Hahnemühle

CATALOGUE FILTRATION & SEPARATION

FILTER PAPERS

INDUSTRY & LABORATORY

Hahnemühle

CATALOGUE FILTRATION & SEPARATION

Microfiltration

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Hahnemühle

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With the brand Albet LabScience, we are providing you with a wide range of products for challenging filtrations in chemical and biological laboratories, as well as for life science and analytical applications. Our extensive portfolio of filter papers is known in laboratories throughout the world for its purity and consistency.
As a globally operating company, Hahnemühle is focusing, in addition to the standard product range for laboratories, on the production of filter papers that are tailored to the customers' requirements, as part of its core business. Our papers are known as reliable products on the market, which always provide reproducible filtration results. Many years of production know-how, a constant exchange of ideas with customers and internal research & development have made us a reliable partner when customised filter papers are required for sensitive areas of application, even in the case of new formulas with functional fibres.

Experience

The first filter paper production of the types 589/1, 589/2 and 589/3 took place as early as 1883. To this day, we use exclusively first class raw materials. Thus we guarantee the consistently high quality that is indispensable in the sensitive areas of application.

Strength

Our strength is close cooperation with our customers in every project phase – from development to production, to the end product. We think in terms of networks, with the necessary eye for detail. Our internal structure allows us to react quickly to changes and to adapt to new requirements. Our production systems also allow the manufacture of smaller quantities at attractive prices.

Competence

Leading companies from different fields put their trust in our products. These include, amongst others, the food and beverage industry, the pharmaceutical and chemical industry, and agriculture, environmental monitoring and automotive engineering. The consistent quality of our products gives customers the confidence that they can achieve reproducible results with every filtration.

Our staff will be glad to assist you in finding the perfect product for you and your application.

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Hahnemühle Filtration

About us

Hahnemühle FineArt GmbH is an internationally active company that specialises in the development and production of high quality papers. Hahnemühle has been developing and manufacturing filter papers for both liquid and air filtration technologies in various areas of application since 1883. The premium quality pulp, cotton linters, glass and quartz fibre materials are suitable for all laboratory and industrial applications and are manufactured individually according to customer specifications. Our in-house team of developers ensures that the filter media we offer meet the modern, diverse and individual requirements of our customers.

Clientele

Leading businesses from the manufacturing sector and analytical laboratories rely on the consistent quality of our products. With over 150 filter papers, we offer our customers a wide spectrum of papers that cover almost all filter requirements.

Flexibility

Our company structure allows us to quickly respond to specific customer needs; we also offer low volume production. Our specialists will be happy to assist you in the development of an individual paper that fully meets your specific requirements. In cooperation with the client and the raw material supplier, we create new formulas which we then use to manufacture filter papers with the required properties at our factory.

Hahnemühles history

1584	Establishment of Hahnemühle FineArt
1883	Filter papers produced for the first time
1886	Carl Hahne buys the paper mill, which subsequently bears his name
1927 - 2004	Hahnemühle was part of the „Schleicher & Schuell“ group. Under this name, the papers produced here gained an international reputation
2004	Hahnemühle FineArt GmbH becomes an independent company again, with subsidiaries and distribution companies in the USA, the UK, China and France
Since 2008	Hahnemühle‘s pure filter papers are marketed directly under the company name

Quality Management

Our paper manufacturing process combines traditional craftsmanship with state-of-the-art production technology and conversion. The quality of our papers is not only a result of our many years of manufacturing and paper making expertise; we also use only high-class raw materials and pure spring water to produce them.

Our production process is strictly controlled, which guarantees consistently even, proven quality, charge by charge. We hold a DEKRA certificate, which confirms that the quality management system we have introduced complies with all DIN EN ISO 9001 standard requirements.

The implementation of these quality assurance systems guarantees our high quality standard and competitiveness in increasingly international markets with increasingly sophisticated requirements.

The fact that we hold this certificate also proves that we are thoroughly customer-focused, from product development to the services we provide. Ongoing further product development and process improvements allow us to exceed the required quality standards.

For every application the optimal filter paper

Interest: Retained Particles

Quantitative analysis

Aequous solutions, very acidic / alkaline

Pressure / vacuum high	Pressure / vacuum normal
Paper hardened quantitative	Glass microfibre
Very large precipitate (12–25 µm)*, fast: **1505**	Colloidal precipitate (1–2 µm)*, fast: **GF 50-51-52-55, GF 6-8**
Medium-fine precipitate (4–12 µm)*, medium: **1506**	Colloidal precipitate (1–2 µm)*, fast: **QFH (extreme pH)**
Fine precipitate (≤ 2 µm)*, slow: **1507**	

Aequous solutions, acidic / alkaline

Pressure / vacuum normal	
Paper quantitative	Glass microfibre
Very large precipitate (12–25 µm)*, fast: **589/1**	Colloidal precipitate (1–2 µm)*, medium: **GF 50-51-52-55, GF 6-8**
Medium-fine precipitate (4–12 µm)*, medium: **589/2**	
Medium-fine precipitate (4–7 µm)*, medium: **589/4**	
Fine precipitate (4 µm)*, medium: **589/5**	
Very fine precipitate (2 µm)*, slow: **589/6**	
Coloidal precipitate (1–2 µm)*, very slow: **589/3**	
Precipitate of Nitrates, slow: **2095**	

Air / Gases

Pressure / vacuum normal
Glass / Quartz-microfibre
Colloidal precipitate (1–2 µm)*, fast: **QFH / CFV GF 9-10**

*Retention range are approximate values.

Please use Quartz and Glass microfibre filter at high pressure with support only.

Qualitative analysis

Aequous solutions, very acidic / alkaline	Aequous solutions, acidic / alkaline
Pressure / vacuum high	Pressure / vacuum normal
Paper hardened qualitative	Paper qualitative
Coarse precipitate (12–25 µm)*, fast: **1573**	Very large precipitate (12–25 µm)*, fast: **604**
Medium-fine precipitate (7–12 µm)*, medium: **1574**	Medium-fine precipitate (7–12 µm)*, medium: **591, 598**
Very fine precipitate (≤ 2 µm)*, slow: **1575, 1577**	Medium-fine precipitate (4–7 µm)*, medium: **597, 595**
	Fine precipitate (2–5 µm)*, medium: **593**
	Very fine precipitate (≤ 2 µm)*, slow: **602h**
	Colloidal precipitate (< 2 µm)*, very slow: **602eh**

*Retention range are approximate values.

Please use Quartz and Glass microfibre filter at high pressure with support only.

For every application the optimal filter paper

Interest: Filtrate

Removal of particles (sample preparation)

Aequous solutions, very acidic / alkaline

Pressure / vacuum high

Hardened qualitative paper

- Coarse precipitate (12–25 µm)*, fast: **1573**
- Medium-fine precipitate (7–12 µm)*, medium: **1574**
- Very fine precipitate (< 2 µm)*, slow: **1575, 1577**

Pressure / vacuum normal

Glass microfibre

- Colloidal precipitate (1–2 µm)*, medium: **GF 51, GF 9**
- Colloidal precipitate (1–2 µm)*, medium: **QFH (extreme pH)**

Aequous solutions acidic / alkaline

Pressure / vacuum normal

Paper qualitative

- Coarse precipitate (12–25 µm)*, fast: **604**
- Medium-fine precipitate (7–12 µm)*, medium: **591, 598**
- Medium-fine precipitate (4–7 µm)*, medium: **597, 595**
- Fine precipitate (2–5 µm)*, medium: **593**
- Very fine precipitate (2 µm)*, slow: **602h**
- Colloidal precipitate (< 2 µm)*, very slow: **602eh**

Glass microfibre

- Colloidal precipitate (1–2 µm)*, medium: **GF 51, GF 9**

Paper general

- Coarse precipitate (12–25 µm)*, fast: **1450nf, 0905**
- Medium-fine precipitate (7–12 µm)*, medium: **0860, 0859, 400, 0858**
- Fine precipitate (4–7 µm)*, medium: **0903**

*Retention range are approximate values.

Please use Quartz and Glass microfibre filter at high pressure with support only.

Overview of filtration speed

	Technical Grade	Analytical Grade		Feature	
		qualitative	quantitative	of the precipitate	
slow	287	602eh		colloidal	1 µm
		1577	589/3		
	23	602h, 1575	1507	very fine	
			589/6		
	2589d				
medium	0903, 2589c	593	589/5		
	BF, 22			fine	
	2589b				
	572	595, 1574	589/4, 1506		
	3605, 3205	597	589/2		
	0860			medium	
	2529a, 2048				
	0858, 0859	591, 598			
fast	2208, 2294				
	2410			coarse	
	1450nf, 2282	604	589/1		
	2772, 0905	1573	1505		
	520a				
	3744L			colloidal	
	520b, 520bII				25 µm

Particle size

The relative position of the individual grades is to be understood as approximately instead of absolutely.

Ashless filter papers for quantitative analysis

Ashless filters (approx. 0.004%), recommended for quantitative analysis, routine gravimetric tests and sample preparation for instrumental analysis.

- Made of super-refined cotton linters and cellulose
- α-Cellulose content above 95%, therefore high stability and durability
- Acid-washed and rinsed with water to neutralise
- Free of minerals and metallic ions, ideal for the detection of metallic ions
- For analytical applications, routine quantitative and /or gravimetric procedures

Gravimetric analysis: Type of quantitative analysis that involves the precipitation of a chemical compound that can be weighed and analysed once dried.

These filter papers are perfectly qualified for: Food control, beverage analysis and environmental monitoring.

For critical filtering processes, we recommend hardened ashless filters, which have a greater resistance to both humidity and aggressive chemicals. (Grade: 1505 - 1506 - 1507).

Technical data

ALBET LabScience

Grade	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
589/1 – black	fast	50	12 – 25	79	0.19
589/2 – white	medium-fast	140	4 – 12	85	0.18
589/4 – yellow	medium-fast, low-fat	170	4 – 7	81	0.17
589/5 – red	medium-fast	450	2 – 4	84	0.17
589/6 – green	slow, thin	900	2	74	0.15
589/3 – blue	slow	750**	< 2	84	0.16

* Approximate values ** Measured with 100 mm water column instead of 50mm

Applications

Grade 589/1 – black

- Determination of the ash content and PCB contamination in foodstuffs
- Ashing of samples of juices for photometric determinations according to LFBG §64 para. 1 and 2* (e.g. phosphate)
- Analysis in electroplating: baths of aluminium, chrome, copper and nickel
- Coarse floc and gelatinous precipitates: $Fe(OH)_3$, $Al(OH)_3$, $Cr(OH)_3$, CuS, Bi_2S_3, SiO_2
- Determination of heavy metals in water analysis
- Cement industry: Blaine test (regulations UNE 80-112-91 and EN-196-6) and other analyses performed on cements
- Beverage industry, based on recommended procedures of the EBC (European Brewery Convention):
    - Determination of solids and turbidity (Feld method)
    - Determination of the ash content according to LFBG §64 para. 1 and 2*
    - Determination of the proteins in Gyle and beer by $MgSO_4$ precipitation

Grade 589/2 – white

- Determination of sand content and grade of flour in foodstuffs
- $Mg(NH_4)PO_4$, CaC_2O_4 (hot precipitates)
- Analysis of alkaline earth carbonates
- Analysis in electroplating: baths of chrome, copper, gold, silver, lead and brass
- Cement industry: Blaine test (regulations UNE 80-112-91 and EN-196-6) and other analyses performed on cements
- Beverage industry, based on recommended procedures of the EBC (European Brewery Convention):
    - Determination of nitrogen compounds by phosphor molybdenum precipitation
    - Determination of carbohydrates by hydrolysis
    - Determination of the proteins in Gyle and beer by $MgSO_4$ precipitation

Grade 589/3 – blue

- For very fine crystalline precipitates
- BaSO4 (hot precipitates), $PbSO_4$, ZnS, NiS
- Oil and fat analysis of animal or vegetable origin: determination of the content of insoluble impurities
- Treatment of drinking water and residuals: determination of chemical elements and some radioactive substances by using gravimetric, photometric, colorimetric and precipitation methods
- Soil analysis (soluble sulphates)
- Analysis in electroplating: baths of chrome, copper, brass and lead
- Medical diagnostics: Allergy testing
- Separation of particles with >1 µm from suspension of nano particles

Grade 589/4 – yellow

- For medium fine crystalline precipitates
- Especially for determination of fat

Grade 589/5 – red

- CaC_2O_4, $BaCrO_4$, $PbSO_4$ (cold precipitates)
- Determination of fats and oils in water (floatables based on the trichlorofluorethane method or totally based on partition-gravimetric method)
- General gravimetric analysis for many components in cements, mud, iron and steel products
- Soil analysis: basic filtering process for the separation of solid particles from water extractions.
- Determination sulphates, carbonates and organic materials.
- High impact of clarification to determine micronutrients available for plants

Grade 589/6 – green

- For fine crystalline precipitates
- CaC_2O_4, $PbSO_4$, $BaSO_4$ (hot precipitates)

* German law for food, feed and utensils

Ordering information

The types 589/1, 589/2, 589/3, 589/4, 589/5 and 589/6 are available as filter circles with the following sizes (in mm): 12,5 – 40,5 – 47 – 55 – 70 – 90 – 110 – 125 – 150 – 185 – 240. The product reference is structured as described on page 58. Other sizes, folded filters, sheets and special cuts are available on request.

Hardened ashless filter papers for quantitative analysis

Hardened ashless filters (approx. 0.002%), especially recommended for vacuum and pressure filtration, and for the use of acidic and alkaline solutions.

- Made of super-refined cotton linters and cellulose
- α-Cellulose content above 95%, therefore high stability and durability
- Acid-washed and rinsed with water
- Free of minerals and metallic ions, ideal for the detection of metallic ions
- Hardened by small quantities of nitrogen-containing resin, which does not bleed significant impurities into the filtrate
- High wet strength; easy to scrape off or wash off precipitates
- High resistance to aggressive chemical components, like sulphuric and nitric acids (up to 40 % at 50 ° Celsius) and alkalis (up to 10 % at 20 ° Celsius)
- For analytical applications, routine quantitative and /or gravimetric procedures

Technical data

ALBET LabScience

	Grade	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
Hardened ashless filter papers	1505	fast	50	12 – 25	88	0.17
	1506	medium	170	4 – 12	90	0.16
	1507	slow	600**	≤ 2	90	0.14

* Approximate values ** Measured with 150 mm water column instead of 50 mm

Applications

Grade 1505

- For coarse crystalline precipitates
- Determination of proteins
- Determination of fibres in foodstuffs
- Cement analysis
- Analysis in electroplating: baths of aluminium, chrome and copper

Grade 1506

- For fine crystalline precipitates
- Gravimetric determination of metals in acidic/alkaline solutions
- Analysis in electroplating: baths of aluminium, copper, nickel and tin

Grade 1507

- For very fine crystalline precipitates
- Gravimetric analysis of fine metals: barium and lead sulphate, nickel and tin sulphide, oxalate and calcium fluoride

Ordering information

The types 1505, 1506 and 1507 are available as filter circles with the following sizes (in mm):
110 – 125 – 150 – 185. The product reference is structured as described on page 58. Other sizes, folded filters, sheets and special cuts are available on request.

Highly pure filter papers for qualitative analysis

Highly pure filter paper (approx. 0.08% ash) recommended for precise identification of materials and for sample preparation prior to sensitive detection methods.

- Made of the same super-refined cotton linters and cellulose like the quantitative filter papers
- α-Cellulose content above 95%, therefore high stability and durability
- Very low content of minerals (approx. 0.08% ash)
- Designs: plain (DP) and folded (DF) filters, sheets and rolls

These filter papers are perfectly qualified for food control, beverage analysis and environmental monitoring. For critical filtering processes, we recommend hardened, ashless filters, which have a greater resistance to both humidity and aggressive chemicals. (Grade: 1573, 1574, 1575, and 1577).

Technical data

ALBET LabScience

	Grade	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
Highly pure filter papers	604	fast	50	12 – 25	79	0.19
	591	medium-fast, thick	90	7 – 12	161	0.35
	598	medium-fast, thick	100	8 – 10	139	0.32
	597	medium-fast	155	4 – 7	85	0.18
	597L	medium-fast	170	4 – 7	81	0.17
	595	medium-fast, thin	160	4 – 7	68	0.15
	593	medium to slow	450	2 – 5	84	0.17
	602h	slow / dense	750**	2	84	0.16
	602eh	very slow / very dense	1500**	<2	84	0.15

* Approximate values
** Measured with 100 mm water column instead of 50 mm

Ordering information

The types 591, 593, 595, 597, 597L, 598, 602h, 602eh and 604 are available as filter circles and folded filters with the following sizes (in mm): 6 – 12,7 – 42,5 – 47 – 55 – 70 – 90 – 110 – 125 – 150 – 185 – 240 – 320 (folded filters from 70 mm). The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Applications

Grade 604

- For coarse crystalline precipitates
- Sodium chloride in foodstuffs, ferrous hydroxide, aluminum hydroxide and metal sulphide analysis
- Routine cleaning of organic extracts and biological fluids
- Analyses in the food industry according to LFBG §64 para. 1 and 2*
- High flow rates in air pollution monitoring and exhaust fumes detection

Grade 591
- For medium fine crystalline precipitates
- Its thickness enables greater load quantities of solutes
- High wet strength
- Determination of water retention in mortar (EN 413-2:1994)

Grade 598
- For fast filtration of medium fine particles
- Its thickness enables a greater particle load
- For general routine laboratory work

Grade 597
- For fine crystalline precipitates
- Calcium oxalate, metal sulphide
- Determination of total fat content in foodstuff (folded) according to LFBG §64 para. 1 and 2*
- Analysis of soils and seeds
- Analyses in the food industry
- Determination of the total fat content in milk and milk products according to the Weibull-Berntrop-method (DIN 10342)
- Beer and malt analysis based on the parameters recommended by the EBC (European Brewery Convention):
  - Removal of carbon dioxide and turbidity from beer
  - Determination of coagulated proteins (Nitrogen)
  - Determination of the grade of fermentation

Grade 597L
- Made of ultrapure cotton-linters
- For fine particles
- Nitrate determination in foodstuffs according to LFBG §64 para. 1 and 2*
- Detection of soot in exhaust fumes

Grade 595
- For medium-fine precipitates
- Determination of total fat content in foodstuff (folded) according to LFBG §64 para. 1 and 2*
- Particle separation from food extracts for sample preparation (folded)
- Determination of the unsaponifiable fraction in fats and oils
- Digestion of solids with aqua regia e.g. for ICP/AAS analysis (folded)
- For general routine laboratory work and sample preparation

Grade 593
- For fine crystalline precipitates
- Barium sulphate (hot), tin sulphide
- Analysis of soils
- Analysis of fertilizers

Grade 602h
- For very fine crystalline precipitates
- Barium sulfate (cold), zinc sulphide
- Sample preparation for separation of solid particles
- Analyses in the beverage industry based on the recommendation the European Brewery Convention (EBC):
  - Removal of carbon dioxide and turbidity from beer, wine and juices
  - Sample preparation for spectra, refractometric analysis and HPLC
- Monitoring the amount of soot in diesel engine lubricant oil: Measurement of the dispersancy of the oil on absorptive paper (Oil Conditioning Monitoring: OCM)

Grade 602eh
- For ultrafine filtration
- Recovery of crystalline components with sizes below 1µm
- For environmental analysis

* German law for food, feed and utensils

Hardened highly pure filter papers for qualitative analysis

Hardened highly pure filter papers (approx. 0.05%) with extremely high chemical and mechanical resistance, especially recommended for vacuum and pressure filtration, and for the use of acidic and alkaline solutions.

- Made of super-refined cotton linters and cellulose
- α-cellulose content above 95%, therefore high stability and durability
- High wet strength; easy to scrape off or wash off precipitates, no fibre release
- Hardened by small quantities of nitrogen-containing resin, which does not introduce significant impurities into the filtrate
- Very low content of minerals (approx. 0.05% ash)
- High resistance to aggressive chemical components, like sulphuric and nitric acids (up to 40% at 50° Celsius) and alkalis (up to 10% at 20° Celsius) and alkalis (up to 10% at 20° Celsius)
- Available as plain discs (DP), folded discs (DF), sheets, and rolls

These filter papers are perfectly qualified for food control, beverage analysis and environmental monitoring.

Technical data

	Grade	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
Hardened highly pure filter papers	1573	fast	50	12 – 25	88	0.17
	1574	medium	170	7 – 12	90	0.16
	1575	slow	600**	2	92	0.14
	1577	slow	650**	<2	81	0.12

* Approximate values
** Measured with 150 mm water column instead of 50 mm

Applications

Grade 1573
- For coarse crystalline precipitates
- Iron hydroxide, aluminium, chrome, copper sulphate, bismuth, cobalt and iron
- Silicon determination in iron analysis
- Used as rolls for filtration of biosolids

Grade 1574
- For fine crystalline precipitates
- Calcium oxalate, metal sulphide, barium sulphate and lead molybdate
- Emission controls on atmospheric pollution (sulphur oxide, ammoniac gases, etc.)
- Fat-extracting equipment
- Oil and food industry

Grade 1575
- Retention of very fine precipitates, such as barium sulphate, zinc sulphide

Grade 1577
- For very fine precipitates
- Used as a protective layer in filter presses

Ordering information

The types 1573, 1574, 1575 and 1577 are available as filter circles with the following sizes (in mm):
47 – 55 – 70 – 90 – 110 – 125 – 150 – 185 – 240. The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Hahnemühle Filtration
Lab products

Glass fibre filters – with binders

Recommended filters for environmental analysis and controlling both air and water pollution.

- Made of 100 % borosilicate glass fibres with binders
- Glass fibre filters capture fine particles down to approx. 1 µm from liquids, in air, gases and aerosols with even 0.3 – 0.5 µm being absorbed
- The large surface area (approx. $2m^2/g$) provides an outstanding retention capacity
- Extremely low content in alkali-earth metals
- Chemical stability: It keeps all its properties in contact with acid solutions (except hydrofluoric acid) and basic solutions at moderate concentrations
- Stability at high temperatures:
  It keeps its properties up to 500 °C, and 180 °C for GF 10 and GF15
- High flow speed and high permeability to air
- Usable as a pre-filter for membranes to prevent the membranes from silting up

Technical data

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	Grade	Binder	Retention rate % NaCl-particle size <1 µm*	Filter class EN 779	Filtration Gurley [s]	Weight [g/m²]	Thickness [mm]	Max T [°C]
Glass fibre filters	GF 6	inorg.	99.97	H14	40	80	0,35	500
	GF 8	inorg.	99		12	75	0,35	500
	GF 9	inorg.	99.97	U15	27	70	0,35	500
	GF 10	org.	99.97	H13	12	70	0,35	180

* Tested with NaCl particles size <1 µm, main fraction at 0.3 to 0.5 um

Ordering information

Types GF 6, GF 8, GF 9, GF 10, GF 15 and GF 3362 are available as filter circles with the following sizes (in mm): 25– 47 – 55 – 70 – 90 – 110 – 125 – 150. The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Notes for handling

Weight consistency: No relevant changes in weight due to variations in the ambient humidity. Limited bending resistance. Brushing against other surfaces may cause the loss of fibres (keep the filters in their original box until their use).

Applications

Grade GF 6

- Deposition of (radioactive) aerosols and monitoring of nuclear power plants
- Gravimetrical analysis of organic and inorganic impurities in water and waste water according to DIN 38409 and EN 872 (suspended particles)
- Measurement of scintillation
- Determination of chlorophyll and phytoplankton residues
- Removal of proteins in beer samples prior to analysis

Grade GF 8 and GF 9

- Measurement of immission, measurement of dust in air and gases, monitoring of the efficiency of filtration and dedusting, monitoring the combustion air of power plants and of the steel and iron industry
- Measurement of dust release in workplace and production processes and the purification of compartment air
- Measurement of the proportion of dust particles in technical gases
- GF9 can be used as membrane pre-filter, it offers the same performance as the formerly used grade GF 92

Grade GF 10

- Due to the high mechanical stability it is used as a roll filter in automatic air filter units and air analysers
- Deposition and measurement of soot, oil fume and suspended particles

Glass fibre filters – without binders

Recommended filters for controlling both air and water pollution.

- Made of 100% borosilicate glass fibres without binders
- Glass fibre filters absorb the finest particles down to approx. 1 µm from liquids, in air, gases and even aerosols with 0.3 – 0.5 µm are separated
- The large surface area (about $2 m^2/g$) provides an outstanding retention capacity
- Extremely low content in metals
- Chemical stability: It keeps all its properties in contact with acid solutions (except hydrofluoric acid) and/or basic solutions at moderate concentrations
- Stability at high temperatures: It keeps its properties up to 500 °C
- High flow speed and high permeability to air
- Usable as pre-filter for membranes to prevent the membranes from silting up

Technical data

ALBET LabScience

	Grade	Air permeability * [L/m2s]	Retention rate % NaCl-particle size <1 µm ***	Filter class EN 779	Filtration Gurley [s]	Weight [g/m²]	Thickness [mm]	Max T [°C]
Glass fibre filters	GF 50	25	99.97	H14	19	56	0.29	500
	GF 51	11	99.993	H13	44	140	1.00	500
	GF 52	54**	99.995	U15	25	54	0.28	500
	GF 55	<10	99.999	U15	67	75	0.40	500

* According DIN 53887
** Air resistance in mbar at 400 cm^3/s, A= 10 cm^2
*** Tested with NaCl particles size <1 µm, main fraction at 0.3 to 0.5 µm

Notes for handling

Weight consistency: no relevant changes in weight due to variations in the ambient humidity. Limited bending resistance. Brushing against other surfaces may cause the loss of fibres (keep the filters in their original box until their use).

Ordering information

The types GF 50, GF 51, GF 52 and GF 55 are available as filter circles with the following sizes (in mm): 25 – 37 – 47 – 55 – 70 – 90 – 110 – 125 – 142 – 150. The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Applications

Grade GF 50

- Immission and emission: routine and specialised atmospheric pollution controls
- Sampling of suspended particles <30 µm, according to directive 80/779/EEG, 15.7.1980
- Emission control: Determination of particles, inorganic lead and other metals by isokinetic probe (up to 500 °C)
- Water pollution analysis: for total determination of suspended solids
- Algae and bacteria determination in water and sewage analysis
- Clearing solvents, buffer solutions and reagents that are used for the application of spectrophotometric techniques
- Biochemical issues like DNA, RNA, proteins and polysaccharides
- Determination of suspended particles (SPM and TSP) in ambient air acc. to the direction of the US EPA (Environmental Protection Agency)

Grade GF 51

- Membrane pre-filter to prevent silting
- Clearing liquids for later analysis using instrumental techniques
- Concentrated suspended solids quantification, counting the fine particles
- Biochemical issues like DNA, RNA, proteins and polysaccharides

Grade GF 52

- Determination of suspended solids in drinking water, sewage and industrial waste, based on European regulation UNE EN 872 and/or Standard Methods 2540 D
- Control and analysis of drinking water or sewage, including processes for clearing aqueous solutions with a low level of fine particles
- Biochemical tests: analysis of carbohydrates, cell cultures, counting scintillation in liquids and links analysis, DNA, RNA, proteins and polysaccharides
- Clearing of protein solutions prior to freeze-drying
- Protein precipitates collection, especially in analysis of terminal groups followed by counting of the scintillation in the filter
- Cell cultures, for example in studies on incorporation
- Collecting fragments of membrane tissue in analysis of receptor links

Grade GF 55

- Sample and solvent filtration for HPLC
- Biochemical tests: clarification and filtration of proteins, cell cultures, etc
- Gravimetric analysis of pigments
- Elimination of fine suspended carbon material in liquids to be filtered
- Electrolyte filtration used in particle size analysis

* German law for food and utensils

Hahnemühle Filtration
Lab products

Quartz fibre filters

Recommended filters for atmospheric pollution control and for particles determination at high temperatures.

- Filters made of pure quartz microfibre (SiO_2), free of binding elements or additives
- Extremely low content in alkali-earth metals
- Retention: Excellent retention of very fine particles through the adsorption mechanisms of quartz fibres
- Air permeability: Extremely high. Able to pass through large volumes of air per time unit
- Chemical stability: excellent stability with hardly any loss of filter-material due to chemical reactions under extreme conditions with acid gases (HCl, SO_2, SO_3, H_2SO_4, NO and NO_3)
- Resistance to chemical reagents: excellent resistance to solvents, acids (except HF) and alkaline substances
- Stability at high temperatures: higher resistance than glass microfibre. Very good up to 1000 °C; beyond this value it starts losing its normal properties

Technical data

ALBET LabScience

	Grade	Weight [g/m²]	Thickness [mm]	TSI efficiency % [particles 0,3 µm]	Max T [°C]	Binder
Quartz fibre filters	QFH	85	0,45	99,999	1000	no

Applications

- Immission: sampling and analysis of PM 10 and PM 2.5 particles and other pollutants
- Determination of suspended particles (SPM and TSP) in ambient air acc. to the directive of the US EPA (Environmental Protection Agency) and the EN 23210
- Applications that require a maximum filter purity with a low metal content and no carbon traces
- Filtration and analysis of both acid and alkaline gases and of solvents
- Emission: pollution controls performed on air within industrial stacks, smoke ducts and aerosols

Ordering information

The type QFH is available as filter circles with the following sizes (in mm):
37 – 47 – 70 – 150. The product reference is structured as described on page 58. The package size is 50 per box. Other sizes, sheets, rolls and special cuts are available on request.

General use filter papers

Recommended for identification of substances, clarification of liquids and for the preparation of samples in a broad range of chemical analysis.

- Made of super-refined cellulose
- For quick separation of large particles
- For reliable clarification of viscous liquids
- 3 surfaces: smooth, grained and creped filter papers have a particularly large surface area and correspondingly shorter filtration times
- Available as: plain and folded discs, sheets, cuts and rolls

Technical data

ALBET LabScience

	Grade	Surface	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
General use filter papers	1450nf	smooth	fast	50	15 – 25	118	0.30
	0860	smooth	medium	120	7 – 12	74	0.17
	0859	smooth	medium	150	7 – 12	61	0.14
	400	smooth	medium	200	7 – 12	61	0.17
	0903	smooth	medium	350	4 – 7	65	0.15
	0858	grained	medium	110	7 – 12	75	0.17
	0905	creped	fast	40	12 – 25	74	0.27

* Approximate values

Applications

- Preparation of ordinary samples
- Clarification of:
  - Alcohols, essences, vinegar, essential oils, extracts
  - Electroplating baths, flotation sludge
  - Gelatin, glycerol, paints, lacquers, hair tonics, perfumes, tinctures
  - Beer wort, spirits, syrups
  - Salt solutions
- Used as protection sheet of filter presses

Ordering information

The types 1450nf, 0860, 0859, 400, 0903, 0858 and 0905 are available as filter circles and folded filters with the following sizes (in mm): 47 – 55 – 70 – 90 – 110 – 125 – 150 – 185 – 240 – 320 (folded filters from 70 mm). The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Low nitrogen filter paper

Recommended for filtration of fine precipitates used for further analysis according to Kjeldahl.

- Filter paper made from carefully selected raw materials
- Extremely low content of nitrogen, approx. 0.05 mg / 110 mm disc
- Used for filtration of fine particles

Technical data

ALBET LabScience

	Grade	Filtration Herzberg [s]	Weight [g/m²]	Thickness [mm]
Low nitrogen filter paper	2095	650	85	0.17

Applications

Filtration of precipitates in preparations for the determination of Nitrogen by Kjeldahl. Determination of fine crystalline precipitates of sulphides of iron and steel alloys.

Ordering information

Type 2095 is available folded filters with 240 mm. The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Kieselguhr filter paper

Recommended for filtration of the finest semi-colloidal turbidities.

- Medium to slow flow rate
- High absorption rate

Technical data

ALBET LabScience

	Grade	Filtration Herzberg [s]	Weight [g/m²]	Thickness [mm]
Kieselguhr filter paper	287	660	154	0.36

Applications

- For separation of very fine semi-colloidal turbidity
- Clarification of extracts of soil suspensions, of milk serum, of starch solutions and sugar-containing solutions prior to polarimetry and refractometry
- For retention of protein precipitates and slime particles from solutions
- Clarification of urine samples

Ordering information

Type 287 is available as folded filters with the following sizes (in mm): 125 – 150 – 185 – 240. The product reference is structured as described on page 58. Other sizes, sheet formats and special cuts are available on request.

Activated carbon filter paper

Recommended for the adsorption of certain molecules in liquids and gases and for the removal of the finest semi-colloidal turbidities.

- Medium flow rate
- High absorption rate
- Minimum of 35 % content of activated carbon

Technical data

ALBET LabScience

	Grade	Filtration Herzberg [s]	Weight [g/m²]	Thickness [mm]
Activated carbon filter paper	508	360	196	0.52

Applications

- For separation of very fine semi-colloidal turbidity
- Clarification of extracts of soil suspensions, of milk serum, of starch solutions and sugar-containing solutions prior to polarimetry and refractometry
- Absorption of iodine 131 from air
- For filtration of electroplating baths

Ordering information

Type 508 is available as filter circles with 110 mm. The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Black filter paper

Recommended for the detection of very fine traces of light particles and precipitates.

- The filter paper grade 551 is a technical filter paper made with the addition of black dye
- White and light particles can be detected easily by the strong contrast to the black filter paper

Technical data

ALBET LabScience

	Grade	Properties	Filtration Herzberg [s]	Weight [g/m²]	Thickness [mm]
Black filter paper	551	slow, black	850	95	0.20

Applications

- Detection of very fine traces of white precipitates and particles
- Detection of traces of silicone/fluorine traces (water drop test)
- Determination of the antiseptic effect of wood preservatives against fungal attack
- Visualisation of mycelial threads from fungi

Ordering information

Type 551 is available as filter circles with the following sizes (in mm): 55 – 70 – 90 – 240. The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Filter paper for malt and beer analysis

Suitable for analytical methods in breweries to filter and analyse, based upon recommended procedures of the EBC (European Brewery Convention).

- Medium fast filter papers
- Ideal for clarification and sample preparation
- Useful to remove CO_2 and turbidities

For quantitative analysis in breweries the types 589/1 and 589/2 are recommended. Technical features of both types are listed in the chapter “Ashless filter papers for quantitative analysis”.

Technical data

ALBET LabScience

	Grade	Surface	Filtration Herzberg [s]	Weight [g/m²]	Thickness [mm]
Filter paper for malt and beer analysis	2555	crained	110	75	0.17
	595	smooth	140	68	0.18
	597	smooth	160	85	0.15
	602h	smooth	750	84	0.16

Applications

- 2555: Sample preparation for extract determination of malt
- 595: Sample preparation
- 597: Removal of carbon dioxide and turbidity from beer; Determination of coagulated proteins (Nitrogen); Determination of the grade of fermentation
- 602h: Removal of carbon dioxide and turbidity from beer

Ordering information

Types 2555, 597, 595 and 602h are available as folded filters with the following sizes (in mm): 55 – 70 – 90 - 110 – 125 – 150 – 185 – 240 – 320. The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Filter papers for sugar industry

Recommended for the clarifying filtration of beet extracts and juices prior to analysis.

- High filtration speed combined with high retention of particles
- Two surfaces are available: smooth or creped

Technical data

ALBET LabScience

	Grade	Properties	Filtration Herzberg [s]	Weight [g/m²]	Thickness [mm]
Filter papers for sugar industry	3459	fast, creped	110	74	0.30
	3002	medium, smooth	150	61	0.14

Applications

- Clarification of dried beet pulp extracts
- Filtration of beet juice after addition of lead acetate for polarimetric sugar determination
- 3459 is recommended for Venema unit according to the sodium acetate method

Ordering information

Types 3002 und 3459 are available as filter circles with the following sizes: 3002 in 200 mm (prod. ref. DP3002200), 3459 in 230 mm (prod. ref. DP3459230). The product reference is structured as described on page 58. Other sizes, sheets, rolls and special cuts are available on request.

Cellulose extraction thimbles

For reliable and fast analysis in the areas of food control and environmental monitoring. Suitable for Soxhlet-type, Tecator-type or similar devices, to extract certain components out of solid material with an appropriate solvent.

- Made of pure cellulose that is totally free from binding elements
- High purity of selected cellulose guarantees reliable and replicable results
- Ideal for very sensitive detections
- Wall thickness:
  - 1.3 mm at thimbles with ≤ 35 mm inner diameter
  - 1.7 mm at thimbles with > 35 mm inner diameter
- The consistent high porosity ensures fast flow through
- High fitting accuracy for all available extraction systems
- For two systems:
  - Grade 900: Soxhlet Extraction
  - Grade 901: Tecator Extraction

Applications

- Extraction of fatty/greasy materials in foodstuffs, paints, varnishes and bituminous materials
- Detection of resins and grease in cellulose
- Analysis of pesticide waste, poly-aromatic carbohydrates and dioxins in foodstuffs
- Determination of oil content in oil-bearing seeds
- Extraction of secondary plant constituents
- Extraction of active agents from medicaments
- Extraction of plasticisers from synthetic materials

Ordering information

ALBET LabScience

Soxhlet Thimbles (Grade 900)	
Ø 19 x 90 mm	90019090
Ø 22 x 60 mm	90022060
Ø 22 x 80 mm	90022080
Ø 22 x 100 mm	90022100
Ø 25 x 60 mm	90025060
Ø 25 x 70 mm	90025070
Ø 25 x 80 mm	90025080
Ø 25 x 100 mm	90025100
Ø 28 x 80 mm	90028080
Ø 28 x 100 mm	90028100
Ø 30 x 80 mm	90030080
Ø 30 x 90 mm	90030090
Ø 30 x 100 mm	90030100
Ø 33 x 60 mm	90033060
Ø 33 x 80 mm	90033080
Ø 33 x 90 mm	90033090

Soxhlet Thimbles (Grade 900)	
Ø 33 x 94 mm	90033094
Ø 33 x 100 mm	90033100
Ø 33 x 118 mm	90033118
Ø 33 x 205 mm	90033205
Ø 35 x 100 mm	90035100
Ø 35 x 110 mm	90035110
Ø 35 x 150 mm	90035150
Ø 40 x 123 mm	90040123
Ø 40 x 150 mm	90040150
Ø 43 x 123 mm	90043123
Ø 48 x 145 mm	90048145
Ø 53 x 315 mm	90053315

Tecator Thimbles (Grade 901)	
Ø 26 x 60 mm	90126060

Presentation: 25 units per box

Format grade 900: Inner diameter x Height
Format grade 901: External diameter x Height

Other sizes are available on request.

Glass fibre thimbles

Recommended for analysis of particles and aerosols in gases and air.

- Made of 100 % pure borosilicate fibres, without binding elements
- High loading capacity and highly permeable to air
- Thickness is 1.5 mm (diameter < 33 mm)
- High retention of small particles, > 99 % according to BS 4400
- Good stability at high temperatures
- Recommended for hot, moist, and acidic gases.

Technical data

ALBET LabScience

	Grade	Retention rate % * (NaCl-particle size <1 µm)	Max. Temp. [°C]
Glass fibre thimbles	CFV	>99	500

* Tested with NaCl particles size <1 µm, main fraction at 0.3 to 0.5 µm

Ordering information

Size	CFV Grade
Ø 19 x 90 mm	CFV19090
Ø 22 x 80 mm	CFV22080
Ø 25 x 100 mm	CFV25100
Ø 26 x 60 mm	CFV26060
Ø 30 x 100 mm	CFV30100
Ø 33 x 94 mm	CFV33094
Ø 43 x 123 mm	CFV43123

Format: Inner diameter x height. Presentation: 25 units / box

Other sizes available on request.

Applications

- Extraction of solvents which are incompatible with cellulose fibres
- Gas emission controls in industrial furnaces
- Gravimetric determinations of dust in hot gases
- Collection of dust particles or aerosols from air and gas flows
- Determination of particles, inorganic leads and metals
- Extraction at special biochemical analysis

Blotting papers

Recommended for blotting techniques with gels.

- Made from ultrapure cotton linters and cellulose, entirely without additives to ensure that no contamination will occur during the transfer steps
- Tested specifically for chromatographic and blotting techniques to ensure high and uniform capillary actions and even transfers
- High wet strength for safe handling

Technical data

ALBET LabScience

	Grade	Properties	Surface	Thickness [mm]	Weight [g/m²]
Blotting papers	BP002	medium absorbency	smooth	0.35	192
	BP003	medium absorbency	smooth	0.90	320
	BP005	high absorbency	smooth	1.50	570

Ordering information

Types BP002, BP003 and BP005 are available as:

- Sheets with standard dimensions 46 x 57 cm and 58 x 60 cm

Product reference: BP0024657, BP0025860, BP0035860, BP0055860.
Pack size per box is: 100 units of type BP002, 50 units of type BP003, 25 units of type BP005.

- Sheets with individual formats: The product reference is structured as described on page 58. Pack size per box is 100 sheets.
- Rolls and cuts with special dimensions are available on request.

Applications

BP002

- Southern, Northern and Western blots
- Dot and slot-blots
- Lifting of sequencing gels
- Buffer wicking and gel support

BP003

- Lysis / denaturation of colony or plaque lifts
- Western blots

BP005

- Semidry blotting of proteins

Antibiotic test paper

Recommended for identification of pathogens of infectious diseases by determination of the degree of resistance against antibiotics.

- Made from ultrapure raw materials, entirely without additives to ensure that no inhibition will occur during the incubation
- Consistent thickness and absorption volume
- Available as small circles, even individually printed on one or both sides
- Meet the directive for carriers for active agents acc. to DIN 58940 - 2

Technical data

ALBET LabScience

	Grade	Weight [g/m²]	Thickness [mm]	Absorption* [µl]
Antibiotic test paper	22	180	0.35	70
	2668	320	0.90	215
	3324	280	0.73	220

*Measured with water, with 10 assay discs of 6 mm in diameter.

Applications

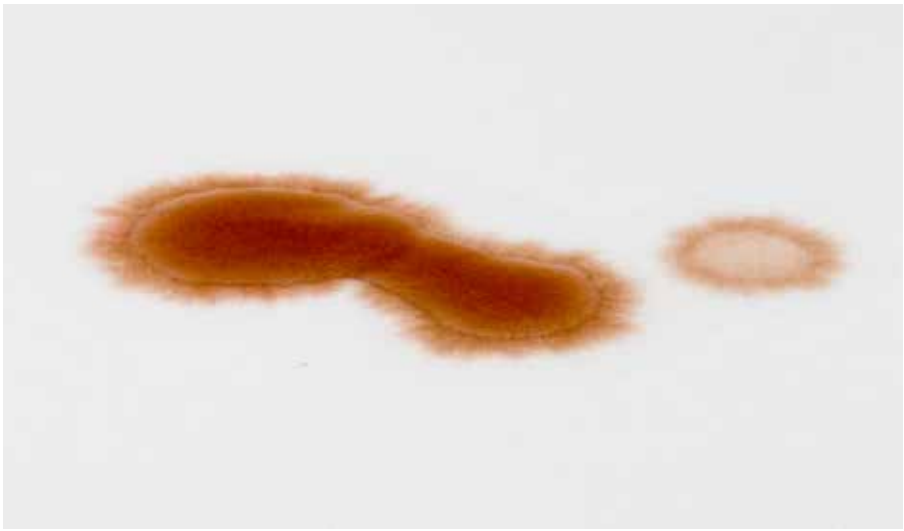
The test discs are impregnated with antibiotics or chemotherapeutic agents, placed on the inoculated nutrient agar and incubated. The size of the inhibition zone is a measurement of the potency of the substances.

Ordering information

Size / Grade	22	2668	3324
6 mm	A22060	A2668060	A3324060
9 mm	A22090	A2668090	
12,7 mm		A26680127	

Package size : 1000 units/box

Other sizes, sheets, rolls and special cuts are available on request.



Absorbent protective paper with polyethylene layer

Enables total protection of surfaces in the laboratory, thanks to its waterproof polyethylene layer that prevents liquids from reaching the protected surface.

- Double layer: cellulose layer: pure filter paper enables a large quantity of liquids to be absorbed.
- Polyethylene layer: totally waterproof, prevents liquids from reaching the protected surface
- The high purity of the filter paper allows for recovery of the spilt liquids
- Once used, it can be disposed of without harming the environment as it can be incinerated (the polyethylene layer does not melt but burns)

Technical data

ALBET LabScience

	Grade	Weight [g/m²]	Thickness [mm]	Water absorption [g/m²]
Absorbent paper	295PE	120	0.20	110

Applications

- Ensures total protection for laboratory tables and trays
- Covering of hard surfaces helps to prevent glassware breaking
- Allows recovering of spilt valuable liquids
- Recommended when working with valuable (precious metals) or dangerous substances (toxic, corrosive, radioactive, alkaline, acids, etc)
- Hygienic covering of animal cages
- Pathological anatomy laboratories and bacteriological laboratories
- Saturating the atmosphere in wet chambers (humidity controls)
- Clinical laboratories: to protect the table from potential infectious agents
- Radiochemical laboratories: prevents radioactive pollution of the working-area

Ordering information

Size	Unit	Code
460 mm x 50m	1 roll	55335865
1200 mm x 50m	1 roll	55335874
460 x 570 mm	100 sheet	55335885

Other sizes are available on request.

Chromatography papers

Recommended for chromatographic analysis and preparations.

- Made from pure linters with an α-cellulose content of > 98%
- High-performance resolution and wet strength
- The fibres are oriented in predominantly one direction
- Thicker papers allow higher sample volumes
- Lower capillary rises offer higher resolutions

Technical data

ALBET LabScience

	Grade	Properties	Weight [g/m²]	Thickness [mm]	Capillary rise* [mm]
Analytical chromatography paper	2043a	medium	90	0.17	105
	2043b	medium	125	0.22	105
Preparative chromatography paper	2668	fast	320	0.90	155**
Chamber saturation paper	5703	medium	239	0.55	–

*Measures in 30 min.

**Measures in 10 min.

Notes for handling

The absorption is always slightly greater along the linters fibres. The chromatography should be carried out along the direction of the fibres. This is indicated by the 570 or 600mm long edge of the sheet. Grades “a” and “b” differ in thickness only!
The performance in resolution is the same. For two-dimensional chromatography the “b” grades are recommended.

Applications

Analytical work

- For most chromatographic work: type 2043a, type 2043b
- Evaluation by elution: type 2043b

Preparative work

- Working with large amounts of substances: type 2668

Ordering information

Types 2043a, 2043b, 2668 and 5703 are available as sheets with 460 x 570 mm and 580 x 600 mm. The product reference is structured as the type plus format. Example of a product reference: 2043a5860 (for sheets of type 2043a with 58 x 60 cm).

Packing size of sheets per box is:
- 100 sheets of types 2043a / b and 5703
- 50 sheets of type 2668

Other sizes, sheets, rolls and special cuts are available on request.

Germination test paper

Recommended for the reliable evaluation of seeds. All papers comply with ISTA requirements of 2014.

All papers are made of pure cellulose and are free from mould, bacteria and any toxic substances which might interfere with the growth of seeds. Sufficient moisture is stored for the whole duration of the test. The papers have an open pore structure for a high degree of water absorption, but the roots are not able to grow into the paper.

- The conductivity of the papers is lower than 40 mS/m and the pH is between 6.0 and 7.5
- All seed testing papers meet the ISTA and AOSA rules
- Broad range of papers for the various germination methods TP, BP and PP

ISTA methods

TP (top of paper): The seed is placed on one or more layers of paper and then allowed to germinate in a Copenhagen tank, petri dish or incubator.

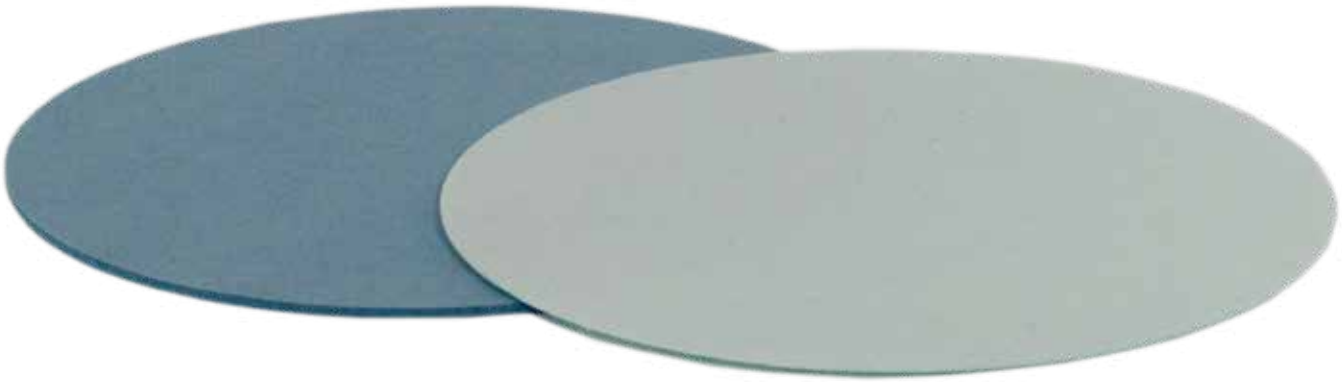
BP (between paper): The seeds are placed between two horizontal layers of paper or are rolled up in vertical standing rolls of paper.

PP (pleated paper): The seeds are placed between the folds of a paper strip folded like a piano accordion. The pleated strips are placed in a plastic box and kept uniformly moist by a surrounding wrapping strip.

Technical data

ALBET LabScience

	Grade	Properties	Weight [g/m²]	Thickness [mm]
TP-Method	597	for petri dishes, Jacobsen tank	81	0.18
	598	for petri dishes, Jacobsen tank	140	0.32
	520bII	for petri dishes, Jacobsen tank, creped	135	0.53
	3024	white	150	0.35
	3621	blotter, light blue	700	1.45
	3633	blotter, light blue	300	0.65
	3644	blotter, blue	720	1.42
	3645	yellow	165	0.34
BP - Method	520b	white	155	0.65
	5703	white	239	0.55
PP - Method	3014	pleated strips, white	110	0.22
	3236	pleated strips, grey	110	0.22
	0858	wrapping strips for pleated strips	75	0.17



Pleated strips with exactly 50 double folds ensure optimal water supply and allow a simple identification of the individual seedlings. Coloured germination test papers are free from growth-inhibiting substances and simplify counting of seedlings.

Applications

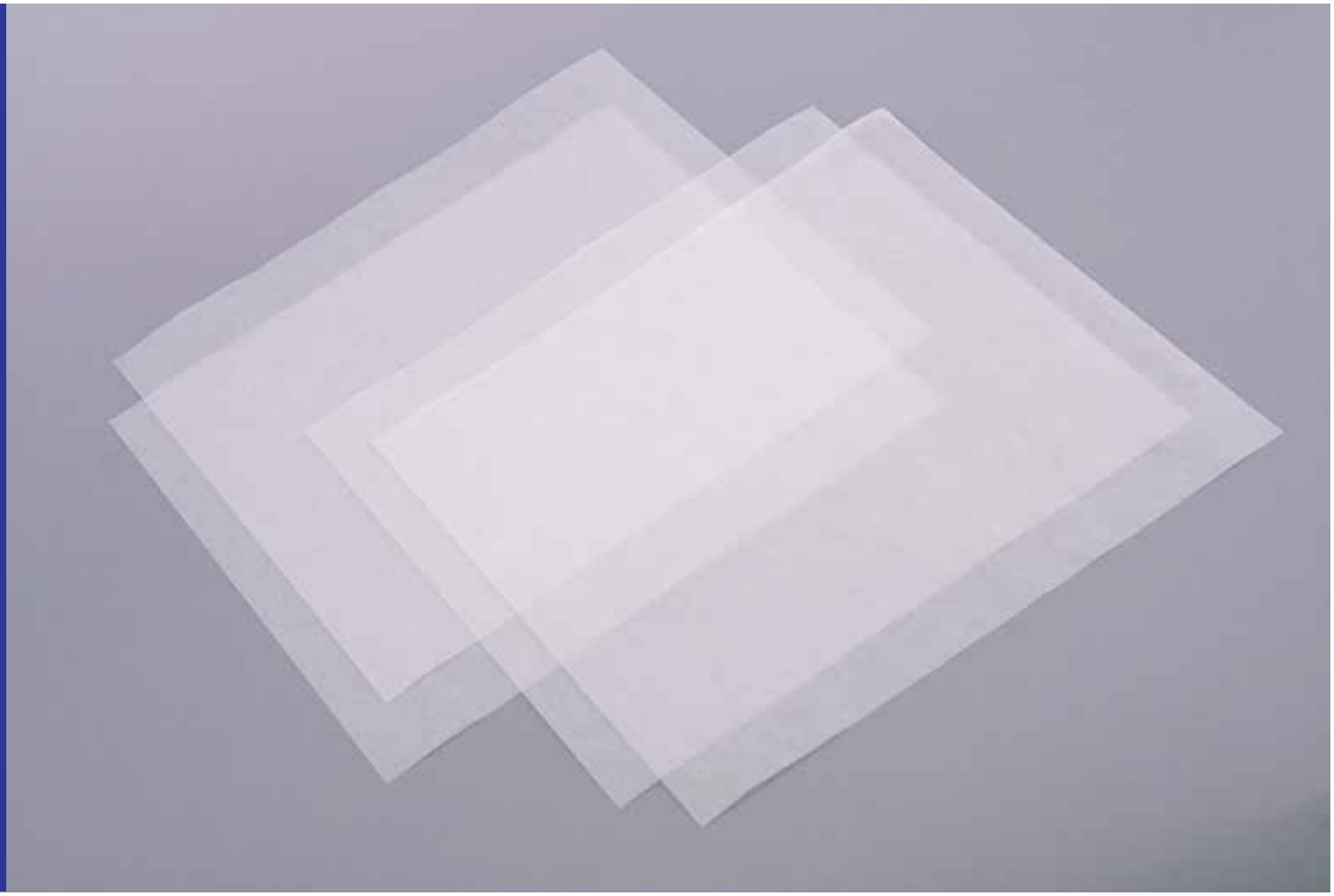
- Grade 3014, 3236 plus 0858 optional: Medium large and coated seeds (sugar beet, fodder beet, grain, sunflower, rapeseed, mustard)
- Grade 3621, 3633, 3645: Seeds with small, white rootlets
- Grade 520b, 5703: Grain (BP method)
- Grade 3014: Very sensitive seeds
- Grade 597, 598, 2048: Small seeds (flowers, grasses)
- Grade 3024: Sunflowers

Ordering information

Following standard formats are available:

- Types 3014, 3236 as pleated strips 110 x 20 x 2000 mm
  (product references 301411200 and 323611200, respectively; package size 1008 strips)
  (product references 301411200V300 and 323611200V300, respectively; package size 306 strips)
- Type 0858 as wrapping strips 110 x 580 mm (product reference 08581158; package size 500 strips).
- Types 520b and 5703 as sheets 580 x 580 mm (product references 520B5858 and 57035858, respectively; package size 100 sheets).

Other special cuts, filter circles and rolls are available on request.



Weighing Paper

Its smooth surface guarantees the quantitative transfer of the material being weighed without any losses.

- Smooth and polished surfaces on both sides
- Removes the need to clean the trays
- It can be used instead of weighing boats

Applications

Useful for weighing and handling of all kinds of solid samples

Grade	Weight [g/m²]	Thickness [mm]	Nitrogen content%
360	25	0.02	0.04

Ordering information

Size	Grade 360
5 x 5 cm	3600505
10 x 10 cm	3601010
15 x 15 cm	3601515

Presentation: 500 units / box

Lens cleaning paper

Soft paper free of fibres is recommended for cleaning sensitive, optical surfaces.

- Fine, soft and white paper
- No release of fibres

Applications

- Cleaning optical lenses, trays, etc.
- As protective paper for microscopic and metallographic sections

Ordering information

Size	Grade 310
10 x 15 cm	3101015

Presentation: 6 x 100 sheets per box

You can also find more information on special applications with filter paper here:

www.hahnemuehle.com/Downloadcenter

Do you need an individual solution?

We would be pleased to develop a product which meets your exact requirements.
Contact us: + 49 5561 791 688 or filtration@hahnemuehle.com

OEM / Private Label

A number of manufacturers and suppliers from different markets are choosing the high-quality papers from Hahnemühle when selecting their filter papers. Our many years of experience as a filter paper manufacturer and the quality of our products make us a qualified partner.

Supplement your high-quality product range with our reliable products. As an original equipment manufacturer, we are happy to cut papers to the customer's requirements – in the spirit of the "extended workbench". Our machinery allows us to respond flexibly to finishing requirements; we produce a variety of widths, lengths and formats, in accordance with your specifications.

We take the continuous monitoring of our production systems, narrow tolerances and unique quality just as much for granted as flexibility, customer service and delivery reliability. Our company structure allows us a quick response to customer requirements. All these factors make us an important OEM partner for industry.

Due to the loyalty to the production site in Dassel, we have access to a steady and very well trained staff. Our customers, as well as our younger generation of employees, benefit from their experience. The interaction and cooperation of several generations is one of our strengths. With the knowledge of our employees and the impetus from our customers, we are constantly performing product optimisations and developing new products

Please do not hesitate to contact us for further information.

Filter papers for technical and industrial use

We offer our customers in the manufacturing and processing industries a continuously broadening product range of specialty papers for a number of very different, technical applications. Currently approximately 100 types of technical filter papers can be purchased. We can call upon our extensive expertise when developing new varieties to customer specifications. Our industrial customers rely on our innovative energy and experience in the development process to produce the papers that are required for their production and as finished products for the customers' on going requirements. Due to this the Hahnemühle FineArt GmbH became contract manufacturer and important strategic partner for users of highly pure papers for filtration, as well as chemical and biological analysis.

The market sectors we supply with our technical specialty papers are equally as diverse and efficient as the properties of our papers. The purification and clarification of valuable liquids by using filter papers of consistent high quality are of high priority for several sectors: medical and diagnostic area, general and luxury foodstock, chemical and pharmaceutical industries, recycling of oils and industrial liquids, and electroplating. All users in these sectors can be reassured that our papers are only released after passing strict quality controls.

In addition our papers are used as an aid in the production process of products, as a basic material or as component in the production of manufactured final products or – due to its high absorbency – as a substrate for chemical materials. Our customers include global market leaders from a variety of traditional and innovative sectors of the manufacturing and processing industries, such as electrical industry, solar cell manufacturers, adhesive tape manufacturers and supplier of impregnated papers.

Paper types with special features have been developed for specific technical applications. For decades their use has been documented in protocols as their performance is guaranteed to give optimal results in separation.

- Made of super-refined cellulose, cotton linters or blends.
- Two surfaces: smooth and creped papers.
- Available as filter cards (weight up to 850 g/m^2).

Technical Data

Material	Grade	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
Smooth	1450nf	very fast, wet strength	50	12 – 15	118	0.30
	604L	fast	12**	12 – 15	80	0.18
	598	medium-fast, thick	100	8 – 10	140	0.32
	3205	medium-fast	150	5 – 7	95	0.20
	3427	medium-fast, wet strength	26**	5 – 7	100	0.20
	572	medium-fast	160	5 – 7	125	0.28
	597L	medium-fast	170	4 – 7	81	0.17
	508	medium-fast, activated carbon	360	n.d.	196	0.52
	BF	medium to slow, wet strength	300	4 – 6	135	0.26
	1577	very slow, very high wet strength, (hardened filter)	2000	≤2	82	0.12
Creped	520bII	very fast, wet strength, thick	30	15 – 19	135	0.50
	520b	very fast, wet strength, extra thick	30	16 – 20	155	0.65
	3144L	very fast, wet strength, extra thick	30 (4,2**)	16 – 20	190	0.65
	520a	very fast, wet strength	35	15 – 18	90	0.32
	2772	very fast, wet strength	40	12 – 14	65	0.24
	2410	fast, wet strength	70	9 – 11	107	0.40
	2048	medium-fast, wet strength	135	5 – 8	149	0.65
Card	0048	Cellulose / Synthetic, low density, high break load	500***	n.d.	130	0.68
	2282	fast, wet strength, thick	35	15 – 18	440	1.45
	2294	fast, wet strength, thick	55	8 – 15	570	1.50
	2208	fast, wet strength, thick	75 (12**)	7 – 13	350	0.90
	2589a	medium-fast, wet strength	120	6 – 12	200	0.45
	5703	medium-fast, wet strength	120	6 – 12	240	0.55
	3605	medium-fast, wet strength	120	6 – 12	310	0.80
	2589b	medium-fast, wet strength	220	5 – 10	300	0.60
	2589c	medium to slow, wet strength	320	4 – 8	400	0.75
	22	medium to slow, wet strength, thin	350	3 – 8	180	0.35
	2589d	medium to slow, wet strength, thick	470	2 – 6	500	1.00
	2589e	slow, wet strength, thick	470	2 – 6	610	1.30
	8272	slow, wet strength, thick	600	2 – 4	707	1.50

* Approximate values
** Gurley
*** Air permeability at 50 Pa

Recommendation on filter papers for special applications

The selection of the right filter paper for the intended technical and industrial separation depends on many different factors: These include the volume and the size of the separated particles, volume and temperature of the liquid to filter, as well as the required precision of the filtration result.

The individual demands on the filter paper can vary immensely. The chemical and physical nature of the sample has to be considered, as well as the further processing and analysis of the isolated precipitate or clarified filtrate.

Therefore a closer look into the aims and objectives of the filtration process should be completed before a filtration medium is selected. The following questions will help to find the best filter paper:

- What is filtered?
- Which kind of particles are in the solution?
- What is the size of these particles?
- What shall be the maximum particle size in the resulting filtrate?
- What is the pH of the solution?
- What is the temperature during the filtration process?
- Can the temperature be increased?
- What is the viscosity of the solution?
- What is the pressure during the filtration?
- Are the paper sheets supported in the filter press?
- What is the material of this support?
- How long does the filtration process take?
- How many grams of particle load per sqm of filter paper are expected?
- Are there any additional requests on the filter material?

The use of a special filter paper in certain filtration equipment usually requires a specific paper shape. Paper rolls with various width and lengths, filter circles with centre hole, large sheets with exactly positioned holes for the right fitting into a filter press and specific shapes with a flute or with pleats. All these conversions can be done with our own specific equipment. Please contact us!

Applications

Application	Smooth	Creped	Cards
Separation of soot particles from air	604L, 597L		
Filtration of unsweetened juice, wine and spirits	572	2048	3605
Filtration of viscous liquids and emulsions (e.g. sweetened viscous juices, spirits and syrups, resin solutions, lacquers, essential oils, essences and plant extracts)	1450nf, 3205	520bII, 520b, 520a, 3144L	
Purification of electroplating baths		520b	2589a
Fine impurities in industrial liquids	1577, 3205	2772	5703, 2208, 2589a-d, 2294, 2282
Filtration of difficult to clarify liquids, edible oils, transformer and turbine oils	BF		22
Use in filter presses (protective paper)	1577	2410	
Filtration of tanning solutions and paints, vacuum and pressure filtration and lining larger suction filters	1577		2208
Boiler water filtration and filtration of active carbon particles			2589a-b
Determination of water uptake according to Cobb			5703
Monitoring dye stuffs in the textile industry	1450nf		
Cytocentrifugation in cytological diagnosis			2589c, 2589d
Determination of the whiteness of milk, textile fibres	0048		

Ordering information

All types of papers listed above are available as filter circles, sheets, rolls and even as special cuts. The product reference is structured as described on page 58. For any assistance or further details please contact our customer service: +49-5561-791-688 and filtration@hahnemuehle.com

The paper types 2589c and 2589d used for **centrifugation** are offered as special cuts of 25 mm x 75 mm, with two holes of 6 mm each. Order numbers are 2589c2575 and 2589d2575, respectively. Pack size: 200 pieces.

Filter papers for the purification of electroplating baths

Recommended for the purification and regeneration of electroplating baths.

- High resistance to extreme pH conditions, as the papers are made from extremely pure cotton linters and cellulose, entirely without any additives
- Broad range of various papers with different filtration and retention times, according to individual needs

Optimal filter papers for the analysis of electroplating baths are listed in the chapters “Ashless Filter Papers” and “Hardened Ashless Filter Papers”.

Technical Data

	Grade	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
Cards and papers	2282	fast, wet strength, thick	35	15 – 18	440	1.45
	2772, creped	fast, wet strength	40	12 – 14	65	0.24
	2294	fast, wet strength, thick	55	8 – 15	570	1.50
	2589a	medium-fast, wet strength, thick	120	6 – 12	200	0.45
	5703	medium-fast, wet strength, thick	120	6 – 12	239	0.55
	3205	medium-fast	150	5 – 7	95	0.20
	2589b	medium-fast, wet strength, thick	220	5 – 10	300	0.60
	2589c	medium to slow, wet strength, thick	320	4 – 8	400	0.75
	22	medium to slow, wet strength	350	3 – 8	180	0.35
	2589d	medium to slow, wet strength, thick	470	2 – 6	500	1.00
	1577	very slow, very high wet strength (hardened filter)	2000	≤ 2	82	0.12
	508	medium-fast, activated carbon	360	k.A.	196	0.52

* Approximate values
** Gurley: Air permeability

Applications

Purification and regeneration of electroplating baths used for plating with: Aluminium, Brass, Cadmium, Chrome, Copper, Gold, Iridium, Manganese, Nickel, Lead, Silver and Tin.

Ordering information

Available as circles with centre hole, rolls, sheets and customised cuts. Please contact us for further details and advice: +49-5561-791-688, filtration@hahnemuehle.com

Filter papers for the production of beverages

Recommended for the clarification of juices, wines and extracts.

- The pure raw materials – Cotton linters and cellulose are used in the production of these filter papers, which allow their use with food and beverages
- For selected types, the conformity to both the U.S. FDA recommendation 21 CFR and by the German BfR (Federal Institute for Risk Evaluation) recommendation XXXVI and XXXVI/1 (1.6.2009) can be approved
- Creped papers shorten the duration of the filtration process as the surface area is enlarged
- Qualified for the use in filter presses

Technical Data

	Grade	Properties	Filtration Herzberg [s]	Retention of particles** [µm]	Weight [g/m²]	Thickness [mm]
Papers and cards	1450nf	very fast	50	12 – 15	118	0.30
	3605	medium-fast wet strength	120	6 – 12	310	0.80
	3205	medium-fast	150	5 – 7	95	0.20
	572	medium-fast wet strength	160	5 – 7	125	0.28
Creped papers	520bII	very fast, wet strength, thick	30	15 – 19	135	0.50
	520b	very fast, wet strength, extra thick	30	16 – 20	155	0.65
	3144L	very fast, wet strength, extra thick	30 (4,2*)	16 – 20	190	0.65
	520a	very fast, very wet strength, thin	35	15 – 18	90	0.32
Protective papers in filter presses	2410	creped, fast, wet strength	70	9 – 11	107	0.40
	1577	smooth, very slow, high wet strength (hardened)	2000	≤ 2	82	0.12

*Gurley: Air permeability ** Approximate values

Applications

- Clarification of sweetened viscous juices, spirits and syrups (1450nf, 3205, 3144L, 520bII, 520b, 520a)
- Filtration of unsweetened juices, spirits and wines (572, 2048, 3605)
- Clarification of resin solutions, essential oils, essences, plant extracts and low viscosity oils and syrups (1450nf, 3205, 3144L, 520bII, 520b, 520a)

Ordering information

Available as rolls, sheets and customised cuts. Please contact us for further details and advice: +49-5561-791-688, filtration@hahnemuehle.de or filtration@hahnemuehle.com

Papers for diagnostic use

Recommended for the production of test strips by impregnation with specific reagents via roll-to-roll or via dipping of sheets.

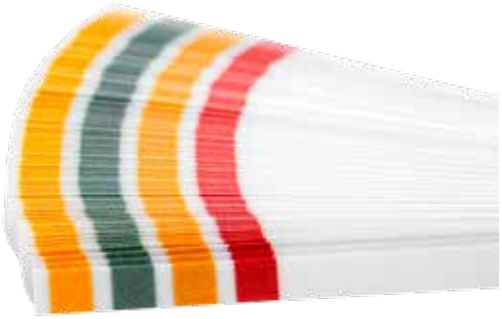
- Made from ultrapure cotton linters and cellulose, entirely without any additives to ensure that no interference will occur with the reagents and their detection reaction
- Tested specifically like chromatographic and blotting papers to ensure high and uniform capillary actions and a homogenous dispersion of the impregnation solution
- High consistency in thickness and capillary force over the whole paper roll and from lot to lot
- High wet strength for safe handling during reel-to-reel impregnation

Absorbent materials for producing diagnostic tools as IVD's have to meet very specific characteristics. The Hahnemühle absorbent media guarantee both, high and consistent performance. Purest available raw materials are used to produce this media and assure that there is no cross contamination with the chemicals in the final test device.

Hahnemühle offer a variety of cellulose, cotton linters and glass fibre filters, that have been the first choice for device manufacturers of Lateral Flow and Flow Through assays, as well as dip sticks, such as a critical "Point of Care" urine test strips.

Technical Data

	Grade	Material	Weight [g/m²]	Thickness [mm]	Water Absorbency [g/100 cm²]	Klemm mm/10 or 30 min
cotton linters paper	2043a	Cotton Linters	85	0.17	1.25	105 mm/30 min
	597L	Cotton Linters	81	0.17	1.20	–
	597nf	Cellulose	81	0.18	1.20	–
	2316	Cotton Linters	165	0.34	2.40	120mm/20 min
	3469	Cotton Linters	192	0.35	2.70	65 mm/10 min
	23SL	Cotton Linters	250	0.44	3.30	140mm/30min
	2992	Cotton Linters	182	0.47	3.35	125mm/10 min
	3324	Cotton Linters	275	0.69	5.80	150 mm/10 min
	2668	Cotton Linters	320	0.90	7.40	155 mm/ 10 min
	3730	Cotton Linters	460	0.97	8.00	95 mm/ 10 min
	2727	Cotton Linters	730	1.45	-	170 mm/30 min
	BP005	Cellulose	570	1.5	14.00	-
glass fibre media	GF 55	Glass Fibre	75	0.40	-	-
	GF 51	Glass Fibre	140	1.0	-	-



Applications – cotton linters paper

Grade	Sample application	Conjugate release	Wicking	Impregnation	Sample taking/storing
2043a				yes	
597L				yes	
597nf				yes	
2316				yes	
3469			yes		
23SL				yes	
2992				yes	yes
3324	yes			yes	
2668	yes		yes	yes	
3730	yes		yes	yes	
2727	yes		yes		
BP005	yes		yes		
GF55		yes			
GF51		yes			

Ordering information

All types of papers listed above are available as sheets, rolls and special cuts. The product reference is structured as described on page 58. Contact us for further details and advice: +49-5561-791-688, filtration@hahnemuehle.com

Indicator and reagent papers for impregnation (raw papers)

Recommended for the production of test strips by impregnation with specific reagents via roll-to-roll or via dipping of sheets.

- Made from ultrapure cotton linters and cellulose, entirely without any additives to ensure that no interference will occur with the reagents and their detection reaction
- Homogenous dispersion of the impregnation solution
- High consistency in thickness and capillary force lot to lot
- High wet strength for safe handling during reel-to-reel impregnation

Technical Data

	Grade	Weight [g/m²]	Thickness [mm]	Capillary rise [mm / 10min]	Wet strength Water column [mm]
Indicator and reagent papers	23SL	250	0.44	140 (30 min)	1300
	597nf	82	0.17	75	1300
	2316	165	0.34	115 (30 min)	300
	3469	192	0.35	75	350

Applications

- For the production of indicator strips used for chemical detections in liquids and gases.
- Use as raw paper for indicators to detect humidity and radioactive irradiation.
- Use as proof of sterilising performance of autoclaves (Bowie Dick test)

Ordering information

Available as rolls, sheets and customised cuts. Please contact us for further details and advice: +49-5561-791-688, filtration@hahnemuehle.com

Filter papers for the clarification of oils

Recommended for the clarification of edible and technical oils and fats.

- The pure raw materials – Cotton Linters and Cellulose are used in the production of these filter papers, which allow their use with food and beverages
- For selected types, the conformity to both the U.S. FDA recommendation 21 CFR and by the German BfR (Federal Institute for Risk Evaluation) recommendation XXXVI and XXXVI/1 (1.6.2009) can be approved
- Broad range of papers with optional filtration time and retention rate, meeting the needs of individual viscosities
- Particularly voluminous papers are the best medium to filter highly viscous liquids
- Creped papers shorten the filtration time as the surface is enlarged
- Qualified for the use in filter presses

Technical Data

	Grade	Properties	Filtration Herzberg [s]	Retention of particles* [µm]	Weight [g/m²]	Thickness [mm]
Papers and cards	1450nf	very fast	50	12 – 25	118	0.30
	2208	fast, wet strength, thick	75 (12**)	7 – 13	350	0.90
	2589a	medium to slow, wet strength	120	6 – 12	200	0.45
	2589b	medium to slow, wet strength	220	5 – 10	300	0.60
	2589c	medium to slow, wet strength	320	4 – 8	400	0.75
	22	medium to slow, wet strength, thin	350	3 – 8	180	0.35
	2589d	medium to slow, wet strength, thick	470	2 – 6	500	1.00
Creped Papers	3144L	very fast, wet strength, extra thick	30 (4,2**)	16 – 20	190	0.65
	2410	fast, wet strength	70	9 – 11	107	0.40

* Approximate values ** Gurley: Air permeability

Applications

- Clarification and purification of edible oils
- Regeneration of lubricating oil, transformer and turbine oils
- Removal of turbidity and particles from used oil in fryers

Note: A recommendation on “Oil condition monitoring (OCM)” to measure the amount of soot in diesel engine lubricant oil, please see chapter “Qualitative Filter Papers”.

Ordering information

Available as rolls, sheets and customised cuts. Please contact us for further details and advice: +49-5561-791-688, filtration@hahnemuehle.com

Appendix

Assembling of the order number for filter circles, folded filters and sheets

Format	Type	Size
DF	**589/1**	**125**

Order number: **DF5891125**

Folded filters are available with sizes starting from 70 mm.
Package size for filter circle is 100 units per box with diameters starting from 13 mm and higher, 1000 units with diameters below 13 mm.
Package size for folded filters and sheets is 100 units or as noted.

More examples of order numbers

Product	Format	Type	Size	Order number
Folded filters of type 595 with 125 mm diameter	DF	595	125	DF595125
Folded filters of type 602h with 320 mm diameter	DF	602	320	DF602320
Filter circles of type 589/1 with 12,7 mm diameter	DP	5891	0127	DF58910127
Sheets of BP003 with 200 mm x 150 mm		BP003	200150	BP003200150
Filter circles, GF 9, 50 mm diameter		GF9	050	GF9050

DP: Disc Plain / Filter circle
DF: Disc Folded / Folded filter
No character:
sheets and special cuts, glass fibres and quartz fibres

Characters are transferred into the order number, but no signs.
Exception: 602h -> 602.

Examples:

589/1	5891
602eh	602eh
520bll	520bll
BP003	BP003
602h	602

ø 12,7 mm	0127
ø 125 mm	125
ø 70 mm	070
200 mm x 150 mm	200150

Appendix

Test methods

- Ash content according to DIN 54370
Weighing the residue after 10g filter paper is ashed in a platinum crucible. (only quantitative and qualitative filter papers).

- Separating performance BS 4400 (only for glass fibre filters
The paper is sprayed with NaCl aerosol <1 µm (maximum 0.3-0.5 µm). Any aerosol passing through the paper is determined photometrical.

- Tensile strength (N/15 mm width)
A 15 mm wide and 100 mm long test strip is subjected to an increasing vertical load. The maximum force at the moment of tearing is the tensile strength. It is determined for the cross and machine direction of the paper.

- Cobb Test (water absorption capability, g/m²)
Test used to determine the amount of water absorbed after 10 mins by the surface of a 100 cm² large test sample under pre assigned conditions. EN ISO 535.

- Thickness (mm)
Thickness is determined using a meter (test area = 2 cm²). The surface pressure depends on the type of paper and averages 25 or 50 kPa.
EN ISO 534.

- Iron (mg /100 g)
DIN 54374.

- Grammage (g /m²)
A 100 cm² sample is weighed.EN ISO 536.

- Gurley (s)
Time is recorded for 100 ml of air to pass through the sample at a pressure of 31 mm water column and 1.56 cm² sample area.
ASTM-D 726.

- Resins and oils (mg /100 g)
Determination of dichloromethane soluble matter. ISO 624.

- Herzberg flow rate tester (s)
Test to determine flow rate using 100 ml prefiltered distilled water (20° C) applied to the test filter (effective area 10cm²) at a constant hydrostatic head (10 cm).

- Copper (mg /100 g)
DIN 54375.

- Air permeability (L/m² s)
Determination of apparent porosity with a pressure differential of 2 mbar and a test area of 20 cm².
DIN 53887. EN ISO 9237

- Wet tensile (mm, water column)
Determined by continuously increasing a water column over a test area of 14.5 cm² until the paper bursts. Plant standard.

- pH value – acqueous extract
A sample of 5g is leached for 1 h with 250 ml of boiling distilled water and the pH value in the extract is measured using a glass electrode after cooling down to 20° C. DIN 53124.

- Capillary test (mm)
Determination of capillary rise by measuring the wet part of a paper strip
(15 x 250 mm) immersed in pre filtered water (20° C). DIN ISO 8787. Klemm.

- Water absorption (g /m²)
Determination using weight differential of a test sample with 100 cm² area. (Weight 2 - weight 1) x 100 = water absorption. Weight 1 = weight in dry state. Weight 2 = weight after immersing the test sample in distilled water for 1 min and removing the excess surface water. Plant standard.

- Whiteness (%)
Determination of CIE whiteness viewed under the CIE D65 daylight illuminant. λ = 460 nm.

Type	Description	Page
BF	Technical Filter Paper	48, 50
BP 002	Blotting Paper	35
BP 003	Blotting Paper	35
BP 005	Blotting Paper	35, 54, 55
CFV	Glass Fibre Thimbles	34
GF 10	Glass Fibre with Binder	20, 21
GF 50	Glass Fibre without Binder	22, 23
GF 51	Glass Fibre without Binder	22, 23, 54
GF 52	Glass Fibre without Binder	22, 23
GF 55	Glass Fibre without Binder	22, 23, 54
GF 6	Glass Fibre with Binder	20, 21
GF 8	Glass Fibre with Binder	20, 21
GF 9	Glass Fibre with Binder	20, 21
QFH	Quartz Fibre without Binder	24
0048	Cellulose/Non-Woven	48, 50
0858	General Filter Paper, Seedtesting Paper	25, 40
0859	General Filter Paper	25
0860	General Filter Paper	25
0903	General Filter Paper	25
0905	General Filter Paper	25
1450nf	Technical Filter Paper	48, 50, 52, 57
1505	Quantitative Filter Paper, hardened	14, 15
1506	Quantitative Filter Paper, hardened	14, 15
1507	Quantitative Filter Paper, hardened	14, 15
1573	Qualitative Filter Paper, hardened	18, 19
1574	Qualitative Filter Paper, hardened	18, 19
1575	Qualitative Filter Paper, hardened	18, 19
1577	Technical Filter Paper	18, 19, 48, 50, 51, 52
2043a	Chromatography Paper, analytical	38, 54, 55
2043b	Chromatography Paper, analytical	38
2048	Technical Filter Paper	48, 50
2095	Qualitative Filter Paper, low Nitrate	26
22	Antibiotic Test Paper, Technical Filter Paper	36, 48, 50, 51, 57
2208	Technical Filter Paper	48, 50, 51, 57
2282	Technical Filter Paper	48, 50, 51
2294	Technical Filter Paper	48, 50, 51
23SL	Technical Filter Paper, Impregnation	54, 55, 56
2316	Chromatography Paper, preparative	38, 54, 55, 56
2410	Technical Filter Paper	48, 50, 52, 57
2555	Filter Paper, Beer and Malt	30
2589a	Technical Filter Paper	48, 50, 51
2589b	Technical Filter Paper	48, 50, 51
2589c	Technical Filter Paper	48, 50, 51, 57
2589d	Technical Filter Paper	48, 50, 51, 57
2668	Chromatography Paper, preparative	48
2727	Chromatography Paper, preparative	38, 54, 55
2772	Technical Filter Paper	38, 54, 55
287	Kieselguhr Paper	48, 50, 51

Hahnemühle Filtration

Appendix

Type	Description	Page
295PE	Surface Protection Paper	27
2992	Technical Filter Paper	37
3002	Filter Paper, Sugar	54, 55
3014	Seedtesting Paper	31
310	Lens Cleaning Paper	40
3144L	Technical Filter Paper	43
3205	Technical Filter Paper	48, 50, 52, 57
3236	Seedtesting Paper	48, 50, 51, 52
3324	Antibiotic Test Paper	40
3427	Technical Filter Paper	36, 54, 55
3459	Filter Paper, Sugar	48
3469	Chromatography Paper, analytical	31
360	Weighing Paper	38
3605	Technical Filter Paper	42
3621	Seedtesting Paper	48, 50, 52
3633	Seed testing Paper	40
3644	Seed testing Paper	40
3645	Seed testing Paper	40
3730	Blotting Paper	40
400	General Filter Paper	35
503	Technical Filter Paper	25
508	Activated Carbon Filter Paper	48
512	Qualitative Filter Paper, low Phosphate	28
520a	Technical Filter Paper	48, 50, 52
520b	Technical Filter Paper	40, 48, 50, 52
520bII	Technical Filter Paper, Seed testing	40, 48, 50, 52
551	Qualitative Filter Paper, black	29
5703	Seed testing Paper, Technical Filter Paper	38, 40, 48, 50, 51
572	Technical Filter Paper	48, 50, 52
589/1	Quantitative Filter Paper	12
589/2	Quantitative Filter Paper	12
589/3	Quantitative Filter Paper	12
589/4	Quantitative Filter Paper	12
589/5	Quantitative Filter Paper	12
589/6	Quantitative Filter Paper	12
591	Qualitative Filter Paper	16
593	Qualitative Filter Paper	16
595	Qualitative Filter Paper	16, 30
597	Qualitative Filter Paper, Seed testing	16, 30, 40, 41
597L	Technical Filter Paper	16, 17, 48, 50, 54, 55
597nf	Technical Filter Paper, Impregnation	54, 55, 56
598	Qualitative Filter Paper	16, 17, 40, 41, 48
602eh	Qualitative Filter Paper	16
602h	Qualitative Filter Paper	16, 30
604	Qualitative Filter Paper	16
604L	Qualitative Filter Paper	48, 50
8272	Filter Board	48
900	Cellulose Thimbles, Soxhlet	32
901	Cellulose Thimbles, Tecator	32

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