

# Filtration

## Discover

Quality filters "Made in Germany" since 1911

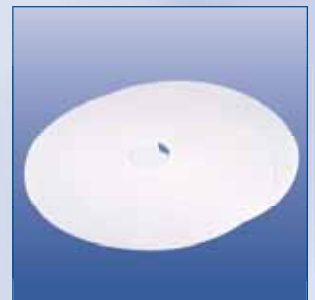
Filtration • Filtration • Filtration • Filtration



Filter Circles



Folded Filters



Technical Cuts



Bulk



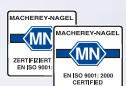
Extraction Thimbles



Membranes

I.C.T. S.L. - MACHEREY-NAGEL

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## 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 feature 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/<br>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 sulphate, calcium oxalate and barium sulphate.  |

## Selection of filter papers

Important filtration properties for certain applications

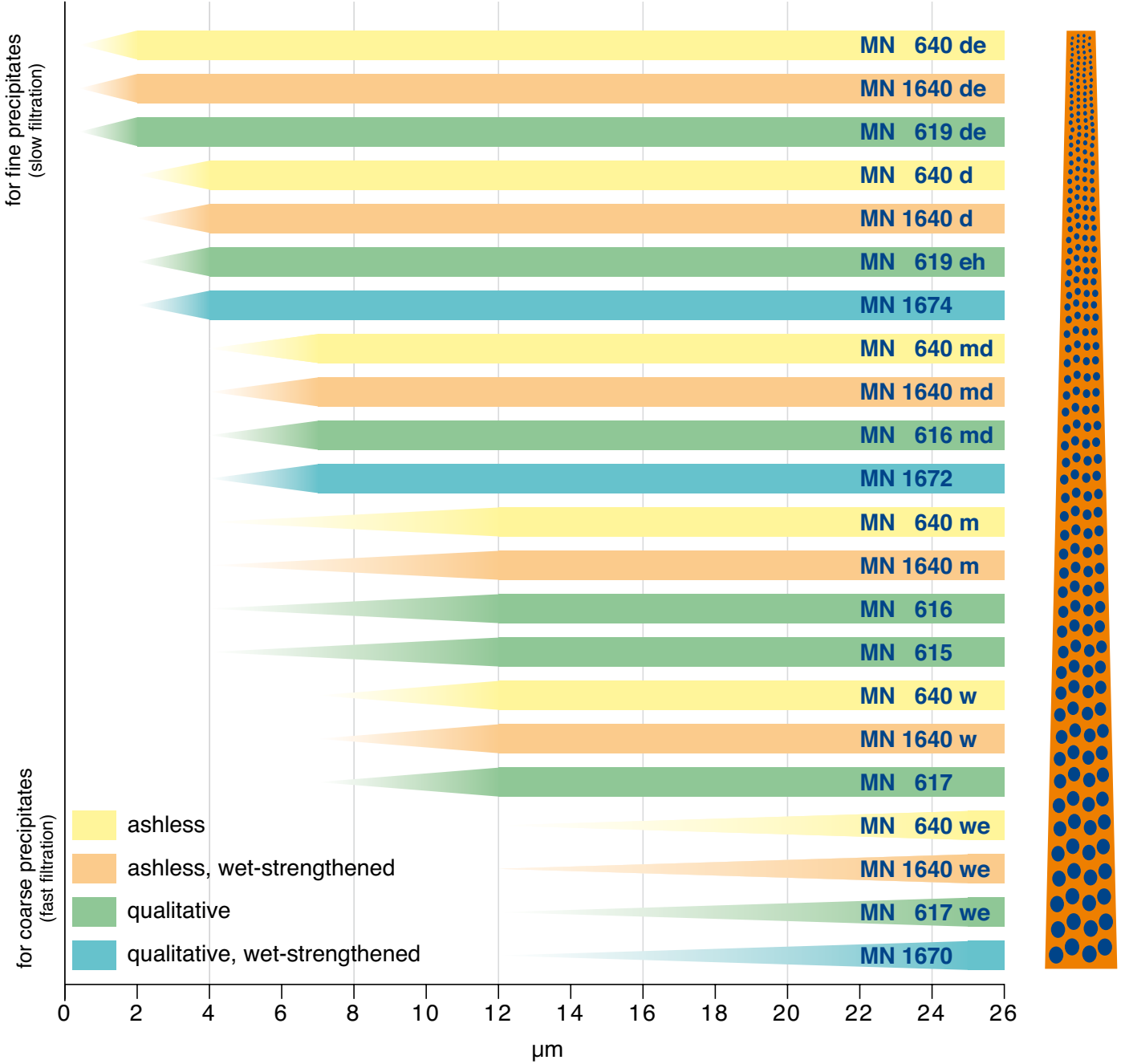
| Application  | Recommended filter                                 |
|--|--|
| filter cake ignition and quantitative determination of the residue (gravimetric analysis)                    | ashless filter papers                              |
| analysis of the filtrate; it is important that no interfering substances are extracted from the filter paper | ashless filter papers or glass fibre filters       |
| mechanical removal of the filter cake from the filter, e.g. with a jet from a wash bottle or with a spatula. | wet-strengthened filters, (hardened filter papers) |
| separation of an organic solvent from water  | hydrophobic filters (MN 616 WA, MN 617 WA)         |
| visualisation of small amounts of light precipitates   | black filter paper (MN 220)                        |
| technical filtration or need for large cuts  | technical filter papers or thick filter papers     |
| retention of very fine precipitates  | slow filter papers                                 |
| retention of coarse precipitates and fast filtration   | fast filter papers                                 |
| filtration of strongly acidic or strongly basic liquids  | glass fibre filters                                |
| filtration of aggressive liquids (e.g. strong oxidants)  | glass fibre filters                                |
| need for very low metal ion blanks of the filter (e.g. for investigation of air-borne particles)             | quartz fibre filters                               |
| accelerated filtration with constant retention efficiency  | creped paper                                       |
| filtration at increased pressure or strong mechanical load (e.g. heavy filter cake).                         | thick technical filter papers                      |
| strongly absorbent paper, no special wet strength required   | chromatography papers                              |

Please also note the list of applications on page 42.

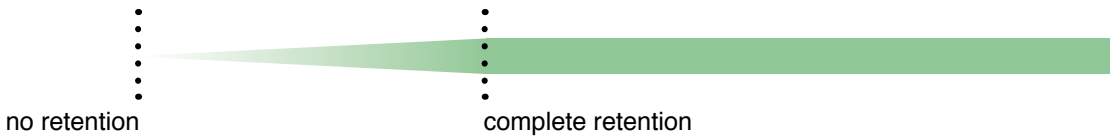


### Particle retention of MN filter papers

The particle retention capacity is an important parameter for characterising a filter paper. The following diagram shows typical values of our analytical filter papers.



### How to read the graph



## Filter papers for quantitative analysis

### Ashless filter papers

Ashless filter papers are particularly suited for quantitative routine analysis and are manufactured from refined pulp and linters. They are acid-washed and have an extremely low ash content of < 0.01%. The amount of  $\alpha$ -cellulose is about 95%.



#### Technical data

| Grade     | Colour code                         | Properties                        | Thickness | Filtration speed | Basis weight         |
|-----------|-------------------------------------|-----------------------------------|-----------|------------------|----------------------|
| MN 640 we |                                     | very fast filtration, smooth      | 0.22 mm   | 5 s              | 85 g/m <sup>2</sup>  |
| MN 640 w  | ≡ No. 41 grey label ≡ black ribbon  | fast filtration, smooth           | 0.2 mm    | 9 s              | 85 g/m <sup>2</sup>  |
| MN 640 m  | ≡ No. 43 white label ≡ white ribbon | medium fast filtration, smooth    | 0.2 mm    | 27 s             | 85 g/m <sup>2</sup>  |
| MN 640 md | ≡ No. 40 yellow label ≡ red ribbon  | medium to slow filtration, smooth | 0.2 mm    | 55 s             | 85 g/m <sup>2</sup>  |
| MN 640 dd | ≡ No. 44 blue label ≡ green ribbon  | slow filtration, smooth           | 0.16 mm   | 100 s            | 70 g/m <sup>2</sup>  |
| MN 640 d  | ≡ No. 42 green label ≡ blue ribbon  | slow filtration, smooth           | 0.17 mm   | 140 s            | 85 g/m <sup>2</sup>  |
| MN 640 de |                                     | very slow filtration, smooth      | 0.2 mm    | 195 s            | 100 g/m <sup>2</sup> |

#### Ordering information

References for packs of 100 filters

| Ø      | MN 640 we | MN 640 w | MN 640 m | MN 640 md | MN 640 dd | MN 640 d | MN 640 de |
|--------|-----------|----------|----------|-----------|-----------|----------|-----------|
|        |           |          |          |           |           |          |           |
| 55 mm  | 20 10 05  | 20 20 05 | 20 30 05 | 20 40 05  | 20 60 05  | 20 50 05 | 20 70 05  |
| 70 mm  | 20 10 07  | 20 20 07 | 20 30 07 | 20 40 07  | 20 60 07  | 20 50 07 | 20 70 07  |
| 90 mm  | 20 10 09  | 20 20 09 | 20 30 09 | 20 40 09  | 20 60 09  | 20 50 09 | 20 70 09  |
| 110 mm | 20 10 11  | 20 20 11 | 20 30 11 | 20 40 11  | 20 60 11  | 20 50 11 | 20 70 11  |
| 125 mm | 20 10 12  | 20 20 12 | 20 30 12 | 20 40 12  | 20 60 12  | 20 50 12 | 20 70 12  |
| 150 mm | 20 10 15  | 20 20 15 | 20 30 15 | 20 40 15  | 20 60 15  | 20 50 15 | 20 70 15  |
| 185 mm | 20 10 18  | 20 20 18 | 20 30 18 | 20 40 18  | 20 60 18  | 20 50 18 | 20 70 18  |
| 240 mm | 20 10 24  | 20 20 24 | 20 30 24 | 20 40 24  | 20 60 24  | 20 50 24 | 20 70 24  |
| 320 mm | 20 10 32  | 20 20 32 | 20 30 32 | 20 40 32  | 20 60 32  | 20 50 32 | 20 70 32  |

other sizes and cuts on request



## Hardened filter papers for quantitative analysis

These wet-strengthened hard filter papers are manufactured from refined pulp and linters and have a low ash content of < 0.01%. They are often used for quantitative routine procedures and for analytical gravimetric applications. Due to their high mechanical strength in wet condition they are particularly suited for applications, where the residue is removed from the filter e.g. with a spatula or a jet of water.



### Technical data

| Grade      | Properties  | Thickness | Filtration speed | Basis weight         |
|------------|---|-----------|------------------|----------------------|
| MN 1640 we | wet strengthened, very fast filtration, smooth      | 0.22 mm   | 5 s              | 85 g/m <sup>2</sup>  |
| MN 1640 w  | wet strengthened, fast filtration, smooth           | 0.2 mm    | 9 s              | 85 g/m <sup>2</sup>  |
| MN 1640 m  | wet strengthened, medium fast filtration, smooth    | 0.2 mm    | 27 s             | 85 g/m <sup>2</sup>  |
| MN 1640 md | wet strengthened, medium to slow filtration, smooth | 0.2 mm    | 55 s             | 85 g/m <sup>2</sup>  |
| MN 1640 d  | wet strengthened, slow filtration, smooth           | 0.17 mm   | 140 s            | 85 g/m <sup>2</sup>  |
| MN 1640 de | wet strengthened, very slow filtration, smooth      | 0.2 mm    | 195 s            | 100 g/m <sup>2</sup> |

### Ordering information

References for packs of 100 filters

| Ø      | MN 1640 we | MN 1640 w | MN 1640 m | MN 1640 md | MN 1640 d | MN 1640 de |
|--------|------------|-----------|-----------|------------|-----------|------------|
|        |            |           |           |            |           |            |
| 55 mm  | 22 10 05   | 22 20 05  | 22 30 05  | 22 40 05   | 22 50 05  | 22 70 05   |
| 70 mm  | 22 10 07   | 22 20 07  | 22 30 07  | 22 40 07   | 22 50 07  | 22 70 07   |
| 90 mm  | 22 10 09   | 22 20 09  | 22 30 09  | 22 40 09   | 22 50 09  | 22 70 09   |
| 110 mm | 22 10 11   | 22 20 11  | 22 30 11  | 22 40 11   | 22 50 11  | 22 70 11   |
| 125 mm | 22 10 12   | 22 20 12  | 22 30 12  | 22 40 12   | 22 50 12  | 22 70 12   |
| 150 mm | 22 10 15   | 22 20 15  | 22 30 15  | 22 40 15   | 22 50 15  | 22 70 15   |
| 185 mm | 22 10 18   | 22 20 18  | 22 30 18  | 22 40 18   | 22 50 18  | 22 70 18   |
| 240 mm | 22 10 24   | 22 20 24  | 22 30 24  | 22 40 24   | 22 50 24  | 22 70 24   |
| 320 mm | 22 10 32   | 22 20 32  | 22 30 32  | 22 40 32   | 22 50 32  | 22 70 32   |

other sizes and cuts on request



## Filter papers for qualitative analysis

### Standard filter papers for qualitative analysis

Qualitative filter papers are manufactured from the same raw materials as the ashless grades and are particularly suited for general laboratory filtrations. The average ash content is about 0.1%, the amount of  $\alpha$ -cellulose is about 95%.



#### Technical data

| Grade             | Properties                                | Thickness | Filtration speed | Basis weight         |
|-------------------|---|-----------|------------------|----------------------|
| MN 617 we         | extra soft, fast filtration, smooth       | 0.22 mm   | 5 s              | 85 g/m <sup>2</sup>  |
| MN 617 = No. 4    | soft, fast filtration, smooth             | 0.2 mm    | 9 s              | 85 g/m <sup>2</sup>  |
| MN 615 = No. 1    | medium fast filtration, smooth            | 0.16 mm   | 22 s             | 70 g/m <sup>2</sup>  |
| MN 616            | medium fast filtration, smooth            | 0.2 mm    | 27 s             | 85 g/m <sup>2</sup>  |
| MN 618 = No. 3    | medium fast filtration, smooth            | 0.32 mm   | 22 s             | 140 g/m <sup>2</sup> |
| MN 616 md = No. 2 | medium to slow filtration, smooth         | 0.2 mm    | 55 s             | 85 g/m <sup>2</sup>  |
| MN 619            | dense, slow filtration, smooth            | 0.17 mm   | 100 s            | 75 g/m <sup>2</sup>  |
| MN 619 eh = No. 6 | dense, slow filtration, smooth            | 0.17 mm   | 140 s            | 85 g/m <sup>2</sup>  |
| MN 619 de = No. 5 | extra dense, very slow filtration, smooth | 0.2 mm    | 195 s            | 100 g/m <sup>2</sup> |

#### Ordering information

References for packs of 100 filters

| Ø      | MN 617 we |          | MN 617   |          | MN 615   |          | MN 616   |          | MN 618   |          |
|--------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|        |           |          |          |          |          |          |          |          |          |          |
| 55 mm  | 43 50 05  | 53 50 05 | 43 40 05 | 53 40 05 | 43 10 05 | 53 10 05 | 43 20 05 | 53 20 05 | 43 60 05 | 53 60 05 |
| 70 mm  | 43 50 07  | 53 50 07 | 43 40 07 | 53 40 07 | 43 10 07 | 53 10 07 | 43 20 07 | 53 20 07 | 43 60 07 | 53 60 07 |
| 90 mm  | 43 50 09  | 53 50 09 | 43 40 09 | 53 40 09 | 43 10 09 | 53 10 09 | 43 20 09 | 53 20 09 | 43 60 09 | 53 60 09 |
| 110 mm | 43 50 11  | 53 50 11 | 43 40 11 | 53 40 11 | 43 10 11 | 53 10 11 | 43 20 11 | 53 20 11 | 43 60 11 | 53 60 11 |
| 125 mm | 43 50 12  | 53 50 12 | 43 40 12 | 53 40 12 | 43 10 12 | 53 10 12 | 43 20 12 | 53 20 12 | 43 60 12 | 53 60 12 |
| 150 mm | 43 50 15  | 53 50 15 | 43 40 15 | 53 40 15 | 43 10 15 | 53 10 15 | 43 20 15 | 53 20 15 | 43 60 15 | 53 60 15 |
| 185 mm | 43 50 18  | 53 50 18 | 43 40 18 | 53 40 18 | 43 10 18 | 53 10 18 | 43 20 18 | 53 20 18 | 43 60 18 | 53 60 18 |
| 240 mm | 43 50 24  | 53 50 24 | 43 40 24 | 53 40 24 | 43 10 24 | 53 10 24 | 43 20 24 | 53 20 24 | 43 60 24 | 53 60 24 |
| 320 mm | 43 50 32  | 53 50 32 | 43 40 32 | 53 40 32 | 43 10 32 | 53 10 32 | 43 20 32 | 53 20 32 | 43 60 32 | 53 60 32 |

| Ø      | MN 616 md |          | MN 619   |          | MN 619 eh |          | MN 619 de |          |
|--------|-----------|----------|----------|----------|-----------|----------|-----------|----------|
|        |           |          |          |          |           |          |           |          |
| 55 mm  | 43 30 05  | 53 30 05 | 43 70 05 | 53 70 05 | 43 80 05  | 53 80 05 | 43 90 05  | 53 90 05 |
| 70 mm  | 43 30 07  | 53 30 07 | 43 70 07 | 53 70 07 | 43 80 07  | 53 80 07 | 43 90 07  | 53 90 07 |
| 90 mm  | 43 30 09  | 53 30 09 | 43 70 09 | 53 70 09 | 43 80 09  | 53 80 09 | 43 90 09  | 53 90 09 |
| 110 mm | 43 30 11  | 53 30 11 | 43 70 11 | 53 70 11 | 43 80 11  | 53 80 11 | 43 90 11  | 53 90 11 |
| 125 mm | 43 30 12  | 53 30 12 | 43 70 12 | 53 70 12 | 43 80 12  | 53 80 12 | 43 90 12  | 53 90 12 |
| 150 mm | 43 30 15  | 53 30 15 | 43 70 15 | 53 70 15 | 43 80 15  | 53 80 15 | 43 90 15  | 53 90 15 |
| 185 mm | 43 30 18  | 53 30 18 | 43 70 18 | 53 70 18 | 43 80 18  | 53 80 18 | 43 90 18  | 53 90 18 |
| 240 mm | 43 30 24  | 53 30 24 | 43 70 24 | 53 70 24 | 43 80 24  | 53 80 24 | 43 90 24  | 53 90 24 |
| 320 mm | 43 30 32  | 53 30 32 | 43 70 32 | 53 70 32 | 43 80 32  | 53 80 32 | 43 90 32  | 53 90 32 |

other sizes and cuts on request

## Wet-strengthened filter papers for qualitative applications

Hardened analytical filter papers are manufactured from refined pulp and linters and feature a content of  $\alpha$ -cellulose of more than 95%. The smooth surface of these papers allows fibre-free filtration. They feature a high wet strength and can also be used in the filtration of strongly alkaline or strongly acidic solutions. Due to their high mechanical strength in wet condition they are particularly suited for applications, where the residue is removed from the filter e.g. with a spatula or a jet of water.









### Technical data

| Grade   | Properties                                       | Thickness | Filtration speed | Basis weight        |
|---------|--|-----------|------------------|---------------------|
| MN 1670 | wet-strengthened, fast filtration, smooth        | 0.13 mm   | 9 s              | 85 g/m <sup>2</sup> |
| MN 1672 | wet-strengthened, medium fast filtration, smooth | 0.13 mm   | 35 s             | 85 g/m <sup>2</sup> |
| MN 1674 | wet-strengthened, slow filtration, smooth        | 0.13 mm   | 110 s            | 85 g/m <sup>2</sup> |

### Ordering information

References for packs of 100 filters

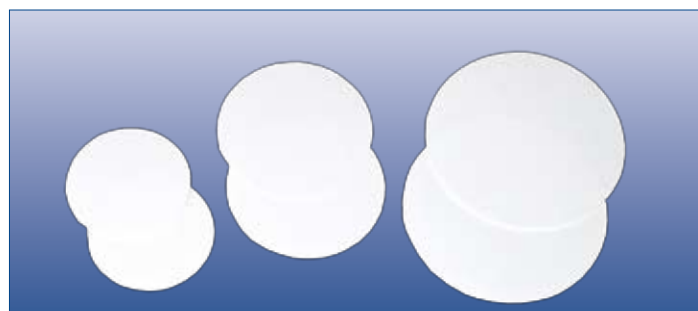
| Ø      | MN 1670  |  | MN 1672  |   | MN 1674  |  |
|--------|--|--|--|---|--|--|
|        |  |  |  |  |  |  |
| 55 mm  | 47 00 05   | 57 00 05   | 47 20 05   | 57 20 05  | 47 40 05   | 57 40 05   |
| 70 mm  | 47 00 07   | 57 00 07   | 47 20 07   | 57 20 07  | 47 40 07   | 57 40 07   |
| 90 mm  | 47 00 09   | 57 00 09   | 47 20 09   | 57 20 09  | 47 40 09   | 57 40 09   |
| 110 mm | 47 00 11   | 57 00 11   | 47 20 11   | 57 20 11  | 47 40 11   | 57 40 11   |
| 125 mm | 47 00 12   | 57 00 12   | 47 20 12   | 57 20 12  | 47 40 12   | 57 40 12   |
| 150 mm | 47 00 15   | 57 00 15   | 47 20 15   | 57 20 15  | 47 40 15   | 57 40 15   |
| 185 mm | 47 00 18   | 57 00 18   | 47 20 18   | 57 20 18  | 47 40 18   | 57 40 18   |
| 240 mm | 47 00 24   | 57 00 24   | 47 20 24   | 57 20 24  | 47 40 24   | 57 40 24   |
| 320 mm | 47 00 32   | 57 00 32   | 47 20 32   | 57 20 32  | 47 40 32   | 57 40 32   |

other sizes and cuts on request



## Glass fibre filters / quartz fibre filters

Glass fibre filters allow a fast filtration and simultaneously a very high particle retention. They are manufactured from borosilicate glass fibres and are chemically resistant towards most organic and inorganic solvents (except HF). For the analysis of air-borne particles we recommend the quartz fibre filters MN QF-10 which feature an extremely low content of metal traces.



### Technical data

| Grade           | Thickness | Basis weight         | Filtration speed air | Particle retention | Max. temperature | Binder  |
|-----------------|-----------|----------------------|----------------------|--------------------|------------------|---------|
| MN GF-1 = GF/A  | 0.3 mm    | 55 g/m <sup>2</sup>  | 12 s                 | 0.7 µm             | 500 °C           | without |
| MN GF-2 = GF/B  | 0.65 mm   | 140 g/m <sup>2</sup> | 30 s                 | 0.5 µm             | 500 °C           | without |
| MN GF-3 = GF/C  | 0.28 mm   | 50 g/m <sup>2</sup>  | 25 s                 | 0.6 µm             | 500 °C           | without |
| MN GF-4 = GF/D  | 0.60 mm   | 120 g/m <sup>2</sup> | 5 s                  | 1.4 µm             | 500 °C           | without |
| MN GF-5 = GF/F  | 0.40 mm   | 85 g/m <sup>2</sup>  | 80 s                 | 0.4 µm             | 500 °C           | without |
| MN GF-6         | 0.35 mm   | 70 g/m <sup>2</sup>  | 12 s                 | 0.6 µm             | 500 °C           | without |
| MN 85/70        | 0.35 mm   | 70 g/m <sup>2</sup>  | 15 s                 | 0.6 µm             | 200 °C           | organic |
| MN 85/70 BF     | 0.35 mm   | 70 g/m <sup>2</sup>  | 15 s                 | 0.6 µm             | 500 °C           | without |
| MN 85/90        | 0.40 mm   | 90 g/m <sup>2</sup>  | 15 s                 | 0.5 µm             | 200 °C           | organic |
| MN 85/90 BF     | 0.40 mm   | 90 g/m <sup>2</sup>  | 15 s                 | 0.5 µm             | 500 °C           | without |
| MN 85/220       | 1.0 mm    | 220 g/m <sup>2</sup> | 15 s                 | 0.4 µm             | 200 °C           | organic |
| MN 85/220 BF    | 1.0 mm    | 220 g/m <sup>2</sup> | 15 s                 | 0.4 µm             | 500 °C           | without |
| MN QF-10 = QM/A |           | 85 g/m <sup>2</sup>  | < 5 s                | -                  | 950 °C           | without |




### Ordering information




References for packs of 100 filters

| Ø      | MN GF-1   | MN GF-2   | MN GF-3   | MN GF-4   | MN GF-5   | MN GF-6   | MN 85/70  |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|        |           |           |           |           |           |           |           |
| 25 mm  | 41 10 025 | 41 20 025 | 41 30 025 | 41 40 025 | 41 50 025 | 41 60 025 | 40 30 025 |
| 37 mm  | 41 10 037 | 41 20 037 | 41 30 037 | 41 40 037 | 41 50 037 | 41 60 037 | 40 30 037 |
| 45 mm  | 41 10 045 | 41 20 045 | 41 30 045 | 41 40 045 | 41 50 045 | 41 60 045 | 40 30 045 |
| 55 mm  | 41 10 05  | 41 20 05  | 41 30 05  | 41 40 05  | 41 50 05  | 41 60 05  | 40 30 05  |
| 70 mm  | 41 10 07  | 41 20 07  | 41 30 07  | 41 40 07  | 41 50 07  | 41 60 07  | 40 30 07  |
| 90 mm  | 41 10 09  | 41 20 09  | 41 30 09  | 41 40 09  | 41 50 09  | 41 60 09  | 40 30 09  |
| 110 mm | 41 10 11  | 41 20 11  | 41 30 11  | 41 40 11  | 41 50 11  | 41 60 11  | 40 30 11  |
| 125 mm | 41 10 12  | 41 20 12  | 41 30 12  | 41 40 12  | 41 50 12  | 41 60 12  | 40 30 12  |
| 150 mm | 41 10 15  | 41 20 15  | 41 30 15  | 41 40 15  | 41 50 15  | 41 60 15  | 40 30 15  |
| 185 mm | 41 10 18  | 41 20 18  | 41 30 18  | 41 40 18  | 41 50 18  | 41 60 18  | 40 30 18  |
| 240 mm | 41 10 24  | 41 20 24  | 41 30 24  | 41 40 24  | 41 50 24  | 41 60 24  | 40 30 24  |
| 270 mm | 41 10 27  | 41 20 27  | 41 30 27  | 41 40 27  | 41 50 27  | 41 60 27  | 40 30 27  |

**Ordering information (cont.)**

References for packs of 100 filters

| Ø      | MN 85/70 BF   | MN 85/90  | MN 85/90 BF   |
|--------|---|---|---|
|        |  |  |  |
| 25 mm  | 40 40 025   | 40 50 025   | 40 60 025   |
| 37 mm  | 40 40 037   | 40 50 037   | 40 60 037   |
| 45 mm  | 40 40 045   | 40 50 045   | 40 60 045   |
| 55 mm  | 40 40 05  | 40 50 05  | 40 60 05  |
| 70 mm  | 40 40 07  | 40 50 07  | 40 60 07  |
| 90 mm  | 40 40 09  | 40 50 09  | 40 60 09  |
| 110 mm | 40 40 11  | 40 50 11  | 40 60 11  |
| 125 mm | 40 40 12  | 40 50 12  | 40 60 12  |
| 150 mm | 40 40 15  | 40 50 15  | 40 60 15  |
| 185 mm | 40 40 18  | 40 50 18  | 40 60 18  |
| 240 mm | 40 40 24  | 40 50 24  | 40 60 24  |
| 270 mm | 40 40 27  | 40 50 27  | 40 60 27  |

| Ø      | MN 85/220   | MN 85/220 BF  | MN QF-10  |
|--------|---|---|---|
|        |  |  |  |
| 25 mm  | 40 70 025   | 40 80 025   | –   |
| 37 mm  | 40 70 037   | 40 80 037   | 41 70 037   |
| 45 mm  | 40 70 045   | 40 80 045   | 41 70 045   |
| 55 mm  | 40 70 05  | 40 80 05  | 41 70 05  |
| 70 mm  | 40 70 07  | 40 80 07  | 41 70 07  |
| 90 mm  | 40 70 09  | 40 80 09  | 41 70 09  |
| 110 mm | 40 70 11  | 40 80 11  | –   |
| 125 mm | 40 70 12  | 40 80 12  | 41 70 12  |
| 150 mm | 40 70 15  | 40 80 15  | –   |
| 185 mm | 40 70 18  | –   | –   |
| 240 mm | 40 70 24  | –   | –   |
| 270 mm | 40 70 27  | –   | –   |

other sizes and cuts on request



## Filter papers for technical applications

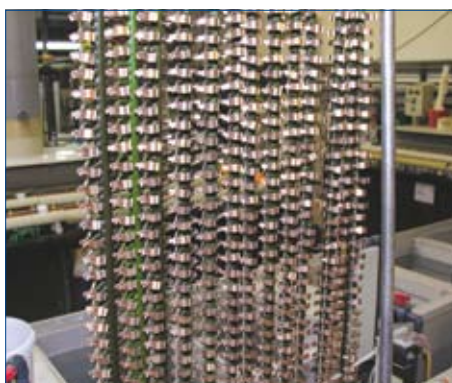
The filter papers listed below are mainly recommended for technical applications such as industrial filtrations. They are available as sheets, filter circles, folded filters (in part), cuts of almost any shape and as rolls. On request, we will be glad to produce other filter papers or filter papers with special properties as to customers demand.

### Smooth and thick filter papers

#### Technical data

| Grade    | Application and properties  | Thickness | Filtration speed | Basis weight         |
|----------|---|-----------|------------------|----------------------|
| MN 713   | medium speed, for general laboratory use  | 0.15 mm   | 20 s             | 70 g/m <sup>2</sup>  |
| MN 615 A | medium speed, for general applications, slightly stronger than MN 615                                   | 0.20 mm   | 20 s             | 80 g/m <sup>2</sup>  |
| MN 672   | medium speed, very high wet strength, e.g. for sugar industry   | 0.20 mm   | 37 s             | 85 g/m <sup>2</sup>  |
| MN 674   | slow, very high wet-strength  | 0.19 mm   | 90 s             | 85 g/m <sup>2</sup>  |
| MN 52 K  | polyester paper with very high mechanical strength, also when wet (moist)                               | –         | –                | 100 g/m <sup>2</sup> |
| MN 875   | medium speed, e.g. for beverage industry  | 0.26 mm   | 25 s             | 120 g/m <sup>2</sup> |
| MN 918   | fast, for filtration of large volumes of liquid   | 0.34 mm   | 9 s              | 120 g/m <sup>2</sup> |
| MN 625   | medium speed, for general applications  | 0.26 mm   | 30 s             | 130 g/m <sup>2</sup> |
| MN 804   | very fast, soft, e.g. beverage industry   | 0.40 mm   | 5 s              | 140 g/m <sup>2</sup> |
| MN 621   | medium speed, wet-strengthened, e.g. for soil analysis  | 0.27 mm   | 40 s             | 130 g/m <sup>2</sup> |
| MN 728   | slow, with about 30% activated charcoal for decolouring coloured liquids, e.g. for electroplating baths | 0.40 mm   | 55 s             | 170 g/m <sup>2</sup> |
| MN 818   | fast, strongly absorbent, e.g. for collection of blood drops (Guthrie test)                             | 0.45 mm   | 8 s              | 180 g/m <sup>2</sup> |
| MN 960   | fast, e.g. for beverage industry  | 0.45 mm   | 14 s             | 180 g/m <sup>2</sup> |
| MN 180   | medium wet strength, hard, for technical filtrations  | 0.35 mm   | 45 s             | 180 g/m <sup>2</sup> |
| MN 675   | slow, firm, for filtration of large volumes of liquid   | 0.35 mm   | 60 s             | 180 g/m <sup>2</sup> |
| MN 604   | fast, thick, e.g. for beverage industry   | 0.40 mm   | 9 s              | 200 g/m <sup>2</sup> |
| MN 827   | strongly absorbent, soft  | 0.70 mm   | 12 s             | 270 g/m <sup>2</sup> |
| MN 835   | similar to MN 827, but wet-strengthened, e.g. for electroplating baths                                  | 0.70 mm   | 12 s             | 270 g/m <sup>2</sup> |
| MN 270   | very high wet-strength, hard, for technical filtrations   | 0.54 mm   | 50 s             | 270 g/m <sup>2</sup> |
| MN 440   | soft thick filter paper, e.g. for electroplating baths  | 1.0 mm    | –                | 400 g/m <sup>2</sup> |
| MN 520   | soft thick filter paper, e.g. for electroplating baths  | 1.5 mm    | –                | 500 g/m <sup>2</sup> |
| MN 866   | soft thick filter paper, e.g. for electroplating baths  | 1.7 mm    | –                | 650 g/m <sup>2</sup> |

Available sizes and ordering information on request



## Creped filter papers

### Technical data

| Grade      | Application and properties   | Thickness | Filtration speed | Basis weight         |
|------------|--|-----------|------------------|----------------------|
| MN 850     | very fast, thin, for fast filtration of small volumes of liquid                            | 0.22 mm   | 3 s              | 53 g/m <sup>2</sup>  |
| MN 692     | fast, for general applications   | 0.24 mm   | 20 s             | 70 g/m <sup>2</sup>  |
| MN 126/70  | medium speed, wet-strengthened, for technical applications                                 | 0.20 mm   | 25 s             | 70 g/m <sup>2</sup>  |
| MN 751     | medium speed for general applications  | 0.27 mm   | 12 s             | 75 g/m <sup>2</sup>  |
| MN 750 N   | very fast, very high wet strength, e.g. for electroplating baths                           | 0.20 mm   | 5 s              | 60 g/m <sup>2</sup>  |
| MN 553     | medium speed, unbleached (brown paper) for applications requiring high mechanical strength | 0.20 mm   | 30 s             | 70 g/m <sup>2</sup>  |
| MN 753     | medium speed, unbleached (brown paper) for applications requiring high mechanical strength | 0.34 mm   | 15 s             | 80 g/m <sup>2</sup>  |
| MN 651     | fast, for general applications   | 0.30 mm   | 9 s              | 90 g/m <sup>2</sup>  |
| MN 605     | very fast, soft, e.g. for filtration of paints and oils                                    | 0.35 mm   | 5 s              | 100 g/m <sup>2</sup> |
| MN 651/120 | fast, wet-strengthened   | 0.44 mm   | 9 s              | 120 g/m <sup>2</sup> |
| MN 601     | very fast, e.g. for clarification of essential oils  | 0.60 mm   | 2 s              | 140 g/m <sup>2</sup> |
| MN 652     | fast, wet-strengthened   | 0.45 mm   | 15 s             | 140 g/m <sup>2</sup> |
| MN 606     | very fast, e.g. for filtration of transformer oils   | 0.50 mm   | 8 s              | 150 g/m <sup>2</sup> |

Available sizes and ordering information on request

## Embossed filter papers

### Technical data

| Grade  | Application and properties   | Thickness | Filtration speed | Basis weight        |
|--------|--|-----------|------------------|---------------------|
| MN 612 | for general applications   | 0.20 mm   | 10 s             | 75 g/m <sup>2</sup> |
| MN 614 | for filtration of essential oils, emulsions, essences etc.               | 0.25 mm   | 20 s             | 75 g/m <sup>2</sup> |
| MN 620 | medium speed, unbleached (brown) e.g. for breweries                      | 0.26 mm   | 20 s             | 75 g/m <sup>2</sup> |
| MN 631 | medium speed, unbleached (brown) e.g. for applications in sugar industry | 0.20 mm   | 30 s             | 80 g/m <sup>2</sup> |

Available sizes and ordering information on request



## Filter papers for special applications

| Product/application                                    | MN Grade  | Page       |
|--|---|------------|
| Activated charcoal paper                               | MN 728  | 16         |
| Antibiotic resistance tests                            | MN 827 ATD, MN 827 ATR, MN 827 ATS/8                      | 21         |
| Black filter paper for detection of light precipitates | MN 220  | 19         |
| Blotting procedures                                    | MN 218 B, MN 827 B, MN 440 B                              | 23         |
| Breweries  | MN 614, MN 312, MN 620                                    | 18         |
| Chromatography   | MN 214, MN 214 ff, MN 218, MN 260, MN 261, MN 827, MN 866 | 23         |
| Fat analysis   | MN 615 ff, MN 715   | 18         |
| Filter aids: filter flocs                              | MN 101, MN 2101   | 22         |
| Hydrophobic phase separation papers                    | MN 617 WA, MN 616 WA                                      | 19         |
| Ion exchange papers                                    | MN 616 LSA-50, MN 616 LSB-50                              | 21         |
| Kieselguhr paper                                       | MN 660  | 19         |
| Lens paper (José tissue paper)                         | MN 13   | 21         |
| Microscopy, absorbent paper                            | MN 224  | 20         |
| Phosphate-free filters                                 | MN 619 G, MN 616 G, MN 617 G                              | 17         |
| Polyester paper  | MN 52 K   | 17         |
| Soil analysis  | MN 280 1/4, MN 619 G, MN 616 G, MN 617 G                  | 17         |
| Surface protection paper Lab-Top, paper coated with PE | MN 210 PE   | 22         |
| Weighing aids  | MN 808, MN 226, MN 40/25, MN 40                           | 20         |
| Guthrie test cards                                     | MN 818 GT   | on request |
| Flue gas testing                                       | MN 1817   | on request |
| Smelling strips for the perfume industry               | MN 270 S  | on request |
| Cellulose tablets for X-ray fluorescence analysis      | MN 2104 (pack of 500 tablets)                             | REF 481040 |
| Sample supports, touch papers for Schöniger method     | MN 640 mS   | REF 486003 |
| Sterilizing paper                                      | MN 68   | on request |
| Electrocardiographs, contact paper                     |   | on request |
| Nitrogen-free paper                                    | MN 321  | on request |

### Activated charcoal filter paper



The activated charcoal filter paper MN 728 is particularly suited for the clarification and decolouring of solutions. The activated charcoal is incorporated in the paper and cannot be washed out into the filtrate.

#### Technical data

| Grade  | Thickness | Filtration speed | Basis weight         |
|--------|-----------|------------------|----------------------|
| MN 728 | 0.4 mm    | 55 s             | 170 g/m <sup>2</sup> |

#### Ordering information

References for packs of 100 filters

| Ø      | MN 728  | Ø      | MN 728  |
|--------|---|--------|---|
|        |  |        |  |
| 55 mm  | 48 10 05  | 150 mm | 48 10 15  |
| 70 mm  | 48 10 07  | 185 mm | 48 10 18  |
| 90 mm  | 48 10 09  | 240 mm | 48 10 24  |
| 110 mm | 48 10 11  | 320 mm | 48 10 32  |
| 125 mm | 48 10 12  |        |   |

other sizes and cuts on request



## Soil analysis, phosphate-free filters

**MN 280 1/4:** folded filters made from acid-washed paper with a high clarification efficiency for determination of micro-nutrients available to vegetation

**MN 619 G, phosphate-free:** slow filtration, phosphate-free filter paper for soil analysis

**MN 616 G, phosphate-free:** medium fast filtration, phosphate-free filter paper

**MN 617 G, phosphate-free:** fast filtration, phosphate-free filter paper





### Technical data

| Grade      | Properties | Thickness | Filtration speed | Basis weight        |
|------------|------------|-----------|------------------|---------------------|
| MN 280 1/4 | smooth     | 0.18 mm   | 95 s             | 75 g/m <sup>2</sup> |
| MN 619 G   | smooth     | 0.17 mm   | 100 s            | 75 g/m <sup>2</sup> |
| MN 616 G   | smooth     | 0.20 mm   | 22 s             | 85 g/m <sup>2</sup> |
| MN 617 G   | smooth     | 0.20 mm   | 9 s              | 85 g/m <sup>2</sup> |



### Ordering information

References for packs of 100 filters

| Ø      | MN 280 1/4  | MN 619 G  | MN 616 G  | MN 617 G  |
|--------|---|---|---|---|
|        |  |  |  |  |
| 55 mm  | –   | 44 00 05  | 54 00 05  | 48 30 05  |
| 70 mm  | –   | 44 00 07  | 54 00 07  | 48 30 07  |
| 90 mm  | –   | 44 00 09  | 54 00 09  | 48 30 09  |
| 110 mm | 52 10 11  | 44 00 11  | 54 00 11  | 48 30 11  |
| 125 mm | 52 10 12  | 44 00 12  | 54 00 12  | 48 30 12  |
| 150 mm | 52 10 15  | 44 00 15  | 54 00 15  | 48 30 15  |
| 185 mm | 52 10 18  | 44 00 18  | 54 00 18  | 48 30 18  |
| 240 mm | 52 10 24  | 44 00 24  | 54 00 24  | 48 30 24  |
| 320 mm | –   | 44 00 32  | 54 00 32  | 48 30 32  |

other sizes and cuts on request

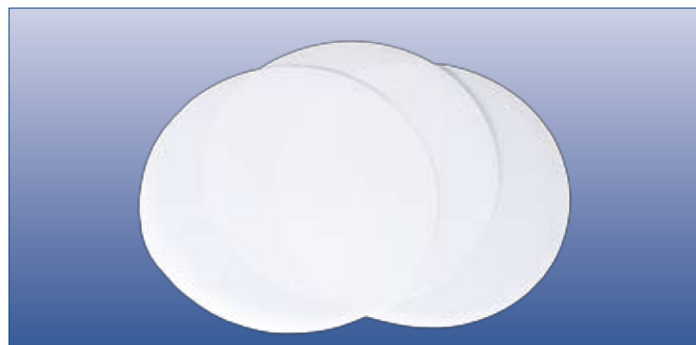
## Polyester paper

This filters made from 100% polyester fibres features a very high mechanical strength in dry as well as in wet condition.

### Technical data

| Grade   | Properties                  | Thickness | Basis weight         |
|---------|-----------------------------|-----------|----------------------|
| MN 52 K | hydrophobic polyester paper | 0.17 s    | 100 g/m <sup>2</sup> |

Available sizes and ordering information on request





## Filter papers for breweries






The filter paper grade MN 620 can be used to efficiently decarbonate beer. MN 614 and the nitrogen-free MN 321 are used for malt analysis.

### Technical data

| Grade  | Properties   | Thick-ness | Filtration speed | Basis weight        |
|--------|--|------------|------------------|---------------------|
| MN 614 | medium speed, embossed filter paper                            | 0.25 mm    | 25 s             | 75 g/m <sup>2</sup> |
| MN 321 | fast filtration, nitrogen free                                 | 0.23 mm    | 5 s              | 85 g/m <sup>2</sup> |
| MN 620 | medium speed, embossed filter paper made from unbleached pulp. | 0.26 mm    | 25 s             | 75 g/m <sup>2</sup> |

### Ordering information

References for packs of 100 filters

| Ø      | MN 614  |   | MN 321  | MN 620  |   |
|--------|---|---|---|---|---|
|        |  |  |  |  |  |
| 55 mm  | 42 70 05  | 52 70 05  | 41 00 05  | –   | –   |
| 70 mm  | 42 70 07  | 52 70 07  | 41 00 07  | –   | –   |
| 90 mm  | 42 70 09  | 52 70 09  | 41 00 09  | 44 10 09  | 54 10 09  |
| 110 mm | 42 70 11  | 52 70 11  | 41 00 11  | 44 10 11  | 54 10 11  |
| 125 mm | 42 70 12  | 52 70 12  | 41 00 12  | 44 10 12  | 54 10 12  |
| 150 mm | 42 70 15  | 52 70 15  | 41 00 15  | 44 10 15  | 54 10 15  |
| 185 mm | 42 70 18  | 52 70 18  | 41 00 18  | 44 10 18  | 54 10 18  |
| 240 mm | 42 70 24  | 52 70 24  | 41 00 24  | 44 10 24  | 54 10 24  |
| 320 mm | 42 70 32  | 52 70 32  | –   | 44 10 32  | 54 10 32  |

other sizes and cuts on request



## Fat analysis

**MN 615 ff:** This paper is particularly suited for the analysis of fats. A special treatment with organic solvents guarantees that these filters are practically free of fats and resins (ether-soluble residue < 0.1 mg for a 27 cm filter circle).



**MN 715:** This paper is also suited for the analysis of fats. Careful selection of the raw materials ensures a low ether-soluble residue for these filters.

### Technical data

| Grade     | Properties                           | Thick-ness | Filtration speed | Basis weight        |
|-----------|--------------------------------------|------------|------------------|---------------------|
| MN 615 ff | smooth, washed with organic solvents | 0.16 mm    | 22 s             | 70 g/m <sup>2</sup> |
| MN 715    | smooth                               | 0.16 mm    | 22 s             | 70 g/m <sup>2</sup> |

### Ordering information

References for packs of 100 filters

| Ø      | MN 615 ff   | MN 715  |
|--------|---|---|
|        |  |  |
| 55 mm  | 59 10 05  | 52 80 05  |
| 70 mm  | 59 10 07  | 52 80 07  |
| 90 mm  | 59 10 09  | 52 80 09  |
| 110 mm | 59 10 11  | 52 80 11  |
| 125 mm | 59 10 12  | 52 80 12  |
| 150 mm | 59 10 15  | 52 80 15  |
| 185 mm | 59 10 18  | 52 80 18  |
| 240 mm | 59 10 24  | 52 80 24  |
| 270 mm | 59 10 27  | 52 80 27  |
| 320 mm | –   | 56 10 32  |

other sizes and cuts on request

## Kieselguhr paper MN 660



This filter paper retains very fine turbidities and is e.g. recommended for the clarification of urines or sugar solutions.

### Technical data

| Grade  | Thickness | Basis weight         |
|--------|-----------|----------------------|
| MN 660 | 0.32 mm   | 140 g/m <sup>2</sup> |

### Ordering information

References for packs of 100 filters

| Ø      | MN 660  |   |
|--------|---|---|
|        |  |  |
| 90 mm  | 44 70 09  | –   |
| 110 mm | 44 70 11  | 54 70 11  |
| 125 mm | 44 70 12  | 54 70 12  |
| 150 mm | 44 70 15  | 54 70 15  |
| 185 mm | 44 70 18  | 54 70 18  |
| 240 mm | 44 70 24  | 54 70 24  |
| 320 mm | 44 70 32  | 54 70 32  |

other sizes and cuts on request

## Black filter paper for the detection of light precipitates


This filter paper, which is dyed black with a sulphur dye, is used to identify small quantities of light precipitates. For example, it is used for the detection of fluorine or silicon.

### Technical data

| Grade  | Thickness | Filtration speed | Basis weight        |
|--------|-----------|------------------|---------------------|
| MN 220 | 0.17 mm   | 45 s             | 85 g/m <sup>2</sup> |

### Ordering information

References for packs of 100 filters

| Ø      | MN 220  |
|--------|---|
|        |  |
| 55 mm  | 40 90 05  |
| 70 mm  | 40 90 07  |
| 90 mm  | 40 90 09  |
| 110 mm | 40 90 11  |
| 125 mm | 40 90 12  |
| 150 mm | 40 90 15  |
| 185 mm | 40 90 18  |

other sizes and cuts on request

## Hydrophobic phase separation papers




These papers are made hydrophobic (impermeable to water) by impregnation with a silicone. With the aid of these filters, water can be separated from water-immiscible organic solvents in an elegant manner, by means of a simple filtration.

### Technical data

| Grade     | Properties | Thickness | Filtration speed | Basis weight        |
|-----------|------------|-----------|------------------|---------------------|
| MN 617 WA | smooth     | 0.2 mm    | fast             | 85 g/m <sup>2</sup> |
| MN 616 WA | smooth     | 0.2 mm    | medium fast      | 85 g/m <sup>2</sup> |

### Ordering information

References for packs of 100 filters

| Ø      | MN 617 WA   |   | MN 616 WA   |
|--------|---|---|---|
|        |  |  |  |
| 55 mm  | –   | 48 40 05  | –   |
| 70 mm  | –   | 48 40 07  | –   |
| 90 mm  | 43 00 09  | 48 40 09  | 58 40 09  |
| 110 mm | 43 00 11  | 48 40 11  | 58 40 11  |
| 125 mm | 43 00 12  | 48 40 12  | 58 40 12  |
| 150 mm | 43 00 15  | 48 40 15  | 58 40 15  |
| 185 mm | 43 00 18  | 48 40 18  | 58 40 18  |
| 240 mm | 43 00 24  | 48 40 24  | 52 80 24  |
| 320 mm | –   | 48 40 32  | 52 80 32  |

other sizes and cuts on request



## Microscopy

Paper with good absorbent properties for absorbing liquids from microscopic preparations

### Technical data

| Grade  | Properties            | Thick-ness | Migration distance | Basis weight        |
|--------|-----------------------|------------|--------------------|---------------------|
| MN 224 | for absorbing liquids | 0.2 mm     | 125 mm / 30 min    | 90 g/m <sup>2</sup> |

### Ordering information

| MN 224                             |            |          |
|------------------------------------|------------|----------|
| Presentation                       | Pack of    | REF      |
| blocks of 50 sheets<br>3.7 x 10 cm | 100 blocks | 18 50 00 |

## Weighing aids

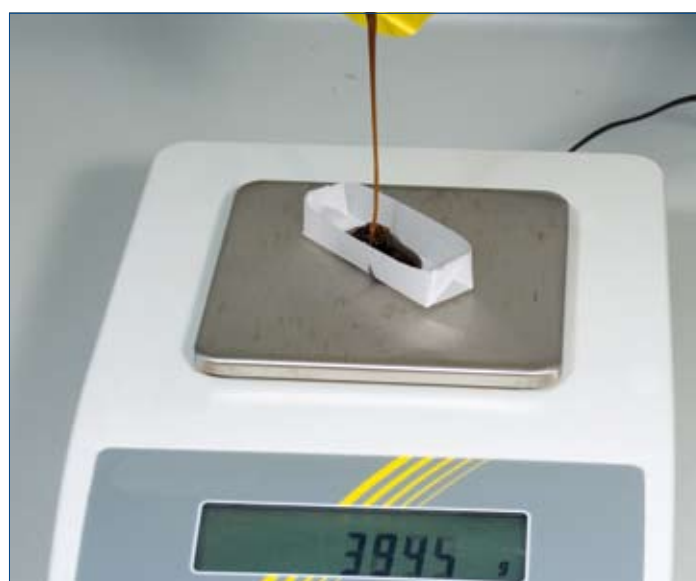
**Weighing boats MN 808:** Weighing boats MN 808 are made from a special, nitrogen-free parchment. They are used to weigh viscous or syrupy substances.

**Weighing paper MN 226:** This is a transparent paper, smooth on both sides, which can be used as substitute for weighing boats. The smooth surface of the paper guarantees that the weighed goods can be transferred without loss.

**Parchment sheets MN 40/25:** These easily crushable (not wet-strengthened) parchment papers are mainly used in the sugar industry for weighing syrupy and semi-crystalline substances.

### Technical data

| Grade    | Properties                | Basis weight        |
|----------|---------------------------|---------------------|
| MN 808   | weighing boats            | n.a.                |
| MN 226   | transparent, smooth       | 40 g/m <sup>2</sup> |
| MN 40/25 | crushable parchment paper | 25 g/m <sup>2</sup> |



### Ordering information

| MN 808          |           |          |
|-----------------|-----------|----------|
| Size            | Pack of   | REF      |
| 58 x 10 x 10 mm | 100 boats | 48 60 00 |
| 70 x 23 x 15 mm | 100 boats | 48 60 01 |

| MN 226                                  |         |          |
|---|---------|----------|
| Size                                    | Pack of | REF      |
| block with<br>100 sheets<br>9 x 11.5 cm | 1 block | 18 60 02 |

| MN 40/25   |            |          |
|------------|------------|----------|
| Size       | Pack of    | REF      |
| 10 x 10 cm | 100 sheets | 19 40 00 |

## Antibiotic resistance testing

These products are used in testing the resistance of pathogens to antibiotics. For this test the filter paper sections can be impregnated with the antibiotic to be tested and placed on the inoculated nutrient medium. Depending on the effectiveness, a smaller or larger zone of inhibition is formed. MACHEREY-NAGEL only supplies non-impregnated filter paper sections!

### Technical data

| Grade  | Thickness | Filtration speed | Basis weight         |
|--------|-----------|------------------|----------------------|
| MN 827 | 0.7 mm    | 12 s             | 270 g/m <sup>2</sup> |

### Ordering information

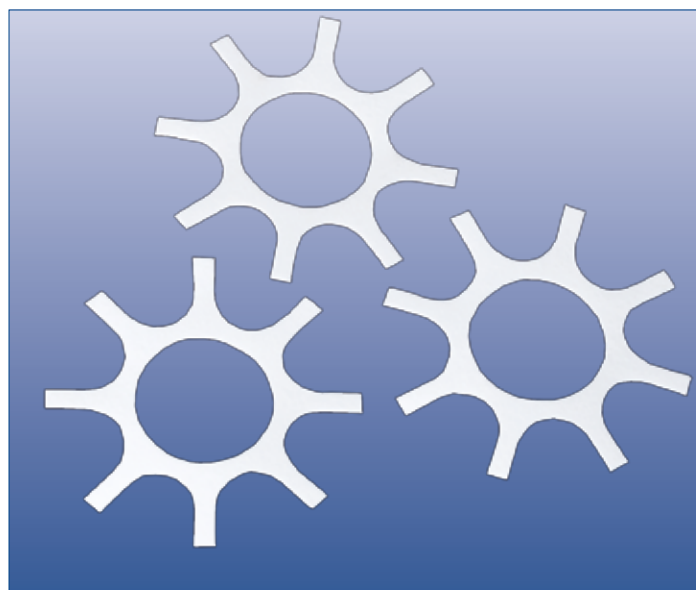
| MN 827                        |         |          |  |
|-------------------------------|---------|----------|--|
| Antibiotic test section       | Pack of | REF      |  |
| Test disks MN 827 ATD, Ø 6 mm | 1000    | 48 40 00 |  |
| Test disks MN 827 ATD, Ø 9 mm | 1000    | 48 40 01 |  |
| Test stars MN 827 ATS/8       | 1000    | 48 40 03 |  |

## Ion exchange papers

**MN 616 LSA-50:** Filter paper with strongly acidic cation exchange resin; matrix polystyrene crosslinked with 8.5% DVB; active groups SO<sub>3</sub>H, strongly acidic, supplied in H<sup>+</sup> form; capacity 2.0 mval/g, applicable up to 100 °C.

A folded filter of 15 cm diameter is sufficient to demineralize 100 ml of water with a hardness of 10° d.

**MN 616 LSB-50:** Filter paper with strongly basic anion exchange resin; matrix polystyrene crosslinked with 6% DBV; active groups quaternary ammonium compounds, strongly basic; supplied in OH<sup>-</sup> form; capacity 1.3 mval/g, applicable up to 70 °C.



### Technical data

| Grade         | Properties                       | Basis weight         |
|---------------|----------------------------------|----------------------|
| MN 616 LSA-50 | contains cationic exchange resin | 100 g/m <sup>2</sup> |
| MN 616 LSB-50 | contains anionic exchange resin  | 100 g/m <sup>2</sup> |

### Ordering information

| Ø     | MN 616 LSA-50 | MN 616 LSB-50 |
|-------|---------------|---------------|
| 48 mm | 43 21 10      | 43 21 20      |

other sizes and cuts on request

## Lens tissue paper (José paper)

Thin, soft, non-fluffing tissue paper for cleaning optical glasses, cuvettes, also suitable as protective paper for metallographic sections

### Technical data

| Grade | Properties        | Basis weight        |
|-------|-------------------|---------------------|
| MN 13 | very thin, smooth | 13 g/m <sup>2</sup> |

### Ordering information

| MN 13                           |            |          |  |
|---------------------------------|------------|----------|--|
| Presentation                    | Pack of    | REF      |  |
| Sheets, 12 x 12 cm              | 500 sheets | 41 81 01 |  |
| Sheets, 36 x 48 cm              | 500 sheets | 41 81 02 |  |
| Blocks with 50 sheets 8 x 10 cm | 1 block    | 11 80 00 |  |

other sizes and cuts on request



## Surface protection paper LAB-TOP

Filter paper coated on one side with polyethylene, e.g. for covering laboratory workbenches. The filter paper absorbs spilt liquids. It is especially suited for isotope and bacteriological laboratories as well as for chemical storerooms and cupboards.

### Technical data

| Grade     | Properties         | Thickness | Basis weight         |
|-----------|--------------------|-----------|----------------------|
| MN 210 PE | one side PE-coated | 0.22 mm   | 140 g/m <sup>2</sup> |

### Ordering information

| MN 210 PE          |  |            |            |
|--------------------|--|------------|------------|
| Presentation       |  | Pack of    | REF        |
| Sheets, 48 x 60 cm |  | 100 sheets | 11 20 00   |
| Sheets, 48 x 60 cm |  | 50 sheets  | 11 20 00.1 |
| Roll, 100 x 0.48 m |  | 1 roll     | 11 20 10   |
| Roll, 50 x 0.48 m  |  | 1 roll     | 11 20 50   |
| Roll, 100 x 0.60 m |  | 1 roll     | 11 20 20   |
| Roll, 50 x 0.60 m  |  | 1 roll     | 11 20 30   |

other sizes and cuts on request



## Filter aids

### Filter flocs

Filter aids transform difficult precipitates and colloidal particles into a form which can be filtered more easily. When slimy and strongly lyophilic, swelling precipitates are involved, the fibres of the filter flocs prevent formation of a continuous, impermeable layer on the filter. The resulting filter cake remains porous and permeable, and clogging of the filter is prevented.

### Technical data

| Grade   | Properties                         |
|---------|------------------------------------|
| MN 101  | qualitative filter flocs           |
| MN 2101 | ashless, quantitative filter flocs |

### Ordering information

| MN 101   |          | MN 2101  |          |
|----------|----------|----------|----------|
| 500 g    | 1000 g   | 500 g    | 1000 g   |
| 48 11 00 | 48 11 10 | 28 11 20 | 28 11 30 |



## Blotting procedures and chromatography

### Blotting papers

The smooth surface of these papers ensures a uniform, high absorptivity. They are particularly recommended for blotting procedures.

### Chromatography papers

Paper chromatography requires high quality papers, since they have a considerable impact on the results of a separation.

The chromatography papers listed below are almost exclusively produced from pure linters without addition of other substances. For this reason they show a low wet strength.



### Technical data

| Grade                   | Migration distance  | Thickness | Basis weight         | Application    |
|-------------------------|---------------------|-----------|----------------------|----------------|
| MN 218 B                | 55 – 65 mm/10 min   | 0.36 mm   | 180 g/m <sup>2</sup> | blotting       |
| MN 827 B                | 130 – 140 mm/10 min | 0.7 mm    | 270 g/m <sup>2</sup> | blotting       |
| MN 440 B                | 130 – 145 mm/10 min | 1.0 mm    | 400 g/m <sup>2</sup> | blotting       |
| MN 214                  | 90 – 100 mm/30 min  | 0.28 mm   | 140 g/m <sup>2</sup> | chromatography |
| MN 214 ff <sup>1)</sup> | 90 – 100 mm/30 min  | 0.28 mm   | 140 g/m <sup>2</sup> | chromatography |
| MN 218                  | 90 – 100 mm/30 min  | 0.36 mm   | 180 g/m <sup>2</sup> | chromatography |
| MN 260                  | 120 – 130 mm/30 min | 0.20 mm   | 90 g/m <sup>2</sup>  | chromatography |
| MN 261                  | 90 – 100 mm/30 min  | 0.18 mm   | 90 g/m <sup>2</sup>  | chromatography |
| MN 827                  | 130 – 140 mm/10 min | 0.70 mm   | 270 g/m <sup>2</sup> | chromatography |
| MN 866                  | 100 – 120 mm/10 min | 1.7 mm    | 650 g/m <sup>2</sup> | chromatography |

<sup>1)</sup> MN 214 defatted

### Ordering information

References for packs of 100 sheets

| MN 218 B   |          | MN 827 B   |          | MN 214     |          | MN 214 ff  |          |
|------------|----------|------------|----------|------------|----------|------------|----------|
| Size       |          | Size       |          | Size       |          | Size       |          |
| 58 x 60 mm | 74 21 11 | 58 x 60 mm | 74 21 18 | 58 x 60 mm | 81 70 01 | 58 x 60 mm | 81 70 08 |
| 30 x 60 mm | 74 21 12 | 20 x 20 mm | 74 21 20 |            |          |            |          |
| 57 x 46 mm | 74 21 13 | 16 x 16 mm | 74 21 28 |            |          |            |          |
| 20 x 20 mm | 74 21 15 |            |          |            |          |            |          |
| 15 x 20 mm | 74 21 38 |            |          |            |          |            |          |
| 21 x 9 mm  | 74 21 31 |            |          |            |          |            |          |
| 13 x 10 mm | 74 21 16 |            |          |            |          |            |          |
| 10 x 7 mm  | 74 21 39 |            |          |            |          |            |          |
| 9.3 x 8 mm | 74 21 37 |            |          |            |          |            |          |
|            |          |            |          |            |          |            |          |
|            |          | MN 440 B   |          |            |          |            |          |
|            |          | 58 x 60 mm | 74 21 25 |            |          |            |          |
|            |          |            |          |            |          |            |          |
|            |          |            |          | MN 260     |          | MN 261     |          |
|            |          |            |          | 58 x 60 mm | 81 70 03 | 58 x 60 mm | 81 70 04 |
|            |          |            |          |            |          |            |          |
|            |          |            |          | MN 827     |          | MN 866     |          |
|            |          |            |          | 58 x 60 mm | 81 70 05 | 80 x 80 mm | 81 70 07 |
|            |          |            |          |            |          | 38 x 38 mm | 81 70 06 |

other sizes and cuts on request

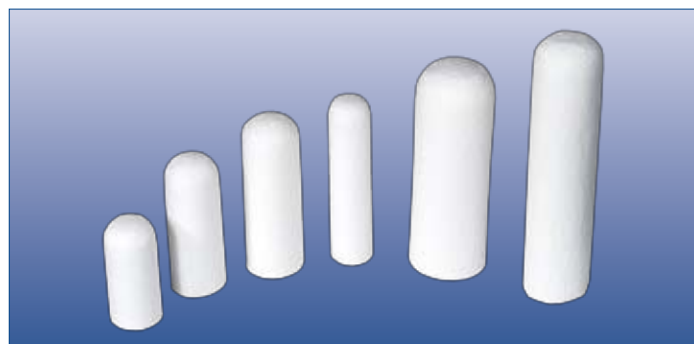
## Extraction thimbles

Extraction thimbles are often used for holding solid materials, from which certain substances are to be eluted (extracted) with a suitable solvent. Additionally, extraction thimbles are used in the fields of air and waste gas analysis for collecting solid particles (dust).

### Extraction thimbles made from cellulose

#### Technical data

| Grade    | Properties  |
|----------|---|
| MN 645   | standard grade, extraction thimbles made from pure cellulose  |
| MN 645 D | extraction thimbles MN 645 with lid to prevent loss of contents   |
| MN 645 F | extraction thimbles made from cellulose, denser than MN 645   |
| MN 645 W | extraction thimbles made from cellulose, more permeable than MN 645   |
| MN 645 R | extraction thimbles MN 645 with sealing collar and two finger recesses on opposite sides of the collar, for dust analysis in industrial gases, exhaust gases and room air |



#### Ordering information

References for packs of 25 thimbles

| MN 645      |                |          |
|-------------|----------------|----------|
| ID x height | wall thickness | REF      |
| 8 x 40 mm   | 1.0 mm         | 64 50 01 |
| 9 x 50 mm   | 1.0 mm         | 64 50 02 |
| 15 x 50 mm  | 1.0 mm         | 64 50 03 |
| 15 x 100 mm | 1.0 mm         | 64 50 04 |
| 20 x 80 mm  | 1.5 mm         | 64 50 05 |
| 22 x 80 mm* | 1.5 mm         | 64 50 06 |
| 23 x 90 mm  | 1.5 mm         | 64 50 07 |
| 23 x 100 mm | 1.5 mm         | 64 50 08 |
| 27 x 60 mm  | 1.5 mm         | 64 50 11 |
| 27 x 80 mm  | 1.5 mm         | 64 50 09 |
| 27 x 100 mm | 1.5 mm         | 64 50 10 |
| 28 x 80 mm  | 1.5 mm         | 64 50 15 |
| 28 x 90 mm  | 1.5 mm         | 64 50 16 |
| 28 x 100 mm | 1.5 mm         | 64 50 13 |
| 28 x 120 mm | 1.5 mm         | 64 50 14 |
| 29 x 100 mm | 1.5 mm         | 64 50 17 |
| 30 x 60 mm  | 1.5 mm         | 64 50 19 |
| 30 x 80 mm  | 1.5 mm         | 64 50 20 |
| 30 x 90 mm  | 1.5 mm         | 64 50 21 |
| 30 x 100 mm | 1.5 mm         | 64 50 23 |
| 30 x 150 mm | 1.5 mm         | 64 50 18 |

| MN 645       |                |          |
|--------------|----------------|----------|
| ID x height  | wall thickness | REF      |
| 31 x 118 mm  | 1.5 mm         | 64 50 24 |
| 31 x 130 mm  | 1.5 mm         | 64 50 25 |
| 33 x 80 mm   | 1.5 mm         | 64 59 51 |
| 33 x 94 mm*  | 1.5 mm         | 64 50 22 |
| 33 x 205 mm* | 1.5 mm         | 64 50 26 |
| 34 x 120 mm  | 1.5 mm         | 64 50 27 |
| 34 x 150 mm  | 1.5 mm         | 64 50 28 |
| 38 x 200 mm  | 1.5 mm         | 64 50 29 |
| 40 x 123 mm  | 2.0 mm         | 64 50 31 |
| 40 x 150 mm  | 2.0 mm         | 64 50 30 |
| 43 x 130 mm  | 2.0 mm         | 64 50 32 |
| 48 x 145 mm  | 2.0 mm         | 64 50 33 |
| 48 x 200 mm  | 2.0 mm         | 64 50 34 |
| 48 x 230 mm* | 2.0 mm         | 64 50 35 |
| 51 x 145 mm  | 2.0 mm         | 64 50 36 |
| 51 x 180 mm  | 2.0 mm         | 64 50 37 |
| 55 x 275 mm  | 2.0 mm         | 64 50 40 |
| 57 x 315 mm* | 2.0 mm         | 64 50 38 |
| 60 x 180 mm  | 2.0 mm         | 64 50 39 |
| 68 x 250 mm  | 2.0 mm         | 64 50 42 |
| 70 x 330 mm  | 2.0 mm         | 64 50 43 |

| MN 645 D    |                |          |
|-------------|----------------|----------|
| ID x height | wall thickness | REF      |
| 30 x 80 mm  | 1.5 mm         | 64 52 20 |
| 30 x 100 mm | 1.5 mm         | 64 52 23 |
| 31 x 130 mm | 1.5 mm         | 64 52 25 |

| MN 645 F    |                |          |
|-------------|----------------|----------|
| ID x height | wall thickness | REF      |
| 22 x 80 mm  | 1.5 mm         | 64 54 06 |
| 30 x 100 mm | 1.5 mm         | 64 54 23 |

| MN 645 W    |                |          |
|-------------|----------------|----------|
| ID x height | wall thickness | REF      |
| 20 x 80 mm  | 1.5 mm         | 64 51 05 |
| 28 x 90 mm  | 1.5 mm         | 64 51 16 |
| 31 x 205 mm | 1.5 mm         | 64 51 26 |

| MN 645 R    |                |          |
|-------------|----------------|----------|
| ID x height | wall thickness | REF      |
| 79 x 155 mm | 102 mm         | 64 55 00 |

\* Extraction thimbles in accordance with DIN 12449 for extractors with defined nominal volumes according to DIN 12602 and 12604

## Extraction thimbles made from borosilicate glass

### Technical data

#### Grade Properties

**MN 649** extraction thimbles made from glass microfibres without binder, short-term temperature resistance up to 500 °C, very high particle retention, for dust analysis in hot exhaust gases

**MN 649 R** extraction thimbles MN 649 with sealing collar and two finger recesses on opposite sides of the collar, for dust analysis in industrial gases, exhaust gases and room air

### Ordering information

References for packs of 25 thimbles

| MN 649       |                |          |
|--------------|----------------|----------|
| ID x height  | wall thickness | REF      |
| 15 x 50 mm   | 1.0 mm         | 64 91 03 |
| 16 x 100 mm  | 1.0 mm         | 64 91 04 |
| 22 x 80 mm*  | 1.5 mm         | 64 91 06 |
| 23 x 90 mm   | 1.5 mm         | 64 91 07 |
| 23 x 100 mm  | 1.5 mm         | 64 91 08 |
| 28 x 60 mm   | 1.5 mm         | 64 91 11 |
| 27 x 80 mm   | 1.5 mm         | 64 91 09 |
| 28 x 120 mm  | 1.5 mm         | 64 91 14 |
| 30 x 150 mm  | 1.5 mm         | 64 91 18 |
| 33 x 80 mm   | 1.5 mm         | 64 91 20 |
| 33 x 90 mm   | 1.5 mm         | 64 91 21 |
| 33 x 94 mm*  | 1.5 mm         | 64 91 22 |
| 33 x 100 mm  | 1.5 mm         | 64 91 23 |
| 33 x 118 mm  | 1.5 mm         | 64 91 24 |
| 33 x 205 mm* | 1.5 mm         | 64 91 26 |
| 35 x 150 mm  | 1.5 mm         | 64 91 28 |
| 43 x 123 mm  | 2.0 mm         | 64 91 31 |
| 48 x 230 mm* | 2.0 mm         | 64 91 35 |
| 57 x 315 mm* | 2.0 mm         | 64 91 38 |
| 75 x 330 mm  | 2.0 mm         | 64 91 43 |

| MN 649 R    |          |          |
|-------------|----------|----------|
| ID x height | collar Ø | REF      |
| 79 x 155 mm | 102 mm   | 64 95 00 |
| 27 x 55 mm  | 50 mm    | 64 95 01 |

\* Extraction thimbles in accordance with DIN 12449 for extractors with defined nominal volumes according to DIN 12602 and 12604





## Membranes

Membranes enable a very convenient, fast and economical separation. Often they are also used as a neutral sample support for further analysis.

### Overview of available membrane filters

| Material and properties   | Type            | Pore sizes [µm]               | Page |
|---|-----------------|-------------------------------|------|
| <b>Cellulose mixed esters</b> <ul style="list-style-type: none"> <li>• suitable for aqueous solutions</li> <li>• also available sterile and/or with grid</li> <li>• recommended for gravimetric analysis</li> <li>• autoclaving possible at 121 °C</li> <li>• economical</li> </ul>           | PORA FIL® CM    | 0.2 · 0.45 · 0.65 · 0.8 · 1.2 | 28   |
|   | CHROMAFIL® MV   | 0.2 · 0.45                    | 33   |
| <b>Cellulose mixed esters, fabric-reinforced</b> <ul style="list-style-type: none"> <li>• suitable for aqueous solutions</li> <li>• higher mechanical stability than PORA FIL® CM</li> </ul>  | PORA FIL® MV    | 0.2 · 0.45 · 0.8 · 3.0        | 29   |
| <b>Cellulose nitrate</b> <ul style="list-style-type: none"> <li>• thermally stable up to 125 °C</li> <li>• autoclaving possible at 121 °C</li> </ul>  | PORA FIL® NC    | 0.2 · 0.45                    | 29   |
| <b>Polycarbonate</b> <ul style="list-style-type: none"> <li>• very low halogen blank values</li> <li>• suitable for quantitative AOX determination</li> <li>• thermally stable up to 140°C</li> </ul>   | PORA FIL® PC    | 0.4                           | 30   |
| <b>Cellulose acetate</b> <ul style="list-style-type: none"> <li>• suitable for aqueous and many alcoholic media</li> <li>• low protein binding capacity</li> <li>• thermally stable up to 180°C</li> </ul>  | PORA FIL® CA    | 0.2 · 0.45 · 0.8 · 1.2        | 29   |
|   | CHROMAFIL® CA   | 0.2 · 0.45                    | 34   |
| <b>Polytetrafluoroethylene (PTFE)</b> <ul style="list-style-type: none"> <li>• hydrophobic membrane</li> <li>• suitable for almost all solvents, chemical resistance towards acids and bases</li> <li>• for filtration of aggressive media</li> <li>• thermally stable up to 145°C</li> </ul> | PORA FIL® TE    | 0.2 · 0.45 · 1.0 · 3.0        | 30   |
|   | CHROMAFIL® PTFE | 0.2 · 0.45                    | 33   |
| <b>Polyester</b> <ul style="list-style-type: none"> <li>• chemically very resistant membrane (not as stable as PTFE)</li> <li>• suitable for TOC/DOC determination</li> <li>• thermally stable up to 150 °C</li> </ul>  | PORA FIL® PE    | 0.05 · 0.2 · 0.4 · 1.0 · 5.0  | 30   |
|   | CHROMAFIL® PET  | 0.2 · 0.45 · 1.20             | 32   |
| <b>Regenerated cellulose</b> <ul style="list-style-type: none"> <li>• suitable for all media except strong acids and bases</li> <li>• thermally stable up to 180°C</li> </ul>   | PORA FIL® RC    | 0.2 · 0.45                    | 30   |
|   | CHROMAFIL® RC   | 0.2 · 0.45                    | 32   |
| <b>Polyamide</b> <ul style="list-style-type: none"> <li>• for aqueous and organic solvents</li> <li>• thermally stable up to 135 °C</li> </ul>  | CHROMAFIL® PA   | 0.2 · 0.45                    | 35   |
| <b>Polyethersulfon</b> <ul style="list-style-type: none"> <li>• for aqueous and slightly organic solvents</li> <li>• suitable for organic acids</li> </ul>  | CHROMAFIL® PES  | 0.2 · 0.45 · 5.00             | 34   |
| <b>Polyvinylidene difluoride</b> <ul style="list-style-type: none"> <li>• hydrophobic membrane</li> <li>• suitable for filtration of polar and nonpolar solutions</li> <li>• chemically inert towards many solvents, similar stability to PTFE</li> </ul>                                     | CHROMAFIL® PVDF | 0.2 · 0.45                    | 35   |
| <b>Glass fibre</b> <ul style="list-style-type: none"> <li>• inert filter</li> <li>• for highly contaminated samples</li> <li>• optional pre filter</li> </ul>   | CHROMAFIL® GF   | 1.0                           | 35   |

## Chemical resistance of filter membranes

| Substances                   | CA | CM/MV | NC | PC | PE/PET | TE/PTFE | RC | PA | PES | PVDF | GF |
|------------------------------|----|-------|----|----|--------|---------|----|----|-----|------|----|
| <b>Hydrocarbons</b>          |    |       |    |    |        |         |    |    |     |      |    |
| aliphatic hydrocarbons       | +  | +     | +  | +  | +      | +       | +  | +  | +   | +    | -  |
| petroleum ether              | +  | +     | +  | +  | +      | +       | +  | +  | +   | +    | -  |
| cyclohexane                  | +  | +     | -  | -  | +      | +       | +  | +  | +   | +    | -  |
| aromatic hydrocarbons        | +  | +     | ○  | ○  | +      | +       | +  | +  | +   | +    | -  |
| benzene                      | +  | +     | +  | +  | +      | +       | +  | +  | -   | +    | +  |
| chloroform                   | -  | +     | +  | -  | +      | +       | +  | -  | -   | +    | -  |
| methylene chloride           | -  | +     | -  | -  | +      | +       | +  | -  | -   | ○    | -  |
| trichloroethylene            | +  | +     | +  | -  | +      | +       | +  | +  | -   | +    | +  |
| tetrachloromethane           | ○  | +     | +  | +  | +      | +       | +  | +  | -   | +    | +  |
| chlorobenzene, freon         | +  | +     | +  | +  | +      | +       | +  | -  | -   | -    | -  |
| gasoline                     | +  | +     | +  | +  | +      | +       | +  | +  | +   | +    | -  |
| acetonitrile                 | -  | -     | -  | -  | +      | +       | +  | +  | +   | ○    | +  |
| <b>Alcohols</b>              |    |       |    |    |        |         |    |    |     |      |    |
| methanol, 98%                | +  | -     | -  | -  | ○      | +       | +  | +  | +   | +    | -  |
| butanol                      | +  | +     | +  | +  | +      | +       | +  | ○  | +   | ○    | +  |
| ethanol, 98%                 | +  | -     | ○  | +  | +      | +       | +  | +  | +   | +    | +  |
| ethanol, 70%                 | +  | ○     | ○  | +  | +      | +       | +  | +  | +   | +    | +  |
| isopropanol                  | +  | +     | ○  | +  | +      | +       | +  | +  | +   | +    | -  |
| n-propanol                   | +  | +     | ○  | +  | +      | +       | +  | +  | +   | +    | +  |
| amyl alcohol                 | +  | +     | +  | +  | +      | +       | +  | -  | +   | -    | -  |
| benzyl alcohol               | ○  | ○     | +  | ○  | +      | +       | +  | -  | +   | -    | -  |
| ethylene glycol              | +  | ○     | ○  | +  | +      | +       | +  | +  | +   | +    | +  |
| glycerine                    | +  | +     | +  | +  | +      | +       | +  | -  | +   | -    | -  |
| cyclohexanol                 | -  | -     | +  | -  | +      | +       | +  | -  | +   | -    | -  |
| polyethylene glycol 400      | +  | ○     | +  | +  | +      | +       | +  | -  | +   | -    | -  |
| <b>Aldehydes, ketones</b>    |    |       |    |    |        |         |    |    |     |      |    |
| acetaldehyde                 | -  | -     | -  | -  | +      | +       | +  | ○  | -   | -    | +  |
| acetone                      | -  | -     | -  | -  | ○      | +       | +  | +  | -   | ○    | +  |
| cyclohexanone                | -  | -     | -  | -  | ○      | +       | +  | -  | -   | -    | -  |
| methyl ethyl ketone          | ○  | -     | -  | -  | ○      | +       | +  | -  | -   | -    | -  |
| methyl isobutyl ketone       | ○  | ○     | -  | -  | +      | +       | +  | -  | -   | -    | -  |
| <b>Esters</b>                |    |       |    |    |        |         |    |    |     |      |    |
| methyl acetate               | -  | -     | -  | -  | ○      | +       | +  | -  | +   | -    | -  |
| ethyl acetate                | -  | -     | -  | -  | ○      | +       | +  | +  | +   | ○    | +  |
| amyl, propyl, butyl acetate  | ○  | -     | -  | +  | +      | +       | +  | -  | +   | -    | -  |
| methyl glycol acetate        | ○  | -     | ○  | +  | +      | +       | +  | -  | +   | -    | -  |
| benzyl benzoate              | +  | +     | +  | -  | ○      | +       | +  | -  | +   | -    | -  |
| i-propyl myristate           | +  | ○     | ○  | ○  | +      | +       | -  | -  | -   | -    | -  |
| tricresyl phosphate          | +  | ○     | ○  | ○  | +      | +       | +  | -  | -   | -    | -  |
| <b>Ethers and sulfoxides</b> |    |       |    |    |        |         |    |    |     |      |    |
| diethyl ether                | +  | ○     | -  | ○  | +      | +       | +  | +  | +   | ○    | +  |
| dioxan                       | -  | -     | -  | -  | +      | +       | +  | +  | -   | ○    | +  |
| tetrahydrofuran              | -  | -     | -  | -  | +      | +       | +  | ○  | -   | +    | +  |
| dimethylsulphoxide           | -  | -     | -  | -  | +      | +       | ○  | -  | -   | -    | -  |

| Substances                          | CA | CM/MV | NC | PC | PE/PET | TE/PTFE | RC | PA | PES | PVDF | GF |
|-------------------------------------|----|-------|----|----|--------|---------|----|----|-----|------|----|
| <b>Solvents containing nitrogen</b> |    |       |    |    |        |         |    |    |     |      |    |
| dimethylformamide                   | -  | -     | -  | -  | +      | +       | ○  | +  | -   | ○    | +  |
| dimethylacetamide                   | -  | -     | -  | ○  | +      | +       | +  | -  | -   | -    | -  |
| triethanolamine                     | +  | ○     | +  | ○  | +      | +       | +  | -  | -   | -    | -  |
| aniline                             | -  | ○     | ○  | -  | +      | +       | +  | -  | -   | -    | -  |
| pyridine                            | -  | -     | -  | -  | +      | +       | +  | -  | -   | -    | -  |
| <b>Acids</b>                        |    |       |    |    |        |         |    |    |     |      |    |
| hydrochloric acid 30%               | -  | -     | -  | -  | +      | +       | -  | -  | -   | +    | +  |
| hydrochloric acid 25%               | -  | -     | ○  | -  | +      | +       | +  | -  | -   | -    | +  |
| nitric acid 65%                     | -  | -     | -  | ○  | -      | +       | -  | -  | -   | +    | +  |
| nitric acid 1 N                     | +  | +     | ○  | -  | +      | +       | +  | -  | -   | -    | +  |
| sulphuric acid 96%                  | -  | -     | -  | -  | +      | +       | -  | -  | -   | -    | -  |
| phosphoric acid 80%                 | -  | -     | -  | -  | +      | +       | ○  | -  | -   | +    | +  |
| phosphoric acid 25%                 | +  | ○     | ○  | ○  | ○      | +       | +  | -  | -   | -    | +  |
| formic acid 100%                    | -  | +     | -  | ○  | +      | +       | ○  | -  | +   | +    | +  |
| formic acid 25%                     | ○  | -     | +  | ○  | +      | +       | +  | -  | +   | -    | +  |
| acetic acid 96%                     | -  | -     | -  | ○  | +      | +       | -  | -  | +   | +    | +  |
| acetic acid 25%                     | +  | +     | -  | ○  | +      | +       | +  | -  | +   | -    | +  |
| oxalic acid 10% aq.                 | -  | +     | -  | -  | +      | +       | +  | -  | +   | +    | -  |
| trichloroacetic acid 10%            | +  | -     | +  | ○  | +      | +       | -  | -  | -   | -    | -  |
| <b>Bases</b>                        |    |       |    |    |        |         |    |    |     |      |    |
| ammonia 25%                         | ○  | -     | ○  | -  | -      | +       | -  | -  | +   | +    | +  |
| ammonia 1 N                         | +  | +     | +  | -  | +      | +       | +  | -  | +   | -    | -  |
| sodium hydroxide 1 N                | -  | -     | -  | -  | -      | +       | ○  | +  | -   | ○    | -  |
| potassium hydroxide 1 N             | -  | -     | -  | -  | ○      | +       | ○  | +  | -   | ○    | -  |
| <b>Miscellaneous</b>                |    |       |    |    |        |         |    |    |     |      |    |
| aqueous phenol solution             | -  | +     | -  | -  | +      | +       | +  | -  | -   | -    | -  |
| formalin 30%                        | ○  | +     | +  | +  | +      | +       | -  | -  | -   | -    | -  |
| turpentine oil                      | +  | +     | +  | +  | +      | +       | +  | -  | -   | -    | -  |
| castor oil                          | +  | +     | +  | +  | +      | +       | +  | -  | -   | -    | -  |
| cremophor 2%                        | +  | ○     | ○  | +  | +      | +       | +  | -  | -   | -    | -  |
| hydrogen peroxide 30%               | +  | +     | +  | +  | +      | +       | +  | -  | -   | -    | -  |
| photoresist                         | -  | -     | +  | +  | +      | +       | +  | -  | -   | -    | -  |
| nail varnish remover                | -  | -     | +  | +  | +      | +       | +  | -  | -   | -    | -  |

+ : resistant    ○ : partly resistant    - : not resistant  
 - : no information

## PORAFIL® membrane filters

### Cellulose mixed ester membranes · PORAFIL® CM

Membranes of cellulose mixed esters are ideal for gravimetric analysis. They are particularly suited for aqueous solutions. The hydrophilic membrane is thermally stable to 125 °C and can be autoclaved at 121 °C. This membrane is often used for contamination tests.

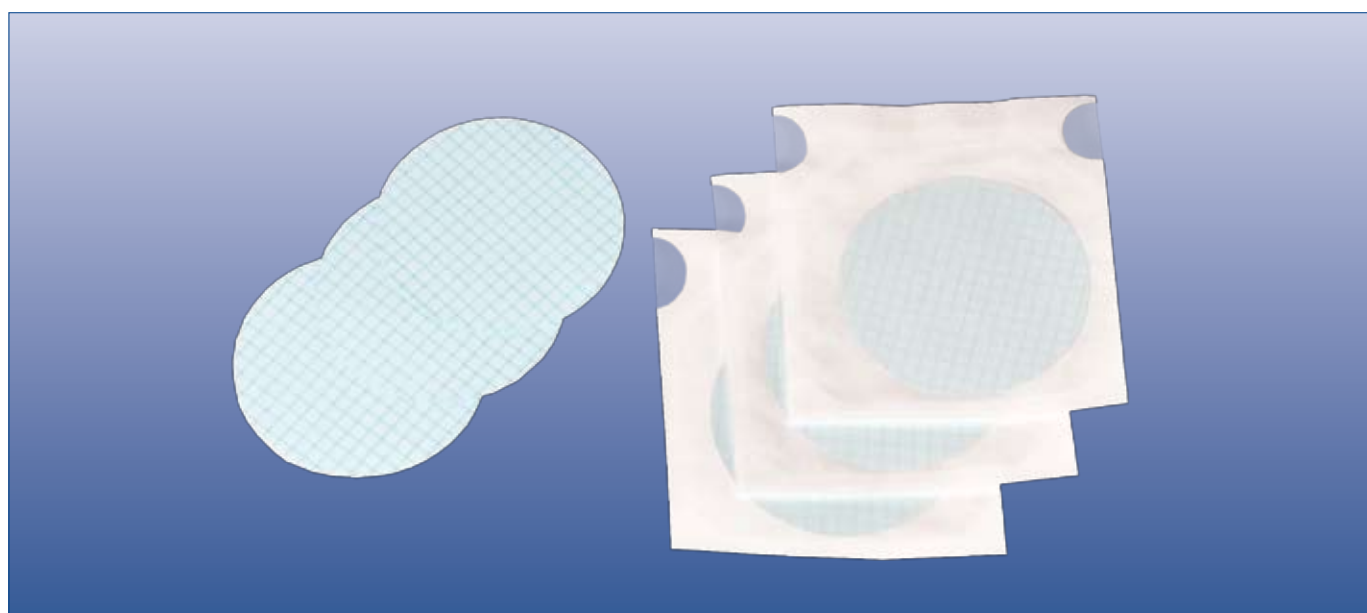
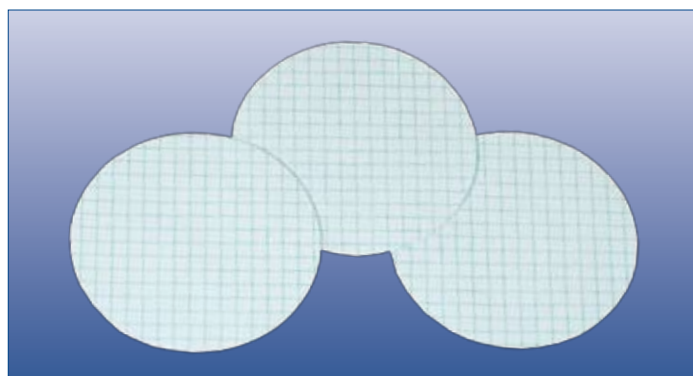
#### Ordering information

##### PORAFIL® CM sterile / not sterile

| Ø                        | Colour | Sterile | Grid  | Pack of | REF            |
|--------------------------|--------|---------|-------|---------|----------------|
| <b>Pore size 0.45 µm</b> |        |         |       |         |                |
| 47 mm                    | white  | ✓       | black | 100     | 653 000 45 047 |
| 47 mm                    | white  | ✓       | –     | 100     | 653 020 45 047 |
| 47 mm                    | black  | ✓       | white | 100     | 653 100 45 047 |
| 47 mm                    | green  | ✓       | black | 100     | 653 200 45 047 |
| 50 mm                    | white  | ✓       | black | 100     | 653 000 45 050 |
| 50 mm                    | black  | ✓       | white | 100     | 653 100 45 050 |
| 50 mm                    | green  | ✓       | black | 100     | 653 200 45 050 |
| 47 mm                    | white  | –       | black | 100     | 656 000 45 047 |
| 47 mm                    | black  | –       | white | 100     | 656 100 45 047 |
| 47 mm                    | green  | –       | black | 100     | 656 200 45 047 |
| 50 mm                    | white  | –       | black | 100     | 656 000 45 050 |
| 50 mm                    | black  | –       | white | 100     | 656 100 45 050 |
| 50 mm                    | green  | –       | black | 100     | 656 200 45 050 |

##### PORAFIL® CM white, not sterile, no grid

| Ø                        | Pack of | REF            |
|--------------------------|---------|----------------|
| <b>Pore size 0.20 µm</b> |         |                |
| 13 mm                    | 100     | 651 000 20 013 |
| 47 mm                    | 100     | 651 000 20 047 |
| 50 mm                    | 100     | 651 000 20 050 |
| 142 mm                   | 25      | 651 000 20 142 |
| 293 mm                   | 25      | 651 000 20 293 |
| <b>Pore size 0.45 µm</b> |         |                |
| 13 mm                    | 100     | 651 000 45 013 |
| 25 mm                    | 100     | 651 000 45 025 |
| 47 mm                    | 100     | 651 000 45 047 |
| 50 mm                    | 100     | 651 000 45 050 |
| 100 mm                   | 25      | 651 000 45 100 |
| 142 mm                   | 25      | 651 000 45 142 |
| 220 mm                   | 25      | 651 000 45 220 |
| 293 mm                   | 25      | 651 000 45 293 |



## Cellulose mixed ester membranes, fabric-reinforced · PORAFIL® MV

These cellulose mixed ester membranes are reinforced with a polyester fabric. Their filtration properties are very similar to membranes PORAFIL® CM, however, they are mechanically much more stable.

### Ordering information

| Ø      | Pack of | Pore size 0.2 µm | Pore size 0.45 µm | Pore size 0.8 µm | Pore size 3.0 µm |
|--------|---------|------------------|-------------------|------------------|------------------|
| 13 mm  | 100     | 650 000 20 013   | 650 000 45 013    | 650 000 80 013   | 650 003 00 013   |
| 25 mm  | 100     | 650 000 20 025   | 650 000 45 025    | 650 000 80 025   | 650 003 00 025   |
| 47 mm  | 100     | 650 000 20 047   | 650 000 45 047    | 650 000 80 047   | 650 003 00 047   |
| 50 mm  | 100     | 650 000 20 050   | 650 000 45 050    | 650 000 80 050   | 650 003 00 050   |
| 90 mm  | 25      | 650 000 20 090   | 650 000 45 090    | 650 000 80 090   | 650 003 00 090   |
| 100 mm | 25      | 650 000 20 100   | 650 000 45 100    | 650 000 80 100   | 650 003 00 100   |
| 142 mm | 25      | 650 000 20 142   | 650 000 45 142    | 650 000 80 142   | 650 003 00 142   |
| 220 mm | 25      | 650 000 20 220   | 650 000 45 220    | 650 000 80 220   | 650 003 00 220   |
| 293 mm | 25      | 650 000 20 293   | 650 000 45 293    | 650 000 80 293   | 650 003 00 293   |

## Cellulose acetate membranes · PORAFIL® CA

These membranes of cellulose acetate have a low protein binding capacity and are suited for aqueous and alcoholic media. The membranes are hydrophilic and can be used for hot gases up to 180 °C. They can be sterilised.

### Ordering information

| Ø      | Pack of | Pore size 0.2 µm | Pore size 0.45 µm | Pore size 0.8 µm | Pore size 1.2 µm |
|--------|---------|------------------|-------------------|------------------|------------------|
| 13 mm  | 100     | 680 000 20 013   | 680 000 45 013    | 680 000 80 013   | 680 00 120 013   |
| 25 mm  | 100     | 680 000 20 025   | 680 000 45 025    | 680 000 80 025   | 680 00 120 025   |
| 47 mm  | 100     | 680 000 20 047   | 680 000 45 047    | 680 000 80 047   | 680 00 120 047   |
| 50 mm  | 100     | 680 000 20 050   | 680 000 45 050    | 680 000 80 050   | 680 00 120 050   |
| 90 mm  | 50      | 680 000 20 090   | 680 000 45 090    | 680 000 80 090   | 680 00 120 090   |
| 100 mm | 25      | 680 000 20 100   | 680 000 45 100    | 680 000 80 100   | 680 00 120 100   |
| 142 mm | 25      | 680 000 20 142   | 680 000 45 142    | 680 000 80 142   | 680 00 120 142   |
| 220 mm | 25      | 680 000 20 220   | 680 000 45 220    | 680 000 80 220   | 680 00 120 220   |
| 293 mm | 25      | 680 000 20 293   | 680 000 45 293    | 680 000 80 293   | 680 00 120 293   |

## Nitrocellulose membranes · PORAFIL® NC

PORAFIL® NC membranes are made from cellulose nitrate. They are easily wettable and suited for filtration of aqueous solutions. In dry atmosphere these membranes are thermally stable to 125 °C and can be autoclaved at 121 °C.

### Ordering information

| Ø      | Pack of | Pore size 0.2 µm | Pore size 0.45 µm |
|--------|---------|------------------|-------------------|
| 13 mm  | 50      | 657 002 00 13    | 657 004 50 13     |
| 25 mm  | 50      | 657 002 00 25    | 657 004 50 25     |
| 47 mm  | 50      | 657 002 00 47    | 657 004 50 47     |
| 50 mm  | 50      | 657 002 00 50    | 657 004 50 50     |
| 90 mm  | 50      | 657 002 00 90    | 657 004 50 90     |
| 100 mm | 25      | 657 002 01 00    | 657 004 51 00     |
| 142 mm | 25      | 657 002 01 42    | 657 004 51 42     |
| 220 mm | 10      | 657 002 02 20    | 657 004 52 20     |
| 293 mm | 10      | 657 002 02 93    | 657 004 52 93     |



## Polytetrafluoroethylene membranes · PORAFIL® TE

Membranes of polytetrafluoroethylene (PTFE) are particularly suited for aggressive media, since they are chemically inert towards aqueous and organic solutions as well as towards concentrated acids and bases. These membranes are hydrophobic, thus the pressure for filtration of aqueous solutions has to be higher than the breakthrough pressure. PORAFIL® TE membranes can be used at temperatures up to 145 °C.

### Ordering information

| Ø      | Pack of | Pore size 0.2 µm | Pore size 0.45 µm | Pore size 1.0 µm | Pore size 3.0 µm |
|--------|---------|------------------|-------------------|------------------|------------------|
| 13 mm  | 50      | 670 020 013      | 670 045 013       | 670 100 013      | 670 300 013      |
| 25 mm  | 50      | 670 020 025      | 670 045 025       | 670 100 025      | 670 300 025      |
| 47 mm  | 50      | 670 020 047      | 670 045 047       | 670 100 047      | 670 300 047      |
| 50 mm  | 50      | 670 020 050      | 670 045 050       | 670 100 050      | 670 300 050      |
| 90 mm  | 50      | 670 020 090      | 670 045 090       | 670 100 090      | 670 300 090      |
| 100 mm | 25      | 670 020 100      | 670 045 100       | 670 100 100      | 670 300 100      |
| 142 mm | 25      | 670 020 142      | 670 045 142       | 670 100 142      | 670 300 142      |
| 220 mm | 25      | 670 020 220      | 670 045 220       | 670 100 220      | 670 300 220      |
| 293 mm | 10      | 670 020 293      | 670 045 293       | 670 100 293      | 670 300 293      |

## Polyester membranes · PORAFIL® PE

Polyester membranes are hydrophilic and particularly suited for fine filtration, dust analysis, aerosol analysis and ultra-purification of solvents.

### Ordering information

| Ø     | Pack of | Pore size 0.05 µm | Pore size 0.2 µm | Pore size 0.4 µm | Pore size 1.0 µm | Pore size 5.0 µm |
|-------|---------|-------------------|------------------|------------------|------------------|------------------|
| 13 mm | 100     | 671 005 013       | 671 020 013      | 671 040 013      | 671 100 013      | 671 500 013      |
| 25 mm | 100     | 671 005 025       | 671 020 025      | 671 040 025      | 671 100 025      | 671 500 025      |
| 37 mm | 100     | 671 005 037       | 671 020 037      | 671 040 037      | 671 100 037      | 671 500 037      |
| 47 mm | 100     | 671 005 047       | 671 020 047      | 671 040 047      | 671 100 047      | 671 500 047      |
| 50 mm | 100     | 671 005 050       | 671 020 050      | 671 040 050      | 671 100 050      | 671 500 050      |

## Regenerated cellulose membranes · PORAFIL® RC

Membranes of regenerated cellulose are resistant towards most organic solvents. They are e.g. used for filtration of solvent mixtures and ultrapurification and degassing of HPLC eluents.

### Ordering information

| Ø      | Pack of | Pore size 0.2 µm | Pore size 0.45 µm |
|--------|---------|------------------|-------------------|
| 13 mm  | 100     | 659 020 013      | 659 045 013       |
| 25 mm  | 100     | 659 020 025      | 659 045 025       |
| 47 mm  | 100     | 659 020 047      | 659 045 047       |
| 50 mm  | 100     | 659 020 050      | 659 045 050       |
| 100 mm | 25      | 659 020 100      | 659 045 100       |
| 142 mm | 25      | 659 020 142      | 659 045 142       |
| 293 mm | 25      | 659 020 293      | 659 045 293       |

## Polycarbonate membranes · PORAFIL® PC

Polycarbonate membranes are mainly used for the determination of AOX.

### Ordering information

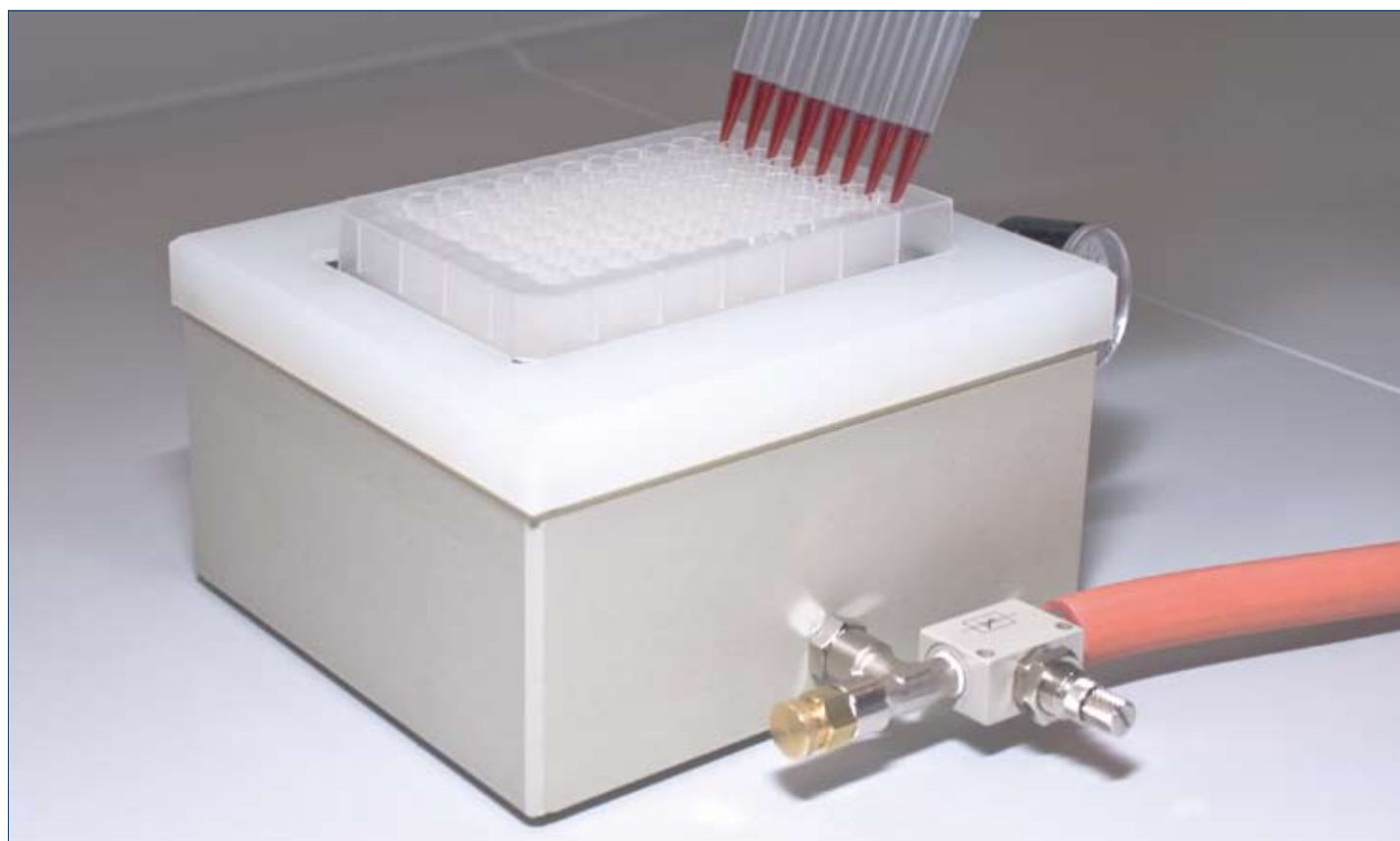
| Ø     | Pack of | Pore size 0.40 µm |
|-------|---------|-------------------|
| 25 mm | 100     | 676 040 025       |
| 47 mm | 100     | 676 040 047       |
| 50 mm | 100     | 676 040 050       |

## CHROMABOND® MULTI 96 filters

CHROMABOND® MULTI 96 filter plates are very well suited for efficient filtration in 96-well microtiter plate format.

### Ordering information

| Material of the filter elements  | Pore size | Plates per pack | REF       |
|--|-----------|-----------------|-----------|
| MV (cellulose mixed esters)  | 0.20 µm   | 1               | 738770.M  |
| MV (cellulose mixed esters)  | 0.45 µm   | 1               | 738771.M  |
| MV (cellulose mixed esters)  | 3.00 µm   | 1               | 738772.M  |
| RC (regenerated cellulose)   | 0.20 µm   | 1               | 738656.M  |
| RC (regenerated cellulose)   | 0.45 µm   | 1               | 738657.M  |
| PTFE (polytetrafluoroethylene)   | 0.20 µm   | 1               | 738660.M  |
| PTFE (polytetrafluoroethylene)   | 0.45 µm   | 1               | 738661.M  |
| PTFE (polytetrafluoroethylene)   | 1.00 µm   | 1               | 738662.M  |
| PTFE (polytetrafluoroethylene)   | 3.00 µm   | 1               | 738663.M  |
| PE (polyethylene)  | 20 µm     | 1               | 738655.M  |
| PE (polyethylene)  | 50 µm     | 1               | 738659.M  |
| Glass fibre nominal  | 1 µm      | 1               | 738655.2M |
| Glass fibre nominal  | 3 µm      | 1               | 738658.M  |
| CHROMABOND® MULTI 96 vacuum manifold for monoblocks, with reservoir tank, vacuum gauge and control valve, required for filtration with 96-well filter plates |           | 1               | 738630.M  |



## CHROMAFIL® syringe filters

Disposable syringe filters CHROMAFIL® are ready-to-use filtration units, which are filter elements incorporated in a polypropylene housing. Because every filter is only used once, contaminations are avoided.

### CHROMAFIL® PET

- hydrophilic multipurpose membrane
- for polar as well as nonpolar solvents  
the HPLC filter, especially suited for mixtures of water and organic solvents  
for TOC/DOC determination, not cytotoxic, does not inhibit the growth of microorganisms and higher cells
- polyester filter with integrated glass fibre prefilter (GF/PET):  
recommended for solutions with a high load of particulate matter or for highly viscous solutions

#### Ordering information

| Type                   | Pore size   | Membrane<br>Ø | Colour code |        | Standard pack |         | BIG-BOX |             |
|------------------------|-------------|---------------|-------------|--------|---------------|---------|---------|-------------|
|                        |             |               | top         | bottom | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b> |             |               |             |        |               |         |         |             |
| PET-20/25              | 0.20 µm     | 25 mm         | labelled    | –      | 100           | 729 221 | 400     | 729 221.400 |
| PET-45/25              | 0.45 µm     | 25 mm         | labelled    | –      | 100           | 729 220 | 400     | 729 220.400 |
| PET-120/25             | 1.2 µm      | 25 mm         | labelled    | –      | 100           | 729 229 | 400     | 729 229.400 |
| <b>CHROMAFIL®</b>      |             |               |             |        |               |         |         |             |
| PET-20/15 MS           | 0.20 µm     | 15 mm         | yellow      | orange | 100           | 729 022 | 800     | 729 022.800 |
| PET-45/15 MS           | 0.45 µm     | 15 mm         | colourless  | orange | 100           | 729 023 | 800     | 729 023.800 |
| PET-20/25              | 0.20 µm     | 25 mm         | yellow      | orange | 100           | 729 021 | 400     | 729 021.400 |
| PET-45/25              | 0.45 µm     | 25 mm         | colourless  | orange | 100           | 729 020 | 400     | 729 020.400 |
| PET-120/25             | 1.2 µm      | 25 mm         | colourless  | black  | 100           | 729 029 | 400     | 729 029.400 |
| GF/PET-20/25           | 1.0/0.20 µm | 25 mm         | blue        | orange | 100           | 729 032 | 400     | 729 032.400 |
| GF/PET-45/25           | 1.0/0.45 µm | 25 mm         | black       | orange | 100           | 729 033 | 400     | 729 033.400 |

MS = minispikes on filter exit

### CHROMAFIL® RC

- hydrophilic membrane with very low adsorption
- for aqueous and organic/aqueous liquids, i. e. polar and medium polar sample solutions
- binding capacity for proteins 84 µg/filter

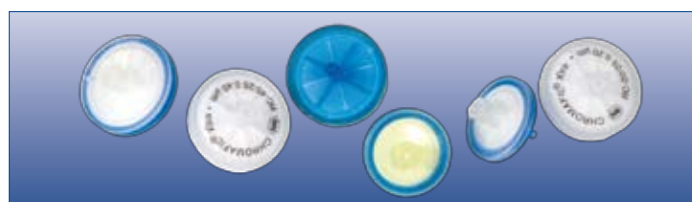
#### Ordering information

| Type                   | Pore size | Membrane<br>Ø | Colour code |        | Standard pack |         | BIG-BOX |             |
|------------------------|-----------|---------------|-------------|--------|---------------|---------|---------|-------------|
|                        |           |               | top         | bottom | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b> |           |               |             |        |               |         |         |             |
| RC-20/25               | 0.20 µm   | 25 mm         | labelled    | –      | 100           | 729 230 | 400     | 729 230.400 |
| RC-45/25               | 0.45 µm   | 25 mm         | labelled    | –      | 100           | 729 231 | 400     | 729 231.400 |
| <b>CHROMAFIL®</b>      |           |               |             |        |               |         |         |             |
| RC-20/15 MS            | 0.20 µm   | 15 mm         | yellow      | blue   | 100           | 729 036 | 800     | 729 036.800 |
| RC-45/15 MS            | 0.45 µm   | 15 mm         | colourless  | blue   | 100           | 729 037 | 800     | 729 037.800 |
| RC-20/25               | 0.20 µm   | 25 mm         | yellow      | blue   | 100           | 729 030 | 400     | 729 030.400 |
| RC-45/25               | 0.45 µm   | 25 mm         | colourless  | blue   | 100           | 729 031 | 400     | 729 031.400 |

MS = minispikes on filter exit

#### Recommended filter sizes for different volumes

| sample volume | recommended filter Ø |
|---------------|----------------------|
| ≤ 1 ml        | 3 mm                 |
| 1 – 10 ml     | 15 mm                |
| 10 – 100 ml   | 25 mm                |



## CHROMAFIL® PTFE

- hydrophobic membrane
- for nonpolar liquids and gases
- very resistant towards all kinds of solvents as well as acids and bases flushing with alcohol, followed by water, makes the originally hydrophobic membrane more hydrophilic



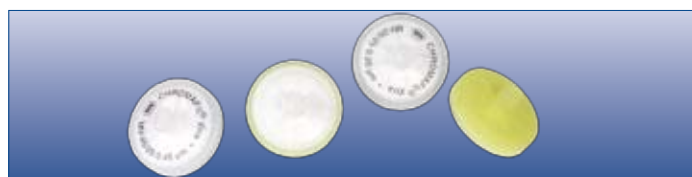
### Ordering information

| Type                   | Pore size | Membrane<br>Ø | Colour code |            | Standard pack |         | BIG-BOX |             |
|------------------------|-----------|---------------|-------------|------------|---------------|---------|---------|-------------|
|                        |           |               | top         | bottom     | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b> |           |               |             |            |               |         |         |             |
| PTFE-20/25             | 0.20 µm   | 25 mm         | labelled    | –          | 100           | 729 207 | 400     | 729 207.400 |
| PTFE-45/25             | 0.45 µm   | 25 mm         | labelled    | –          | 100           | 729 205 | 400     | 729 205.400 |
| <b>CHROMAFIL®</b>      |           |               |             |            |               |         |         |             |
| O-20/3                 | 0.20 µm   | 3 mm          | colourless  | colourless | 100           | 729 014 |         |             |
| O-45/3                 | 0.45 µm   | 3 mm          | colourless  | colourless | 100           | 729 015 |         |             |
| O-20/15 MS             | 0.20 µm   | 15 mm         | yellow      | colourless | 100           | 729 008 | 800     | 729 008.800 |
| O-45/15 MS             | 0.45 µm   | 15 mm         | colourless  | colourless | 100           | 729 009 | 800     | 729 009.800 |
| O-20/25                | 0.20 µm   | 25 mm         | yellow      | colourless | 100           | 729 007 | 400     | 729 007.400 |

MS = minispikes on filter exit

## CHROMAFIL® MV

- hydrophilic membrane with very low adsorption
- for aqueous or polar solutions



### Ordering information

| Type                   | Pore size | Membrane<br>Ø | Colour code |        | Standard pack |         | BIG-BOX |             |
|------------------------|-----------|---------------|-------------|--------|---------------|---------|---------|-------------|
|                        |           |               | top         | bottom | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b> |           |               |             |        |               |         |         |             |
| MV-20/25               | 0.20 µm   | 25 mm         | labelled    | –      | 100           | 729 206 | 400     | 729 206.400 |
| MV-45/25               | 0.45 µm   | 25 mm         | labelled    | –      | 100           | 729 204 | 400     | 729 204.400 |
| <b>CHROMAFIL®</b>      |           |               |             |        |               |         |         |             |
| A-20/25                | 0.20 µm   | 25 mm         | yellow      | yellow | 100           | 729 006 | 400     | 729 006.400 |
| A-45/25                | 0.45 µm   | 25 mm         | colourless  | yellow | 100           | 729 004 | 400     | 729 004.400 |



## CHROMAFIL® CA

- hydrophilic membrane
- for filtration of water-soluble oligomers and polymers, especially suited for biological macromolecules
- very high shape stability in aqueous solutions
- extremely low binding capacity for proteins (21 µg/filter)
- also available in a sterile package (S) for filtration under sterile conditions (each filter individually sealed)



### Ordering information

| Type                              | Pore size | Membrane<br>Ø | Colour code |        | Standard pack |         | BIG-BOX |             |
|-----------------------------------|-----------|---------------|-------------|--------|---------------|---------|---------|-------------|
|                                   |           |               | top         | bottom | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b>            |           |               |             |        |               |         |         |             |
| CA-20/25                          | 0.20 µm   | 25 mm         | labelled    | –      | 100           | 729 226 | 400     | 729 226.400 |
| CA-45/25                          | 0.45 µm   | 25 mm         | labelled    | –      | 100           | 729 227 | 400     | 729 227.400 |
| <b>CHROMAFIL®</b>                 |           |               |             |        |               |         |         |             |
| CA-20/25                          | 0.20 µm   | 25 mm         | yellow      | red    | 100           | 729 026 | 400     | 729 026.400 |
| CA-45/25                          | 0.45 µm   | 25 mm         | colourless  | red    | 100           | 729 027 | 400     | 729 027.400 |
| <b>CHROMAFIL® Sterile filters</b> |           |               |             |        |               |         |         |             |
| CA-20/25 S                        | 0.20 µm   | 25 mm         | yellow      | red    | 50            | 729 024 |         |             |
| CA-45/25 S                        | 0.45 µm   | 25 mm         | colourless  | red    | 50            | 729 025 |         |             |

## CHROMAFIL® PES

- hydrophilic membrane
- for aqueous and slightly organic liquids with higher flow rates
- very low adsorption for pharmaceuticals and proteins
- good stability against acids and bases
- for sterile filtration of non-sterile solutions we recommend the CHROMAFIL® Sterilizer PES (each filter individually sealed)
- binding capacity for proteins 29 µg/filter



### Ordering information

| Type                              | Pore size | Membrane<br>Ø | Colour code |          | Standard pack |         | BIG-BOX |             |
|-----------------------------------|-----------|---------------|-------------|----------|---------------|---------|---------|-------------|
|                                   |           |               | top         | bottom   | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b>            |           |               |             |          |               |         |         |             |
| PES-20/25                         | 0.20 µm   | 25 mm         | labelled    | –        | 100           | 729 240 | 400     | 729 240.400 |
| PES-45/25                         | 0.45 µm   | 25 mm         | labelled    | –        | 100           | 729 241 | 400     | 729 241.400 |
| PES-500/25                        | 5.0 µm    | 25 mm         | labelled    | –        | 100           | 729 242 | 400     | 729 242.400 |
| <b>CHROMAFIL®</b>                 |           |               |             |          |               |         |         |             |
| PES-20/25                         | 0.20 µm   | 25 mm         | yellow      | amber    | 100           | 729 040 | 400     | 729 040.400 |
| PES-45/25                         | 0.45 µm   | 25 mm         | colourless  | amber    | 100           | 729 041 | 400     | 729 041.400 |
| PES-500/25                        | 5.0 µm    | 25 mm         | red         | amber    | 100           | 729 042 | 400     | 729 042.400 |
| <b>CHROMAFIL® Sterile filters</b> |           |               |             |          |               |         |         |             |
| Sterilizer PES                    | 0.20 µm   | 25 mm         |             | blue rim | 50            | 729 401 |         |             |

## CHROMAFIL® PA

- rather hydrophilic membrane
- for aqueous and organic/aqueous medium polar liquids

### Ordering information



| Type                   | Pore size | Membrane<br>Ø | Colour code |            | Standard pack |         | BIG-BOX |             |
|------------------------|-----------|---------------|-------------|------------|---------------|---------|---------|-------------|
|                        |           |               | top         | bottom     | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b> |           |               |             |            |               |         |         |             |
| PA-20/25               | 0.20 µm   | 25 mm         | labelled    | –          | 100           | 729 212 | 400     | 729 212.400 |
| PA-45/25               | 0.45 µm   | 25 mm         | labelled    | –          | 100           | 729 213 | 400     | 729 213.400 |
| <b>CHROMAFIL®</b>      |           |               |             |            |               |         |         |             |
| AO-20/3                | 0.20 µm   | 3 mm          | colourless  | colourless | 100           | 729 010 |         |             |
| AO-45/3                | 0.45 µm   | 3 mm          | colourless  | colourless | 100           | 729 011 |         |             |
| AO-20/25               | 0.20 µm   | 25 mm         | yellow      | green      | 100           | 729 012 | 400     | 729 012.400 |
| AO-45/25               | 0.45 µm   | 25 mm         | colourless  | green      | 100           | 729 013 | 400     | 729 013.400 |

## CHROMAFIL® PVDF

- hydrophilic membrane
- for polar and nonpolar solutions, water-soluble oligomers and polymers like proteins
- binding capacity for proteins 82 µg/filter
- the PVDF filter with integrated glass fibre prefilter is recommended for filtration of biological samples with high particle loads. This filter features a high binding capacity for proteins.
- also suited for filtration of polar and nonpolar solutions

### Ordering information

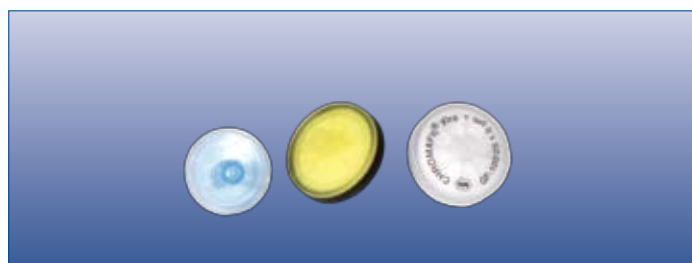


| Type                   | Pore size   | Membrane<br>Ø | Colour code |        | Standard pack |         | BIG-BOX |             |
|------------------------|-------------|---------------|-------------|--------|---------------|---------|---------|-------------|
|                        |             |               | top         | bottom | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b> |             |               |             |        |               |         |         |             |
| PVDF-20/25             | 0.20 µm     | 25 mm         | labelled    | –      | 100           | 729 218 | 400     | 729 218.400 |
| PVDF-45/25             | 0.45 µm     | 25 mm         | labelled    | –      | 100           | 729 219 | 400     | 729 219.400 |
| <b>CHROMAFIL®</b>      |             |               |             |        |               |         |         |             |
| P-20/25                | 0.20 µm     | 25 mm         | yellow      | white  | 100           | 729 018 | 400     | 729 018.400 |
| GF/P-45/25             | 1.0/0.45 µm | 25 mm         | black       | white  | 100           | 729 039 | 400     | 729 039.400 |

## CHROMAFIL® GF

- inert filter, nominal pore size 1 µm, allows higher flow rates than small pore filters
- for solutions with high loads of particulate matter or for highly viscous solutions (e.g. soil samples, fermentation broths)
- as prefilters for other CHROMAFIL® filters, they prevent plugging of the membrane

### Ordering information



| Type                   | Pore size   | Membrane<br>Ø | Colour code |            | Standard pack |         | BIG-BOX |             |
|------------------------|-------------|---------------|-------------|------------|---------------|---------|---------|-------------|
|                        |             |               | top         | bottom     | pack of       | REF     | pack of | REF         |
| <b>CHROMAFIL® Xtra</b> |             |               |             |            |               |         |         |             |
| GF-100/25              | nom. 1.0 µm | 25 mm         | labelled    | –          | 100           | 729 228 | 400     | 729 228.400 |
| <b>CHROMAFIL®</b>      |             |               |             |            |               |         |         |             |
| GF-100/15 MS           | nom. 1.0 µm | 15 mm         | blue        | colourless | 100           | 729 034 |         |             |
| GF-100/25              | nom. 1.0 µm | 25 mm         | yellow      | black      | 100           | 729 028 | 400     | 729 028.400 |

## pH indicator papers

### pH-Fix

pH-Fix test strips are the highly appreciate standard in many laboratories. The easy dip&read procedure provides reliable results in seconds. Due to the patented pH-Fix technology the indicator is chemically bound to the test pad. The dye does not wash out so clothes stay clean and samples remain pure.

#### Ordering information

| Range                                  | Gradation  | REF    |
|--|--|--------|
| <b>Classic flat box</b>                |  |        |
| pH 0 – 14                              | 0 · 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 12 · 13 · 14                                   | 921 10 |
| pH 0.0 – 6.0                           | 0 · 0.5 · 1.0 · 1.5 · 2.0 · 2.5 · 3.0 · 3.5 · 4.0 · 4.5 · 5.0 · 5.5 · 6.0                        | 921 15 |
| pH 2.0 – 9.0                           | 2.0 · 2.5 · 3.0 · 3.5 · 4.0 · 4.5 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0          | 921 18 |
| pH 4.5 – 10.0 <b>CE</b> <sup>1)</sup>  | 4.5 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0 · 9.5 · 10.0                           | 921 20 |
| pH 6.0 – 10.0                          | 6.0 · 6.4 · 6.7 · 7.0 · 7.3 · 7.6 · 7.9 · 8.2 · 8.4 · 8.6 · 8.8 · 9.1 · 9.5 · 10.0               | 921 22 |
| pH 7.0 – 14.0                          | 7.0 · 7.5 · 8.0 · 8.5 · 9.0 · 9.5 · 10.0 · 10.5 · 11.0 · 11.5 · 12.0 · 12.5 · 13.0 · 13.5 · 14.0 | 921 25 |
| pH 0.3 – 2.3                           | 0.3 · 0.7 · 1.0 · 1.3 · 1.6 · 1.9 · 2.3  | 921 80 |
| pH 1.7 – 3.8                           | 1.7 · 2.0 · 2.3 · 2.6 · 2.9 · 3.2 · 3.5 · 3.8  | 921 90 |
| pH 3.6 – 6.1 <b>CE</b> <sup>1)2)</sup> | 3.6 · 4.1 · 4.4 · 4.7 · 5.0 · 5.3 · 5.6 · 6.1  | 921 30 |
| pH 5.1 – 7.2                           | 5.1 · 5.4 · 5.7 · 6.0 · 6.3 · 6.6 · 6.9 · 7.2  | 921 40 |
| pH 6.0 – 7.7                           | 6.0 · 6.4 · 6.7 · 7.0 · 7.3 · 7.7  | 921 50 |
| pH 7.5 – 9.5                           | 7.5 · 7.9 · 8.2 · 8.4 · 8.6 · 8.8 · 9.1 · 9.5  | 921 60 |
| pH 7.9 – 9.8                           | 7.9 · 8.3 · 8.6 · 8.9 · 9.1 · 9.4 · 9.8  | 921 70 |
| <b>PlopTop tube</b>                    |  |        |
| pH 0 – 14                              | 0 · 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 12 · 13 · 14                                   | 921 11 |
| pH 3.6 – 6.1 <b>CE</b> <sup>1)2)</sup> | 3.6 · 4.1 · 4.4 · 4.7 · 5.0 · 5.3 · 5.6 · 6.1  | 921 31 |



Presentation: packs of 100 strips 6 x 85 mm  
**CE**: CE mark in accordance with the European directive for <sup>1)</sup> in vitro diagnostics 98/79/EC <sup>2)</sup> medical devices 93/42/EWG

### PEHANON®

PEHANON® is a special pH test strip that unifies the pH-indicator and the reference colours on one strip. It provides accurate results also for coloured solutions.

#### Ordering information

| Range          | Gradation   | REF    |
|----------------|---|--------|
| pH 1 – 12      | 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 12                | 904 01 |
| pH 0 – 1.8     | 0 · 0.3 · 0.6 · 0.8 · 1.0 · 1.2 · 1.5 · 1.8                     | 904 11 |
| pH 1.0 – 2.8   | 1.0 · 1.3 · 1.6 · 1.8 · 2.0 · 2.2 · 2.5 · 2.8                   | 904 12 |
| pH 1.8 – 3.8   | 1.8 · 2.1 · 2.4 · 2.7 · 3.0 · 3.2 · 3.5 · 3.8                   | 904 13 |
| pH 2.8 – 4.6   | 2.8 · 3.1 · 3.4 · 3.6 · 3.8 · 4.0 · 4.3 · 4.6                   | 904 14 |
| pH 3.8 – 5.5   | 3.8 · 4.0 · 4.2 · 4.4 · 4.6 · 4.9 · 5.2 · 5.5                   | 904 15 |
| pH 4.0 – 9.0   | 4.0 · 4.5 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0 | 904 24 |
| pH 5.2 – 6.8   | 5.2 · 5.5 · 5.7 · 5.9 · 6.1 · 6.3 · 6.5 · 6.8                   | 904 16 |
| pH 6.0 – 8.1   | 6.0 · 6.3 · 6.6 · 6.9 · 7.2 · 7.5 · 7.8 · 8.1                   | 904 17 |
| pH 7.2 – 8.8   | 7.2 · 7.4 · 7.6 · 7.8 · 8.0 · 8.2 · 8.5 · 8.8                   | 904 19 |
| pH 8.0 – 9.7   | 8.0 · 8.2 · 8.4 · 8.6 · 8.8 · 9.1 · 9.4 · 9.7                   | 904 20 |
| pH 9.5 – 12.0  | 9.5 · 10.0 · 10.5 · 11.0 · 11.5 · 12.0                          | 904 21 |
| pH 10.5 – 13.0 | 10.5 · 11.0 · 11.5 · 12.0 · 12.5 · 13.0                         | 904 22 |
| pH 12.0 – 14.0 | 12.0 · 12.5 · 13.0 · 13.5 · 14.0                                | 904 23 |



Presentation: packs of 200 strips 11 x 100 mm

## Universal and special indicator papers

pH indicator papers have been on the market for decades and are the appreciated standard for many applications. For each pH value these papers show a single colour which can be matched with the colour scale at intervals of 0.2 – 1 pH unit.

### Ordering information

| Range                            | Gradation   | REF    |
|----------------------------------|---|--------|
| <b>Universal indicator paper</b> |   |        |
| pH 1 – 11                        | 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11                       | 902 01 |
| pH 1 – 14                        | 1 · 2 · 3 · 5 · 6 · 7 · 8 · 9 · 10 · 12 · 14                      | 902 04 |
| <b>Special indicator papers</b>  |   |        |
| pH 0.5 – 5.5                     | 0.5 · 1.0 · 1.5 · 2.0 · 2.5 · 3.0 · 3.5 · 4.0 · 4.5 · 5.0 · 5.5   | 902 05 |
| pH 3.8 – 5.8                     | <3.8 · 3.8 · 4.1 · 4.3 · 4.5 · 4.7 · 4.9 · 5.2 · 5.5 · 5.8 · >5.8 | 902 06 |
| pH 4.0 – 7.0                     | 4.0 · 4.3 · 4.6 · 4.9 · 5.2 · 5.5 · 5.8 · 6.1 · 6.4 · 6.7 · 7.0   | 902 07 |
| pH 5.4 – 7.0                     | <5.4 · 5.4 · 5.7 · 6.0 · 6.2 · 6.4 · 6.7 · 7.0 · >7.0             | 902 08 |
| pH 5.5 – 9.0                     | 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0                     | 902 09 |
| pH 6.4 – 8.0                     | <6.4 · 6.4 · 6.6 · 6.8 · 7.0 · 7.2 · 7.4 · 7.6 · 7.8 · 8.0 · >8.0 | 902 10 |
| pH 7.2 – 9.7                     | <7.2 · 7.2 · 7.5 · 7.8 · 8.1 · 8.4 · 8.7 · 9.0 · 9.3 · 9.7 · >9.7 | 902 11 |
| pH 8.0 – 10.0                    | 8.0 · 8.2 · 8.4 · 8.7 · 9.0 · 9.2 · 9.6 · 10.0                    | 902 12 |
| pH 9.0 – 13.0                    | 9.0 · 9.5 · 10.0 · 10.5 · 11.0 · 11.5 · 12.0 · 12.5 · 13.0        | 902 13 |
| pH 12.0 – 14.0                   | 12.0 · 12.5 · 13.0 · 13.5 · 14.0                                  | 902 14 |

Presentation: reels of 5 m x 7 mm

refill packs and booklets available on request



## DUOTEST and TRITEST

DUOTEST indicator papers feature two indicator zones separated by a hydrophobic barrier. This facilitates clear assignment of the pH and allows estimation of intermediate values. TRITEST indicator papers feature three different indicator zone for a precise assignment of pH values.

### Ordering information

| Range            | Gradation   | REF    |
|------------------|---|--------|
| <b>DUOTEST</b>   |   |        |
| pH 1 – 12        | 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11 · 12                      | 903 01 |
| pH 1.0 – 4.3     | 1.0 · 1.3 · 1.6 · 1.9 · 2.2 · 2.5 · 2.8 · 3.1 · 3.4 · 3.7 · 4.0 · 4.3 | 903 02 |
| pH 3.5 – 6.8     | 3.5 · 3.8 · 4.1 · 4.4 · 4.7 · 5.0 · 5.3 · 5.6 · 5.9 · 6.2 · 6.5 · 6.8 | 903 03 |
| pH 5.0 – 8.0     | 5.0 · 5.3 · 5.6 · 5.9 · 6.2 · 6.5 · 6.8 · 7.1 · 7.4 · 7.7 · 8.0       | 903 04 |
| pH 7.0 – 10.0    | 7.0 · 7.3 · 7.6 · 7.9 · 8.2 · 8.5 · 8.8 · 9.1 · 9.4 · 9.7 · 10.0      | 903 05 |
| pH 9.5 – 14.0    | 9.5 · 10.0 · 10.5 · 11.0 · 11.5 · 12.0 · 12.5 · 13.0 · 13.5 · 14.0    | 903 06 |
| <b>TRITEST</b>   |   |        |
| pH 1 – 11        | 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11                           | 905 01 |
| <b>TRITEST L</b> |   |        |
| pH 1 – 11        | 1 · 2 · 3 · 4 · 5 · 6 · 7 · 8 · 9 · 10 · 11                           | 905 10 |

DUOTEST and TRITEST: reels of 5 m x 10 mm

TRITEST L: reels of 6 m x 14 mm

refill packs available on request



## Test papers for qualitative analysis

Test papers allow the qualitative determination of ions and chemical compounds. They are used to detect if compounds tested for are present above the specific detection limit. Some of the papers have specific applications.

### Ordering information

| Determination of  | Test paper / Test strips   | Presentation                          | REF    |
|---|--|---------------------------------------|--------|
| Alkaline phosphatase in milk  | Phosphatesmo MI  | 50 test strips<br>10 x 95 mm          | 906 12 |
| Aluminium ions ( $\text{Al}^{3+}$ )   | Aluminium test paper   | 100 strips 20 x 70 mm                 | 907 21 |
| Ammonia, ammonium ions ( $\text{NH}_3$ , $\text{NH}_4^+$ )                    | Ammonium test paper  | 200 strips 20 x 70 mm                 | 907 22 |
| Antimony ions ( $\text{Sb}^{3+}$ )  | Antimony test paper  | 200 strips 20 x 70 mm                 | 907 23 |
| Arsenic, arsine ( $\text{As}$ , $\text{AsH}_3$ )                              | Arsenic test paper = Mercury bromide paper                       | 200 strips 20 x 70 mm                 | 907 62 |
| Bismuth ions ( $\text{Bi}^{3+}$ )   | Bismuth test paper   | 200 strips 20 x 70 mm                 | 907 33 |
| Blood traces (Peroxidase)   | Peroxtesmo KM  | 25 sheets 15 x 30 mm                  | 906 05 |
| Boric acid, borates ( $\text{H}_3\text{BO}_3$ , $\text{BO}_3^{3-}$ )          | Turmeric paper   | 200 strips 20 x 70 mm                 | 907 47 |
| Chlorine, free halogens   | Chlortesmo<br>Potassium iodide starch paper (see "Nitrite ions") | 200 strips 20 x 70 mm                 | 906 03 |
| Chromium, chromate ( $\text{Cr(VI)}$ , $\text{CrO}_4^{2-}$ )                  | Chromium test paper  | 200 strips 20 x 70 mm                 | 907 24 |
| Cobalt ions ( $\text{Co}^{2+}$ )  | Cobalt test paper  | 100 strips 20 x 70 mm                 | 907 28 |
| Copper, copper ions ( $\text{Cu}$ , $\text{Cu}^+$ , $\text{Cu}^{2+}$ )        | Cuprotesmo   | 40 sheets 40 x 25 mm                  | 906 01 |
| Copper(II) ions ( $\text{Cu}^{2+}$ )  | Copper test paper  | 200 strips 20 x 70 mm                 | 907 29 |
| Cyanides, hydrocyanic acid ( $\text{CN}^-$ , $\text{HCN}$ )                   | Cyantesmo  | reel of 5 m length                    | 906 04 |
| Fluorides, hydrogen fluorides ( $\text{F}^-$ , $\text{H}_2\text{F}_2$ )       | Fluoride test paper  | 200 strips 20 x 70 mm                 | 907 50 |
| Halogens, especially free chlorine  | Chlortesmo   | 200 strips 20 x 70 mm                 | 906 03 |
| Hydrocyanic acid  | Cyantesmo  | reel of 5 m length                    | 906 04 |
| Hydrogen sulphide ( $\text{H}_2\text{S}$ ), sulphide ions ( $\text{S}^{2-}$ ) | Lead acetate paper   | reel of 5 m length                    | 907 44 |
|   |  | refill pack of 3 rolls                | 907 45 |
|   |  | booklet with 100 strips<br>10 x 75 mm | 907 46 |
|   | Sulphide test paper  | reel of 5 m length                    | 907 61 |
| Iron(II) ions ( $\text{Fe}^{2+}$ )  | Dipyridyl paper  | 200 strips 20 x 70 mm                 | 907 25 |
| Iron ions ( $\text{Fe}^{2+}$ , $\text{Fe}^{3+}$ )                             | Iron test paper  | 100 strips 20 x 70 mm                 | 907 26 |
| Lactoperoxidase in milk   | Peroxtesmo MI  | 100 strips 15 x 15 mm                 | 906 27 |
| Lead, lead ions ( $\text{Pb}$ , $\text{Pb}^{2+}$ )                            | Plumbtesmo   | 40 sheets 40 x 25 mm                  | 906 02 |
| Mastitis  | Udder test paper   | PE bag with 20 sheets                 | 907 48 |
| Nickel(II) ions ( $\text{Ni}^{2+}$ )  | Nickel test paper  | 200 strips 20 x 70 mm                 | 907 30 |
| Nitrate and nitrite ( $\text{NO}_3^-$ , $\text{NO}_2^-$ )                     | Nitratesmo   | reel of 5 m length                    | 906 11 |



| Determination of  | Test paper / Test strips  | Presentation  | REF                        |
|---|---|---|----------------------------|
| Nitrite ions ( $\text{NO}_2^-$ ),<br>nitrous acid ( $\text{HNO}_2$ ),<br>ozone ( $\text{O}_3$ ) | Potassium iodide starch<br>paper MN 816 N<br>(normal sensitivity) | reel of 5 m length<br>refill pack of 3 rolls<br>booklet of 100 strips<br>10 x 75 mm | 907 54<br>907 55<br>907 56 |
|   | Potassium iodide starch<br>paper MN 616 T<br>(for spot tests)     | 200 strips 20 x 70 mm   | 907 58                     |
|   | Oil in water and soil   | Oil test paper  | 100 strips 20 x 70 mm      |
| Peroxidase in foodstuffs  | Peroxtesmo KO   | 100 sheets 15 x 15 mm   | 906 06                     |
| Peroxidase in milk  | Peroxtesmo MI   | 100 sheets 15 x 15 mm   | 906 27                     |
| Potassium ions ( $\text{K}^+$ )   | Potassium test paper  | 200 sheets 20 x 70 mm   | 907 27                     |
| Protein residues  | INDIPRO   | 60 test strips<br>10 x 95 mm and<br>reagents  | 907 65                     |
| Reducing agents, $\text{SO}_2$ ,<br>sulphite ions   | Potassium iodate starch<br>paper                                  | reel of 5 m length  | 907 53                     |
| Silver ions ( $\text{Ag}^+$ )   | Silver test paper   | 200 strips 20 x 70 mm   | 907 32                     |
| Sulphur dioxide ( $\text{SO}_2$ ),<br>sulphite ions   | Sulphite test paper   | 100 strips 20 x 70 mm   | 907 63                     |
| Sperm, acid phosphatase   | Phosphatesmo KM   | 25 sheets 15 x 30 mm  | 906 07                     |
| Vat dyes,<br>end point of conversion  | Indanthrene<br>yellow paper                                       | 200 strips 20 x 70 mm   | 907 51                     |
| Water on the bottom of<br>fuel tanks  | AQUATEC test sticks   | 100 strips 10 x 200 mm  | 907 42                     |
| Water in org. solvents  | WATESMO   | reel of 5 m length  | 906 09                     |
| Water distribution in butter  | WATOR   | 50 sheets 78 x 40 mm  | 906 10                     |
| Zirconium ions ( $\text{Zr}^{4+}$ )   | Zirconium test paper  | 100 strips 20 x 70 mm   | 907 21                     |

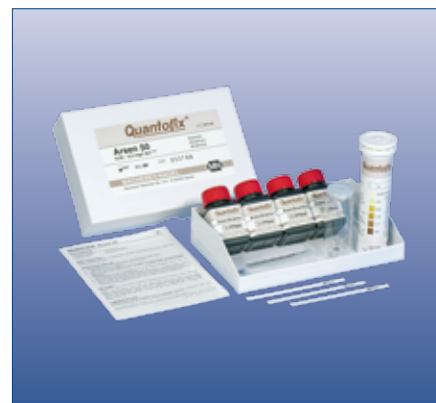


## QUANTOFIX® test strips for semi-quantitative determinations

QUANTOFIX® test strips can be used for a large variety of different substances. In most cases an easy dip&read procedure provides reliable results in 10 – 120 seconds. As labs in a pocket QUANTOFIX® test strips are easy to use for professional analysts as well as chemical laymen.

### Ordering information

| Test                                       | Gradation  | REF                            |
|--|--|--------------------------------|
| QUANTOFIX® Aluminium <sup>1)</sup>         | 0 · 5 · 20 · 50 · 200 · 500 mg/l Al <sup>3+</sup>  | 913 07                         |
| QUANTOFIX® Ammonium <sup>1)</sup>          | 0 · 10 · 25 · 50 · 100 · 200 · 400 mg/l NH <sub>4</sub> <sup>+</sup>   | 913 15                         |
| QUANTOFIX® Arsenic 50 <sup>1)</sup>        | 0 · 0.05 · 0.1 · 0.5 · 1.0 · 1.7 · 3.0 mg/l As <sup>3+/5+</sup>  | 913 32                         |
| QUANTOFIX® Arsenic 10 <sup>1)</sup>        | 0 · 0.01 · 0.025 · 0.05 · 0.1 · 0.5 mg/l As <sup>3+/5+</sup>   | 913 34                         |
| QUANTOFIX® Ascorbic acid<br>vitamin C      | 0 · 50 · 100 · 200 · 300 · 500 · 1000 · 2000 mg/l  | 913 14                         |
| QUANTOFIX® Calcium <sup>1)</sup>           | 0 · 10 · 25 · 50 · 100 mg/l Ca <sup>2+</sup>   | 913 24 <sup>2)</sup>           |
| QUANTOFIX® Carbonate<br>hardness           | 0 · 3 · 6 · 10 · 15 · 20 °d  | 913 23                         |
| QUANTOFIX® Chloride                        | 0 · 500 · 1000 · 1500 · 2000 · ≥ 3000 mg/l Cl <sup>-</sup>   | 913 21                         |
| QUANTOFIX® Chlorine <sup>1)</sup>          | 0 · 1 · 3 · 10 · 30 · 100 mg/l Cl <sub>2</sub>   | 913 17                         |
| QUANTOFIX® Chromate <sup>1)</sup>          | 0 · 3 · 10 · 30 · 100 mg/l CrO <sub>4</sub> <sup>2-</sup>  | 913 01                         |
| QUANTOFIX® Cobalt                          | 0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/l Co <sup>2+</sup>  | 913 03                         |
| QUANTOFIX® Copper                          | 0 · 10 · 30 · 100 · 300 mg/l Cu <sup>+2+</sup>   | 913 04                         |
| QUANTOFIX® Cyanide <sup>1)</sup>           | 0 · 1 · 3 · 10 · 30 mg/l CN <sup>-</sup>   | 913 18                         |
| QUANTOFIX® EDTA                            | 0 · 100 · 200 · 300 · 400 mg/l EDTA  | 913 35                         |
| QUANTOFIX® Formalde-<br>hyde <sup>1)</sup> | 0 · 10 · 20 · 40 · 60 · 100 · 200 mg/l HCHO  | 913 28                         |
| QUANTOFIX® Iron 1000 <sup>1)</sup>         | 0 · 5 · 20 · 50 · 100 · 250 · 500 · 1000 mg/l Fe <sup>2+/3+</sup>  | 913 02                         |
| QUANTOFIX® Iron 100 <sup>1)</sup>          | 0 · 2 · 5 · 10 · 25 · 50 · 100 mg/l Fe <sup>2+/3+</sup>  | 913 08                         |
| QUANTOFIX® Lubricheck                      | 0 · 15 · 50 · 75 · 130 · 200 mmol/l KOH  | 913 36                         |
| QUANTOFIX® Molybdenum <sup>1)</sup>        | 0 · 5 · 20 · 50 · 100 · 250 mg/l Mo <sup>6+</sup>  | 913 25                         |
| QUANTOFIX® Nickel                          | 0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/l Ni <sup>2+</sup>  | 913 05                         |
| QUANTOFIX® Nitrate/Nitrite                 | 0 · 10 · 25 · 50 · 100 · 250 · 500 mg/l NO <sub>3</sub> <sup>-</sup><br>0 · 1 · 5 · 10 · 20 · 40 · 80 mg/l NO <sub>2</sub> <sup>-</sup>                    | 913 13                         |
| QUANTOFIX® Nitrite                         | 0 · 1 · 5 · 10 · 20 · 40 · 80 mg/l NO <sub>2</sub> <sup>-</sup>  | 913 11                         |
| QUANTOFIX® Nitrite 3000                    | 0 · 0.1 · 0.3 · 0.6 · 1 · 2 · 3 g/l NO <sub>2</sub> <sup>-</sup>   | 913 22                         |
| QUANTOFIX® Nitrite/pH                      | 0 · 1 · 5 · 10 · 20 · 40 · 80 mg/l NO <sub>2</sub> <sup>-</sup><br>pH 6.0 · 6.4 · 6.7 · 7.0 · 7.3 · 7.6 · 7.9 ·<br>8.2 · 8.4 · 8.6 · 8.8 · 9.0 · 9.3 · 9.6 | 913 38                         |
| QUANTOFIX® Peroxide 25                     | 0 · 0.5 · 2 · 5 · 10 · 25 mg/l H <sub>2</sub> O <sub>2</sub>   | 913 19                         |
| QUANTOFIX® Peroxide 100                    | 0 · 1 · 3 · 10 · 30 · 100 mg/l H <sub>2</sub> O <sub>2</sub>   | 913 12                         |
| <b>CE</b>                                  |  |                                |
| QUANTOFIX® Peroxide<br>1000                | 0 · 50 · 150 · 300 · 500 · 800 · 1000 mg/l H <sub>2</sub> O <sub>2</sub>   | 913 33                         |
| QUANTOFIX® Phosphate <sup>1)</sup>         | 0 · 3 · 10 · 25 · 50 · 100 mg/l PO <sub>4</sub> <sup>3-</sup>  | 913 20                         |
| QUANTOFIX® Potassium <sup>1)</sup>         | 0 · 200 · 400 · 700 · 1000 · 1500 mg/l K <sup>+</sup>  | 913 16                         |
| QUANTOFIX® QUAT                            | 0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/l<br>Benzalkonium-chloride  | 913 37                         |
| QUANTOFIX® Suphate                         | <200 · >400 · >800 · >1200 · >1600 mg/l SO <sub>4</sub> <sup>2-</sup>  | 913 29                         |
| QUANTOFIX® Sulphite                        | 0 · 10 · 25 · 50 · 100 · 250 · 500 · 1000 mg/l SO <sub>3</sub> <sup>2-</sup>   | 913 06                         |
| QUANTOFIX® Tin                             | 0 · 10 · 25 · 50 · 100 · 250 · 500 mg/l Sn <sup>2+</sup>   | 913 09                         |
| QUANTOFIX® Zinc <sup>1)</sup>              | 0 · 2 · 5 · 10 · 25 · 50 · 100 mg/l Zn <sup>2+</sup>   | 913 10                         |
| QUANTOFIX® for aquarium<br>owners          | 0 · 5 · 10 · 15 · 20 · 25 °d total hardness<br>0 · 3 · 6 · 10 · 15 · 20 °d carbonate hardness<br>pH 6.4 · 6.8 · 7.2 · 7.6 · 8.0 · 8.4                      | 913 26<br>913 27 <sup>3)</sup> |



Container with 100 test strips 6 x 95 mm

<sup>1)</sup> The tests are supplied complete with all reagents required for the determination

<sup>2)</sup> Container with 60 test strips

<sup>3)</sup> Container with 25 test strips

**CE**: CE-marked according to the European directive for medical devices 93/42/EWG

## Other test strips and papers for semi-quantitative determinations

### Ordering information

| Determination of           | Test paper / test strips                   | Gradation  | Presentation                          | REF                       |
|----------------------------|--|--|---------------------------------------|---------------------------|
| Chlorine                   | Chlorine test                              | 0 · 10 · 50 · 100 · 200 mg/l Cl <sub>2</sub>                                 | reel of 5 m x 10 mm                   | 907 09                    |
| Fluoride ions              | Fluoride test                              | 0 · 2 · 5 · 10 · 20 · 50 · 100 mg/l F <sup>-</sup>                           | 30 test disks + reagent               | 907 34                    |
| Halide ions                | Saltesmo                                   | 0 · 0.25 · 0.5 · 1 · 2 · 3 · 4 · 5 g/l NaCl                                  | 30 test disks                         | 906 08                    |
| Humidity in air (relative) | Moisture indicator                         | 20 · 30 · 40 · 50 · 60 · 70 · 80%  | 12 adhesive labels 50 x 100 mm        | 908 01                    |
|                            | Moisture indicator                         | 8%   | 1000 test papers 60 x 35 mm           | 908 901                   |
|                            | Moisture indicator without cobalt chloride | 8%   | 1000 test papers 60 x 35 mm           | 908 903                   |
| Ozone content in air       | Ozone test strips                          | < 90 · 90 – 150 · 150 – 210 · > 210<br>µg/m <sup>3</sup> O <sub>3</sub>      | 12 test strips 10 x 95 mm             | 907 36                    |
| QUATS                      | INDIQUAT                                   | on request   | reel of 5 m x 10 mm                   | 909 00-2                  |
| Silver                     | Ag-Fix (test paper)                        | 0 · 1 · 2 · 3 · 5 · 7 · 10 g/l Ag <sup>+</sup>                               | reel of 5 m x 7 mm                    | 907 40                    |
|                            | Ag-Fix (test strips)                       | 0 · 0.5 · 1 · 2 · 3 · 5 · 7 · 10 g/l Ag <sup>+</sup><br>pH 4 · 5 · 6 · 7 · 8 | 100 test strips 6 x 95 mm             | 907 41                    |
| Swimming pool parameters   | Swimming Pool Test 5 in 1                  | total hardness:<br>0 · 100 · 250 · 500 · 1000 mg/l CaCO <sub>3</sub>         | 50 test strips 6 x 95 mm              | 907 59                    |
|                            |  | free chlorine:<br>0 · 0.5 · 1 · 3 · 5 · 10 mg/l Cl <sub>2</sub>              |                                       |                           |
|                            |  | total chlorine:<br>0 · 1 · 3 · 5 · 10 mg/l Cl <sub>2</sub>                   |                                       |                           |
|                            | Swimming Pool Test 3 in 1                  | alkalinity:<br>0 · 80 · 120 · 180 · 240 mg/l CaCO <sub>3</sub>               | 50 test strips 6 x 95 mm              | 907 52                    |
|                            |  | pH:<br>6.4 · 6.8 · 7.2 · 7.6 · 8.4   |                                       |                           |
|                            |  | free chlorine:<br>0 · 0.5 · 1 · 3 · 5 · 10 mg/l Cl <sub>2</sub>              |                                       |                           |
|                            | Cyanuric acid test                         | 0 · 50 · 100 · 150 · 300 ppm C <sub>3</sub> H <sub>3</sub> NO <sub>3</sub>   | 25 test strips 6 x 95 mm              | 907 10                    |
| Water hardness             | AQUADUR®                                   | < 3 · > 5 · > 10 · > 15 · > 20 · > 25 °d                                     | 100 test strips 6 x 95 mm             | 912 01                    |
|                            |  | < 3 · > 4 · > 7 · > 14 · > 21 °d   | 100 test strips 6 x 95 mm             | 912 20                    |
|                            |  | < 3 · > 4 · > 8.4 · > 14 °d  | 100 test strips 6 x 95 mm             | 912 39                    |
|                            |  | < 3 · > 5 · > 10 · > 15 · > 20 · > 25 °d                                     | 1000 individual sealed strips         | 912 23                    |
|                            |  | < 3 · > 4 · > 7 · > 14 · > 21 °d   | 1000 individual sealed strips         | 912 24                    |
|                            |  | < 3 · > 4 · > 8.4 · > 14 · > 21 °d   | 1000 individual sealed strips         | 912 40                    |
|                            |  | < 3 · > 5 · > 10 · > 15 · > 20 · > 25 °d                                     | 5000 strips without colour scale      | 912 21                    |
|                            |  | < 3 · > 4 · > 7 · > 14 · > 21 °d   | 5000 strips without colour scale      | 912 22                    |
|                            |  | < 3 · > 5 · > 10 · > 15 · > 20 · > 25 °d                                     | 50 sets of 3 individual sealed strips | 919 902                   |
|                            |  | AQUADUR® sensitive   | 0 · 0.3 · 0.6 · 1.1 °d                | 100 test strips 6 x 95 mm |



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| Airborne germ analysis                              | membrane filters PORAFIL® CM  | 28         |
| Air pollution monitoring                            | glass fibre filters MN GF-1, MN GF-6, MN 85/90 BF, MN QF-10                           | 12         |
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| quantitative analysis                               | MN 1640 d, MN 1640 de, MN 1640 m, MN 1640 md,<br>MN 1640 w, MN 1640 we                | 9          |
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| quantitative analysis                               | glass fibre filters MN 85/70 BF, MN 85/90 BF  | 12         |
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| Finest particles down to 0.4 µm                     | glass fibre filters MN GF-5  | 12         |
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| Milk serum, clarification  | kieselguhr paper MN 660  | 19      |
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| Waste water, removal of suspended particles                           | glass fibre filters MN GF-3, MN 85/90 BF   | 12     |
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## List of filter paper grades

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| MN 13         | lens tissue paper (José paper)                   | 21         |
| MN 40/25      | parchment sheets, crushable                      | 20         |
| MN 52 K       | polyester paper                                  | 17         |
| MN 59         | electrocardiograph contact paper                 | on request |
| MN 68         | sterilizing paper                                | on request |
| MN 85/70      | glass fibre filters                              | 12         |
| MN 85/70 BF   | glass fibre filters without binder               | 13         |
| MN 85/90      | glass fibre filters                              | 13         |
| MN 85/90 BF   | glass fibre filters without binder               | 13         |
| MN 85/220     | glass fibre filters                              | 13         |
| MN 85/220 BF  | glass fibre filters without binder               | 13         |
| MN 101        | cellulose filter flocs                           | 22         |
| MN 112        | glass fibre wadding                              | on request |
| MN 126/70     | technical filter paper, creped                   | 15         |
| MN 180        | thick filter paper                               | 14         |
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| MN 214        | chromatography paper                             | 23         |
| MN 214 ff     | chromatography paper                             | 23         |
| MN 218        | chromatography paper                             | 23         |
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| MN 226        | weighing paper                                   | 20         |
| MN 260        | chromatography paper                             | 23         |
| MN 261        | chromatography paper                             | 23         |
| MN 270        | thick filter paper                               | 14         |
| MN 270 S      | smelling strips                                  | on request |
| MN 280        | filter paper for soil analysis                   | 17         |
| MN 321        | nitrogen-free filter paper                       | 18         |
| MN 440        | thick filter paper                               | 14         |
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| MN 520        | thick filter paper                               | 14         |
| MN 553        | technical filter paper, creped                   | 15         |
| MN 601        | technical filter paper, creped                   | 15         |
| MN 604        | technical filter paper                           | 14         |
| MN 605        | technical filter paper, creped                   | 15         |
| MN 606        | technical filter paper, creped                   | 15         |
| MN 612        | technical filter paper, embossed                 | 15         |
| MN 614        | qualitative and technical filter paper, embossed | 15, 18     |
| MN 615        | qualitative filter paper                         | 10         |
| MN 615 A      | technical filter paper                           | 14         |
| MN 615 ff     | fat-free filter paper                            | 18         |
| MN 616        | qualitative filter paper                         | 10         |
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| MN 616 md     | qualitative filter paper                      | 10         |
| MN 616 WA     | water impermeable (hydrophobic) filter paper  | 19         |
| MN 617        | qualitative filter paper                      | 10         |
| MN 617 G      | phosphate free filter paper                   | 17         |
| MN 617 WA     | water impermeable (hydrophobic) filter paper  | 19         |
| MN 617 we     | qualitative filter paper                      | 10         |
| MN 618        | qualitative filter paper                      | 10         |
| MN 619        | qualitative and technical filter paper        | 10         |
| MN 619 de     | qualitative filter paper                      | 10         |
| MN 619 eh     | qualitative filter paper                      | 10         |
| MN 619 G      | phosphate-free filter paper                   | 17         |
| MN 620        | technical filter paper, embossed              | 18         |
| MN 621        | technical filter paper                        | 14         |
| MN 625        | technical filter paper                        | 14         |
| MN 631        | technical filter paper, embossed              | 15         |
| MN 640 d      | ashless filter paper                          | 8          |
| MN 640 dd     | ashless filter paper                          | 8          |
| MN 640 de     | ashless filter paper                          | 8          |
| MN 640 m      | ashless filter paper                          | 8          |
| MN 640 md     | ashless filter paper                          | 8          |
| MN 640 mS     | filter paper cuts for Schöniger method        | 16         |
| MN 640 we     | ashless filter paper                          | 8          |
| MN 645        | cellulose extraction thimbles                 | 24         |
| MN 645 D      | cellulose extraction thimbles                 | 24         |
| MN 645 F      | cellulose extraction thimbles                 | 24         |
| MN 645 R      | cellulose extraction thimbles                 | 24         |
| MN 645 W      | cellulose extraction thimbles                 | 24         |
| MN 646        | cellulose filter thimbles for Liesgang-Glocke | on request |
| MN 649        | glass fibre extraction thimbles               | 25         |
| MN 649 R      | glass fibre filter thimbles                   | 25         |
| MN 651        | technical filter paper, creped                | 15         |
| MN 651/120    | technical filter paper, creped                | 15         |
| MN 652        | technical filter paper, creped                | 15         |
| MN 660        | kieselguhr-filter paper                       | 19         |
| MN 672        | technical filter paper, wet-strengthened      | 14         |
| MN 674        | technical filter paper, wet-strengthened      | 14         |
| MN 675        | technical filter paper                        | 14         |
| MN 692        | technical filter paper, creped                | 15         |
| MN 704        | technical filter paper                        | on request |
| MN 713        | technical filter paper                        | 14         |
| MN 714        | technical filter paper                        | on request |
| MN 715        | fat-free filter paper                         | 18         |
| MN 728        | activated charcoal filter paper               | 14, 16     |
| MN 750 N      | technical filter paper, creped                | 15         |
| MN 751        | technical filter paper, creped                | 15         |
| MN 753        | technical filter paper, creped                | 15         |
| MN 804        | technical filter paper                        | 14         |
| MN 807        | nitrogen-free filter paper                    | on request |
| MN 808        | weighing boats                                | 20         |



| Grade             | Description   | Page       |
|-------------------|---|------------|
| MN 818            | thick filter paper  | 14         |
| MN 818 GT         | Guthrie test cards  | on request |
| MN 827            | thick filter paper, also suited for chromatography                                  | 14, 23     |
| MN 827 ATD        | antibiotic test disks   | 21         |
| MN 827 ATS        | antibiotic test stars   | 21         |
| MN 827 B          | blotting paper  | 23         |
| MN 835            | thick filter paper  | 14         |
| MN 850            | technical filter paper, creped  | 15         |
| MN 866            | thick filter paper, also suited for chromatography                                  | 14, 23     |
| MN 875            | technical filter paper  | 14         |
| MN 918            | technical filter paper  | 14         |
| MN 960            | technical filter paper  | 14         |
| MN 1640 d         | ashless, wet-strengthened filter paper  | 9          |
| MN 1640 de        | ashless, wet-strengthened filter paper  | 9          |
| MN 1640 m         | ashless, wet-strengthened filter paper  | 9          |
| MN 1640 md        | ashless, wet-strengthened filter paper  | 9          |
| MN 1640 w         | ashless, wet-strengthened filter paper  | 9          |
| MN 1640 we        | ashless, wet-strengthened filter paper  | 9          |
| MN 1670           | qualitative wet-strengthened filter paper   | 11         |
| MN 1672           | qualitative wet-strengthened filter paper   | 11         |
| MN 1674           | qualitative wet-strengthened filter paper   | 11         |
| MN 1817           | flue gas test   | on request |
| MN 2101           | ashless filter flocs  | 22         |
| MN 2104           | cellulose tablets for x-ray fluorescence analysis                                   | 16         |
| MN GF-1           | glass fibre filters   | 12         |
| MN GF-2           | glass fibre filters   | 12         |
| MN GF-3           | glass fibre filters   | 12         |
| MN GF-4           | glass fibre filters   | 12         |
| MN GF-5           | glass fibre filters   | 12         |
| MN GF-6           | glass fibre filters   | 12         |
| MN QF-10          | quartz fibre filters  | 13         |
| CHROMABOND®       | filter plates for filtration in 96-well microtiter plate format                     | 31         |
| CHROMAFIL® CA     | syringe filters (cellulose acetate, sterile / not sterile)                          | 35         |
| CHROMAFIL® GF     | syringe filters (glass fibre)   | 35         |
| CHROMAFIL® GF/PET | syringe filters (polyester with glass fibre pre-filter)                             | 35         |
| CHROMAFIL® MV     | syringe filters (cellulose mixed esters)  | 33         |
| CHROMAFIL® PA     | syringe filters (polyamide)   | 35         |
| CHROMAFIL® PES    | syringe filters (polyethersulfone)  | 34         |
| CHROMAFIL® PET    | syringe filters (polyester)   | 32         |
| CHROMAFIL® PTFE   | syringe filters (polytetrafluoroethylene)   | 33         |
| CHROMAFIL® PVDF   | syringe filters (polyvinylidene difluoride)   | 35         |
| CHROMAFIL® RC     | syringe filters (regenerated cellulose)   | 32         |
| PORAFIL® CA       | membrane filters made from cellulose acetate  | 29         |
| PORAFIL® CM       | membrane filters made from cellulose mixed esters (sterile / not sterile)           | 28         |
| PORAFIL® MV       | membrane filters made from cellulose mixed esters, reinforced with polyester fabric | 28         |
| PORAFIL® NC       | membrane filters made from nitrocellulose (cellulose nitrate)                       | 29         |
| PORAFIL® PC       | membrane filters made from polycarbonate  | 30         |
| PORAFIL® PE       | membrane filters made from polyester  | 30         |
| PORAFIL® RC       | membrane filters made from regenerated cellulose                                    | 30         |
| PORAFIL® TE       | membrane filters made from polytetrafluoroethylene                                  | 29         |

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