-209-240 | FT-4-210-240 | FT-4-211-240 |

**Sheets in 580 × 580 mm, 100 pieces**

| Grade 1288 | Grade 1289 | Grade 1290 | Grade 1291 | Grade 1292 | Grade 293 |
|---|---|---|---|---|---|
| FT-2-206-580580 | FT-2-207-580580 | FT-2-208-580580 | FT-2-209-580580 | FT-2-210-580580 | FT-2-211-580580 |

Other dimensions are available on request

# High-Purity Filter Papers for Qualitative Analyses

These paper grades are used for analytical purposes that require a low ash content. Grades 292 and 292a are especially suitable for soil analyses because they are low in nitrogen. For phosphate or sodium determination, we recommend grades 131 and 132.

## Application Examples

| Application | Grade |
|---|---|
| Malt filtration according to EBC standards | 292 |
| Determination of nitrogen content in soils | 292, 292a |
| Determination of phosphate and sodium content in soils | 131, 132 |

- Pure cotton linters or cotton linters with refined pulp
- No additives, such as wet-strengthening agents
- Supplied in rolls, sheets, discs and folded filters

## Technical Specifications

| Grade | Weight ($g/m^2$)* | Thickness (mm)* | Particle retention (µm) | Filtration (s)* | Material |
|---|---|---|---|---|---|
| 292 | 87 | 0.18 | 5 – 8 | 45 | Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370 |
| 292a | 97 | 0.19 | 4 – 7 | 60 | Cotton linters, low-nitrogen and nitrates, ash content ≤ 0.06% according to DIN 54370 |
| 132 | 80 | 0.17 | 5 – 7 | 55 | Cotton linters and refined pulp, low-phosphate and low-potassium, ash content < 0.02% according to DIN 54370 |
| 131 | 80 | 0.16 | 3 – 5 | 100 | Cotton linters and refined pulp, low-phosphate and low-potassium, ash content < 0.02% according to DIN 54370 |

* See test methods, page 35

## Ordering Information

**Filter Discs, 100 pieces**

| ∅ in mm | Grade 131 | Grade 132 | Grade 292 | Grade 292a |
|---|---|---|---|---|
| 55 | | FT-3-329-055 | FT-3-205-055 | FT-3-215-055 |
| 70 | | FT-3-329-070 | FT-3-205-070 | FT-3-215-070 |
| 90 | | FT-3-329-090 | FT-3-205-090 | FT-3-215-090 |
| 110 | | FT-3-329-110 | FT-3-205-110 | FT-3-215-110 |
| 125 | FT-3-351-125 | FT-3-329-125 | FT-3-205-125 | FT-3-215-125 |
| 150 | | FT-3-329-150 | FT-3-205-150 | FT-3-215-150 |
| 185 | | FT-3-329-185 | FT-3-205-185 | FT-3-215-185 |
| 240 | | FT-3-329-240 | FT-3-205-240 | FT-3-215-240 |

**Folded Filters, 100 pieces**

| ∅ in mm | Grade 131 | Grade 132 | Grade 292 | Grade 292a |
|---|---|---|---|---|
| 110 | FT-4-351-110 | FT-4-329-110 | FT-4-205-110 | FT-4-215-110 |
| 125 | FT-4-351-125 | FT-4-329-125 | FT-4-205-125 | FT-4-215-125 |
| 150 | FT-4-351-150 | FT-4-329-150 | FT-4-205-150 | FT-4-215-150 |
| 185 | FT-4-351-185 | FT-4-329-185 | FT-4-205-185 | FT-4-215-185 |
| 240 | | FT-4-329-240 | FT-4-205-240 | FT-4-215-240 |

**Sheets in 580 × 580 mm, 100 pieces**

| Grade 292 | Grade 292a |
|---|---|
| FT-2-205-580580 | FT-2-215-580580 |

Other dimensions are available on request

# Smooth Filter Papers for Qualitative & Technical Analyses

These filter papers are used for routine analyses like clarification, determination of substances, but also as discs with a center hole for technical applications. Grades with a wet burst resistance > 30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration. White and bright particles can be easily detected with the black paper grade 918, due to the color contrast for example for the detection of fluorine or silicon in water or the detection of mycelium in mildews.

## Application Examples

| Application | Grade |
|---|---|
| Routine work in the lab | 3 hw |
| Degassing beer before analysis | 6 |
| Determination of the sugar content | 100/N |
| Clarification of clear or dyed liquids | 3 m/N |
| Water Absorption test for mortar according to EN 1015-18 | 3 S/h |
| Durum wheat flour and semolina – Determination of yellow pigment content (ISO 11052:1994) | 918 |
| Clarification and brightening of dull and dark urines | 69 k |
| Polarimetric sugar determination | 69 k |

- Made of refined pulp and cotton linters with an > 95% α-cellulose content
- Ash content between 0.1 – 0.15% (grade 100/N < 0.1%)
- Wet-strengthened
- Supplied in rolls, sheets, discs and folded filters as well as customer-specific cuts

## Technical Specifications

| Grade | Weight ($g/m^2$)* | Thickness (mm)* | Filtration (s)* | Particle Retention (µm) | Wet burst resistance (kPa)* | Properties |
|---|---|---|---|---|---|---|
| 10 | 120 | 0.33 | 8 | 11 – 16 | 30 | Fast filtering, wide-pore |
| 6 | 80 | 0.17 | 15 | 10 – 13 | 30 | Fast filtering |
| 3 w | 65 | 0.14 | 15 | 9 – 13 | 15 | Medium fast filtering |
| 3 hw | 65 | 0.14 | 20 | 8 – 12 | 40 | Medium fast filtering |
| C 140 | 140 | 0.30 | 20 | 7 – 11 | > 50 | Medium fast filtering |
| 4 b | 75 | 0.15 | 22 | 8 – 12 | 30 | Medium fast filtering |
| 3 m/N | 65 | 0.14 | 30 | 7 – 10 | 30 | Medium fast filtering |
| 50 S | 120 | 0.22 | 30 | 6 – 10 | 20 | Medium fast filtering |
| 100/N | 85 | 0.18 | 30 | 6 – 8 | 80 | Medium fast filtering, low ammonium, potassium & sodium content |
| 3 h | 65 | 0.13 | 35 | 6 – 9 | 15 | Medium fast to slow filtering |
| 918 | 85 | 0.17 | 45 | 8 – 10 | | Medium fast to slow filtering, black paper |
| 460/N | 90 | 0.17 | 50 | 3 – 4 | 30 | Medium fast to slow filtering |
| 3 S/h | 200 | 0.36 | 55 | 5 – 7 | 15 | Medium fast to slow filtering, narrow-pore |
| 69 k | 155 | 0.36 | 65 | 7 – 9 | 20 | Slow filtering, narrow-pore, black activated charcoal paper |

* See test methods, page 35

# Ordering Information

## Filter Discs

| ∅ in mm | Grade 10 (50 pieces) | Grade 100/N (100 pieces) | Grade 3 h (100 pieces) | Grade 3 hw (100 pieces) | Grade 3 m/N (100 pieces) | Grade 3 S/h (50 pieces) |
|---|---|---|---|---|---|---|
| 55 | FT-3-352-055 | FT-3-328-055 | FT-3-302-055 | FT-3-303-055 | FT-3-305-055 | FT-3-307-055 |
| 70 | FT-3-352-070 | FT-3-328-070 | FT-3-302-070 | FT-3-303-070 | FT-3-305-070 | FT-3-307-070 |
| 90 | FT-3-352-090 | FT-3-328-090 | FT-3-302-090 | FT-3-303-090 | FT-3-305-090 | FT-3-307-090 |
| 110 | FT-3-352-110 | FT-3-328-110 | FT-3-302-110 | FT-3-303-110 | FT-3-305-110 | FT-3-307-110 |
| 125 | FT-3-352-125 | FT-3-328-125 | FT-3-302-125 | FT-3-303-125 | FT-3-305-125 | FT-3-307-125 |
| 150 | FT-3-352-150 | FT-3-328-150 | FT-3-302-150 | FT-3-303-150 | FT-3-305-150 | FT-3-307-150 |
| 185 | FT-3-352-185 | FT-3-328-185 | FT-3-302-185 | FT-3-303-185 | FT-3-305-185 | FT-3-307-185 |
| 240 | FT-3-352-240 | FT-3-328-240 | FT-3-302-240 | FT-3-303-240 | FT-3-305-240 | FT-3-307-240 |

| ∅ in mm | Grade 3 w (100 pieces) | Grade 4 b (100 pieces) | Grade 6 (100 pieces) | Grade 69 k (100 pieces) | Grade 918 (100 pieces) | Grade C 140 (50 pieces) |
|---|---|---|---|---|---|---|
| 55 | FT-3-308-055 | FT-3-309-055 | FT-3-312-055 | | FT-3-607-055 | |
| 70 | FT-3-308-070 | FT-3-309-070 | FT-3-312-070 | FT-3-326-070 | | |
| 90 | FT-3-308-090 | FT-3-309-090 | FT-3-312-090 | FT-3-326-090 | FT-3-607-090 | FT-3-356-090 |
| 110 | FT-3-308-110 | FT-3-309-110 | FT-3-312-110 | FT-3-326-110 | | |
| 125 | FT-3-308-125 | FT-3-309-125 | FT-3-312-125 | FT-3-326-125 | | |
| 150 | FT-3-308-150 | FT-3-309-150 | FT-3-312-150 | FT-3-326-150 | | |
| 185 | FT-3-308-185 | FT-3-309-185 | FT-3-312-185 | FT-3-326-185 | | FT-3-356-185 |
| 240 | FT-3-308-240 | FT-3-309-240 | FT-3-312-240 | | | |

## Folded Filters, 100 pieces

| ∅ in mm | Grade 10 | Grade 100/N | Grade 3 h | Grade 3 hw | Grade 3 m/N |
|---|---|---|---|---|---|
| 110 | FT-4-352-110 | | FT-4-302-110 | FT-4-303-110 | FT-4-305-110 |
| 125 | FT-4-352-125 | | FT-4-302-125 | FT-4-303-125 | FT-4-305-125 |
| 150 | FT-4-352-150 | FT-4-328-150 | FT-4-302-150 | FT-4-303-150 | FT-4-305-150 |
| 185 | FT-4-352-185 | | FT-4-302-185 | FT-4-303-185 | FT-4-305-185 |
| 240 | FT-4-352-240 | FT-4-328-240 | FT-4-302-240 | FT-4-303-240 | FT-4-305-240 |
| 270 | FT-4-352-270 | FT-4-328-270 | FT-4-302-270 | FT-4-303-270 | FT-4-305-270 |
| 320 | FT-4-352-320 | FT-4-328-320 | FT-4-302-320 | FT-4-303-320 | FT-4-305-320 |
| 385 | FT-4-352-385 | | FT-4-302-385 | FT-4-303-385 | FT-4-305-385 |

| ∅ in mm | Grade 3 S/h | Grade 3 w | Grade 4 b | Grade 6 | Grade C 140 |
|---|---|---|---|---|---|
| 110 | | FT-4-308-110 | FT-4-309-110 | FT-4-312-110 | FT-4-356-110 |
| 125 | | FT-4-308-125 | FT-4-309-125 | FT-4-312-125 | FT-4-356-125 |
| 150 | | FT-4-308-150 | FT-4-309-150 | FT-4-312-150 | FT-4-356-150 |
| 185 | | FT-4-308-185 | FT-4-309-185 | FT-4-312-185 | FT-4-356-185 |
| 240 | FT-4-307-240 | FT-4-308-240 | FT-4-309-240 | FT-4-312-240 | FT-4-356-240 |
| 270 | FT-4-307-270 | FT-4-308-270 | FT-4-309-270 | FT-4-312-270 | FT-4-356-270 |
| 320 | FT-4-307-320 | FT-4-308-320 | FT-4-309-320 | FT-4-312-320 | FT-4-356-320 |
| 385 | | FT-4-308-385 | FT-4-309-385 | FT-4-312-385 | |

## Sheets in 580 × 580 mm, 100 pieces

| Grade 10 | Grade 100/N | Grade 3 h | Grade 3 hw | Grade 3 m/N |
|---|---|---|---|---|
| FT-2-352-580580 | FT-2-328-580580 | FT-2-302-580580 | FT-2-303-580580 | FT-2-305-580580 |

| Grade 3 S/h | Grade 3 w | Grade 4 b | Grade 460/N | Grade 6 |
|---|---|---|---|---|
| FT-2-307-580580 | FT-2-308-580580 | FT-2-309-580580 | FT-2-332-580580 | FT-2-312-580580 |

Other dimensions are available on request

# Crêped Filter Papers
## for Qualitative & Technical Analyses

Crêped filter papers are mostly used for the rapid filtration of relatively coarse precipitates; because of their crêped structure they provide a larger filtration area than smooth filter papers. Grades with a wet burst resistance > 30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration. Below you will find an overview of the most commonly used grades.

### Application Examples

| Application | Grade |
|---|---|
| Cooking oils | 39/N |
| Vinegar filtration | 39/N |
| Fine filtration of tar | 17/N |
| Galvanic baths | 34/N |
| Prefilters for transformer oil | 6 S/N |
| Filtration of sugar solutions | 603/N |
| Filtration of essential oils | 5 H/N |
| Juice filtration | 67/N |

- Made of refined pulp and cotton linters with an > 95% α-cellulose content
- Ash content between 0.1 – 0.15%
- Wet-strengthened
- Supplied in rolls, sheets, discs and folded filters as well as customer-specific cuts

### Technical Specifications

| Grade | Weight ($g/m^2$)* | Thickness (mm)* | Filtration (s)* | Wet burst resistance (kPa)* | Air resistance (mbar)* | Properties |
|---|---|---|---|---|---|---|
| 5 H/N | 85 | 0.28 | 3 | ≥ 40 | | Very fast filtering, wide-pore |
| 34/N | 60 | 0.20 | 4 | 40 | 1.5 | Very fast filtering |
| 37/N | 135 | 0.50 | 4 | ≥ 70 | 1.9 | Very fast filtering, wide-pore |
| FT 55 | 55 | 0.15 | 5 | 20 | | Very fast filtering |
| 1602/N | 70 | 0.23 | 5 | ≥ 30 | | Very fast filtering |
| 39/N | 180 | 0.65 | 5 | 90 | 2.5 | Very fast filtering, wide-pore |
| 39/N | 300 | 0.95 | 5 | 120 | 2.5 | Very fast filtering, wide-pore |
| 603/N | 75 | 0.25 | 8 | ≥ 50 | | Fast filtering |
| 6 S/N | 145 | 0.55 | 12 | ≥ 90 | | Medium fast filtering |
| 601/N | 65 | 0.19 | 13 | ≥ 30 | | Medium fast filtering |
| 67/N | 160 | 0.65 | 13 | ≥ 70 | 5.5 | Medium fast filtering |
| 17/N | 90 | 0.30 | 20 | ≥ 30 | | Medium filtering |

* See test methods, page 35

## Ordering Information

**Filter Discs**

| ∅ in mm | Grade 5 H/N (100 pieces) | Grade 6 S/N (50 pieces) | Grade 601/N (100 pieces) | Grade 603/N (100 pieces) | Grade 37/N (50 pieces) | Grade 39/N, 180 g/m² (50 pieces) |
|---|---|---|---|---|---|---|
| 47 | FT-3-423-047 | | | | FT-3-480-047 | |
| 70 | | FT-3-314-070 | | | FT-3-480-070 | |
| 90 | FT-3-423-090 | FT-3-314-090 | | FT-3-335-090 | FT-3-480-090 | |
| 110 | FT-3-423-110 | FT-3-314-110 | FT-3-354-110 | FT-3-335-110 | FT-3-480-110 | FT-3-483-110 |
| 125 | FT-3-423-125 | FT-3-314-125 | FT-3-354-125 | FT-3-335-125 | FT-3-480-125 | |
| 150 | FT-3-423-150 | FT-3-314-150 | FT-3-354-150 | FT-3-335-150 | FT-3-480-150 | |
| 185 | FT-3-423-185 | FT-3-314-185 | FT-3-354-185 | FT-3-335-185 | FT-3-480-185 | FT-3-483-185 |
| 240 | FT-3-423-240 | FT-3-314-240 | FT-3-354-240 | FT-3-335-240 | FT-3-480-240 | |
| 320 | | | FT-3-354-320 | FT-3-335-320 | | |

**Folded Filters, 100 pieces**

| ∅ in mm | Grade 5 H/N | Grade 6 S/N | Grade 603/N | Grade 34/N | Grade 37/N | Grade 39/N, 180 g/m² |
|---|---|---|---|---|---|---|
| 125 | FT-4-423-125 | FT-4-314-125 | FT-4-335-125 | FT-4-478-125 | FT-4-480-125 | |
| 150 | FT-4-423-150 | FT-4-314-150 | FT-4-335-150 | | FT-4-480-150 | FT-4-483-150 |
| 185 | FT-4-423-185 | FT-4-314-185 | FT-4-335-185 | | FT-4-480-185 | FT-4-483-185 |
| 240 | FT-4-423-240 | FT-4-314-240 | FT-4-335-240 | | FT-4-480-240 | FT-4-483-240 |
| 270 | FT-4-423-270 | FT-4-314-270 | FT-4-335-270 | | | |
| 320 | FT-4-423-320 | FT-4-314-320 | FT-4-335-320 | FT-4-478-320 | FT-4-480-320 | |
| 385 | FT-4-423-385 | | | | | FT-4-483-385 |
| 500 | FT-4-423-500 | | | | FT-4-480-500 | FT-4-483-500 |

**Sheets in 580 × 580 mm, 100 pieces**

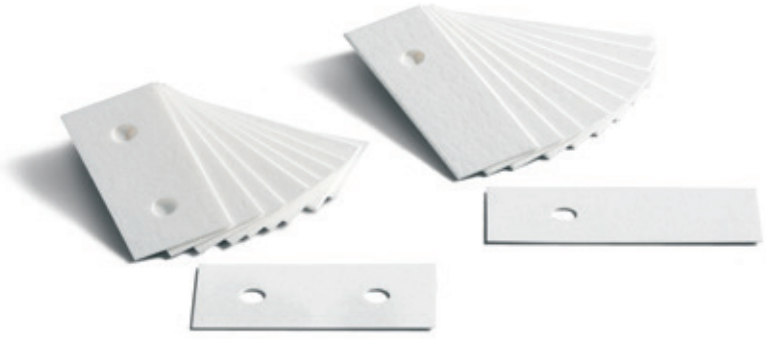
| Grade 5 H/N | Grade 6 S/N | Grade 601/N | Grade 603/N |
|---|---|---|---|
| FT-2-423-580580 | FT-2-314-580580 | FT-2-354-580580 | FT-2-335-580580 |
| **Grade 17/N** | **Grade 37/N** | **Grade 39/N, 180 g/m²** | **Grade FT 55** |
| FT-2-321-580580 | FT-2-480-580580 | FT-2-483-580580 | FT-2-348-580580 |

Other dimensions are available on request

# Paper Boards for the Filtration and Absorption of Liquids

Among other applications, these boards are used for the filtration of cooking and transformer oils, galvanic baths and as base paper for further impregnation with certain reagents. Grades with a wet burst resistance > 30 kPa are referred to as wet-strengthened and are therefore suitable for pressure or vacuum filtration.

- Made of refined pulp or cotton linters
- Smooth
- Supplied in sheets, discs and as well as customer-specific cuts



## Application Examples

| Application | Grade |
|---|---|
| Cytocards | 151 |
| Transformer oils | C 250 |
| Clarifications of galvanic baths | C 350 |
| Blotting paper for determination of water absorptiveness according to COBB (EN 20535) | A 250 |
| Cooking oil | C 251 |
| Paper air fresheners | 157 |
| Fragrance test cards | C 160 |

## Technical Specifications

| Grade | Weight ($g/m^2$)* | Thickness (mm)* | Filtration (s)* | Air resistance (mbar)* | Capillary rise (mm/10 min)* | Dry burst resistance (kPa)* | Wet burst resistance (kPa)* | Water capacity (%) |
|---|---|---|---|---|---|---|---|---|
| C 160 | 160 | 0.30 | 40 | 25 | 80 | | ≥ 50 | |
| S 165 | 165 | 0.34 | | 35 | ≥ 40 | | | |
| C 250 | 250 | 0.48 | 40 | 25 | 100 | | ≥ 80 | |
| C 251 | 250 | > 0.55 | 8 | 3.5 | 180 | ≥ 200 | ≥ 80 | |
| A 250 | 250 | 0.45 | | | 70 | | | 180 |
| C 300 | 300 | 0.55 | 40 | 25 | 100 | | ≥ 80 | |
| 1339 | 315 | 0.63 | | 42 | 60 | ≥ 500 | ≥ 230 | |
| C 350 | 350 | 0.63 | 40 | 25 | 110 | | ≥ 80 | |
| C 350L | 360 | 0.75 | | 30 | 80 | | ≥ 200 | |
| C 450 | 450 | 0.95 | 40 | 25 | 110 | | ≥ 50 | |
| 151 | 460 | 1.00 | | 19 | 120 | ≥ 400 | | |
| 1220 | 475 | 1.10 | 200 | | 120 | | | |
| K12 | 520 | 1.60 | | 2.5 | 200 | ≥ 250 | ≥ 50 | |
| 157 | 700 | 1.80 | | 8 | 150 | | | |
| SEK 770 | 770 | 1.00 | | | | | | 400 |

* See test methods, page 35

## Ordering Information

**Sheets in 580 × 580 mm, 100 pieces**

| Grade C 160 | Grade C 250 | Grade C 251 | Grade C 300 |
|---|---|---|---|
| FT-2-343-580580 | FT-2-344-580580 | FT-2-355-580580 | FT-2-345-580580 |

| Grade C 350 | Grade C 450 | Grade S 165 |
|---|---|---|
| FT-2-346-580580 | FT-2-347-580580 | FT-2-368-580580 |

Other dimensions are available on request

# Seed Testing Papers

These papers satisfy the requirements for the determination of germination capability according to ISTA (International Seed Testing Association) and are ideal for ensuring optimal moisture content for the most diverse types of seeds and germination forms. Their pH ranges between 6.0 and 7.5, they are wet-strengthened and their special structure prevents fine seed roots from growing through the paper. The colored papers are produced with dyes that do not influence the growth of roots. These papers are mainly used to count more easily very fine and white roots.

## Application Examples

This method is mainly applied with corn, sugar beets, wheat, barley and various grasses, but can also be used for all other seed types.

**PP ("Pleated Paper") Method**
The pleated paper is placed in a box; the seeds are distributed among the folds of the pleated paper and covered with a wrapping strip to keep the seeds moist. The pleated papers have 50 double folds that are 20 mm in depth; usually, 2 seeds are placed in each fold. Both white and grey papers are available. Colored paper makes it easier to count white seed species.

## Technical Specifications & Ordering Information

| Grade | Properties | Weight (g/m²)* | Thickness (mm)* | Size (mm) | Qty per box | Order No. |
|---|---|---|---|---|---|---|
| 20 | Pleated strips, white | 110 | 0.22 | 2,000 × 110 | 1,008** | FT-2003532000110 |
| 20, grey | Pleated strips, grey | 110 | 0.22 | 2,000 × 110 | 1,008** | FT-2003662000110 |
| 4 b | Wrapping strips | 75 | 0.15 | 110 × 580 | 100 | FT-2-309-110580 |
| 6 | Wrapping strips | 80 | 0.17 | 110 × 580 | 100 | FT-2-312-110580 |

* See test methods, page 35
** 112 rods à 9 pleated strips

**BP ("Between Paper") Method**
One wetted paper sheet is laid on top of a second, the seeds are placed on the double sheet which is then rolled up.

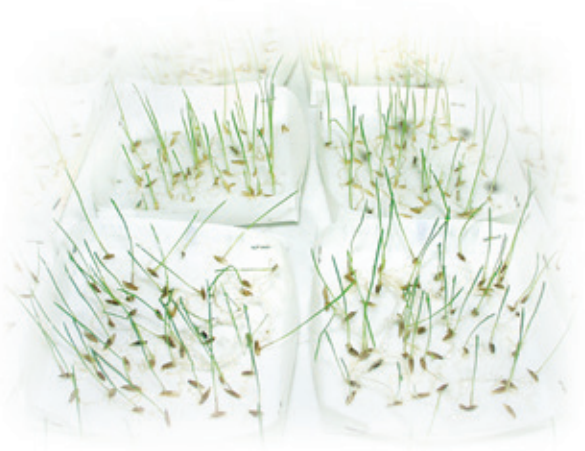
## Application Examples

The method is used for peas and oats, among others.

## Technical Specifications & Ordering Information

| Grade | Properties | Weight (g/m²)* | Thickness (mm)* | Size (mm) | Qty per box | Order No. |
|---|---|---|---|---|---|---|
| 1750 | Sheets, white | 90 | 0.20 | 220 × 400 | 500 | FT-210607-220400 |
| 1755 | PE-coated sheets | 82 | 0.19 | 190 × 400 | 500 | FT-210608-190400 |
| 39/N | Crêped white paper | 180 | 0.65 | 580 × 580 | 100 | FT-2-483-580580 |

* See test methods, page 35



**TP ("Top of Paper") Method**
The seeds are placed on the paper (discs or sheets) and then transferred either to petri dishes or plastic boxes. By supplying the filter with water, wick papers are used for constant moistening during the Jacobsen method. They are also supplied as blue and yellow papers to make it easier to count white seed species.

## Application Examples

The method is applied to small seeds like clover species, for example.

## Technical Specifications & Ordering Information

| Grade | Properties | Weight (g/m²)* | Thickness (mm)* | Size (mm) | Qty per box | Order No. |
|---|---|---|---|---|---|---|
| 94/N | Smooth, white wick paper | 100 | 0.20 | 30 × 60 | 100 | FT-210374-030160 |
| 50 S | Smooth, white filter discs | 120 | 0.22 | 95 | 50 | FT-3-353-095 |
| 50 S | Smooth white paper sheets | 120 | 0.22 | 225 × 225 | 100 | FT-2-353-225225 |
| C 140 | Smooth white paper | 140 | 0.30 | | | |
| 6 S/N | Crêped white paper | 145 | 0.55 | | | |
| 193 | Smooth, yellow paper sheets | 160 | 0.32 | 110 × 170 | 1000 | FT-2-381-110170 |
| 190 | Smooth, blue wick paper | 300 | 0.65 | 25 × 133 | 100 | FT-2-378-025133 |
| 190 | Smooth, blue paper sheets | 300 | 0.65 | 90 × 133 | 100 | FT-2-378-090133 |
| 194 | Smooth, dark blue paper | 430 | 0.68 | | | |
| 191 | Smooth, blue paper | 700 | 1.35 | | | |
| 192 | Smooth, dark blue paper | 720 | 1.45 | | | |

Other paper grades and dimensions are available on request

* See test methods, page 35

# Filter Papers
## for the Sugar Industry

In the sugar industry, filter papers are used in laboratories to assay sugar beet or cane sugar. The sugar beets are mashed and further analyzed according to the aluminum sulfate method. Potassium, nitrogen, sodium and saccharose content are measured using a spectrophotometer or the likes. These papers are wet-strengthened and either smooth or crêped. They are made of cellulose or a mixture of cellulose and diatomaceous earth.

Grade 100/N is not only supplied as discs or folded filters, but also on rolls for VENEMA systems.

## Technical Specifications

| Grade | Properties | Weight ($g/m^2$)* | Thickness (mm)* | Filtration (s)* | Wet burst resistance (kPa)* | Order No. |
|---|---|---|---|---|---|---|
| 603/N | Crêped paper, very fast filtering | 75 | 0.25 | 8 | ≥ 50 | See page 15 |
| 6 S/N | Crêped paper, very fast filtering | 145 | 0.55 | 12 | ≥ 90 | See page 15 |
| 601/N | Crêped paper, fast filtering | 65 | 0.19 | 13 | ≥ 30 | See page 15 |
| 3 hw | Smooth paper, medium fast filtering | 65 | 0.14 | 20 | 40 | See page 13 |
| 470 | Diatomaceous earth filter paper, slow filtering | 140 | 0.32 | 80 | 30 | See page 21 |
| 100/N | Smooth paper, medium fast filtering, low phosphate and low sodium | 85 | 0.18 | 30 | 80 | See below on rolls or page 13 as sheets, discs or folded filters |

* See test methods, page 35

## Ordering Information

**Venema Rolls, Grade 100/N**

| Width | Length | Qty per box | Order No. |
|---|---|---|---|
| 150 mm | 1,000 m | 1 roll | FT-1-328-1501000 |
| 240 mm | 1,000 m | 1 roll | FT-1-328-2401000 |

# Diatomaceous Earth Filter Paper

Grade 470 papers are made of cellulose and diatomaceous earth and offer a much better separating capability than pure cellulose papers at the same rate of filtration. This grade quickly retains the finest particles at high flow rates.

## Application Examples

Clarification of beer, wine, urine during spectophotometric or refractometric tests

Filtration of the finest, semi-colloidal precipitates, e.g. those consisting of proteins, clay or cold-precipitated barium

## Technical Specifications

| Grade | Weight (g/m²)* | Thickness (mm)* | Filtration (s)* |
|---|---|---|---|
| 470 | 140 | 0.32 | 80 |

* See test methods, page 35

## Ordering Information

**Filter Discs, 100 pieces**

| ∅ in mm | Order No. |
|---|---|
| 90 | FT-3-606-090 |
| 110 | FT-3-606-110 |
| 125 | FT-3-606-125 |
| 150 | FT-3-606-150 |
| 185 | FT-3-606-185 |

**Folded Filters, 100 pieces**

| ∅ in mm | Order No. |
|---|---|
| 125 | FT-4-606-125 |
| 150 | FT-4-606-150 |
| 185 | FT-4-606-185 |
| 240 | FT-4-606-240 |
| 320 | FT-4-606-320 |

# Phase Separating Paper

Grade 480 is impregnated with stabilized silicon, thus rendering it hydrophobic: It retains water, but allows solvents to flow through. The flow stops automatically when the entire solvent has passed through. In many applications, this phase separator paper eliminates the need to use separating funnels.

## Application Examples

Filtration of organic solvents that have been contaminated with water to separate the aqueous from the organic phase

Filtration of extracting solvents in clinical or medical labs

Separation of emulsions that are formed during the extraction of aqueous plant or drug solutions

## Technical Specifications

| Grade | Weight (g/m²)* | Thickness (mm)* |
|---|---|---|
| 480 | 85 | 0.19 |

* See test methods, page 35

## Ordering Information

**Filter Discs, 100 pieces**

| ∅ in mm | Order No. |
|---|---|
| 70 | FT-3-602-070 |
| 90 | FT-3-602-090 |
| 110 | FT-3-602-110 |
| 125 | FT-3-602-125 |
| 150 | FT-3-602-150 |
| 185 | FT-3-606-185 |

**Folded Filters, 100 pieces**

| ∅ in mm | Order No. |
|---|---|
| 90 | FT-4-602-090 |
| 125 | FT-4-602-125 |
| 150 | FT-4-602-150 |
| 185 | FT-4-602-185 |
| 270 | FT-4-602-270 |

# Nonwovens

These nonwoven grades are made of rayon or polyester and are available in different weights. They can be used for the filtration or prefiltration of viscous solutions containing particles visible with the naked eye.

## Application Examples

Testing of mortars containing mineral binders; determination of water retentivity of freshly mixed mortar by the filter plate method according to DIN 18555-7 : FT-3-01308-185

Food-processing industry: Detection of contaminants in dairy products, baby food : FT-3-01324-032, FT-3-01324-047

Petrochemical industry: Filtration of viscous solutions to retain the biggest particles before further analysis with a viscosimetry: FT-3-01304-025

Metal-processing industry: Non-woven belt filters (rolls) for the removal of particles from liquids.

## Technical Specifications

| Grade | Material |
|---|---|
| 2601 | Rayon (viscose) supplied in pore sizes from 75 to 115 µm |
| 2701 | Polyester supplied in pore sizes from 60 to 140 µm |
| 2602 | Rayon (viscose) \| Polyester |

## Ordering Information

| Grade, Weight | Thickness (mm)* | Mean pore size (µm) | Max. pore size (µm) | Format | Size | Qty per box | Order No. |
|---|---|---|---|---|---|---|---|
| 2601, 20 g/m$^2$ | 0.19 | 75 | 200 | Filter discs | 185 mm | 100 | FT-3-01308-185 |
| 2601, 60 g/m$^2$ | 0.46 | 50 | 95 | Filter discs | 25 mm | 100 | FT-3-01304-025 |
| 2601, 60 g/m$^2$ | 0.46 | 50 | 95 | Filter discs | 47 mm | 100 | FT-3-01304-047 |
| 2701, 60 g/m$^2$ | 0.20 | 60 | 80 | Roll | 380 mm × 40 m | 1 | FT-1-01323-38040 |
| 2602, 150 g/m$^2$ | 0.80 | - | - | Filter discs | 25 mm | 1,000 | FT-3-01324-025 |
| 2602, 150 g/m$^2$ | 0.80 | - | - | Filter discs | 32 mm | 1,000 | FT-3-01324-032 |
| 2602, 150 g/m$^2$ | 0.80 | - | - | Filter discs | 47 mm | 1,000 | FT-3-01324-047 |

# Weighing Paper

Grade 605 weighing paper is made of transparent smooth parchment that is ideal for the weighing of viscous, semi-crystalline or solid substances.

- Keeps the balance pan clean
- Allows easy transfer of weighed substances
- Nitrogen-free, smooth, transparent and soluble
- Supplied in sheets, discs as well as weighing boats

## Technical Specifications & Ordering Information

| Grade | Material | Weight ($g/m^2$)* | Thickness (mm)* | Format | Size | Qty per box | Order No. |
|---|---|---|---|---|---|---|---|
| 605 | Nitrogen-free parchment paper | 20 | 0.02 | Sheets | 100 × 100 mm | 1,000 | FT-2-605-100100R |
| 605 | Nitrogen-free parchment paper | 20 | 0.02 | Boats | 58 × 10 × 10 mm | 100 | FT-2-605-581010 |

* See test methods, page 35

# Lens Cleaning Paper

Grade 2113 lens cleaning paper is a thin, non-linting silk tissue paper used for cleaning very sensitive surfaces, such as optical glasses or lenses without scratching them.



- Prevents scratching or surfaces
- Supplied in sheets as well as customer-specific cuts

## Technical Specifications & Ordering Information

| Grade | Material | Weight ($g/m^2$)* | Format | Size | Qty per box | Order No. |
|---|---|---|---|---|---|---|
| 2113 | Non-linting silk paper | 13 | Sheets | 120 × 120 mm | 500 | FT-2-1111-120120 |

* See test methods, page 35

# Surface Protection Paper

LabSorb is a highly absorptive grade of paper coated on one side with polyethylene. Used with the cellulose side up, the paper absorbs liquids, which are stopped by the polyethylene layer and thus prevented from soaking through.
Used with the polyethylene side up, the paper is highly useful for recovery of valuable or toxic liquids.

## Technical Specifications

– Weight: 140 g/m²

– Water capacity: 140 %

## Application Examples

| |
|---|
| Preventing radioactive contamination of work surfaces in radiochemical laboratories |
| Recovering spilled solutions containing expensive reagents |
| Protecting laboratory bench surfaces from spillage or splashes of liquids by preventing absorption and seepage of these liquids into work surfaces |
| Lining animal cages for protection and hygiene |
| Reducing the risk of objects breaking after falling on hard surfaces |

## Ordering Information

| Grade | Format | Size | Qty per box | Order No. |
|---|---|---|---|---|
| LabSorb | Roll | 400 mm × 50 m | 1 | FT-1-601-400050 |
| Labsorb | Roll | 400 mm × 100 m | 1 | FT-1-601-400100 |
| LabSorb | Roll | 460 mm × 50 mm | 1 | FT-1-601-460050 |
| LabSorb | Roll | 600 mm × 50 m | 1 | FT-1-601-600050 |
| LabSorb | Roll | 600 mm × 100 m | 1 | FT-1-601-600100 |
| LabSorb | Sheets | 460 × 570 mm | 50 | FT-2-601-460570K |
| LabSorb | Sheets | 480 × 600 mm | 50 | FT-2-601-480600K |

# Blotting Papers

These blotting papers are made from the purest raw materials with the maximum degree of absorptiveness and cellulose content. They are available in a choice of different weights and thicknesses as well as in different formats to cover the majority of blotting applications. Furthermore, they are the ideal complement to the Sartorius nitrocellulose blotting membranes available in two pore sizes, 0.22 µm and 0.45 µm.

## Application Examples

| Application | Grade |
|---|---|
| To cover the gel membrane sandwich in the buffer tank | BF 1 |
| For gel wicking and drying, capillary blotting using Western, Southern or semidry techniques | BF 2 |
| To increase and maintain the transport of liquid from the buffer and as buffer reservoir in capillary and semidry blotting methods | BF 3 |
| To transfer DNA or RNA according to the Southern technique or semidry blotting of proteins | BF 4 |

- Made of high-purity cotton linters for uniform buffer flow and resulting blots
- No additives to avoid any interference during the transfer
- Supplied in sheets, rolls as well as in customized sizes to save time and avoid any waste

## Technical Specifications

| Grade | Weight (g/m²)* | Thickness (mm)* | Capillary rise (mm/10 min)* | Capillary rise (mm/30 min)* |
|---|---|---|---|---|
| BF 1 | 90 | 0.16 | 80 | 140 |
| BF 2 | 195 | 0.35 | 70 | 115 |
| BF 3 | 330 | 0.76 | 130 | |
| BF 4 | 550 | 1.30 | 160 | |

* See test methods, page 35

## Ordering Information

**Sheets**

| Grade | Size (in mm) | Qty per box | Order No. |
|---|---|---|---|
| BF 1 | 580 × 600 | 100 | FT-2-518-560600N |
| BF 2 | 80 × 90 | 100 | FT-2-519-080090N |
| BF 2 | 130 × 210 | 100 | FT-2-519-130210N |
| BF 2 | 200 × 200 | 100 | FT-2-519-200200N |
| BF 2 | 460 × 570 | 100 | FT-2-519-460570N |
| BF 2 | 580 × 600 | 100 | FT-2-519-580600N |
| BF 3 | 135 × 155 | 100 | FT-2-520-135155N |
| BF 3 | 200 × 200 | 100 | FT-2-520-200200N |
| BF 3 | 460 × 570 | 50 | FT-2-520-460570K |
| BF 3 | 580 × 600 | 50 | FT-2-520-580600K |
| BF 4 | 110 × 170 | 25 | FT-2-521-110170G |
| BF 4 | 150 × 150 | 25 | FT-2-521-150150G |
| BF 4 | 580 × 580 | 25 | FT-2-521-580580G |
| BF 4 | 580 × 600 | 25 | FT-2-521-580600G |

Other dimensions are available on request

# Blotting Membranes

Sartorius blotting membranes are ideal as a complement to the blotting papers for western blotting, DNA blotting as well as dot or slot blots. They have been optimized for all protein blotting systems, such as electrotransfer, semi-dry or simple capillary blotting.

- High membrane surface area for high binding capacity & no sample loss
- Exceptionally low background allowing longer exposure times & better results
- High membrane stability for easy handling

## Technical Specifications

| Description | 11327 | 11306 |
|---|---|---|
| Material | Cellulose Nitrate | Cellulose Nitrate |
| Pore size (µm) | 0.22 | 0.45 |
| Thickness (µm) | 120 | 130 |
| Water flow rate (ml/[min.cm$^2$ bar]) | 27 | 70 |
| Bubble point with water (bar) | 4.4 | 2.4 |
| Extractables in water (%) | < 1 | < 1 |
| Burst pressure (bar) | 0.8 | 0.2 |
| Binding capacity for IgG (µg/cm$^2$) | 200 | 200 |

## Ordering Information

**Rolls**

| Grade | Roll Size | Order Number |
|---|---|---|
| 11327 | 30 cm × 3 m | 11327------41BL |
| 11306 | 30 cm × 3 m | 11306------41BL |

# Chromatography Papers

Chromatography papers are made of 100% cotton linters. These highly pure papers are not only ideal for blotting & chromatography, but also for a wide range of absorption applications like those common in the life sciences and diagnostics.

## Application Examples

| Application | Grade |
|---|---|
| The most commonly used chromatography paper | FN 100 |
| Analytical paper for routine and repetitive separations | FN 1 |
| Routine analysis of proteins in serum (e.g. human albumin) | FN 3 |
| Blotting paper in analysis sets | FN 8 |
| Antibiotic test strips | FN 30 |
| Testing of mortars containing mineral binders; determination of water retentivity of freshly mixed mortar by the filter plate method according to DIN 18555-7: FT-210501-190190 | 27 CH |

## Technical Specifications

| Grade | Weight (g/m²)* | Thickness (mm)* | Capillary rise (mm/30 min)* |
|---|---|---|---|
| FN 1 | 90 | 0.19 | 145 |
| FN 2 | 125 | 0.24 | 145 |
| FN 3 | 90 | 0.19 | 95 |
| FN 4 | 125 | 0.24 | 95 |
| FN 5 | 90 | 0.18 | 60 |
| FN 6 | 125 | 0.22 | 60 |
| FN 7 | 150 | 0.32 | 145 |
| FN 7a | 200 | 0.41 | 145 |
| FN 8 | 280 | 0.55 | 170 |
| FN 30 | 320 | 0.90 | 240 |
| FN 100 | 195 | 0.35 | 115 |
| 27 CH | 700 | 1.30 | 170 |

* See test methods, page 35

## Ordering Information

**Sheets**

| Grade | Size (in mm) | Qty per box | Order No. |
|---|---|---|---|
| FN 1 | 400 × 400 | 100 | FT-2-501-400400N |
| FN 1 | 470 × 580 | 100 | FT-2-501-470580N |
| FN 1 | 580 × 600 | 100 | FT-2-501-580600N |
| FN 2 | 580 × 600 | 100 | FT-2-502-580600N |
| FN 3 | 300 × 580 | 100 | FT-2-503-300580N |
| FN 3 | 460 × 570 | 100 | FT-2-503-460570N |
| FN 3 | 580 × 600 | 100 | FT-2-503-580600N |
| FN 4 | 580 × 600 | 100 | FT-2-504-580600N |
| FN 5 | 200 × 200 | 100 | FT-2-505-200200N |
| FN 5 | 580 × 600 | 100 | FT-2-505-580600N |
| FN 7 | 460 × 570 | 50 | FT-2-507-460570K |
| FN 7 | 580 × 600 | 50 | FT-2-507-580600K |
| FN 7a | 460 × 570 | 50 | FT-2-508-460570K |
| FN 7a | 580 × 600 | 50 | FT-2-508-580600K |
| FN 8 | 470 × 580 | 50 | FT-2-509-460580K |
| FN 8 | 580 × 600 | 50 | FT-2-509-580600K |
| FN 30 | 254 × 305 | 100 | FT-2-526-254305N |
| FN 30 | 580 × 600 | 25 | FT-2-526-580600G |
| FN 100 | 76 × 102 | 100 | FT-2-527-076102N |
| FN 100 | 200 × 200 | 100 | FT-2-527-200200N |
| FN 100 | 260 × 410 | 100 | FT-2-527-260410N |
| FN 100 | 460 × 570 | 50 | FT-2-527-460570K |
| FN 100 | 460 × 570 | 100 | FT-2-520-460570N |
| FN 100 | 580 × 600 | 50 | FT-2-527-580600K |
| FN 100 | 580 × 680 | 50 | FT-2-527-580680K |
| 27 CH | 190 × 190 | 100 | FT-210501-190190 |

Other dimensions are available on request

# Glass Microfiber Filters With Binder

These filters are mostly used either for monitoring air and gas or as prefilter. They are manufactured with synthetic binding agents to ensure that the filter has a defined strength. They are mechanically and chemically stable, have a temperature resistance up to 180°C and – depending on the binding agent used – are either hydrophobic or hydrophilic.

## Application Examples

| Application | Grade |
|---|---|
| Prefiltration | 13400, MG 1387/1 |
| Emission testing | MG 161 |
| Smoke number measurement | MG 227 |
| Gas monitoring | MG 1387/1 |

- Mechanically and chemically stable
- Temperature resistant up to 180°C (Grade MG 161 up to 500°C)
- Supplied as discs or sheets

## Technical Specifications

| Grade | Weight (g/m²)* | Thickness (mm)* | Penetration 0.3 µm (%) | Pressure drop 5.3 cm/s (Pa) | Binding agent |
|---|---|---|---|---|---|
| MG 227/1/60 | 60 | 0.32 | < 0.5 | 260 | Hydrophobic |
| 13430 | 220 | 1.25 | 0.02 | 360 | Hydrophilic |
| 13400 | 73 | 0.39 | 0.015 | 363 | Hydrophilic |
| MG 227 | 75 | 0.40 | < 0.01 | 350 | Hydrophobic |
| MG 161 | 75 | 0.40 | ≤ 0.002 | ≤ 580 | Hydrophilic |
| MG 400 | 80 | 0.38 | < 0.001 | 400 | Hydrophilic |
| MG 1387/1 | 90 | 0.37 | ≤ 0.003 | 400 | Hydrophilic |

* See test methods, page 35

## Ordering Information

### Filter Discs

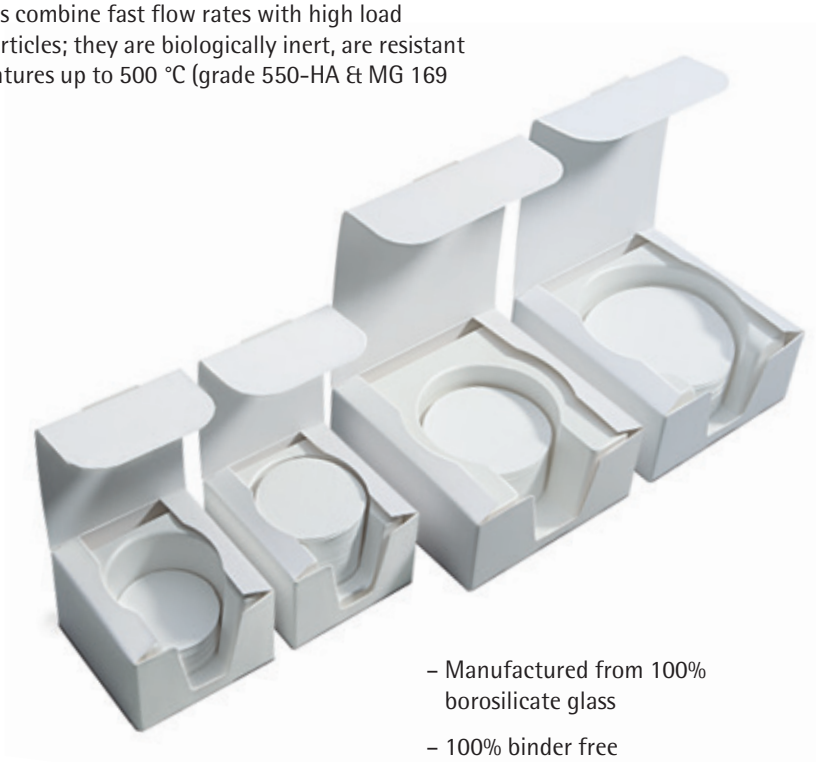
| ∅ in mm | MG 227/1/60 (100 pieces) | 13430** | 13400** | MG 227 (100 pieces) | MG 1387/1 (50 pieces) |
|---|---|---|---|---|---|
| 13 | | | 13400--13------S | | |
| 20 | | | 13400--20------S | | |
| 42 | | | 13400--42------Q | | |
| 44 | | | 13400--44------Q | | |
| 45 | | | | | FT-3-01125-045 |
| 47 | | 13430--47------S | 13400--47------Q | FT-3-01120-047 | FT-3-01125-047 |
| 50 | | | 13400--50------Q | | FT-3-01125-050 |
| 55 | | | | FT-3-01120-055 | FT-3-01125-055 |
| 80 | | | 13400--80------N | | |
| 100 | | 13430-100------K | 13400-100------K | | |
| 110 | | | | FT-3-01120-110 | FT-3-01125-110 |
| 120 | | | 13400-120------K | | |
| 124 | | | 13400-124------K | | |
| 125 | | | | | FT-3-01125-125 |
| 127 | | 13430-127------K | 13400-127------K | | |
| 130 | | 13430-130------K | 13400-130------K | | FT-3-01125-130 |
| 150 | FT-3-01124-150 | | | | |

Other dimensions are available on request

** K= 50 pieces,
N= 100 pieces,
Q = 500 pieces,
S= 200 pieces

# Glass Microfiber Filters Without Binder

Binder-free glass microfiber filters are recommended for analytical and gravimetric analyses and also as prefilters. These filters combine fast flow rates with high load capacity and the retention of very fine particles; they are biologically inert, are resistant to most chemicals and withstand temperatures up to 500 °C (grade 550-HA & MG 169 up to 550 °C).



- Manufactured from 100% borosilicate glass
- 100% binder free
- pH stable
- Withstand temperatures up to 500 °C (Grade MG 550-HA & MG 169 up to 550 °C)
- Supplied as discs or sheets

## Application Examples

| Application | Grade |
|---|---|
| Prefiltration | 13440, MGB, MGD |
| Analysis of suspended solids in wastewater according to EN 862 | MGC |
| Analysis of suspended solids in wastewater according to 2540D | MG 550-HA, MG 169 |
| Clarification of buffer & reagent solutions | MGA |
| Clarification of protein solutions | MGF |
| Air Monitoring | MG 160 |

## Technical Specifications

| Grade | Weight ($g/m^2$)* | Thickness (mm)* | Penetration 0.3 µm (%)** | Particle retention in liquids (µm) | Filtration speed (mL/min)* | Fulfills the requirements in EN 872:2005 (weigh loss) |
|---|---|---|---|---|---|---|
| MGA | 55 | 0.25 | < 0.002 | 1.6 | 510 | yes |
| MGB | 140 | 0.70 | < 0.002 | 1.0 | 210 | |
| MGC | 52 | 0.26 | < 0.002 | 1.2 | 335 | yes |
| MGD | 120 | 0.53 | < 0.1 | 2.7 | 920 | |
| MGF | 75 | 0.38 | ≤ 0.001 | 0.7 | 110 | |
| MGG | 64 | 0.28 | ≤ 0.001 | 1.5 | 600 | |
| 13440 | 88 | 0.44 | | 0.7 | 120 | yes |
| MG 160 | 75 | 0.35 | 0.002 | 1.2 | 400 | |
| MG 550-HA | 65 | 0.27 | | 1.5 | 400 | |
| MG 169 | 68 | 0.33 | | 1.0 | 130 | |

* See test methods, page 35
** Measurement according to EN 143 (0.3 µm, 15 cm/s, paraffin oil)

## Ordering Information

**Filter Discs**

| ∅ in mm | MGA (100 pieces) | MG 160 (50 pieces) | MGB (50 pieces) | MGC (100 pieces) | MGD (50 pieces) |
|---|---|---|---|---|---|
| 21 | | | FT-3-1102-021 | FT-3-1103-021 | |
| 25 | FT-3-1101-025 | | FT-3-1102-025 | FT-3-1103-025 | FT-3-1104-025 |
| 37 | FT-3-1101-037 | FT-3-01110-037 | | | |
| 47 | FT-3-1101-047 | FT-3-01110-047 | FT-3-1102-047 | FT-3-1103-047 | FT-3-1104-047 |
| 50 | FT-3-1101-050 | FT-3-01110-050 | FT-3-1102-050 | FT-3-1103-050 | FT-3-1104-050 |
| 55 | FT-3-1101-055 | | FT-3-1102-055 | FT-3-1103-055 | |
| 70 | FT-3-1101-070 | FT-3-01110-070 | FT-3-1102-070 | FT-3-1103-070 | FT-3-1104-070 |
| 80 | FT-3-1101-080 | | | | |
| 90 | FT-3-1101-090 | FT-3-01110-090 | FT-3-1102-090 | FT-3-1103-090 | FT-3-1104-090 |
| 100 | FT-3-1101-100 | FT-3-01110-100 | FT-3-1102-100 | FT-3-1103-100 | FT-3-1104-100 |
| 110 | FT-3-1101-110 | FT-3-01110-110 | FT-3-1102-110 | FT-3-1103-110 | FT-3-1104-110 |
| 125 | FT-3-1101-125 | | FT-3-1102-125 | FT-3-1103-125 | FT-3-1104-125 |
| 150 | FT-3-1101-150 | | FT-3-1102-150 | FT-3-1103-150 | FT-3-1104-150 |

| ∅ in mm | MGF (100 pieces) | MGG (100 pieces) | MG 550-HA (100 pieces) | 13440*** |
|---|---|---|---|---|
| 24 | | | FT-3-01147-024 | |
| 25 | FT-3-1105-025 | FT-3-1106-025 | | |
| 42 | | | | 13440-042------Q |
| 44 | | | | 13440-044------Q |
| 47 | FT-3-1105-047 | FT-3-1106-047 | FT-3-01147-047 | 13440-047------Q |
| 50 | FT-3-1105-050 | FT-3-1106-050 | FT-3-01147-050 | 13440-050------Q |
| 55 | FT-3-1105-055 | FT-3-1106-055 | FT-3-01147-055 | |
| 70 | FT-3-1105-070 | FT-3-1106-070 | FT-3-01147-070 | |
| 90 | FT-3-1105-090 | FT-3-1106-090 | FT-3-01147-090 | |
| 100 | | | | 13440-100------K |
| 110 | FT-3-1105-110 | FT-3-1106-110 | FT-3-01147-110 | |
| 125 | FT-3-1105-125 | FT-3-1106-125 | FT-3-01147-125 | |
| 130 | | | | 13440-130------K |
| 150 | FT-3-1105-150 | FT-3-1106-150 | | |

Other dimensions are available on request

*** Q = 500 pieces
K = 50 pieces

# Pre-heated Quartz Microfiber Filters

The quartz microfiber material of the Sartorius pre-heated filters, grade Q3400, is made of high-purity quartz microfibers without any addition of glass microfibers or binding agents. In addition, the Q3400 filter grade is tempered to remove all chemically combined water and to give the filters excellent weight and dimensional stability. Sartorius filters are especially suitable for emissions monitoring at temperatures of up to 900 °C and wherever filters of the highest purity are needed.

## Application Examples

| |
|---|
| Analysis of dust levels according to EN 13284 1:2001 |
| Emission monitoring at high temperatures (air pollution) |
| Analysis of hot and acidic gases |
| Trace element analyis |
| Analytical and gravimetrical analyses |

- High-purity filters with the lowest trace metal values
- Extreme temperature resistance up to 900°C
- Exceptional chemical resistance
- Excellent weight and dimensional stability
- Biologically inert
- Certificate on trace elements available for every batch

## Technical Specifications

| Grade | Material | Weight ($g/m^2$)* | Thickness (mm)* | Penetration 0.3 µm (%)** | Tensile strength, dry, MD (N/m) | Pressure drop 5.3 cm/s (Pa) |
|---|---|---|---|---|---|---|
| Q3400 | 100% Quartz microfiber silicium dioxide ($SiO_2$) | 85 | 0.43 | < 0.002 | 200 | 450 |

* See test methods, page 35
** according to EN 143 (0.3 µm, 15 cm/s, paraffin oil)

## Ordering Information

**Filter Discs**

| Size (in mm) | Qty per box | Order No. |
|---|---|---|
| 20 | 25 | Q3400--20------G |
| 25 | 25 | Q3400--25------G |
| 37 | 25 | Q3400--37------G |
| 45 | 25 | Q3400--45------G |
| 47 | 25 | Q3400--47------G |
| 50 | 25 | Q3400--50------G |
| 82 | 100 | Q3400--82------N |
| 90 | 100 | Q3400--90------N |
| 142 | 50 | Q3400-142------K |
| 150 | 50 | Q3400-150------K |

Other dimensions are available on request

# Quality Control
## Test Methods

**Basis Weight According to DIN EN ISO 536**
The basis weight is determined by weighing a paper sheet that is between 500 $cm^2$ and 1000 $cm^2$ in size on a calibrated paper scale showing an accuracy of +/- 0.5%. The basis weight is expressed in grams per square meter ($g/m^2$).

**Thickness According to DIN EN ISO 20534**
The thickness is measured using a thickness meter or gauge readings and is expressed in millimeters.

**Filtration Speed (s)**
The time required to filter 10 mL of distilled water at 20 °C through a free-hanging, fully-wetted filter disc with a diameter of 110 mm folded in quarters.
The filtration rate is expressed in seconds.

**Filtration Speed (ml/min – Herzberg)**
The time required to filter distilled water at 20 °C through a filter surface of 10 $cm^2$ and at a constant pressure of 5 cm water column.
The filtration rate is expressed in ml/min.

**Ash Content According to DIN 54370**
The ash content is the residue determined after ignition of 10 g of filter paper at 800 °C in a platinum crucible.
The ash content is expressed in percent.

**Tensile Strength According to DIN EN ISO 1924-2**
A continually increasing load is applied vertically to a paper strip measuring 15 mm in width and 180 mm in length. The tensile strength is defined as the stretching force necessary to break the piece and measured lengthwise and in the transverse direction.
The tensile strength is expressed in N/15 mm.

**Dry Bursting Strength According to DIN ISO 2758**
A paper with a surface area of 10 $cm^2$ is clamped over and subjected to increasing pressure from a rubber diaphragm. The bursting strength is the pressure reading at the time of rupture.
The bursting strength is expressed in kilopascal (kPa).

**Wet Burst Resistance According to DIN ISO 3689**
A paper with surface area of 10 $cm^2$ is immersed in water and then clamped over a rubber diaphragm. The paper is subjected to evenly increasing pressure from the rubber diaphragm. The bursting strength is the pressure reading at the time of rupture.
The wet bursting strength is expressed in kilopascal (kPa).

**Air Resistance**
Air resistance is the pressure drop that occurs after filtration of a defined air stream (270 L/h and | or 75 cm/s at 10 $cm^2$) through a filter paper.
The air resistance is expressed in mbar.

**Capillary Rise According to DIN ISO 8787 (Klemm Method)**
The capillary rise is defined as the height to which a paper strip measuring 15 mm in width and 250 mm in length, whose narrow side is immersed in prefiltered distilled water (20 °C), is wetted after 10 or 30 min. After this test period of 10 and 30 min., the wetted part of the strip is measured in mm.
The capillary rise is expressed in mm per 10 min and | or 30 min.

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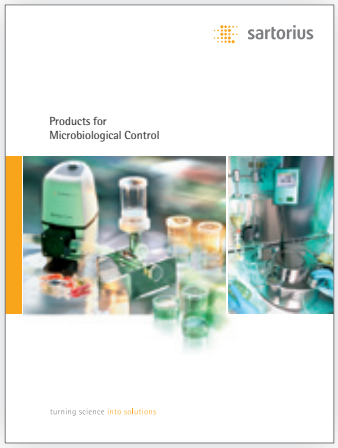


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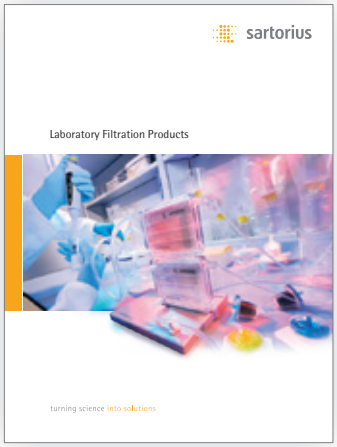


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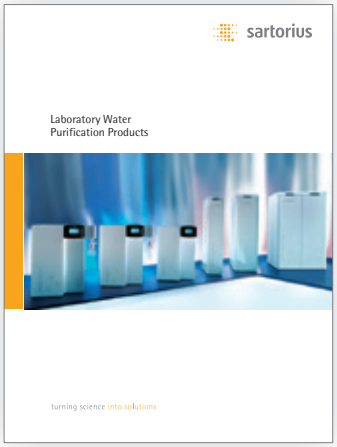


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