

MACHEREY-NAGEL

Filtration



Filter papers, extraction thimbles and membranes

**MACHEREY-NAGEL**

[www.mn-net.com](http://www.mn-net.com)





# Welcome to MACHEREY-NAGEL!

## MACHEREY-NAGEL meets your needs

We are pleased that you are interested in our range of high quality filtration products. In a new design, we present our filter papers, filter membranes and extraction thimbles for a broad range of applications as well as special products made from filter paper. Since 1911, MACHEREY-NAGEL produces high quality filter papers, which represent the roots of the company. Even today, only the best raw materials are used in production, following long-proven recipes. This guarantees our continuous high quality. Since 1996, MN has established a quality management system in accordance with ISO 9001. Our friendly team of experts in Düren and our competent external sales team are happy to be there for you.

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Enjoy our new catalog; we are pleased to listen to your feedback

Your MACHEREY-NAGEL-Team



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## 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 fibers.

Cotton linters are short-fibered 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 fiber filters we use staple fibers made from borosilicate glass (exception: paper from quartz fibers). With a diameter of 0.5–1.5  $\mu\text{m}$  these glass fibers are considerably thinner than cellulose fibers. One of the most important feature of glass fiber filters is their resistance to almost all chemicals (exception e.g. hydrogen fluoride).



### Important technical parameters of filter papers

Parameter	Description
Ash content / residue on ignition	The ash content is determined in accordance with DIN 54370: 10 g filter paper are weighed after ignition in a platinum crucible at 800 °C. Results are expressed as % of original paper weight
Dry bursting strength	For determination of the dry bursting strength the paper is clamped over a rubber diaphragm with an area of 10 cm <sup>2</sup> . The strain on the paper is then increased by applying an increasing air pressure, until the paper bursts. The dry bursting strength in accordance with DIN 53113 is stated in KPa.
Tensile strength	For determination of the tensile strength a paper strip (measuring 180 × 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 × 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.
Retention capacity	The retention capacity of filter papers is influenced by many factors such as the shape and material of the filtered particles. Values given in this catalog refer to retention (95 % = complete retention) of inorganic particles from liquids. See also page 8.
Wet strength	The wet strength of a paper is a measure for the mechanical stability of a paper in a wet or moist condition. For example, it can be determined as the tensile strength or the bursting strength (see above).
Pore size	The retention efficiency of a filter paper is influenced by several factors. Since filter papers are deep bed filters, one usually refers to a mean particle retention.
Capillary rise according to Klemm	The capillary rise according to Klemm indicates how far a strip of filter paper is moistened in 10 min when vertically dipped with one end into distilled water (20 °C).
Particle retention	Particle retention refers to the efficiency of filter papers in retaining certain precipitates. It is characterised by the permeability of the paper for precipitates of iron(III) oxyhydrate, lead sulfate, calcium oxalate and barium sulfate.

## Selection of filter papers

Important filtration properties for certain applications

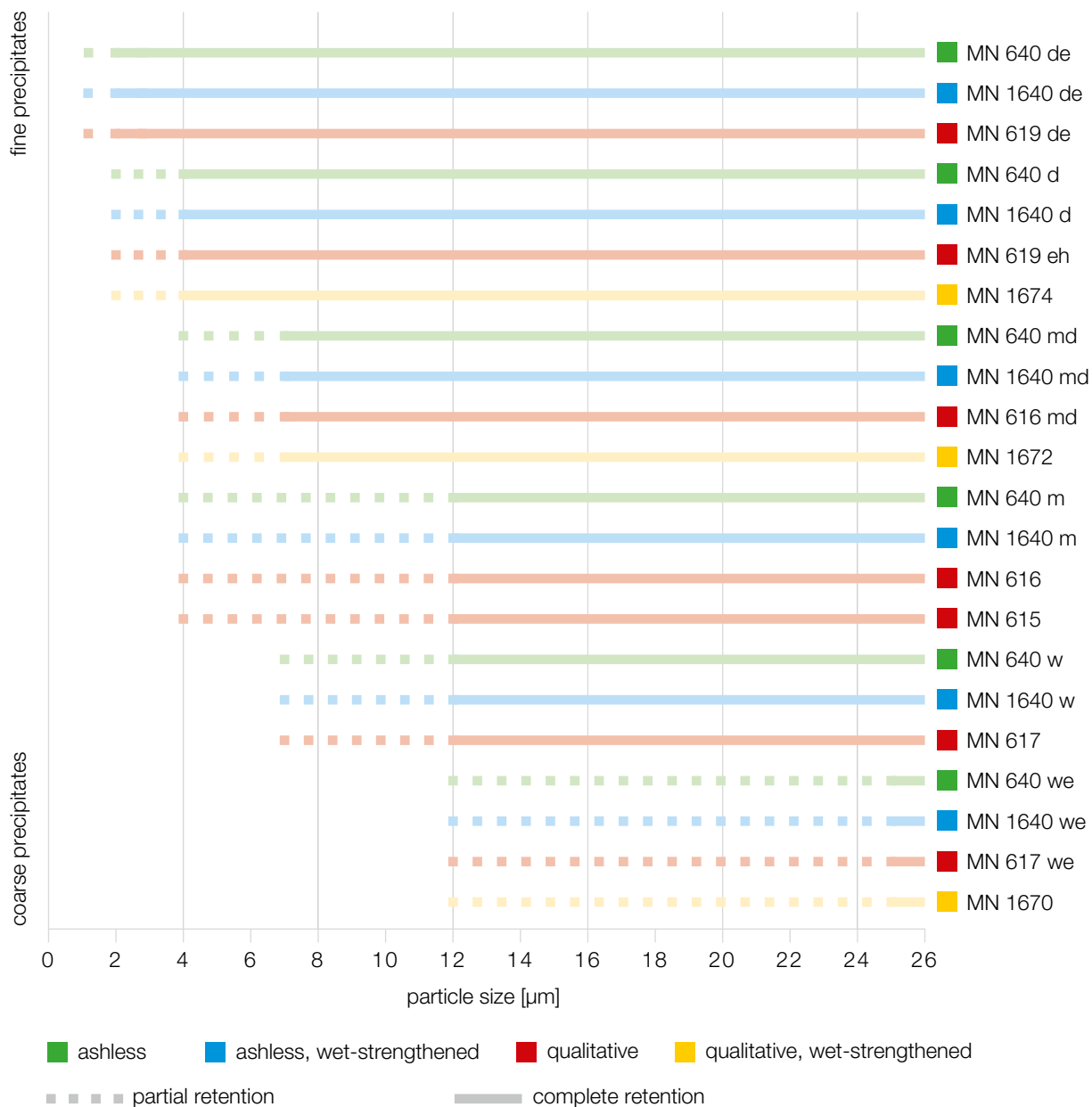
Application	Recommended filter paper
filter cake ignition and quantitative determination of the residue (gravimetric analysis)	ashless filter papers
analysis of the filtrate; it is important that no interfering substances are extracted from the filter paper	ashless filter papers or glass fiber filters
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)
visualization 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 fiber filters
filtration of aggressive liquids (e.g. strong oxidants)	glass fiber filters
need for very low metal ion blanks of the filter (e.g. for investigation of air-borne particles)	quartz fiber filters (MN QF 10)
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 41.



# Particle retention of MN filter papers

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










## 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	Color 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 ≡ black ribbon	fast filtration, smooth	0.20 mm	9 s	85 g/m <sup>2</sup>
MN 640 m	≡ No. 43 ≡ white ribbon	medium fast filtration, smooth	0.20 mm	27 s	85 g/m <sup>2</sup>
MN 640 md	≡ No. 40 ≡ red ribbon	medium to slow filtration, smooth	0.20 mm	55 s	85 g/m <sup>2</sup>
MN 640 dd	≡ No. 44 ≡ green ribbon	slow filtration, smooth	0.16 mm	100 s	70 g/m <sup>2</sup>
MN 640 d	≡ No. 42 ≡ blue ribbon	slow filtration, smooth	0.17 mm	140 s	85 g/m <sup>2</sup>
MN 640 de		very slow filtration, smooth	0.20 mm	195 s	100 g/m <sup>2</sup>

### Ordering information

Ø	MN 640 we	MN 640 w	MN 640 m	MN 640 md	MN 640 dd	MN 640 d	MN 640 de
							
55 mm	201005	202005	203005	204005	206005	205005	207005
70 mm	201007	202007	203007	204007	206007	205007	207007
90 mm	201009	202009	203009	204009	206009	205009	207009
110 mm	201011	202011	203011	204011	206011	205011	207011
125 mm	201012	202012	203012	204012	206012	205012	207012
150 mm	201015	202015	203015	204015	206015	205015	207015
185 mm	201018	202018	203018	204018	206018	205018	207018
240 mm	201024	202024	203024	204024	206024	205024	207024
320 mm	201032	202032	203032	204032	206032	205032	207032

References for packs of 100 filters, other diameters and formats on request











## Ashless and wet-strengthened filter papers

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.

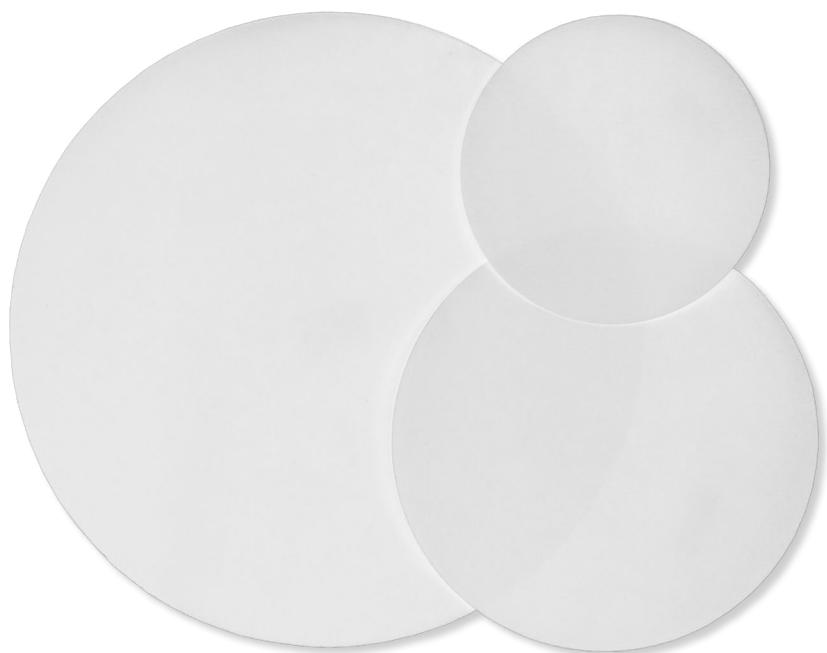
### Technical data

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	0.20 mm	9 s	85 g/m <sup>2</sup>
MN 1640 m	wet-strengthened, medium fast filtration, smooth	0.20 mm	27 s	85 g/m <sup>2</sup>
MN 1640 md	wet-strengthened, medium to slow filtration, smooth	0.20 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	0.20 mm	195 s	100 g/m <sup>2</sup>

### Ordering information

Ø	MN 1640 we	MN 1640 w	MN 1640 m	MN 1640 md	MN 1640 d	MN 1640 de
						
55 mm	221005	222005	223005	224005	225005	227005
70 mm	221007	222007	223007	224007	225007	227007
90 mm	221009	222009	223009	224009	225009	227009
110 mm	221011	222011	223011	224011	225011	227011
125 mm	221012	222012	223012	224012	225012	227012
150 mm	221015	222015	223015	224015	225015	227015
185 mm	221018	222018	223018	224018	225018	227018
240 mm	221024	222024	223024	224024	225024	227024
320 mm	221032	222032	223032	224032	225032	227032

References for packs of 100 filters, other diameters and formats on request













## Qualitative filter paper

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	0.20 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	0.20 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	0.20 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	0.20 mm	195 s	100 g/m <sup>2</sup>

### Ordering information

Ø	MN 617 we		MN 617		MN 615		MN 616		MN 618	
										
55 mm	435005	535005	434005	534005	431005	531005	432005	532005	436005	536005
70 mm	435007	535007	434007	534007	431007	531007	432007	532007	436007	536007
90 mm	435009	535009	434009	534009	431009	531009	432009	532009	436009	536009
110 mm	435011	535011	434011	534011	431011	531011	432011	532011	436011	536011
125 mm	435012	535012	434012	534012	431012	531012	432012	532012	436012	536012
150 mm	435015	535015	434015	534015	431015	531015	432015	532015	436015	536015
185 mm	435018	535018	434018	534018	431018	531018	432018	532018	436018	536018
240 mm	435024	535024	434024	534024	431024	531024	432024	532024	436024	536024
320 mm	435032	535032	434032	534032	431032	531032	432032	532032	436032	536032

References for packs of 100 filters, other diameters and formats on request

Ø	MN 616 md		MN 619		MN 619 eh		MN 619 de	
								
55 mm	433005	533005	437005	537005	438005	538005	439005	539005
70 mm	433007	533007	437007	537007	438007	538007	439007	539007
90 mm	433009	533009	437009	537009	438009	538009	439009	539009
110 mm	433011	533011	437011	537011	438011	538011	439011	539011
125 mm	433012	533012	437012	537012	438012	538012	439012	539012
150 mm	433015	533015	437015	537015	438015	538015	439015	539015
185 mm	433018	533018	437018	537018	438018	538018	439018	539018
240 mm	433024	533024	437024	537024	438024	538024	439024	539024
320 mm	433032	533032	437032	537032	438032	538032	439032	539032

References for packs of 100 filters, other diameters and formats on request







## Qualitative and wet-strengthened filter paper

Wet-strengthened analytical filter papers are manufactured from refined pulp and linters featuring a content of  $\alpha$ -cellulose of more than 95 %. The smooth surface of these papers allows fiber-free filtration. They feature a high wet strength and can 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	Filtrations 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

Ø	MN 1670		MN 1672		MN 1674	
						
55 mm	470005	570005	472005	572005	474005	574005
70 mm	470007	570007	472007	572007	474007	574007
90 mm	470009	570009	472009	572009	474009	574009
110 mm	470011	570011	472011	572011	474011	574011
125 mm	470012	570012	472012	572012	474012	574012
150 mm	470015	570015	472015	572015	474015	574015
185 mm	470018	570018	472018	572018	474018	574018
240 mm	470024	570024	472024	572024	474024	574024
320 mm	470032	570032	472032	572032	474032	574032

References for packs of 100 filters, other diameters and formats on request










## Glass fiber filters and quartz fiber filters

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

### Technical data

Grade		Thickness	Basis weight	Filtrations 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 439	≡ 934-AH	0.42 mm	66 g/m <sup>2</sup>	13 s	1.5 µm	550 °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		90 g/m <sup>2</sup>	< 5 s	–	950 °C	without

### Ordering information






Ø	MN GF-1	MN GF-2	MN GF-3	MN GF-4	MN GF-5	MN GF-6	MN 439
							
25 mm	4110025	4120025	4130025	4140025	4150025	4160025	4020025
37 mm	4110037	4120037	4130037	4140037	4150037	4160037	4020037
45 mm	4110045	4120045	4130045	4140045	4150045	4160045	4020045
47 mm	4110047	4120047	4130047	4140047	4150047	4160047	4020047
55 mm	411005	412005	413005	414005	415005	416005	402005
70 mm	411007	412007	413007	414007	415007	416007	402007
90 mm	411009	412009	413009	414009	415009	416009	402009
110 mm	411011	412011	413011	414011	415011	416011	402011
125 mm	411012	412012	413012	414012	415012	416012	402012
150 mm	411015	412015	413015	414015	415015	416015	402015
185 mm	411018	412018	413018	414018	415018	416018	402018
240 mm	411024	412024	413024	414024	415024	416024	402024
270 mm	411027	412027	413027	414027	415027	416027	402027

References for packs of 100 filters, other diameters and formats on request



## Glass fiber filter and quartz fiber filters

### Ordering information (cont.)

Ø	MN 85/70	MN 85/70 BF	MN 85/90	MN 85/90 BF	MN 85/220	MN 85/220 BF	MN QF-10
							
25 mm	4030025	4040025	4050025	4060025	4070025	4080025	–
37 mm	4030037	4040037	4050037	4060037	4070037	4080037	4170037
45 mm	4030045	4040045	4050045	4060045	4070045	4080045	4170045
47 mm	4030047	4040047	4050047	4060047	4070047	4080047	4170047
55 mm	403005	404005	405005	406005	407005	408005	417005
70 mm	403007	404007	405007	406007	407007	408007	417007
90 mm	403009	404009	405009	406009	407009	408009	417009
110 mm	403011	404011	405011	406011	407011	408011	–
125 mm	403012	404012	405012	406012	407012	408012	417012
150 mm	403015	404015	405015	406015	407015	408015	417015
185 mm	403018	404018	405018	406018	407018	–	–
240 mm	403024	404024	405024	406024	407024	–	–
270 mm	403027	404027	405027	406027	407027	–	–

References for packs of 100 filters, other diameters and formats on request



## Smooth and thick filter papers

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.

### 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 decoloring colored 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	1.4 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 and embossed filter papers

## Creped filter papers

Creped filter papers offer an increased surface area compared to smooth filter paper, which allows filtration of large volumes quickly. The types listed are available as sheets, round filters, pleated filters, special cuts, as well as rolls.

### Technical data

Grade	Application and properties	Thickness	Filtration speed	Basis weight
MN 850	medium speed, wet-strengthened, for technical applications	0.20 mm	3 s	53 g/m <sup>2</sup>
MN 692	medium speed for general applications	0.27 mm	20 s	70 g/m <sup>2</sup>
MN 126/70	very fast, very high wet-strength, e.g. for electroplating baths	0.20 mm	25 s	70 g/m <sup>2</sup>
MN 751	medium speed, unbleached (brown paper) for applications requiring high mechanical strength	0.27 mm	12 s	75 g/m <sup>2</sup>
MN 750 N	medium speed, unbleached (brown paper) for applications requiring high mechanical strength	0.34 mm	5 s	60 g/m <sup>2</sup>
MN 553	fast, for general applications	0.30 mm	22 s	65 g/m <sup>2</sup>
MN 753	very fast, soft, e.g. for filtration of paints and oils	0.35 mm	15 s	80 g/m <sup>2</sup>
MN 651	fast, wet-strengthened	0.44 mm	9 s	90 g/m <sup>2</sup>
MN 605	very fast, e.g. for clarification of essential oils	0.60 mm	5 s	100 g/m <sup>2</sup>
MN 651/120	fast, wet-strengthened	0.45 mm	9 s	120 g/m <sup>2</sup>
MN 601	very fast, e.g. for filtration of transformer oils	0.50 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

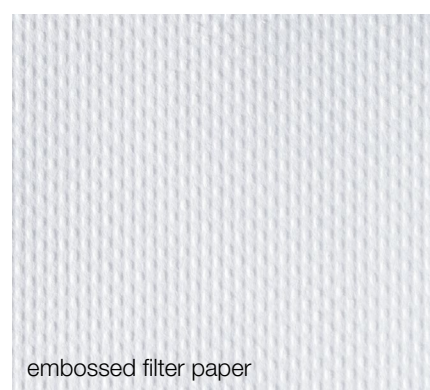
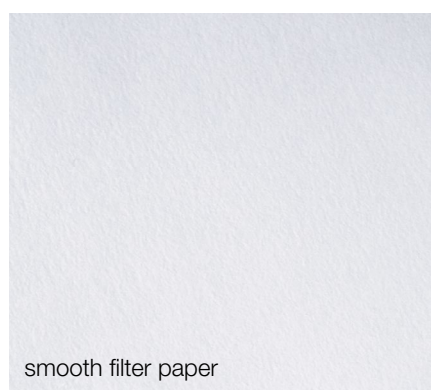
## Embossed filter papers

Embossed filter papers offer an increased surface area compared to smooth paper and are used e.g. in beverage analysis for removing carbon dioxide from sparkling wine or beer.

### Technical data

Grade	Application and properties	Thickness	Filtration speed	Basis weight
MN 612	for general applications	0.30 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
Weighing aids	MN 808, MN 226, MN 40/25	20
Activated charcoal filter paper	MN 728	16
Antibiotic resistance testing	MN 827 ATD, MN 827 ATR, MN 827 ATS/8	21
Blotting procedures	MN 218 B, MN 827 B, MN 440 B	25
Soil analysis	MN 280 ¼, MN 619 G, MN 616 G, MN 617 G	17
Filter papers for breweries	MN 614, MN 321, MN 620	18
Chromatography	MN 214, MN 214 ff, MN 218, MN 260, MN 261, MN 827, MN 866	25
Fat analysis	MN 615 ff, MN 715	18
Filtration with suction filters	MN 640 w, MN 615	23
Filter aids: filter flocs	MN 101, MN 2101	23
Ion exchange papers	MN 616 LSA-50, MN 616 LSB-50	21
Kieselguhr paper	MN 660	19
Lens tissue paper (José paper)	MN 13	22
Microscopy	MN 224	22
Surface protection paper LAB-TOP, paper coated with PE	MN 210 PE	22
Phosphate-free filters	MN 619 G, MN 616 G, MN 617 G	17
Polyester paper	MN 52 K	17
Black filter paper for the detection of light precipitates	MN 220	24
Nitrogen-free paper	MN 321	18
Hydrophobic phase separation papers	MN 617 WA, MN 616 WA	24
Sample supports, touch papers for Schöniger method	MN 640 mS	REF 486003
Flue gas testing	MN 1817	on request
Smelling strips for the perfume industry	MN 270 S	on request
Sterilizing paper	MN 68	on request


### Activated charcoal filter paper

The activated charcoal filter paper MN 728 is particularly suited for the clarification and decoloring 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

Ø	MN 728
	
55 mm	481005
70 mm	481007
90 mm	481009
110 mm	481011
125 mm	481012
150 mm	481015
185 mm	481018
240 mm	481024
320 mm	481032

References for packs of 100 filters, other diameters and formats on request





## Soil analysis

### Soil analysis, phosphate-free filters

MN 280 ¼: folded filters made from acid-washed paper with a high clarification efficiency for determination of micronutrients 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 ¼	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

Ø	MN 280 ¼	MN 619 G	MN 616 G	MN 617 G
				
55 mm	–	440005	540005	483005
70 mm	–	440007	540007	483007
90 mm	–	440009	540009	483009
110 mm	521011	440011	540011	483011
125 mm	521012	440012	540012	483012
150 mm	521015	440015	540015	483015
185 mm	521018	440018	540018	483018
240 mm	521024	440024	540024	483024
320 mm	–	440032	540032	483032

References for packs of 100 filters, other diameters and formats on request

### Polyester paper


This filters made from 100 % polyester fibers 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 mm	100 g/m <sup>2</sup>

Available sizes and ordering information on request

#### Ordering information

Ø	MN 52 K
	
55 mm	40052K005
70 mm	40052K007
90 mm	40052K009
110 mm	40052K011
125 mm	40052K012
150 mm	40052K015

References for packs of 100 filters, other diameters and formats on request








## Filter papers for breweries

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

### Technical data

Grade	Properties	Thickness	Filtration speed	Basis weight
MN 614	medium speed, embossed filter paper	0.25 mm	20 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	20 s	75 g/m <sup>2</sup>

### Ordering information

Ø	MN 614		MN 321	MN 620	
					
55 mm	427005	527005	410005	–	–
70 mm	427007	527007	410007	–	–
90 mm	427009	527009	410009	441009	541009
110 mm	427011	527011	410011	441011	541011
125 mm	427012	527012	410012	441012	541012
150 mm	427015	527015	410015	441015	541015
185 mm	427018	527018	410018	441018	541018
240 mm	427024	527024	410024	441024	541024
320 mm	427032	527032	–	441032	541032

References for packs of 100 filters, other diameters and formats 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	Thickness	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

Ø	MN 615 ff	MN 715
		
55 mm	591005	528005
70 mm	591007	528007
90 mm	591009	528009
110 mm	591011	528011
125 mm	591012	528012
150 mm	591015	528015
185 mm	591018	528018
240 mm	591024	528024
270 mm	591027	528027
320 mm	–	561032

References for packs of 100 filters, other diameters and formats on request



## Sugar analysis



### Kieselguhr (diatomaceous earth) 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

Ø		MN 660	
			
90 mm	447009	–	
110 mm	447011	547011	
125 mm	447012	547012	
150 mm	447015	547015	
185 mm	447018	547018	
240 mm	447024	547024	
320 mm	447032	547032	

References for packs of 100 filters, other diameters and formats on request

### Filter paper for Venema plants

MN 672 is a wet-strength paper that is ideal for automated sugar beet analysis in Venema plants.

#### Technical data

Grade	Thickness	Filtration speed	Basis weight
MN 672	0.20 mm	37 s	85 g/m <sup>2</sup>

#### Ordering information

MN 672		
Length	Width	
1000 m	24 cm	100672001



## Weighing aids

### Weighing boats

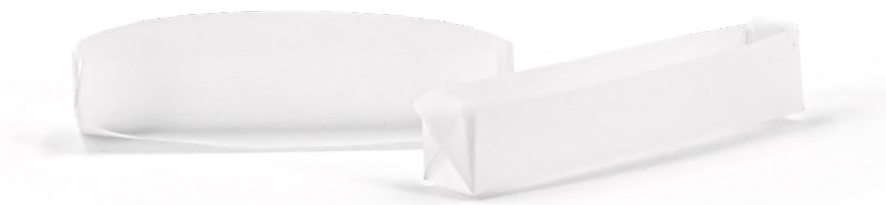
Weighing boats MN 808 are made from a special, nitrogen-free parchment. They are used to weigh viscous or syrupy substances.

#### Technical data

Grade	Properties	Basis weight
MN 808	weighing boats	n.a.

#### Ordering information

MN 808		
Size	Pack of	REF
58 × 10 × 10 mm	100 boats	486000
70 × 23 × 15 mm	100 boats	486001



### Weighing paper

MN 226 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 are easily crushable (not wet-strengthened) mainly used in the sugar industry for weighing syrupy and semi-crystalline substances.

#### Technical data

Grade	Properties	Basis weight
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 226		
Size	Pack of	REF
Block with 100 sheets 9 × 11.5 cm	1 block	186002

MN 40/25		
Size	Pack of	REF
10 × 10 cm	1000 sheets	194000



# Antibiotics and ion exchange

## Ion exchange papers

MN 616 LSA-50 is a filter paper with strongly acidic cation exchange resin; matrix polystyrene crosslinked with 8.5 % DVB; active groups  $\text{SO}_3\text{H}$ , strongly acidic, supplied in  $\text{H}^+$  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 is a filter paper with strongly basic anion exchange resin; matrix polystyrene crosslinked with 6 % DBV; active groups quaternary ammonium compounds, strongly basic; supplied in  $\text{OH}^-$  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	432110	432120

Other sizes and cuts on request

## Antibiotic resistance testing

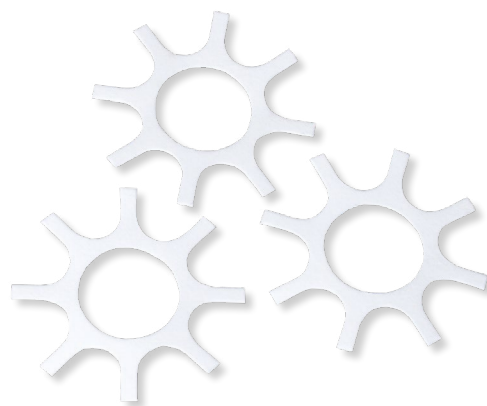
These products are used in testing the resistance of pathogens to antibiotics. For this test the filter paper sections can be impregnated with the antibiotic to be tested and placed on the inoculated nutrient medium. Depending on the effectiveness, a smaller or larger zone of inhibition is formed. MACHEREY-NAGEL 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	484000
Test disks MN 827 ATD, Ø 9 mm	1000	484001
Test stars MN 827 ATS/8	1000	484003



## Optics and surface protection

### 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	19 g/m <sup>2</sup>

#### Ordering information

MN 13		
Presentation	Pack of	REF
Sheets, 12 × 12 cm	500 sheets	418101
Sheets, 36 × 48 cm	500 sheets	418102
Blocks with 50 sheets 8 × 10 cm	1 block	118000

other sizes and cuts on request



### Microscopy

Paper with good absorbent properties for absorbing liquids from microscopic preparations.

#### Technical data

Grade	Properties	Thickness	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 with 50 sheets 3.7 × 10 cm	100 block	185000

### 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 × 60 cm	100 sheets	112000
Sheets, 48 × 60 cm	50 sheets	112000.1
Roll, 100 × 0.48 m	1 roll	112010
Roll, 50 × 0.48 m	1 roll	112050
Roll, 100 × 0.60 m	1 roll	112020
Roll, 50 × 0.60 m	1 roll	112030

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 fibers 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	
Presentation	REF	Presentation	REF
500 g	481100	500 g	281120
1000 g	481110	1000 g	281130



## Filtration with suction filters

These filters are used specifically with suction filters. The elevated border safely prevents sample to run past the edge of the filter. Residues won't stick to the suction filter walls. Thus, the entire filter cake can be used for further analysis quickly and easily.

### Technical data

Grade	Properties	Thickness	Filtration speed	Basis weight
MN 640 w	quantitative	0.20 mm	9 s	85 g/m <sup>2</sup>
MN 615	qualitative	0.16 mm	22 s	70 g/m <sup>2</sup>

### Ordering information

Ø	MN 640 w	MN 615
		
90 mm	202901	431901
110 mm	202903	431903
125 mm	202902	431902

References for packs of 100 filters, other diameters and formats on request



# Phase separation and black filter papers



## 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

Ø	MN 617 WA	MN 616 WA
		
55 mm	–	484005
70 mm	–	484007
90 mm	430009	484009
110 mm	430011	484011
125 mm	430012	484012
150 mm	430015	484015
185 mm	430018	484018
240 mm	430024	484024
320 mm	–	484032

References for packs of 100 filters, other diameters and formats on request




## Black filter papers for the detection of white precipitates

This filter paper, which is dyed black with a sulfur dye, is used to identify small quantities of white 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

Ø	MN 220
	
55 mm	409005
70 mm	409007
90 mm	409009
110 mm	409011
125 mm	409012
150 mm	409015
185 mm	409018

References for packs of 100 filters, other diameters and formats on request





# Blotting procedures and chromatography

## Chromatography papers

Paper chromatography requires high quality papers, since they have a considerable impact on the separation result. The chromatography papers listed below are almost exclusively produced from pure linters without addition of other substances. As a result, they show a low wet strength.

### Technical data

Grade	Migration distance	Thickness	Basis weight
MN 214	90–100 mm/30 min	0.28 mm	140 g/m <sup>2</sup>
MN 214 ff <sup>1)</sup>	90–100 mm/30 min	0.28 mm	140 g/m <sup>2</sup>
MN 218	90–100 mm/30 min	0.36 mm	180 g/m <sup>2</sup>
MN 260	120–130 mm/30 min	0.20 mm	90 g/m <sup>2</sup>
MN 261	45–60 mm/10 min	0.18 mm	90 g/m <sup>2</sup>
MN 827	130–140 mm/10 min	0.70 mm	270 g/m <sup>2</sup>
MN 866	140–160 mm/10 min	1.7 mm	650 g/m <sup>2</sup>

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



### Ordering information

MN 214
Size
58 x 60 cm 817001

MN 214 ff
Size
58 x 60 cm 817008

MN 260
Size
58 x 60 cm 817003

MN 261
Size
58 x 60 cm 817004

MN 827
Size
58 x 60 cm 817005

MN 866
Size
80 x 80 cm 817007
38 x 38 cm 817006

References for packs of 100 filters, other diameters and formats on request

## Blotting papers

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

### Technical data

Grade	Migration distance	Thickness	Basis weight
MN 218 B	55–65 mm/10 min	0.36 mm	180 g/m <sup>2</sup>
MN 827 B	130–140 mm/10 min	0.7 mm	270 g/m <sup>2</sup>
MN 440 B	130–145 mm/10 min	1.0 mm	400 g/m <sup>2</sup>

### Ordering information

MN 218 B
Size
58 x 60 cm 742111
30 x 60 cm 742112
57 x 46 cm 742113
20 x 20 cm 742115
15 x 20 cm 742138
21 x 9 cm 742131
13 x 10 cm 742116
10 x 7 cm 742139
9.3 x 8 cm 742137

MN 827 B
Size
58 x 60 cm 742118
20 x 20 cm 742120
16 x 16 cm 742128

MN 440 B
Size
58 x 60 cm 742125

References for packs of 100 filters, other diameters and formats on request

## Extraction thimbles made from cellulose

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).

### 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 E	MN 645 E extraction thimbles are specially manufactured to meet the requirements of modern, automated solvent extractors. The thimbles match the respective extractor perfectly and guarantee the best fit and easiest use.
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

MN 645		
ID × height	Wall thickness	REF
8 × 40 mm	1.0 mm	645001
9 × 50 mm	1.0 mm	645002
15 × 50 mm	1.0 mm	645003
15 × 100 mm	1.0 mm	645004
20 × 80 mm	1.5 mm	645005
22 × 80 mm*	1.5 mm	645006
23 × 90 mm	1.5 mm	645007
23 × 100 mm	1.5 mm	645008
27 × 60 mm	1.5 mm	645011
27 × 80 mm	1.5 mm	645009
27 × 100 mm	1.5 mm	645010
28 × 80 mm	1.5 mm	645015
28 × 90 mm	1.5 mm	645016
28 × 100 mm	1.5 mm	645013
28 × 120 mm	1.5 mm	645014
29 × 100 mm	1.5 mm	645017
30 × 60 mm	1.5 mm	645019
30 × 80 mm	1.5 mm	645020
30 × 90 mm	1.5 mm	645021
30 × 100 mm	1.5 mm	645023
30 × 150 mm	1.5 mm	645018
31 × 118 mm	1.5 mm	645024
31 × 130 mm	1.5 mm	645025
33 × 80 mm	1.5 mm	645951

MN 645		
ID × height	Wall thickness	REF
33 × 94 mm*	1.5 mm	645022
33 × 205 mm*	1.5 mm	645026
34 × 120 mm	1.5 mm	645027
34 × 150 mm	1.5 mm	645028
38 × 200 mm	1.5 mm	645029
40 × 123 mm	2.0 mm	645031
40 × 150 mm	2.0 mm	645030
43 × 130 mm	2.0 mm	645032
48 × 145 mm	2.0 mm	645033
48 × 200 mm	2.0 mm	645034
48 × 230 mm*	2.0 mm	645035
51 × 145 mm	2.0 mm	645036
51 × 180 mm	2.0 mm	645037
55 × 275 mm	2.0 mm	645040
57 × 315 mm*	2.0 mm	645038
60 × 180 mm	2.0 mm	645039
68 × 250 mm	2.0 mm	645042
70 × 330 mm	2.0 mm	645043

MN 645 D		
ID × height	Wall thickness	REF
30 × 80 mm	1.5 mm	645220
30 × 100 mm	1.5 mm	645223
31 × 130 mm	1.5 mm	645225

MN 645 E		
ID × height	System	REF
28 × 22 mm	FOSS	645061
26 × 60 mm	FOSS, dick	645923
33 × 80 mm	FOSS	645951.2
33 × 80 mm	FOSS, dick	645951.6
33 × 80 mm	Gerhardt	645951.4
25 × 100 mm	Büchi	645917.3
33 × 94 mm	Büchi	645022.3
33 × 80 mm	VELP	645951.7

MN 645 F		
ID × height	Wall thickness	REF
22 × 80 mm	1.5 mm	645406
30 × 100 mm	1.5 mm	645423

MN 645 W		
ID × height	Wall thickness	REF
20 × 80 mm	1.5 mm	645105
28 × 90 mm	1.5 mm	645116
31 × 205 mm	1.5 mm	645126

MN 645 R		
ID × height	Wall thickness	REF
79 × 155 mm	102 mm	645500

References for packs of 25 thimbles

\* 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

Glass fiber extraction thimbles are made from pure borosilicate micro glass fibers without the addition of binders. They demonstrate high temperature stability and are used in the analysis of hot exhaust gases.

### Technical data

Grade	Properties
MN 649	extraction thimbles made from glass microfibers 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

MN 649		
ID × height	Wall thickness	REF
15 × 50 mm	1.0 mm	649103
16 × 100 mm	1.0 mm	649104
22 × 80 mm*	1.5 mm	649106
23 × 90 mm	1.5 mm	649107
23 × 100 mm	1.5 mm	649108
28 × 60 mm	1.5 mm	649111
27 × 80 mm	1.5 mm	649109
28 × 120 mm	1.5 mm	649114
30 × 150 mm	1.5 mm	649118
33 × 80 mm	1.5 mm	649120
33 × 90 mm	1.5 mm	649121
33 × 94 mm*	1.5 mm	649122
33 × 100 mm	1.5 mm	649123
33 × 118 mm	1.5 mm	649124
33 × 205 mm*	1.5 mm	649126
35 × 150 mm	1.5 mm	649128
43 × 123 mm	2.0 mm	649131
48 × 230 mm*	2.0 mm	649135
57 × 315 mm*	2.0 mm	649138
75 × 330 mm	2.0 mm	649143

MN 649 R		
ID × height	collar-Ø	REF
79 × 155 mm	102 mm	649500
27 × 55 mm	50 mm	649501



References for packs of 25 thimbles

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



## Overview of the membrane types

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

Material and Properties	Type	Pore size [µm]	Page
<b>Cellulose mixed esters (CM)</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>	 PORAFIL® CM	0.45	30
	 CHROMAFIL® MV	0.2 · 0.45	38
<b>Cellulose mixed ester, fabric-reinforced (MV)</b> <ul style="list-style-type: none"> <li>• Suitable for aqueous solutions</li> <li>• Higher mechanical stability than PORAFIL® CM</li> </ul>	 PORAFIL® MV	0.2 · 0.45 · 0.8	30
<b>Cellulose nitrate (NC)</b> <ul style="list-style-type: none"> <li>• Thermally stable up to 125 °C</li> <li>• Autoclaving possible at 121 °C</li> </ul>	 PORAFIL® NC	0.2 · 0.45	31
<b>Polycarbonate (PC)</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>	 PORAFIL® PC	0.4	32
<b>Cellulose acetate (CA)</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>	 PORAFIL® CA	0.2 · 0.45 · 0.8	31
	 CHROMAFIL® CA	0.2 · 0.45	37
<b>Polytetrafluoroethylene (PTFE)</b> <ul style="list-style-type: none"> <li>• Hydrophobic membrane. 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>	 PORAFIL® TE	0.2 · 0.45 · 1.0 · 3.0	31
	 CHROMAFIL® PTFE	0.2 · 0.45	36
<b>Polyester (PE, PET)</b> <ul style="list-style-type: none"> <li>• Very chemical resistant membrane (not as stable as PTFE)</li> <li>• Suitable for TOC/DOC determinations</li> <li>• Temperature resistant up to 150 °C</li> </ul>	 PORAFIL® PE	0.2 · 0.4 · 1.0 · 5.0	32
	 CHROMAFIL® PET	0.2 · 0.45 · 1.20	35
	 CHROMAFIL® GF/PET	1.0/0.2 · 1.0/0.45	34
<b>Regenerated Cellulose (RC)</b> <ul style="list-style-type: none"> <li>• Suitable for all media except strong acids and bases</li> <li>• Suitable for HPLC solvent</li> <li>• Thermally stable up to 180 °C</li> </ul>	 PORAFIL® RC	0.2 · 0.45	32
	 CHROMAFIL® RC	0.2 · 0.45	35
	 CHROMAFIL® GF/RC	1.0/0.2 · 1.0/0.45	34
<b>Polyamide (PA)</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	39
<b>Polyethersulfon (PES)</b> <ul style="list-style-type: none"> <li>• Hydrophilic membrane</li> <li>• For aqueous and slightly organic solvents</li> <li>• Good stability towards acids and alkali</li> </ul>	 CHROMAFIL® PES	0.2 · 0.45 · 5.00	38
<b>Polyvinylidene difluoride (PVDF)</b> <ul style="list-style-type: none"> <li>• Hydrophilic membrane</li> <li>• Suitable for filtration of polar and nonpolar solutions</li> <li>• Low protein binding capacity</li> </ul>	 CHROMAFIL® PVDF	0.2 · 0.45	39
	 CHROMAFIL® GF/PVDF	1.0/0.45	34
<b>Glass fiber (GF)</b> <ul style="list-style-type: none"> <li>• Inert filter</li> <li>• For highly contaminated samples</li> <li>• Ideal as a pre-filter</li> </ul>	 CHROMAFIL® GF	1.0	38

# Chemical resistance of 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	○	+	+	+	+	+	+	+	-	+	+
Chlorbenzene, freon	+	+	+	+	+	+	+	-	-	-	-
Gasoline	+	+	+	+	+	+	+	+	+	+	-
Acetonitrile	-	-	-	-	+	+	+	+	+	○	+
<b>Alcohols</b>											
Methanol, 98 %	+	-	-	-	-	○	+	+	+	+	-
Butanol	+	+	+	+	+	+	+	○	+	○	+
Ethanol, 98 %	+	-	○	+	+	+	+	+	+	+	+
Ethanol, 70 %	+	○	○	+	+	+	+	+	+	+	+
Isopropanol	+	+	○	+	+	+	+	+	+	+	-
n-Propanol	+	+	○	+	+	+	+	+	+	+	+
Amyl alkohol	+	+	+	+	+	+	+	-	+	-	-
Benzyl alkohol	○	○	+	○	+	+	+	-	+	-	-
Ethylene glykol	+	○	○	+	+	+	+	+	+	+	+
Glycerine	+	+	+	+	+	+	+	-	+	-	-
Cyclohexanol	-	-	+	-	+	+	+	-	+	-	-
Polyethylen glykol 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	+	○	○	○	+	+	-	-	-	-	-
Trikresyl phosphate	+	○	○	○	+	+	+	-	-	-	-
<b>Ethers und Sulfoxides</b>											
Diethyl ether	+	○	-	○	+	+	+	+	+	○	+
Dioxane	-	-	-	-	+	+	+	+	-	○	+
Tetrahydrofuran	-	-	-	-	+	+	+	○	-	+	+
Dimethylsulfoxide	-	-	-	-	+	+	○	-	-	-	-

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	+	+	○	-	+	+	+	-	-	-	+
Sulfuric 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; ○ : partially 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

Ø	Color	Sterile	Grid	Pack of	REF
PORAFIL® CM, no grid, sterile / not sterile pore size 0.45 µm					
47 mm	white	✓	black	100	65300045047
50 mm	white	✓	black	100	65300045050
50 mm	black	✓	white	100	65310045050
50 mm	green	✓	black	100	65320045050
47 mm	white	–	black	100	65600045047
47 mm	black	–	white	100	65610045047
47 mm	green	–	black	100	65620045047
50 mm	white	–	black	100	65600045050
50 mm	black	–	white	100	65610045050
50 mm	green	–	black	100	65620045050

Ø	Pack of	REF
PORAFIL® CM white, not sterile, no grid, pore size 0.45 µm		
13 mm	100	65100045013
25 mm	100	65100045025
47 mm	100	65100045047
50 mm	100	65100045050
100 mm	25	65100045100
142 mm	25	65100045142
220 mm	25	65100045220

### 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
13 mm	50	650000020013	650000045013	650000080013
25 mm	50	650000020025	650000045025	650000080025
47 mm	50	650000020047	650000045047	650000080047
50 mm	50	650000020050	650000045050	650000080050
90 mm	25	650000020090	650000045090	650000080090
100 mm	25	650000020100	650000045100	650000080100
142 mm	25	650000020142	650000045142	650000080142
220 mm	25	650000020220	650000045220	650000080220

## PORAFIL® membrane filter

### 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 sterilized.

#### Ordering information

Ø	Pack of	Pore size 0.2 µm	Pore size 0.45 µm	Pore size 0.8 µm
13 mm	100	68000020013	68000045013	68000080013
25 mm	100	68000020025	68000045025	68000080025
47 mm	100	68000020047	68000045047	68000080047
50 mm	100	68000020050	68000045050	68000080050
90 mm	50	68000020090	68000045090	68000080090
100 mm	25	68000020100	68000045100	68000080100
142 mm	25	68000020142	68000045142	68000080142
220 mm	25	68000020220	68000045220	68000080220

### Nitrocellulose membranes · PORAFIL® NC

PORAFIL® 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	6570020013	6570045013
25 mm	50	6570020025	6570045025
47 mm	50	6570020047	6570045047
50 mm	50	6570020050	6570045050
90 mm	50	6570020090	6570045090
100 mm	25	6570020100	6570045100
142 mm	25	6570020142	6570045142
220 mm	25	6570020220	6570045220

### 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	670020013	670045013	670100013	670300013
25 mm	50	670020025	670045025	670100025	670300025
47 mm	50	670020047	670045047	670100047	670300047
50 mm	50	670020050	670045050	670100050	670300050
90 mm	25	670020090	670045090	670100090	670300090
100 mm	25	670020100	670045100	670100100	670300100
142 mm	10	670020142	670045142	670100142	670300142
220 mm	10	670020220	670045220	670100220	670300220

## PORAFIL® membrane filter

### 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 0.2 µm	Pore size 0.4 µm	Pore size 1.0 µm	Pore size 5.0 µm
13 mm	100	671020013	671040013	671100013	671500013
25 mm	100	671020025	671040025	671100025	671500025
37 mm	100	671020037	671040037	671100037	671500037
47 mm	100	671020047	671040047	671100047	671500047
50 mm	100	671020050	671040050	671100050	671500050

### Regenerated cellulose membranes · PORAFIL® RC

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

#### Ordering information

Ø	Pack of	Pore size 0.2 µm	Pore size 0.45 µm
13 mm	100	659020013	659045013
25 mm	100	659020025	659045025
47 mm	100	659020047	659045047
50 mm	100	659020050	659045050
100 mm	25	659020100	659045100
142 mm	25	659020142	659045142

### 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	676040025
47 mm	100	676040047
50 mm	100	676040050





# CHROMAFIL® syringe filters

## 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.

### Recommended filter sizes for different volumes

Sample volume	Recommended filter-Ø	Void volumes	Filtration area
≤ 1 mL	3 mm	5 µL	0.07 cm <sup>2</sup>
1–5 mL	13 mm	30 µL	1.33 cm <sup>2</sup>
1–5 mL	15 mm	35 µL	1.77 cm <sup>2</sup>
5–100 mL	25 mm	80 µL	4.91 cm <sup>2</sup>



## CHROMAFIL® Xtra

- Labeled for method validation and certification
- Imprint for direct identification of the membrane type, diameter and pore size
- Low bleeding PP housing
- Color-free plain polypropylene

## CHROMAFIL® BIGbox

- 400 (25 mm) or 800 (15 mm) color-coded quality syringe filters
- Food safe PE box with screw cap

## CHROMAFIL® combi Filters

Combi syringe filters with a coarse glass fiber prefilter and a small-pore membrane as main filter.

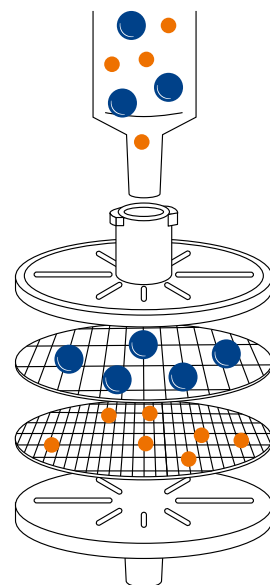
### User benefits:

- For solutions with a high load of particulate matter: lower back pressure, easy filtration
- For high yields of filtrate: more mL of pure filtrate per filter

### The technology:

The glass fiber membrane (1.0 µm) removes coarse particles, before they can block the fine main membrane. This results in a better filtration efficiency, especially for highly contaminated samples.

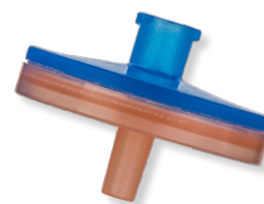
Housing:	Solvent-resistant, ultra low bleed polypropylene
Intel:	Luer lock
Exit:	Luer
Pore diameter:	1.0/0.20 µm or 1.0/0.45 µm
Filter diameter:	25 mm
Void volume:	< 80 µL
Packing unit:	100 i liters; BIGbox with 400 i liters



## CHROMAFIL® syringe filters

### CHROMAFIL® GF/PET (polyester with glass fiber prefilter)

- Hydrophilic multipurpose membrane for polar as well as nonpolar solvents
- The HPLC filter with glass fiber prefilter, especially suited for mixtures of water and organic solvents
- Recommended for solutions with a high load of particulate matter or for highly viscous solutions



#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
CHROMAFIL®								
GF/PET-20/25	1.0/0.20 µm	25 mm	blue	orange	100	729032	400	729032.400
GF/PET-45/25	1.0/0.45 µm	25 mm	black	orange	100	729033	400	729033.400

### CHROMAFIL® GF/PVDF (polyvinylidene difluoride with glass fiber prefilter)

- Hydrophilic membrane (for 100 % aqueous solutions)
- Recommended for filtration of biological samples with high particle loads.
- Filter features a high binding capacity for proteins.
- Suited for filtration of aqueous solutions

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
CHROMAFIL®								
GF/PVDF-45/25	1.0/0.45 µm	25 mm	black	white	100	729039	400	729039.400

### CHROMAFIL® GF/RC (regenerated cellulose with glass fiber prefilter)

- Hydrophilic membrane for aqueous and organic-aqueous liquids, i.e. polar and medium polar sample solutions
- Recommended for solutions with a high particle loading or for highly viscous aqueous solutions

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
CHROMAFIL®								
GF-RC-20/25	1.0/0.20 µm	25 mm	blue	blue	100	729050	400	729050.400
GF-RC-45/25	1.0/0.45 µm	25 mm	black	blue	100	729051	400	729051.400

### CHROMAFIL® Xtra GF/PTFE (polytetrafluoroethylene with glass fiber prefilter)

- Hydrophobic membrane
- 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
- Recommended for highly particle loaded or highly viscous solutions

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Bottom	Unterteil	Pack of	REF	Pack of	REF
CHROMAFIL® Xtra								
GF/PTFE-20/25	1.0/0.20 µm	25 mm	labeled		100	729270	–	–
GF/PTFE-45/25	1.0/0.45 µm	25 mm	labeled		100	729271	–	–

# CHROMAFIL® syringe filters

## CHROMAFIL® Xtra GF/PA (polyamide with glass fiber prefilter)

- Slightly hydrophilic membrane
- Filtration of polar aqueous and organic-aqueous liquids
- Recommended for highly particle loaded or highly viscous aqueous solutions

### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
GF/PA-20/25	1.0/0.20 µm	25 mm	labeled		100	729260	–	–
GF/PA-45/25	1.0/0.45 µm	25 mm	labeled		100	729261	–	–

## CHROMAFIL® PET (polyester)

- Hydrophilic multipurpose membrane
- Especially suited HPLC filter for mixtures of water and organic solvents
- For TOC/DOC determination

### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
PET-20/13	0.20 µm	13 mm	labeled		100	729222	–	–
PET-45/13	0.45 µm	13 mm	labeled		100	729223	–	–
PET-20/25	0.20 µm	25 mm	labeled		100	729221	400	729221.400
PET-45/25	0.45 µm	25 mm	labeled		100	729220	400	729220.400
PET-120/25	1.2 µm	25 mm	labeled		100	729229	400	729229.400
<b>CHROMAFIL®</b>								
PET-20/15 MS	0.20 µm	15 mm	yellow	orange	100	729022	–	–
PET-45/15 MS	0.45 µm	15 mm	colorless	orange	100	729023	–	–
PET-20/25	0.20 µm	25 mm	yellow	orange	100	729021	400	729021.400
PET-45/25	0.45 µm	25 mm	colorless	orange	100	729020	400	729020.400

MS = minispikes on filter exit



# CHROMAFIL® syringe filters

## CHROMAFIL® RC (regenerated cellulose)

- Hydrophilic membrane with very low adsorption
- For filtration of polar aqueous and organic-aqueous liquids
- Binding capacity for proteins 84 µg per 25 mm filter

### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox		
			Top	Bottom	Pack of	REF	Pack of	REF	
<b>CHROMAFIL® Xtra</b>									
RC-20/13	0.20 µm	13 mm	labeled		100	729236	–	–	
RC-45/13	0.45 µm	13 mm	labeled		100	729237	–	–	
RC-20/25	0.20 µm	25 mm	labeled		100	729230	400	729230.400	
RC-45/25	0.45 µm	25 mm	labeled		100	729231	400	729231.400	
<b>CHROMAFIL®</b>									
RC-20/15 MS	0.20 µm	15 mm	yellow	blue	100	729036	–	–	
RC-45/15 MS	0.45 µm	15 mm	colorless	blue	100	729037	–	–	
RC-20/25	0.20 µm	25 mm	yellow	blue	100	729030	400	729030.400	
RC-45/25	0.45 µm	25 mm	colorless	blue	100	729031	400	729031.400	

MS = minispike on filter exit

## CHROMAFIL® PTFE (polytetrafluoroethylene)

- 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

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox		
			Top	Bottom	Pack of	REF	Pack of	REF	
<b>CHROMAFIL® Xtra</b>									
PTFE-20/13	0.20 µm	13 mm	labeled		100	729208	–	–	
PTFE-45/13	0.45 µm	13 mm	labeled		100	729209	–	–	
PTFE-20/25	0.20 µm	25 mm	labeled		100	729207	400	729207.400	
PTFE-45/25	0.45 µm	25 mm	labeled		100	729205	400	729205.400	
PTFE-100/25	1.0 µm	25 mm	labeled		100	729247	–	–	
<b>CHROMAFIL®</b>									
PTFE-20/3	0.20 µm	3 mm	colorless	colorless	100	729014	–	–	
PTFE-45/3	0.45 µm	3 mm	colorless	colorless	100	729015	–	–	
PTFE-20/15 MS	0.20 µm	15 mm	yellow	colorless	100	729008	–	–	
PTFE-45/15 MS	0.45 µm	15 mm	colorless	colorless	100	729009	–	–	
PTFE-20/25	0.20 µm	25 mm	yellow	colorless	100	729007	400	729007.400	

MS = minispike on filter exit



## CHROMAFIL® syringe filters

### CHROMAFIL® H-PTFE (hydrophilized polytetrafluoethylene)

- Hydrophobic membrane with additional hydrophilic properties
- For polar and nonpolar sample solutions
- Resistant towards all kinds of solvents as well as acids and bases

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
H-PTFE-20/13	0.20 µm	13 mm	labeled		100	729256	–	–
H-PTFE-45/13	0.45 µm	13 mm	labeled		100	729257	–	–
H-PTFE-20/25	0.20 µm	25 mm	labeled		100	729245	400	729245.400
H-PTFE-45/25	0.45 µm	25 mm	labeled		100	729246	400	729246.400

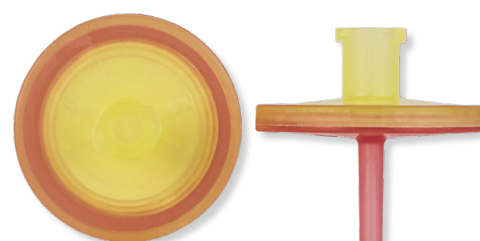
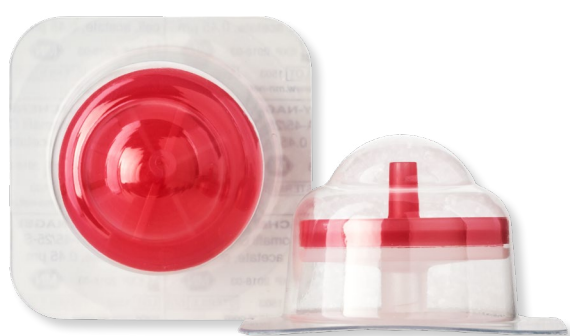
### CHROMAFIL® CA (cellulose acetate)

- 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 per 25 mm filter)
- Also available in a sterile package (S) for filtration under sterile conditions (each filter individually sealed)

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
CA-20/13	0.20 µm	13 mm	labeled		100	729254	–	–
CA-45/13	0.45 µm	13 mm	labeled		100	729255	–	–
CA-20/25	0.20 µm	25 mm	labeled		100	729226	400	729226.400
CA-45/25	0.45 µm	25 mm	labeled		100	729227	400	729227.400
<b>CHROMAFIL®</b>								
CA-20/25	0.20 µm	25 mm	yellow	red	100	729026	400	729026.400
CA-45/25	0.45 µm	25 mm	colorless	red	100	729027	400	729027.400
<b>CHROMAFIL® Sterile Filter</b>								
CA-20/25 (S)	0.20 µm	25 mm	yellow	red	50	729024	–	–
CA-45/25 (S)	0.45 µm	25 mm	colorless	red	50	729025	–	–

MS = minispikes on filter exit



## CHROMAFIL® syringe filters

### CHROMAFIL® MV (cellulose mixed esters)

- Hydrophilic membrane with very low adsorption
- For filtration of aqueous or polar solutions

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
MV-20/25	0.20 µm	25 mm	labeled		100	729206	400	729206.400
MV-45/25	0.45 µm	25 mm	labeled		100	729204	400	729204.400
<b>CHROMAFIL®</b>								
MV-20/25	0.20 µm	25 mm	yellow	yellow	100	729006	–	–
MV-45/25	0.45 µm	25 mm	colorless	yellow	100	729004	400	729004.400

### CHROMAFIL® PES (polyethersulfone)

- Hydrophilic membrane
- For aqueous liquids and liquids with low organic contents
- Very low adsorption for pharmaceuticals and proteins
- Good stability towards acids and bases
- Binding capacity for proteins 29 µg per 25 mm filter

#### Ordering information

Typ	Pore size	Membrane Ø	Color	Standard pack		BIGbox		
				Pack of	REF	Pack of	REF	
<b>CHROMAFIL® Xtra</b>								
PES-20/25	0.20 µm	25 mm	labeled	100	729240	400	729240.400	
PES-45/25	0.45 µm	25 mm	labeled	100	729241	400	729241.400	
PES-500/25	5.0 µm	25 mm	labeled	100	729242	400	729242.400	

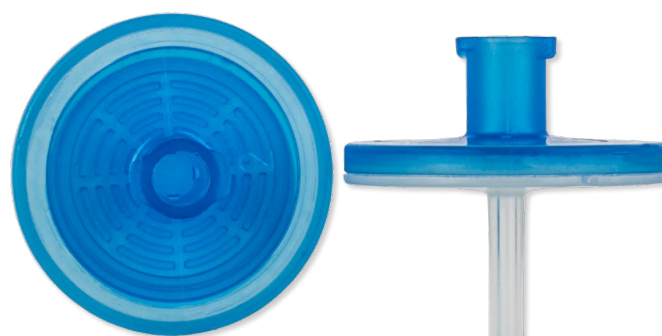
### CHROMAFIL® GF (glass fiber)

- Inert filter, allows higher flow rates than small pore filters
- For highly particle loaded or viscous solutions (e.g. soil samples, fermentation broths)
- As prefilters for other CHROMAFIL® filters, they prevent plugging of the membrane

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
GF-100/13	nom. 1.0 µm	13 mm	labeled		100	729234	–	–
GF-100/25	nom. 1.0 µm	25 mm	labeled		100	729228	400	729228.400
<b>CHROMAFIL®</b>								
GF-100/15 MS	nom. 1.0 µm	15 mm	blue	colorless	100	729034	–	–
GF-100/25	nom. 1.0 µm	25 mm	yellow	black	100	729028	400	729028.400

MS = minispikes on filter exit



## CHROMAFIL® syringe filters

### CHROMAFIL® PA (polyamide/nylon)

- Slightly hydrophilic membrane
- For aqueous and organic-aqueous medium polar liquids

#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
PA-20/13	0.20 µm	13 mm	labeled		100	729248	–	–
PA-45/13	0.45 µm	13 mm	labeled		100	729249	–	–
PA-20/25	0.20 µm	25 mm	labeled		100	729212	400	729212.400
PA-45/25	0.45 µm	25 mm	labeled		100	729213	400	729213.400
<b>CHROMAFIL®</b>								
PA-20/3	0.20 µm	3 mm	colorless	colorless	100	729010	–	–
PA-45/3	0.45 µm	3 mm	colorless	colorless	100	729011	–	–
PA-20/15 MS	0.20 µm	15 mm	yellow	green	100	729048	–	–
PA-45/15 MS	0.45 µm	15 mm	colorless	green	100	729049	–	–
PA-20/25	0.20 µm	25 mm	yellow	green	100	729012	400	729012.400
PA-45/25	0.45 µm	25 mm	colorless	green	100	729013	400	729013.400

MS = minispike on filter exit

### CHROMAFIL® PVDF (polyvinylidene difluoride)

- Hydrophilic membrane
- For 100 % aqueous solutions, water-soluble oligomers and polymers like proteins
- Binding capacity for proteins 20 µg per 25 mm filter

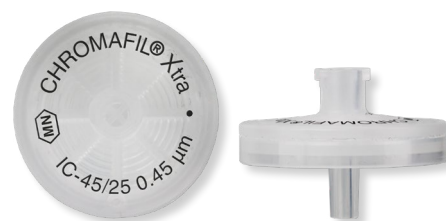
#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
<b>CHROMAFIL® Xtra</b>								
PVDF-20/13	0.20 µm	13 mm	labeled		100	729243	–	–
PVDF-45/13	0.45 µm	13 mm	labeled		100	729244	–	–
PVDF-20/25	0.20 µm	25 mm	labeled		100	729218	400	729218.400
PVDF-45/25	0.45 µm	25 mm	labeled		100	729219	400	729219.400
<b>CHROMAFIL®</b>								
PVDF-20/15 MS	0.20 µm	15 mm	yellow	white	100	729043		
PVDF-45/15 MS	0.45 µm	15 mm	colorless	white	100	729044		

MS = minispike on filter exit

### CHROMAFIL® Xtra IC

- Special filter for ion chromatography
- For filtration of aqueous liquids
- For optimal results (blank values < 5 ppb), we recommend pre-rinsing the filter with deionized water



#### Ordering information

Typ	Pore size	Membrane Ø	Color		Standard pack		BIGbox	
			Top	Bottom	Pack of	REF	Pack of	REF
IC-45/25	0.45 µm	25 mm	labeled		100	729258	–	–

# CHROMAFIL® multi filter plates and filtration cartridges

## CHROMAFIL® filtration cartridges

- Filtration cartridges for sample clarification under vacuum (e.g., using the CHROMABOND® vacuum manifold or SPE automation systems like Gilson Aspec™, Rapidtrace®) or by gravity
- Cartridge sizes 3 mL and 6 mL
- Different membranes (PET, PTFE, GF) and pore sizes (0.2, 0.45 and 1.0 µm). Membrane materials correspond to the respective CHROMAFIL® syringe filters.



### Ordering information

Description	Pore size	Pack of	REF	REF
			Column size 3 mL	Column size 6 mL
Filtration cartridges PET (polyester)	0.20 µm	100	–	730578.620
Filtration cartridges PET (Polyester)	0.45 µm	100	–	730578.645
Filtration cartridges PTFE (polytetrafluoroethylene)	0.20 µm	100	730570.320	730570.620
Filtration cartridges PTFE (polytetrafluoroethylene)	0.45 µm	100	730570.345	730570.645
Filtration cartridges GF (glass fiber)	nom. 1.0 µm	100	730517.3100	730517.6100

## CHROMAFIL® MULTI 96 filter plates

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

### Ordering information

Filter material	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
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)	40–100 µm	1	738659.M
Glass fiber	nom. 1 µm	1	738655.2M
Glass fiber	nom. 3 µm	1	738658.M
CHROMABOND® MULTI 96 vacuum manifold for mono blocks, with reservoir tank, vacuum gauge and control valve, required for filtration with 96-well filter plates		1	738630.M





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Absorption of spilled, valueless liquids	MN 713	14
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Airborne germ analysis	membrane filters PORAFIL® CM	30
Air pollution monitoring	glass fiber filters MN GF-1, MN GF-6, MN 85/90 BF, MN QF-10	12
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	MN 1670, MN 1672, MN 1674	11
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	MN 1640 d, MN 1640 de, MN 1640 m, MN 1640 md, MN 1640 w, MN 1640 we	9
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<b>B</b>		
Bacterial cultures	glass fiber filters MN GF-1	12
Bases		
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<b>D</b>		
Dairy products microbiological examination	membrane filters PORAFIL® CM	30
Decoloring colored solutions, e.g. urine	activated charcoal filters MN 728	16
Desalting of water	MN 616 LSA-50, MN 616 LSB-50	21
Dirt control	membrane filter PORAFIL® CM	30
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Dust analysis from industrial and hot waste gases	glass fiber filter thimbles MN 649	27
<b>E</b>		
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Yeast detection	membrane filters PORAFIL® CM	30

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MN 11	cellu-cotton wadding, unbleached	on request
MN 13	lens tissue paper (José paper)	22
MN 40/25	parchment sheets, crushable	20
MN 52 K	polyester paper	17
MN 68	sterilizing paper	on request
MN 85/70	glass fiber paper	13
MN 85/70 BF	glass fiber paper without binder	13
MN 85/90	glass fiber paper	13
MN 85/90 BF	glass fiber paper without binder	13
MN 85/220	glass fiber paper	13
MN 85/220 BF	glass fiber paper without binder	13
MN 101	cellulose filter flocs	23
MN 126/70	technical filter paper, creped	15
MN 180	thick filter paper	14
MN 210 PE	PE-coated filter paper LAB-TOP	22
MN 214	chromatography paper	25
MN 214 ff	chromatography paper	25
MN 218	chromatography paper	25
MN 218 B	blotting paper	25
MN 220	black filter paper	24
MN 224	adsorbent paper for microscopy	22
MN 226	weighing paper	20
MN 260	chromatography paper	25
MN 261	chromatography paper	25
MN 270	thick filter paper	14
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MN 280	filter paper for soil analysis	17
MN 321	nitrogen-free filter paper	18
MN 439	glass fiber paper	12
MN 440	thick filter paper	14
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MN 514	qualitative and technical filter paper, embossed	on request
MN 520	technical filter paper, creped	14
MN 553	technical filter paper, creped	15
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