

CHROMAFIL®



Pure Filters

MACHEREY-NAGEL

www.mn-net.com



Since 1911

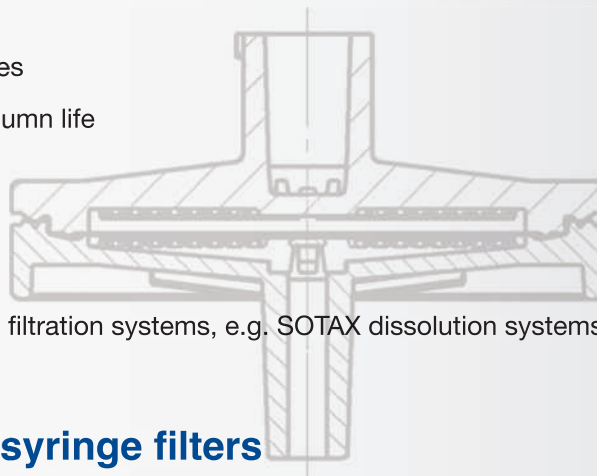


CHROMAFIL® - Disposable filters from MACHEREY-NAGEL

CHROMAFIL®

Ideal for GC, HPLC and UHPLC sample clarification

- different membrane types to meet multiple filtration needs
- low content of extractable compounds ensure reliable analyses
- superior chromatography column protection helps extend column life
- fast flow geometry for easy filtration
- low hold up volume for maximum filtrate recovery
- HPLC certified
- designed to be compatible for use on all common automated filtration systems, e.g. SOTAX dissolution systems



CHROMAFIL® filters are tested and inspected to provide the highest quality syringe filters



CHROMAFIL® Xtra

labelled for method validation and certification

Xtra imprint for direct identification of the membrane type, diameter and pore size

Xtra low bleeding PP housing

Xtra colour-free plain polypropylene

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CHROMAFIL® - Disposable filters from MACHERY-NAGEL

Technical Information

- Housing material
- Luer connections
- “Crash” plate / deflector
- Distributor in “star” form
- Membranes

Complete destruction of polycarbonate housing by acetone (contact for only 1 minute)!



B: Polycarbonate

A: CHROMAFIL® PP

Introduction

CHROMAFIL® syringe filters are used for filtration of suspended matter from liquid samples (1-100 ml) or gases. With CHROMAFIL®, rapid purification and removal of particles is very simple: just place the filter on the syringe, and you are ready for filtration. Special manipulations are not required. Contamination of sensitive instrumentation by solid impurities can be avoided, thus increasing lifetime of chromatographic columns and equipment. The filter can be used for the sample preparation for HPLC, GC, ICP, AAS, TOC, DOC, IR, NMR, photometry, spectroscopy, . . .

- **Low content of extractable substances** due to a high density polypropylene housing
In comparison to filters from polycarbonate, polyacrylate or polystyrene, all CHROMAFIL® filters are resistant against nearly all organic solvents (see list of chemical compatibility)!

A: Stable CHROMAFIL® filter with polypropylene-housing

B: Destroyed competitor filter with polycarbonate-housing



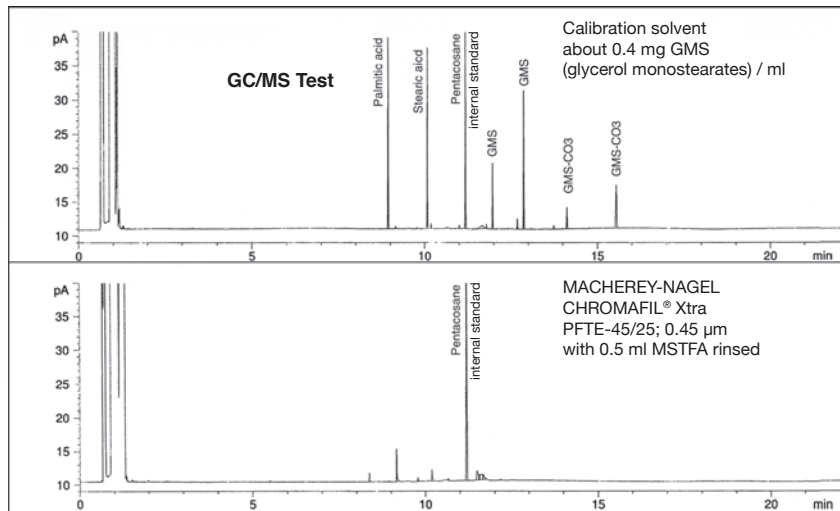


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Low Bleeding PP housing

Even a treatment with very aggressive solvents/reagents does not lead to significant blind values or extractables.

For a proof, a filter was rinsed with 0.5 ml MSTFA (N-methyl-N-trimethylsilyl-trifluoroacetamide), the strongest silylation reagent on the market. The result is shown in the GC/MS chromatogram.





To provide **the lowest content of extractable substances**, the housing of every CHROMAFIL® filter is ultrasonically sealed

- ✦ The filters are **welded, not glued**, because glue may have extractable ingredients
- ✦ The welding leads to a tight connection between the both parts, thus the filter can be used in both directions. No fluid can pass the membrane.

The special **thick rim** of the housing is ideal for use in laboratory robots (e. g. SOTAX®, Benchmate™, . . .).



For a **safe connection on the „high pressure“ side** every CHROMAFIL® filter provides a **Luer Lock on side of entry**



Luer Exit

- ✦ For the 25 and 3 mm diameter filter: standard luer exit
- ✦ For the 15 mm diameter filter: mini spike

This luer configuration offers low hold-up volume and easy filtration into autosampler vials and NMR tubes

Filter inlet and filter exit can be fitted to all CHROMABOND® columns and accessories for selective sample preparation with the aid of a special adaptor.



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No rupture of the membrane due to a stabilising “crash” plate

- ✦ The input solvent stream is “broken” and distributed by the crash plate and does not directly hit the membrane: this prevents rupture of the membrane. The high pressure stream is so diverted in 4 lanes.

Optimal flow geometry because of the star-shaped distribution device

- ✦ The distributor in “star” form: The stream is broken by the crash plate in 4 lanes, the optimised distribution of the fluid is realised by 8 lanes in star form with 5 or 8 cycles (for 15 mm and 25 mm ID)

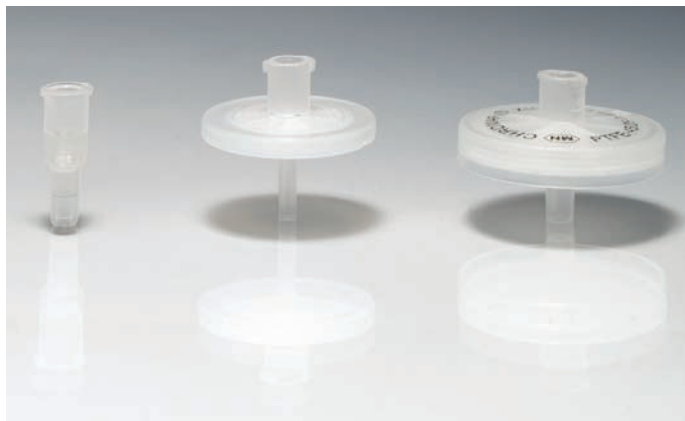
Through this, the fluid is able to penetrate the membrane on the whole surface, not only on a small region; the **filter is not plugged up rapidly**, which results in a high flow efficiency.



Different pore sizes for multiple filtration application

Available **pore sizes** 0.2 and 0.45 μm (additional: PET filters with 1.2 μm , glass fibre filters with 1 μm , PES filters with 5 μm) Filters with 0.45 μm pore size effectively remove fine particles that can plug chromatography columns. **0.2 μm pore size filters are excellent for filtration of UHPLC samples** or other techniques requiring high purity samples.

CHROMAFIL® - Disposable filters from MACHEREY-NAGEL

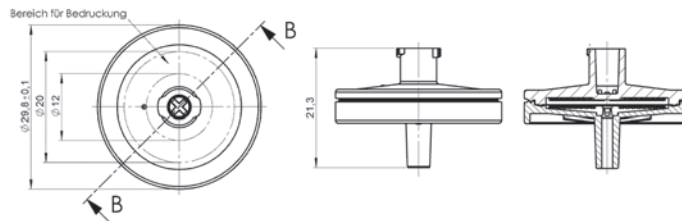


Filter Sizes

3, 15 and 25 mm diameter. The small diameter filters are especially recommended for very small samples, which require extremely low dead volumes: 5 µl for 3 mm Ø, 12 µl for 15 mm Ø, 80 µl for 25 mm Ø

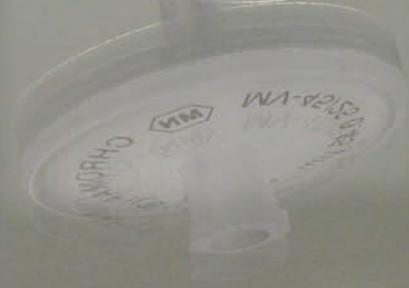
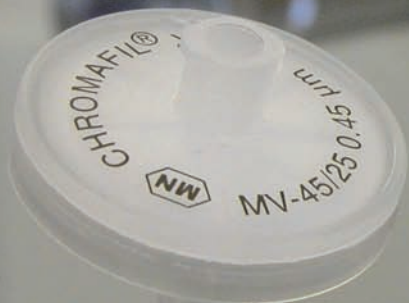
Recommended filter size depending on sample volume
sample volume recommended filter diameter

≤ 1 ml	3 mm
1 – 5 ml	15 mm
5 – 100 ml	25 mm



All filters can be **autoclaved at 121 °C and 1.1 bar for 30 min.**

All 25 mm CHROMAFIL® filters are designed to be **100% compatible and reliable for use with the SOTAX AT70 smart** fully automated dissolution testing systems.



CHROMAFIL® - Disposable filters from MACHERY-NAGEL

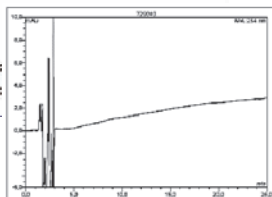


Specification

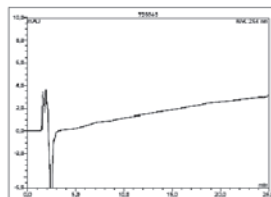
Product: Chromafil® Polysulfone/nylon (PTFE)
Cat. No.: 72020
Filters are HPLC certified for low level UV-absorbing substances for gaining accurate chromatographic results
Housing material: Polysulfone (PS)
Membrane filter material: Polysulfone/nylon
Pore diameter: 0.45 µm
Filter diameter: 25 mm
Filtration area: ~ 4.9 cm²
Connective inlet: Female luer
Connective outlet: Male luer
Dead volume: ~120 µl

HPLC-test

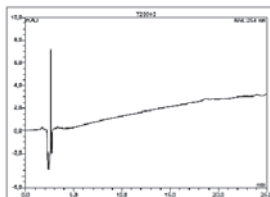
Conditions: Two ml of the solvent (specified under the chromatogram) were applied to the filter, 100 µl of the filtrate were injected to the HPLC.
Eluent A: water, eluent B: acetonitrile
Gradient: 10% → 90% B in 20 minutes
Flow rate: 0.2 ml/min
Sensitivity: 0 to 10 mAU at 254 nm
Column: 125x4 mm ID C18 Gravity 5 µ



Methanol filtrate



Acetonitrile filtrate



Water filtrate

A complete specification data sheet

is available for all membranes and filter diameters

Enhanced quality control for better results

MN certifies CHROMAFIL® syringe filters to be low in UV absorbing extractables.

All filters and membrane types have been HPLC tested for compatibility with the most common HPLC solvents (methanol, water, acetonitrile, see test chromatograms).

HPLC-test certificates are available for every membrane type.

Example of specification data sheet

HPLC-Test certificates for Water filtrate, Methanol filtrate and Acetonitrile filtrate are performed under **realistic gradient and sensitivity conditions** (see Specification Sheet).





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Pressure stability tests for burst protection

The „blue“ test: membrane, pressure and filtration batch test with blue colored silica particles in matching particle sizes provides an excellent method to find leaks, housing problems or membrane faults.

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Package sizes

packs of 100 or 400 (BigBoxes) for 25 mm Ø filter
packs of 100 or 800 (BigBoxes) for 15 mm Ø filter
packs of 100 for 3 mm Ø filter
packs of 50 for sterile filter

Different membrane materials for multiple filtration applications

Depending on your filtration task you can choose filter membranes made from different materials:

Polyester	(PET) with or without glass fibre prefilter*
Regenerated cellulose	(RC) with or without glass fibre prefilter*
Teflon®	(PTFE)
Cellulose mixed esters	(MV)
Cellulose acetate	(CA) sterile and non-sterile
Polyamide / Nylon	(PA)
Polyethersulfone	(PES) sterile and non-sterile
Polyvinylidene difluoride	(PVDF) with or without glass fibre prefilter*
Glass fibre	(GF)

* Filters with (nom. 1 µm) GF prefilter provide a 2-4 times greater throughput than filter without prefilter for extremely viscous and most difficult-to-filter samples



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Solvent	Material									
	MV	CA	RC	PA	PTFE	PVDF	PES	PET	GF	PP
Acetaldehyde	⊖	⊖	⊕	⊕	⊕	⊕		⊕	⊕	⊕
Acetic acid, 100 %	⊖	⊖	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕
Acetone	⊖	⊖	⊕	⊕	⊕	⊖	⊖	⊕	⊕	⊕
Acetonitrile	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Ammonia, 25 %	⊖	⊖	⊕	⊖	⊕	⊕	⊕	⊕	⊕	⊕
Benzene	⊕	⊕	⊕	⊕	⊕	⊕		⊕	⊕	⊕
n-Butanol	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Cyclohexane	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Dichloromethane	⊕	⊖	⊕	⊖	⊕	⊕	⊖	⊕	⊕	⊖
Diethyl ether	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Dimethylformamide	⊖	⊖	⊕	⊕	⊕	⊖	⊖	⊕	⊕	⊕
1,4-Dioxane	⊖	⊖	⊕	⊕	⊕	⊕	⊖	⊕	⊕	⊕
Ethanol	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Ethyl acetate	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Ethylene glycol	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Formic acid, 100 %	⊕	⊖	⊕	⊖	⊕	⊕	⊕	⊕	⊕	⊕
Hydrochloric acid, 30 %	⊖	⊖	⊖	⊖	⊕	⊕	⊕	⊖	⊕	⊕
Methanol	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Nitric acid, 65 %	⊖	⊖	⊖	⊖	⊕	⊕		⊕	⊕	⊖
Oxalic acid, 10 % aqueous	⊕	⊖	⊕	⊖	⊕	⊕		⊕	⊕	⊕
Petroleum ether	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Phosphoric acid, 80 %	⊖	⊖	⊕	⊖	⊕	⊕		⊕	⊕	⊕
Potassium hydroxide, 1 mol/l	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
2-Propanol	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Sodium hydroxide, 1 mol/l	⊖	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Tetrachloromethane	⊕	⊖	⊕	⊕	⊕	⊕		⊕	⊕	⊕
Tetrahydrofuran	⊖	⊖	⊕	⊕	⊕	⊕	⊖	⊕	⊕	⊕
Toluene	⊕	⊖	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Trichloroethylene	⊕	⊕	⊕	⊕	⊕	⊕		⊕	⊕	⊕
Trichloromethane	⊕	⊖	⊕	⊖	⊕	⊕	⊖	⊕	⊕	⊖
Urea	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕
Water	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕	⊕

The table lists the chemical compatibility of our CHROMAFIL® materials. The chemical compatibility depends on several parameters such as time, pressure, temperature and concentration. In most cases, CHROMAFIL® filters will have only short contact with a solvent. In these cases they may be used despite of limited compatibility. For example, a PTFE filter with PP housing does not liberate any UV-detectable substances during filtration of 5 ml THF, although PP shows only limited resistance towards THF.

Data not guaranteed.

⊕ resistant, ⊖ not resistant, ⊕ limited resistance

MV = cellulose mixed esters

CA = cellulose acetate

RC = regenerated cellulose

PA = polyamide

PTFE = polytetrafluoroethylene (Teflon)

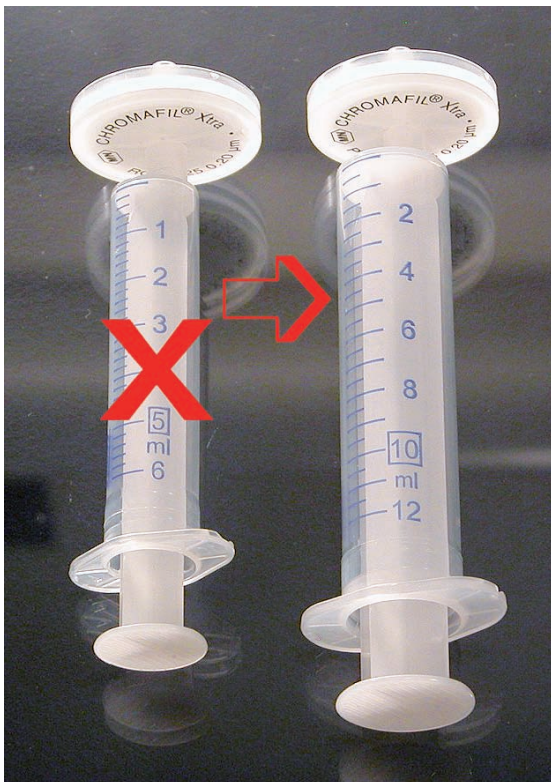
PVDF = polyvinylidene difluoride

PES = polyethersulfone

PET = polyester

GF = glass fibre

PP = polypropylene (housing material)



Do's and Don't's

For optimal filtration results using CHROMAFIL® filter we recommend to consider the following points:

- ✦ We recommend either discarding the first 1 ml or rinsing the filter unit with 1 ml of primary solvent before sample filtration
- ✦ Before filling the syringe draw approx. 1 ml air into it. This air helps to minimize the remaining fluid in the filter
- ✦ Start with gentle pressure at the beginning of the filtration. This helps assure maximum throughput. As the filter “accumulates” particles, filtration become more difficult and the pressure will increase on the filter.
- ✦ Change filter when resistance becomes excessive in order to avoid housing rupture.
- ✦ Do not use CHROMAFIL® syringe filters for direct patient care applications; they are designed for laboratory use only!
- ✦ Do not use syringes smaller than 10 ml; the pressure generated may exceed the 6 bar limit of the filter
- ✦ Do not use at temperatures above 55°C (131°F)
- ✦ Do not reuse the filter



CHROMAFIL® - Disposable filters from MACHEREY-NAGEL



Combi syringe filters with a coarse glass fibre 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 fibre 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
Entry:	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 filters / BigBoxes with 400 filters

Available membranes with GF-prefilter:

Polyester (PET)
Regenerated cellulose (RC)
Polyvinylidene Difluoride (PVDF)

CHROMAFIL® - Disposable filters from MACHEREY-NAGEL



Polyester (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 · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra PET-20/25	0.20	25	labelled		100	729221	400	729221.400
	Xtra PET-45/25	0.45	25	labelled		100	729220	400	729220.400
	Xtra PET-120/25	1.2	25	labelled		100	729229	400	729229.400
	PET-20/15 MS*	0.20	15	yellow	orange	100	729022	800	729022.800
	PET-45/15 MS*	0.45	15	colourless	orange	100	729023	800	729023.800

Combi Filters

	GF/PET-20/25	1.0/0.20	25	blue	orange	100	729032	400	729032.400
	GF/PET-45/25	1.0/0.45	25	black	orange	100	729033	400	729033.400

* MS = minispoke on filter exit





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Regenerated Cellulose (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
- ✦ RC filter with integrated glass fibre prefilter (**GF/RC**): recommended for solutions with a high load of particulate matter or for highly viscous solutions

Ordering information · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra RC-20/25	0.20	25	labelled		100	729230	400	729230.400
	Xtra RC-45/25	0.45	25	labelled		100	729231	400	729231.400
	RC-20/15 MS*	0.20	15	yellow	blue	100	729036	800	729036.800
	RC-45/15 MS*	0.45	15	colourless	blue	100	729037	800	729037.800
Combi Filters									
	GF/RC-20/25	1.0/0.20	25	blue	blue	100	729050	400	729050.400
	GF/RC-45/25	1.0/0.45	25	black	blue	100	729051	400	729051.400

* MS = minispoke on filter exit

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Polytetrafluoroethylene (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 · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra PTFE-20/25	0.20	25	labelled		100	729207	400	729207.400
	Xtra PTFE-45/25	0.45	25	labelled		100	729205	400	729205.400
	O-20/15 MS*	0.20	15	yellow	colourless	100	729008	800	729008.800
	O-45/15 MS*	0.45	15	colourless	colourless	100	729009	800	729009.800
	O-20/3	0.20	3	colourless	colourless	100	729014		
	O-45/3	0.45	3	colourless	colourless	100	729015		

* MS = minispike on filter exit



CHROMAFIL® - Disposable filters from MACHEREY-NAGEL



Cellulose Mixed Ester (MV)

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

Ordering information · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra MV-20/25	0.20	25	labelled		100	729206	400	729206.400
	Xtra MV-45/25	0.45	25	labelled		100	729204	400	729204.400



CHROMAFIL® - Disposable filters from MACHEREY-NAGEL



Cellulose Acetate (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 · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra CA-20/25	0.20	25	labelled		100	729226	400	729226.400
	Xtra CA-45/25	0.45	25	labelled		100	729227	400	729227.400
	Sterile filters								
	CA-20/25 S	0.20	25	yellow	red	50	729024		
	CA-45/25 S	0.45	25	colourless	red	50	729025		





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Polyamide (PA) = Nylon

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

Ordering information · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra PA-20/25	0.20	25	labelled	–	100	729212	400	729212.400
	Xtra PA-45/25	0.45	25	labelled	–	100	729213	400	729213.400
	AO-20/3	0.20	3	colourless	colourless	100	729010		
	AO-45/3	0.45	3	colourless	colourless	100	729011		

CHROMAFIL® - Disposable filters from MACHEREY-NAGEL



Polyethersulfone (PES)

- ✧ hydrophilic membrane
- ✧ for aqueous and slightly organic liquids with higher flow rates
- ✧ very low adsorption for pharmaceuticals and proteins
- ✧ good stability against organic 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 · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra PES-20/25	0.20	25	labelled		100	729240	400	729240.400
	Xtra PES-45/25	0.45	25	labelled		100	729241	400	729241.400
	Xtra PES-500/25	5.0	25	labelled		100	729242	400	729242.400
	Sterilizer PES for sterilisation								
	Sterilizer PES	0.2	25		blue rim	50	729401		



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Polyvinylidene Difluoride (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 (**GF/P**) is recommended for filtration of biological samples with high particle loads. This filter features a high binding capacity for proteins.

Ordering information · CHROMAFIL®




	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra PVDF-20/25	0.20	25	labelled		100	729218	400	729218.400
	Xtra PVDF-45/25	0.45	25	labelled		100	729219	400	729219.400
	PVDF-20/15 MS*	0.20	15	yellow	white	100	729043	800	729043.800
	PVDF-45/15 MS*	0.45	15	colourless	white	100	729044	800	729044.800
Combi Filters									
	GF/P-45/25	1.0/0.45	25	black	white	100	729039	400	729039.400

* MS = minispike on filter exit



CHROMAFIL® - Disposable filters from MACHEREY-NAGEL



Glass Fibre (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 · CHROMAFIL®

	Type	Pore size [µm]	Membrane diameter [mm]	Colour code		Standard pack		BIG-BOX	
				top	bottom	filters/pack	REF	filters/pack	REF
	Xtra GF-100/25	nom. 1.0	25	labelled		100	729228	400	729228.400
	GF-100/15 MS	nom. 1.0	15	blue	colourless	100	729034		





Technical Support and Customer Service

... we Meet your Needs

If you have any questions concerning CHROMAFIL® filters or our chromatography program, or if you are looking for solutions to a special application, please feel free to contact us:

www.mn-net.com · **info@mn-net.com**

The MACHERY-NAGEL internet catalogue with integrated internet shop is full of useful information about our wide product range. After your free registration you can order our products just with a click! In addition, our website offers **more than 3000 applications** which might actually already solve your analytical questions.



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France

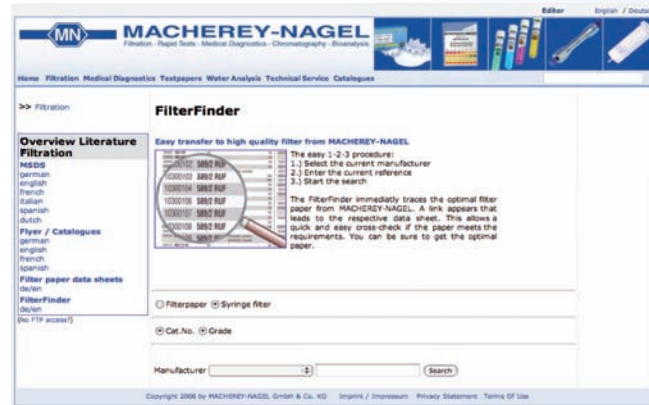
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“FilterFinder” in the internet: THE cross reference for syringe filter

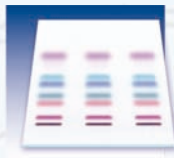




HPLC



GC



TLC



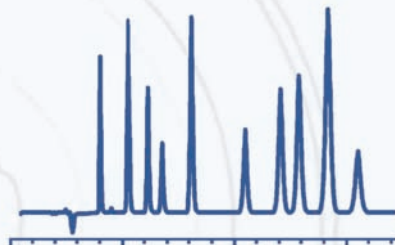
SPE & Flash



Syringe Filters



Vials



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