AHLSTROM
MUNKSJÖ

LABORATORY FILTRATION CATALOG

Ahlstrom-Munksjö is one of the world leading companies in filtration & separation technology.

We are a high performance materials company, partnering with leading businesses around the world to help them stay ahead. Our products are used in a large variety of everyday applications, such as filters, wallcovers, beverages and medical. In laboratories, we are known and recognized for providing superior service, reliability and high quality products.

Ahlstrom-Munksjö acquired Sweden-based Munktell Filter AB and its holdings Munktell & Filtrak GmbH, Munktell Inc and Filtres Fioroni SA in October 2012. Through the transaction, Ahlstrom-Munksjö has strengthened its product portfolio in advanced filtration materials, mainly for life science and laboratory applications.

Founded in 1815 in Sweden as the first company ever to manufacture analytical filter papers, Munktell has been supplying filtration and separation products to become a leading supplier to most parts of Europe and the World. Being now part of the Ahlstrom-Munksjö Group, Munktell will empower its strong position in the European market, at the same time taking advantage from Ahlstrom-Munksjö's solid presence in North America and growing globally. Access to new markets will also be granted by the wider product portfolio now available. There is a clear fit between the two companies, which will allow our customers to be successful and stay ahead.

This catalog highlights main Ahlstrom-Munksjö grades produced in Europe. Please contact us or visit our website to discover all Ahlstrom-Munksjö products portfolio.

Contents

Qualitative Filter Papers

Ahlstrom-Munksjö's qualitative grades of filter paper are recommended for use in analytical methods which determine or identify particulate constituents of a mixture irrespective of the amount present. Qualitative filter papers are often used in routine separation work that still requires high purity and consistent performance.
These filter papers covers a wide range of laboratory applications, as liquids clarification, qualitative analytical separations for precipitates and buffers filtration, and are also used for soil analysis and in food and beverage testing.

Key features

- **Qualitative analysis**
- **General laboratory work**
- **Low ash content**
- **High content α-cellulose**
- **Custom cut**

Standard Grades (Non Wet-Strengthened)

Standard qualitative filter papers are suitable for quadrant folded or gravity flow applications. These grades contain a high level of alpha-cellulose that provides high purity (ash content below 0.06%). The inherent strength of standard grades is suitable for routine quadrant folded applications but does not allow a use in vacuum work due to low wet resistance. Grade 3hw is recommended only for general purpose filtration due to a higher ash content (<0.1%) and lower filtration properties.

Typical grade properties

Standard Grades	Retention µm	Filtration Speed Herzberg sec/100 ml	Filtration Speed sec/10 ml	Loading Capacity
Munktell N°1	10	170	40	High
Munktell N°2	8	400	60	Medium
3 hw	8-10	80	20	Medium

Circles, Folded Filter and Sheets forms with various sizes are available.

Wet-strengthened grades

These grades contain a reinforcement agent that increases their resistance to rupture when wet, such as in vacuum filtration, and their resistance when filtering acidic solutions.

Typical grade properties

Wet-Strengthened Grades	Retention µm	Filtration Speed Herzberg sec/100 ml	Filtration Speed sec/10 ml	Loading Capacity
1288	12-15	40	10	High
1289	8 -12	90	20	High
1292	5-8	300	50	Medium
1290	3-5	800	100	Medium
1291	2-3	1200	180	Medium

Circles, Folded Filter and Sheets forms with various sizes are available.
Other qualitative grades available upon demand. Please contact us for further information.

Quantitative Filter Papers

Ahlstrom-Munksjö manufactures a series of extremely high purity, acid washed filter papers designed for use in analytical and gravimetric analysis. The quantitative grades are manufactured from top quality cotton linters using ultra-pure, deionized water and are further treated with dilute acid to remove any remaining organic and inorganic impurities. All quantitative grades are manufactured in a strictly controlled environment that ensures high uniformity and high purity from filter to filter.

Key features

- **Quantitative analysis**
- **High wet-strength**
- **Highest purity filters**
- **Consistent performance**
- **Custom cut**

Hardened Low-Ash grades (Ash 0.01%)

These filters are treated with a strong acid to remove trace metals and produce high wet strength and chemical resistance. They are suitable for routine gravimetric analysis and typical preparation of samples for use in analysis involving instrumental techniques. Particularly, they can be used for Büchner filtration where the tough smooth surface of the filter makes it easy to recover precipitates.

Typical grade properties

Hardened Low-Ash Grades	Color Code	Retention µm	Filtration Speed Herzberg sec/100 ml	Filtration Speed sec/10 ml	Loading Capacity
388	●	12-15	40	10	Medium
389	○	8 -12	90	20	Medium
392	●	5-8	300	50	Medium
390	●	3-5	800	100	Medium
391	●	2-3	1200	180	Medium
393	●	1-2	2500	250	Medium

Circles, Folded Filter and Sheets forms with various sizes are available.

For your both gravimetric analysis and sample preparation requiring a high-purity filter, Ahlstrom-Munksjö offers ashless grades (<0.006% ash content) which do not contain any reinforcement's agents. Please contact us for further information.

Blotting, Chromatography and Electrophoresis Papers, Blotting Membranes

These papers are made of high purity cotton linters, with no additives to prevent contamination transfer, and produced in a wide range of absorption levels for optimal wicking, drying, and blotting. They are suitable for chromatographic analysis and sample preparation and also for blotting methods with gel (Southern, Northern and Western Blots). Ahlstrom-Munksjö complete it offer with popular cellulose nitrate blotting membranes with an excellent affinity for proteins, high blocking ability, and compatibility with a vast variety of detection methods.

Key features

- **Uniform absorption**
- **Consistency across the sheet**
- **High purity, no sizing or fillers**
- **Custom cut**

Chromatography Papers

Typical grade properties

Grades	Basic weight g/m²	Thickness mm	Capillary Rise mm/30 min	Absorption
FN 3	90	0.19	93	Medium fast
FN 4	125	0.24	93	Medium fast
FN 7	150	0.32	145	Fast
FN 100	195	0.35	115	Fast
FN 7a	200	0.41	145	Fast
FN 30	320	0.90	240	Very fast

Various sizes of sheets are available.

Blotting Papers

Typical grade properties

Grades	Basic weight g/m²	Thickness mm	Capillary Rise mm/10 min
BF 2	195	0.35	70
1600	250	0.50	75
BF 3	330	0.76	130
BF 4	550	1.30	160

Various sizes of sheets are available.

Blotting Membranes

Typical grade properties

Grades	Pore size µm	Size
Cellulose Nitrate	0.22	300 mm x 3 m
Cellulose Nitrate	0.45	300 mm x 3 m

Other blotting papers and membranes available upon demand. Please contact us for further information.

Microfiber Filters

Ahlstrom-Munksjö offers a wide range of binder-free glass and quartz microfiber filters dedicated to environmental analyses as water or air control. Glass and quartz microfiber filters meet the highest requirements for applications including determination of suspended solids in water, PM 10 air monitoring, emission control at high temperature.

Key features

- **100% pure glass and quartz filters without any binder**
- **Fine particle retention and high flow rate**
- **High loading capacity**
- **Chemical and thermal resistance**
- **Brilliant white color reflecting more than 96% of visible light**

Glass microfiber filters – binder free

Ahlstrom-Munksjö offers a full range of glass microfiber filters manufactured from 100% pure borosilicate glass especially suitable for environmental analysis for water, wastewater, testing of soils, air pollution and monitoring, research and process biochemistry, and gravimetric analysis involving ignition of samples (up to 500°C).
The grade MG 550 HA is resistant to 550°C and is recommended for suspended solid analysis in water. The grade MG 160 has been specifically designed for use in high volume PM10 air sampling equipment and ambient air monitoring.

Typical grade properties

Standard Grades	Retention µm	Basic weight g/m²	Thickness mm	Pressure Drop mbar
MGA	1.6	52	0.23	38
MGB	1.0	143	0.70	95
MGC	1.2	52	0.24	55
MGD	2.7	75	0.53	120
MGF	0.7	75	0.45	120
MG 550 HA	1.5	65	0.30	-
MG 160	1.2	75	0.40	-

Circles and Sheets forms with various sizes are available.

Other glass microfiber grades available upon demand. Please contact us for further information.

Quartz microfiber filters – binder free

Ahlstrom-Munksjö offers extremely pure 100% quartz filters with temperature stability up to 900°C which makes these filters ideal for use in applications like hot stack measurements. The heat conditioned MK 360 grade is the first choice when the highest level of purity is required like for trace element analysis. MK 360 is recommended for PM10 monitoring according to EPA standards and ISO 23210.

Typical grade properties

Grades	Efficiency %	Basic weight g/m²	Temperature °C	Pressure Drop mbar
MK360	99.95	85	900	51.5
T293	99.95	85	900	51.5

Circles and Sheets forms with various sizes are available.

Specialty Products – Extraction Thimbles, pH Indicator Papers and Surface Protection Paper

Ahlstrom-Munksjö offers specialty products for the scientific industry. Many products were designed alongside the researchers doing developments to provide the necessary performance characteristics to our customers.

Extraction thimbles

Ahlstrom-Munksjö offers high purity extraction thimbles in cellulose for Soxhlet extractions and in glass and quartz for the analysis of environmental pollution. All extraction thimbles are hollow cylinders with a round bottom.

Cellulose thimbles are high quality sample reservoirs for quality control, research, and analytical applications where solvent extraction of solids and semi-solids must be carried out. The use of a Soxhlet extractor provides a safe method of extraction with toxic and other noxious solvents. Ahlstrom-Munksjö high purity cellulose extraction thimbles are recommended for applications including food testing, different process analysis and in quality management of components used in pharmaceutical formulations.

Micro-glass fiber thimbles are a convenient tool for the separation of aerosol droplets and condensate from gases for applications including sampling dust particles and aerosols from gaseous streams and Soxhlet extractions requiring solvents too aggressive for the cellulose thimbles.

Micro-quartz fiber thimbles meet the highest purity requirements due to the lowest possible heavy metal content. Applications include emission testing in high-temperature environments and testing acidic gases not compatible with micro-glass fiber thimbles.

Typical grade properties

Grades	Internal Diameter mm	Thimble height mm	Wall thickness (mm)	Ash Content	Penetration % DOP (0.3 µm)	Temperature °C
ET/C Cellulose	0/ -3	± 1	1.5 ± 0.5	< 0.1	-	-
ET/MG160 Glass	+1/ -3	± 1	2 ± 0.5	-	<0.002	500 max
ET/MK360 Quartz	+0/ -3	± 1	2 ± 0.5	-	<0.002	900 max

Various sizes are available.

pH Indicator Papers

Ahlstrom-Munksjö offers a wide range of high quality test papers for rapid and easy determination of pH and other specific conditions in solutions.

Test papers are impregnated with one or several indicators that show a distinctive color when exposed to a specific condition. They allow a quicker and less expensive test in applications where the accuracy of an electronic pH meter is not needed. Universal pH indicator papers are available in different ranges of pH to give the user the level of accuracy needed. Additional test papers for qualitative determination are also available for industrial application and educational purpose.

pH Test Strips have small squares of paper, each prepared with a different indicator, attached to a thin but flexible plastic strip for improved handling. pH indicator are strongly bonded to the cellulose fibers to prevent bleeding of the colors to give a more precise measurement and also prevent contamination of the test solution. Reliable pH measurement can be obtained even in weakly buffered solutions and the test strips can remain in the test solution until the final reaction color is obtained.

Universal pH indicator papers

Scale	Interval
pH 0-10	1
pH 0.5-5	0.5
pH 1-11	1
pH 1-14	1
pH 4-7	0.3
pH 5-9	0.5
pH 6.4-8	0.3
pH 6.5-10	0.5
pH 9-13	0.5

Various scales are available with diverse forms (roll, strips).

Papers for qualitative detection

Scale	Color Range
Blue Litmus	Blue to red
Neutral Litmus	Purple to blue/red
Red Litmus	Red to blue
KI starch paper	White to blue/purple

pH test strips

Scale	Interval
pH 0-14	1

Surface Protection Paper - LabSorb

Ahlstrom-Munksjö LabSorb coated paper is a double-layered surface protection that protects benches and working areas from spilled chemicals, corrosive materials, as well as toxic, infectious or radioactive substances. Spills are quickly absorbed into the surface layer of cellulose material (top layer) and prevented from penetrating to the surface of the work bench by a thin coating of polyethylene that serves as a carrier for the absorbent layer (bottom layer).

As Labsorb surface is smooth and firm, it does not inhibit stability of bottles or tubes and allows recovery of dry spills. Furthermore, the soft character of the carrier material lowers the risk of breaking glass. Liquid samples can be recovered by washing the absorbed spill from the inert surface with the appropriate buffer.

LabSorb papers can be treated with disinfectants for use in clinical laboratories to prevent biological contamination. They are also suitable for lining chemical storage areas, trays and experimental animal cages.).

Typical grade properties

Grades	Basic weight g/m²	Water absorption %	Characteristics
LabSorb	140	150	Highly absorbent

Reels and Sheets forms are available under diverse sizes.

MicroFiltration Products

Ahlstrom-Munksjö offers a new Premium range of membrane filters (ReliaDisc™) and syringe filters (ReliaPrep™) manufactured in Germany to accommodate a variety of samples matrices for sample preparation and testing purpose.

ReliaDisc™ sterile gridded microbiology membranes

Ahlstrom-Munksjö offers gridded sterile membranes packed individually specifically designed to save time when performing colony counting and microbiological quality control. These cellulose nitrate membranes are available in a 47 and 50 mm ready-to-use standard size and support optimum colony growth.

Typical grade properties

Polymer	Grid Color	Pore size µm	Diameter mm
Cellulose Nitrate	White/Black	0.2	47
Cellulose Nitrate	White/Black	0.45	47 & 50
Cellulose Nitrate	Grey/White	0.45	47 & 50
Cellulose Nitrate	Green/Dark Green	0.45	47 & 50
Cellulose Nitrate	White/Green	0.45	47 & 50

Available as pack of 100, 3x100 and 1000 pieces.

Key features

- **Wide variety of polymers and pore sizes available**
- **High lot-to-lot reliability for consistent filtration quality**
- **Ultra-pure production facility in Germany according to the highest quality standards**
- **Various filter diameters and pack sizes available on demand**

ReliaDisc™ non-sterile membrane filters

Ahlstrom-Munksjö supplies a wide range of plain white non-sterile microfiltration membranes used to collect or remove particles and microorganisms from various organic solvents and aqueous solutions. Sold by pack of 100 filters.

Typical grade properties

Membrane	Diameter mm	Pore size µm	Flow rate for water* mL/min
Cellulose Acetate	47	0.2/0.45	24/65
Cellulose Acetate	50	0.45	65
Cellulose Nitrate	47	0.45/0.65/0.8	70/130/200
Cellulose Nitrate	47	1.2/5/8	320/ 570/750
Cellulose Nitrate	50	0.45	70
PTFE	47	0.2/0.45/1.2	0.1/0.2/1.6**
Regenerated Cellulose	47	0.45	30
Nylon	47	0.45	>35

* According to DIN 58355 (average values per cm^2 at 1 bar pressure).

** With isopropanol per cm^2 Δp = 1 bar/~15 psi.

Ahlstrom-Munksjö ReliaPrep™ Syringe Filters

Ahlstrom-Munksjö offers a wide variety of syringe filters for convenient sample preparation and fluid sterilization. Cellulose Acetate (CA) and Polyether Sulfone (PES) membranes are ideal for samples containing proteins and generally recommended for aqueous solutions filtration. Nylon (NY), PTFE and Regenerated Cellulose (RC) membranes are recommended for organic solvents filtration. Glass fiber prefilter and a cellulose acetate membrane are recommended for highly loaded aqueous solutions.

Key features

- **Wide variety of membranes, pore size, diameters and connections available**
- **High lot-to-lot reliability and reproducibility for consistent filtration quality**
- **Ultra-pure production facility in Germany according to the highest quality standards**
- **Sterile packaging available for CA and PES ReliaPrep™**
- **Transparent syringe filter housing for full visual control**
- **High quality housing construction and welding to prevent any leaking**

Typical grade properties

Polymer	Diameter mm	Filtration area cm^2	Pore size µm	Held-up Volume µl	Housing*	Outlet
Cellulose Acetate	28	6.2	0.2/0.45/1.2/5	100	MBS	Male Luer Lock
	28	6.2	0.2 / 0.45	100	MBS	Male Luer Lock
Regenerated Cellulose	15	1.7	0.2/0.45	10	PP	Male Luer Slip
	25	4.8	0.2/0.45	100	PP	Male Luer Slip
Nylon (Polyamide)	15	1.7	0.2/0.45	10	PP	Male Luer Slip
	25	4.8	0.2/0.45	100	PP	Male Luer Slip
PES	28	6.2	0.2/0.45	100	MBS	Male Luer Lock
PTFE	15	1.7	0.2/0.45	10	PP	Male Luer Slip
	15	1.7	0.45	10	PP	Spike
	25	4.8	0.2/0.45	100	PP	Male Luer Slip
Cellulose Acetate & Glass Prefilter	28	6.2	0.2/0.45	230	MBS	Male Luer Lock
Glass Fiber	28	6.2	0.7	230	MBS	Male Luer Lock

* MBS: Meta-acrylate-butadiene-styrene polymerisate; PP: polypropylene.

CA and PES references are available as sterile single packed of 50 pieces. All the grades are available as non-sterile pack of 500 pieces.

Other ReliaPrep™ and ReliaDisc™ references available upon demand. Please contact us for further information.

Cross Reference Table

Conversion tables are provided to guide you in selecting the Ahlstrom-Munksjö grade that is most closely equivalent to your current brand of filter paper. Please note that grade comparisons between manufacturers are approximations based upon generally accepted industry practices.
No two grades from different manufacturers are exact matches in terms of physical properties. For additional assistance in interpreting cross-references, or if you need further data, please contact customer service.

Ahlstrom-Munksjö Grade	Whatman Grade
Munktell N°1	1
Munktell N°2	2
1288	4
1289	91
1290	6
1291	5
1292	n/a
388	54
389	41
390	52
391	50
392	43
393	42
3hw	Student grade
BF2	3MMChr
1600	n/a
BF3	GB003
BF4	GB005

Ahlstrom-Munksjö Grade	Whatman Grade
FN3	1 Chr
FN4	2 Chr
FN7	n/a
FN7a	3 Chr
FN30	17 Chr
FN100	3MMChr
MGA	GFA
MGB	GFB
MGC	GFC
MGD	GFD
MGF	GFF
MG 550 HA	934 AH
MG 160	EPM 2000
MK 360	QM-A
T 293	n/a
ET/C	2800
ET/MG160	603 G
ET/MK360	603 Q
Labsorb	Benchkote

Ahlstrom-Munksjö is a global leader in fiber-based materials, supplying innovative and sustainable solutions to customers worldwide. Our offerings include decor paper, filter media, release liners, abrasive backings, nonwovens, electrotechnical paper, glass fiber materials, food packaging and labeling, tape, medical fiber materials and solutions for diagnostics. Combined annual net sales are about EUR 2.15 billion and we employ 6,000 people. The Ahlstrom-Munksjö share is listed on the Nasdaq Helsinki and Stockholm. The company was formed on April 1, 2017 through the merger of Ahlstrom Corporation and Munksjö Oyj.

You'll find our
Cross Reference Table
on the inside back cover.

You'll find
all of our products
in the global catalog.

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