Allied Filter Systems Ltd

Filter Bags

Allied Filter Systems Ltd

Filter bags are manufactured
for industrial processes
and applications including:

Adhesive
Automotive
Beverage
Biofuel
Chemical and Petrochemical
Cosmetics and Toiletries
Cutting Fluids and Cooling Water
Dairy Products
Detergents
Electronics
Foods
Inks/Dyes
Lacquers
Lubricants
Oils
Paints and Powder Coatings
Pharmaceutical
Resins
Varnishes
Water Treatment

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Contents

Concepts of Bag Filter Systems

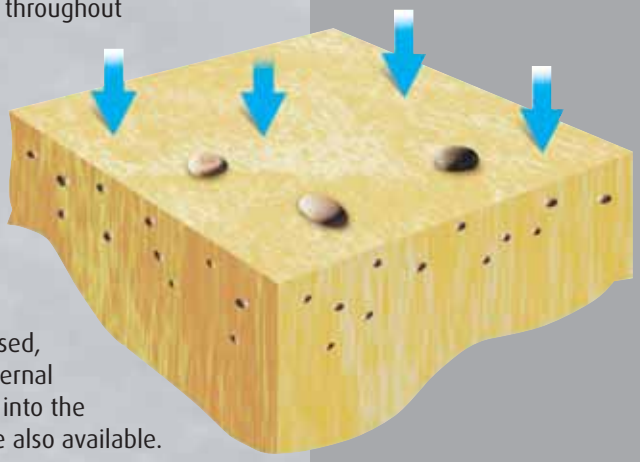
A bag filter system is one of the most popular filtration methods for liquid process applications. It provides a versatile, cost effective and consistent filtration system suitable for a broad range of applications from small batch operations to bulk processing.

Bag filter housings are available in a wide range of materials and sizes, enabling customers to select a system to handle any fluid type and flow rate between 5m³/hr and 960m³/hr. Replacement filter bags are selected from the broadest possible range of media. The required filter media is determined by the size of the particles to be removed (0.2 - 1500 microns), the type of particles to be removed (deformable or non deformable), the required retention efficiency (60 – 99.98%) and the chemical and temperature compatibility of the media.

Particles are contained inside the filter bag, allowing clean, easy disposal, which is of particular benefit for applications involving aggressive chemicals. *'Welseal'* ring products are also fully combustible.

Needlefelt filter bags

By means of a depth filtration mechanism, particles penetrate and are captured throughout the depth of the filter media.



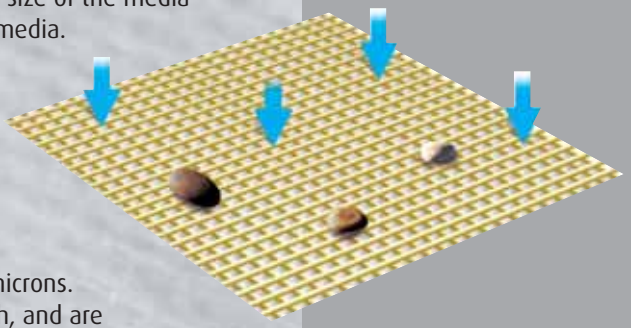
Needlefelts are a versatile and cost effective media providing a high solid holding capacity for both non deformable and deformable gelatinous particles. They are available in 0.5 – 200 microns, and are rated with a nominal (60-70%) efficiency. Polypropylene and polyester are the most widely used, and have a calendered or singed external surface finish to eliminate migration into the filtrate. Nylon, Nomex®, and PTFE are also available.

Micro-fibre filter bags

These provide high efficiency depth filtration and are available in polypropylene and polyester, absolute (upto 99.98% efficient) rated between 0.2 and 25 microns. This media provides highly efficient particle retention for both non deformable and deformable gelatinous particles. Micro-fibre filter bags have excellent oil and hydrocarbon adsorption properties.

Mesh filter bags

These provide surface filtration - a 'Sieving' mechanism, causing particles larger than the pore size of the media to be captured on the surface of the media.



Meshes are available in nylon, polypropylene and polyester monofilament - a precision woven structure thermofixed to give an absolute micron rating with no fibre migration.

Micron ratings range from 1 – 1500 microns. They exhibit high mechanical strength, and are excellent for removing non deformable, solid particles.

Standard Filter Bags

Allied Filter Systems Ltd. manufactures high quality liquid filter bags to fit standard size filter vessels, as well as custom designed products where requested. The constituent materials have been chosen for their purity, consistent high quality and repeatable performance. Filter bags are available in traditional stitched form or with a fully welded construction, and are fitted with a comprehensive choice of rings.

- 7" or 4" Steel rings (or stainless steel) which fit universally into all filter housings. Polypropylene rings and Stainless steel bands are also available.
- Custom designed moulded **Welseal** (polypropylene or polyester) welded rings, giving more positive sealing, needle hole elimination and grab handles for faster and easier bag installation and replacement. A **Welseal** ring product is fully combustible and also makes polymer recycling from used bags possible.
- Custom designed positive sealing **Santaseal** moulded ring, for applications where high temperature or chemical resistance properties are required.

Needlefelts:

- Polypropylene
- Polyester
- Polypropylene extended life
- Polyester extended life
- Nylon
- Nomex®
- PTFE
- Wool

Micron rating range 0.5 – 200

Monofilament meshes:

- Nylon
- Polyester
- Polypropylene
- PTFE

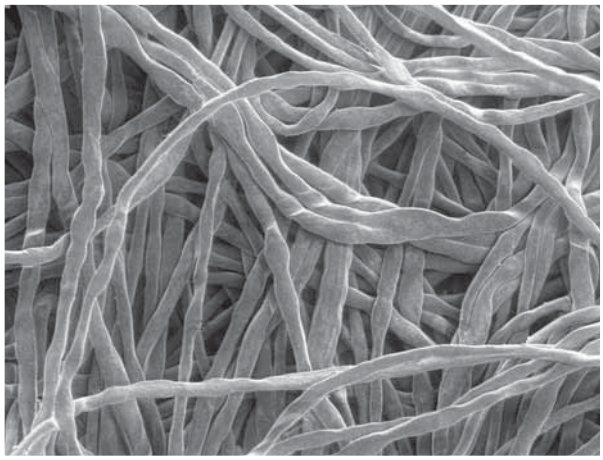
Micron rating range 1 - 1500

Speciality Media:

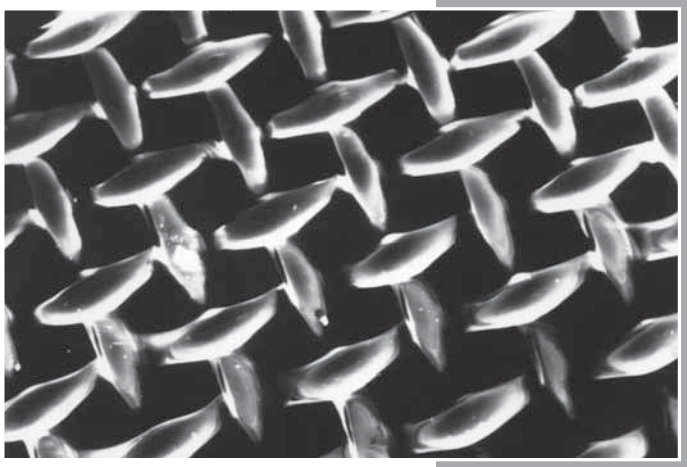
- Polyester multifilament meshes
- Spun bonds
- Meltblowns
- Superabsorbent
- Coated fabrics
- Laminated membrane fabrics
- Woven cloths
- Antistatic fabrics
- Elastomeric fabrics
- Chemically modified and impregnated
- PVC
- Saran

All filter bags are manufactured to ISO 9001 2000 quality standards and under food safe and silicone free conditions to minimise any possible contaminations.

Filter Bag and Media Technical Data



Surface of polyester needlefelt



Nylon monofilament mesh

Taken at the surface science laboratory, University of Oxford

Chemical Compatibility Table

Media / Collar Type	Acids	Alkali	Solvents	Oxidants	Recommended Maximum Operating Temperature (°c)
Polyester	G	G	E	P	140
Polypropylene	E	E	G	E	93
Nylon	F	G	E	F	110
Nomex®	G	G	E	E	200
PTFE	E	E	E	E	260
Santoprene®	E	E	E	E	200

P = Poor F = Fair G = Good E = Excellent

Bag Size	Diameter (Inches/mm)	Length (Inches/mm)	Surface Area (m^2)	Volume (L)	Maximum Flow Rate (m^3/hr)*
1	7″/180mm	17″/435mm	0.25	11.0	20
2	7″/180mm	32″/810mm	0.50	20.5	40
3 (1M)	4″/104mm	9″/230mm	0.07	1.9	6
4 (2M)	4″/104mm	15″/380mm	0.12	3.2	10

* Flow rate depends on factors such as media type, micron rating, and fluid being filtered.

All dimensions are nominal

US Standard Mesh

18	20	25	30	35	40	45	50	60	70	80	100	120	140	170	200	230	270	325	400	550	800	1250
1000	840	710	590	500	420	350	297	250	210	177	149	125	105	88	74	62	53	44	37	25	15	10

Microns

Further technical data and specifications are available on request

Fully Welded Filter Bags

Allied Filter Systems Ltd. is a leading manufacturer of fully welded filter bags, which are available for applications requiring standard polypropylene or polyester felts, extended life felts or high efficiency media.

All seams are welded rather than sewn, and combined with either of our positive sealing moulded **Welseal** (polypropylene or polyester) welded rings, no process liquid can bypass through needleholes caused by the sewing process or around a sewn snap ring. The **Welseal** ring forms a hermetic seal between the filter bag and housing, eliminating any possibility of bypass around a steel ring, which is a potential source of product contamination. These features ensure that fully welded filter bags perform to a higher efficiency than a sewn equivalent.

- Ease of use
- Total elimination of needleholes
- Total elimination of possibility of thread contamination
- Enhanced seam strength
- Higher performance efficiencies
- More positive seal between filter bag and vessel
- Moulded handles enable faster bag change and installation
- Fully combustible
- 100% synthetic components enable polymer recycling

All filter bags are manufactured to ISO 9001 2000 quality standards and under silicone free conditions. Constituent polypropylene and polyester felts are manufactured using 100% virgin fibres, ensuring maximum purity and consistent performance.

Food and Pharmaceutical Grade Filter Bags

Bag filters, when used in food, beverage or pharmaceutical applications, must conform to EC directives governing plastics in contact with food. Migration limits of contaminants from polymers into a food product have been imposed, and independent testing and certification of component materials is required to ensure these regulations are satisfied. Stringent manufacturing and warehousing conditions as well as special packaging procedures are also required to eliminate other sources of contamination.

Allied Filter Systems Ltd. is a leading manufacturer of food grade filter bags which fully satisfy the above conditions.

The constituent materials have been chosen for their purity, giving low levels of migration and ensuring consistent high quality and performance.

Available materials:

- Polypropylene and polyester needlefelt
- Polypropylene and polyester extended life needlefelt
- Nylon monofilament mesh
- Polypropylene and polyester microfibre

Combined with either of our positive sealing **Welseal** (polypropylene or polyester) welded rings, needlefelt food grade filter bags have a **fully welded construction** as standard.
The external surface of the filter bag is calendered or singed, eliminating any possibility of fibre migration into the filtrate. Each bag may be individually wrapped.

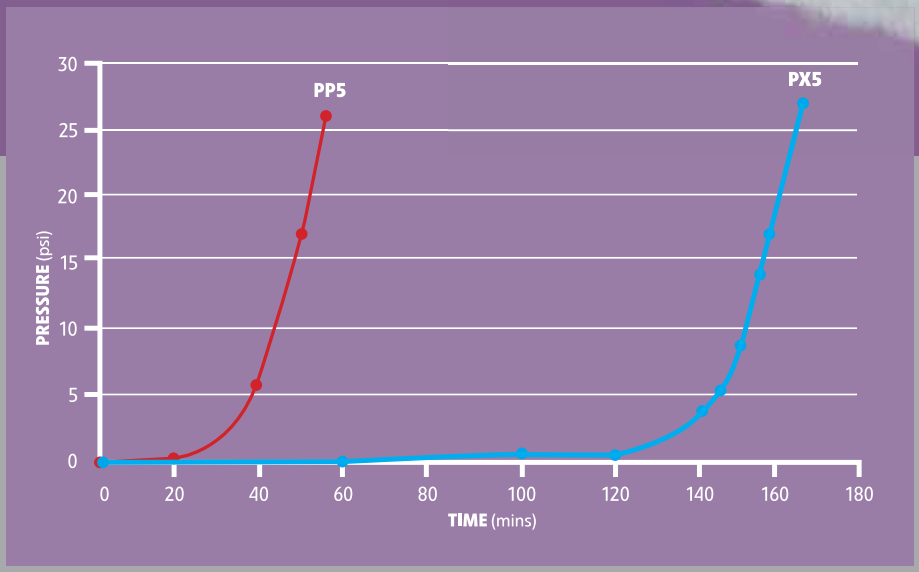
All filter bags are manufactured to ISO 9001 2000 quality standards.

Further information on food grade products is available on request.

Extended Life Filter Bags

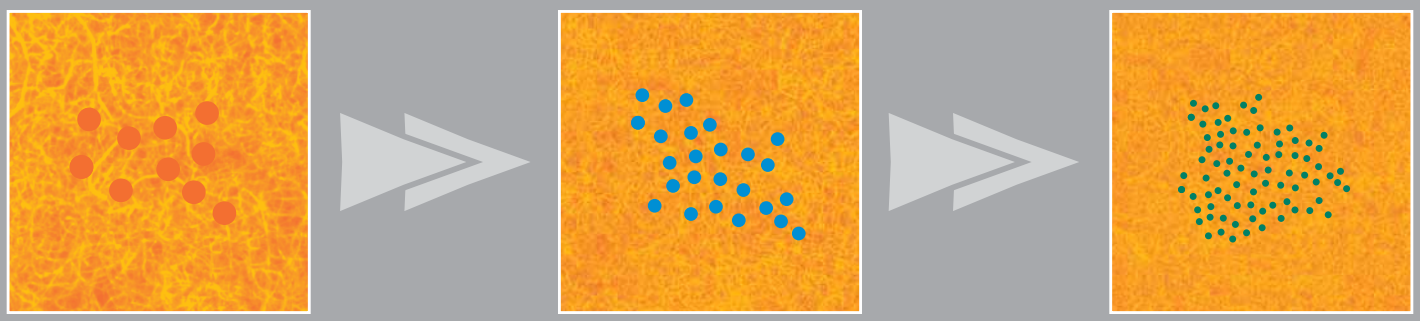
Extended Life filter bags are available in polypropylene or polyester in micron ratings from 0.5-100, and can have a lifetime of upto 5 times that of the equivalent standard filter bag.

Increased thickness of the filter media compared to that of the equivalent standard filter bag enables an increased retention of particles. In addition, the extended life filter media has a graded density structure i.e. Progressively smaller particles are captured as the fluid follows a tortuous path through the media, stopping the filter bag from blinding prematurely. The result is a filter media with a higher dirt holding capacity, leading to increased filter bag lifetime.



Example performance graph of extended life versus standard needlefelt media (actual lifetimes are not indicative of any specific application and are for comparative use only).

Progressively smaller particles are captured as the fluid follows a tortuous path through the graded density media



Within the extended life series, Allied Filter Systems Ltd is uniquely able to offer a **0.5 micron polyester** filter bag. The filter media has a special construction using a blend of micro denier and fine denier fibres, giving the finest filtration results of any needlefelt product available on the market.

As standard, the extended life filter bag is **fully welded**, maximising filtration efficiency by eliminating fluid bypass through needleholes or around a snap ring. The external surface has a special highly glazed finish, eliminating fibre migration into the filtrate.

Other benefits include:

- More efficient filtration process
- Minimisation of equipment downtime
- Minimisation of engineer exposure to process liquids
- Fewer bags to change and dispose of compared with standard felt filter bags – more environmentally friendly
- Excellent at removing deformable particles such as gels
- Conforms to EC food contact directives

High Capacity Filter Bags

Newly installed filter bag housings or existing systems can utilise High Capacity filter bags, which increase the filtration surface area by 70% compared with a similar sized standard bag.

The high capacity bag is situated within a stainless steel filter basket with inner support core. Baskets can be supplied to retrofit existing standard size filter bag housings.

Liquid flow occurs through both the outer surface and the central core of the filter bag and basket, enabling higher flow rates to be achieved compared to similar sized standard filter bags. The increased surface area also leads to a higher dirt holding capacity being achieved, meaning longer service life of the filter bag.

By utilising a high capacity filter bag in a new filter installation, a smaller, lower cost filter housing can achieve the desired flow rate and dirt holding capacity. If retrofitting an existing filter housing with a high capacity basket, its performance capability can be increased at minimal cost.

A high capacity bag also reduces the volume of retained liquid in the filter bag by upto 25% compared to a standard bag system, lowering the filter bag removal weight and decreasing product wastage.

As standard, construction is from our extended life filter media, but high capacity bags can be manufactured from any of Allied's filter media, including our range of high efficiency melt blown materials. The filter bag features our **Welseal** collar to provide an excellent seal with the filter housing, and a support ring in the base to assist installation.

High capacity filter bags are available for size 1 and size 2 filter housings.

High Efficiency Filter Bags

Allied Filter Systems Ltd. manufactures 4 series of High Efficiency filter bags in all standard sizes, giving depth filtration between 0.2 and 25 microns.

Constructed from composites of polypropylene (or polyester – see MBPE series) microfibre media, particle retention is achieved to efficiencies between 90% and 99.98% dependant on type. The high density of small diameter fibres compared to that of a standard needlefelt enhances particle retention, leading to superior, highly efficient filtration.

- **MBP Series**
  1-25 micron, >95% efficient. Also MBPE version with all polyester construction
- **Allipure Series**
  0.2-5 micron , 99.98% efficient
- **OA Series**
  1-25 micron, >90% efficient, with enhanced oil absorbent properties
- **500 Series**
  1-25 micron, >95% efficient, with enhanced oil absorbent and dirt holding properties

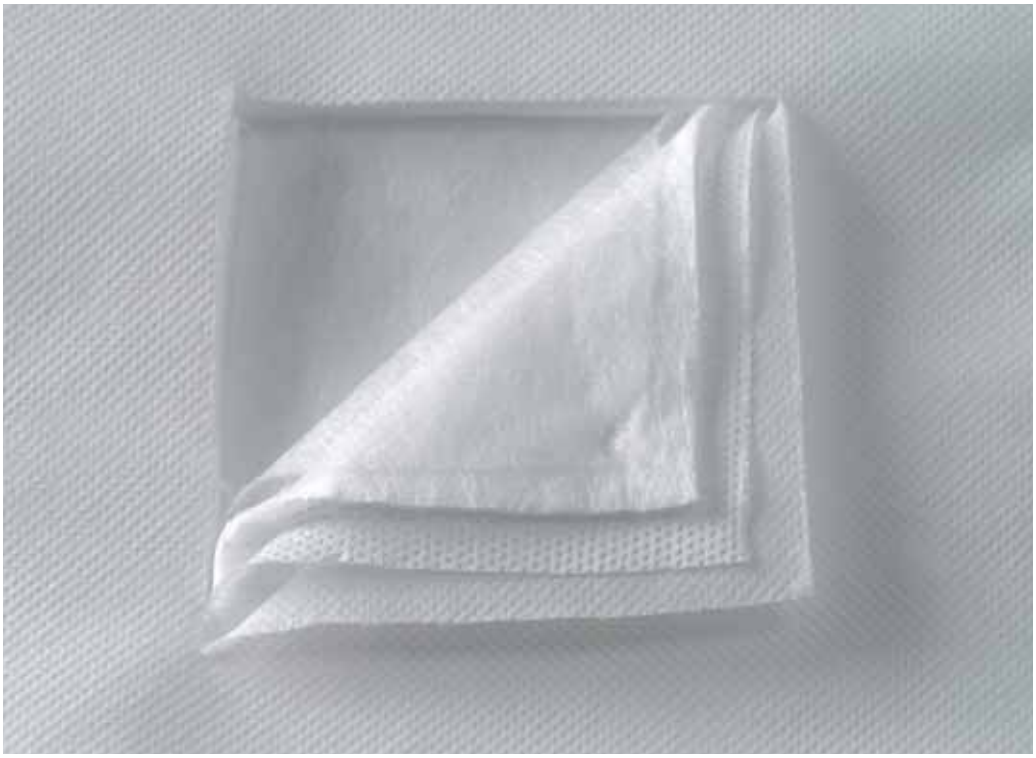
High efficiency bags are now being used in applications previously dominated by expensive cartridge filtration due to higher dirt holding capacities, longer service life and lower overall cost whilst maintaining or increasing the required filtration efficiency.

Example applications where high efficiency bags may replace cartridges include protection of membranes in reverse osmosis systems, carbon removal and final filtration of critical fluids. Alternatively, they can be used as a pre-filter to prolong the life of expensive, absolute rated cartridges.

Industries served include automotive, pharmaceutical, fine and speciality chemicals, food and beverage, potable water, speciality coatings, metalworking, toiletries, cosmetics, electronics and water treatment.

All high efficiency filter bags are constructed from FDA listed materials conforming to code of Federal Regulations 21 CFR Part 177, and also meet EC directives governing requirements for food contact applications.

MBP Series



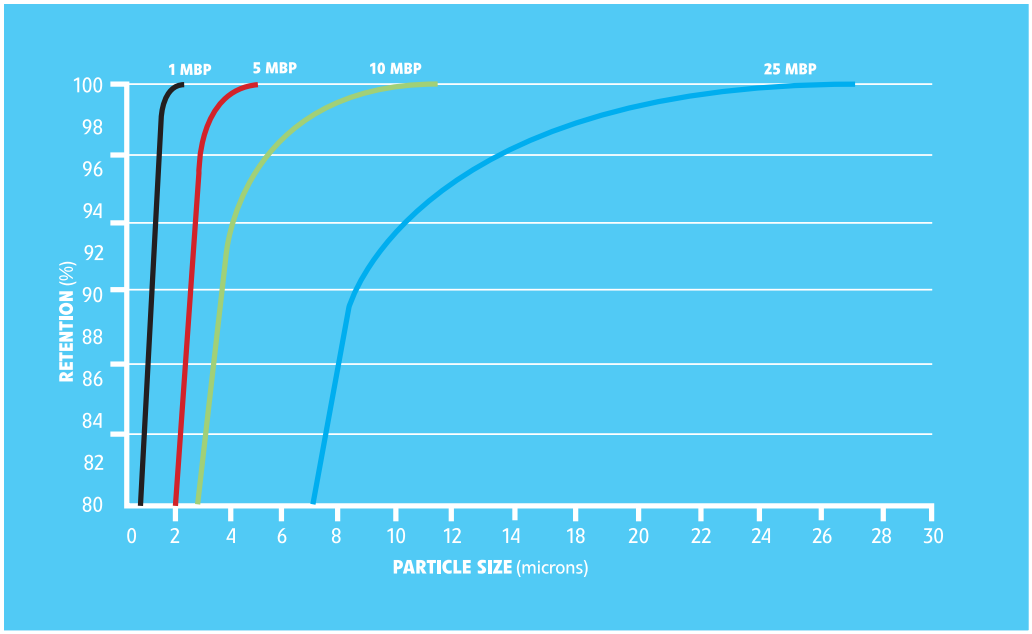
The MBP series high efficiency bags are available rated at 1-25 micron, and perform to efficiencies >95%.

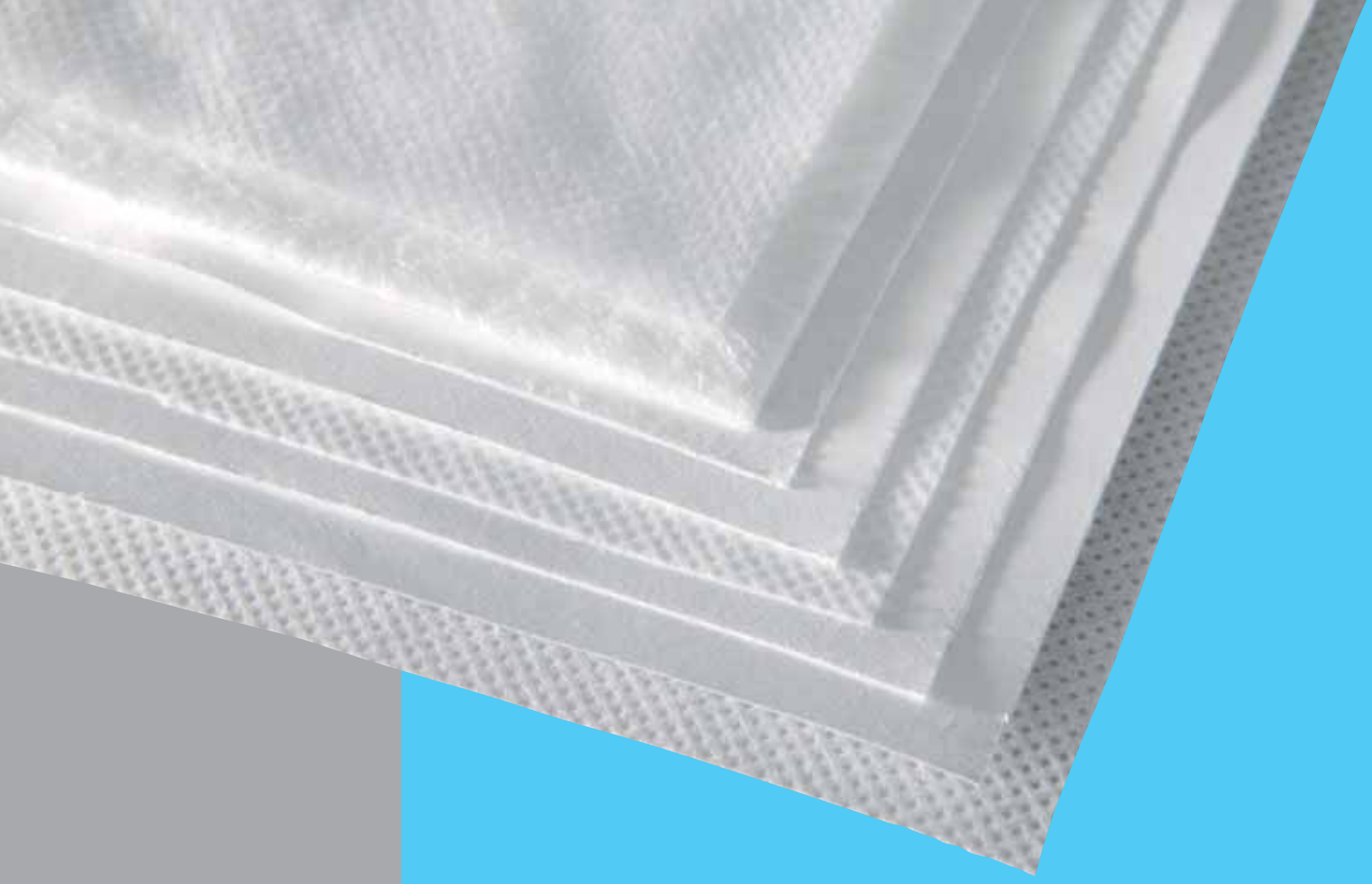
The filter bag consists of upto 4 layers of meltblown polypropylene media, including an outer cover to prevent fibre migration into the filtrate as well as providing added support to the filtration media.

Combined with our polypropylene **Welseal** ring, the MBP series high efficiency filter bags are available with a **fully welded construction**, ensuring that no by-pass of process liquid can occur through needleholes, and eliminating any possible contaminations from sewing threads. Each layer is individually welded, giving enhanced filter bag integrity and seam strength compared to single weld construction methods.

Whilst the fully welded versions give maximum performance, sewn versions with a steel or stainless steel ring are also available for universal fitting into all makes of standard size housings, or for custom manufacturing to non-standard sizes.

Recently developed is our unique the **MBPE Series**, which features an all polyester construction. This enables high performance filtration at temperatures in excess of 100°c. (e.g. filtration of edible oils or resins). It is also used in applications where polypropylene is unsuitable for chemical compatibility reasons.





Allipure Series

Allied Filter Systems Ltd has developed the Allipure series, a unique range of absolute rated filter bags rated from 5-0.2 micron, which perform to an efficiency of 99.98% (Beta 5000) at the stated micron rating.

For processes requiring absolute and/or sub micron liquid process filtration, the use of filter cartridges has previously been the method of choice to achieve high performance in critical applications with consumable filter elements.

The Allipure series utilises filter media which has previously only been used in the manufacture of cartridge filters. This enables processes to achieve the same efficiencies using bag filters whilst benefiting from the advantages that a bag filter system has over an equivalent sized cartridge system.

These advantages include:

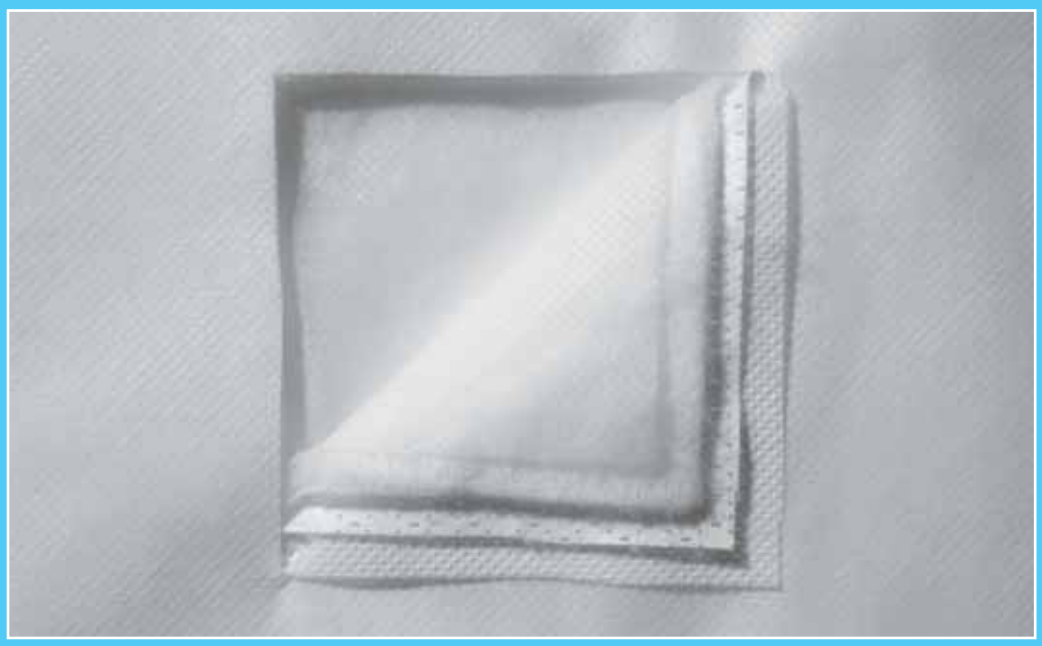
- Higher dirt holding capacities
- Higher flow rates (i.e. lower quantity of filter elements required to achieve the same flow rate as an equivalent sized cartridge system)
- Lower initial pressure drops, resulting in longer service life
- Solids are collected inside the bag, rather than on the exterior of a cartridge, leading to easier and quicker filter element disposal and less cleaning of filter housing
- Ease of handling leading to increased speed of changeout (less process downtime)
- Lower number of sealing points compared with equivalent number of cartridges
- Less storage space required for filter bags compared with necessary number of cartridges
- Lower disposal cost due to the lower quantity of filter elements required

The result is a high performance filter for the most critical applications which provides a significant reduction in the cost of filtration, without compromise to your process.

The Allipure Series is constructed from up to 8 layers of polypropylene melt blown media, graded to give progressively finer filtration as the process liquid passes through the filter bag. This ensures that the dirt loading of fine particles is distributed effectively within the filter media. A coarse meltblown prefilter layer is present, to give high dirt holding capacities and protection to the finer filtration layers, prolonging the filter bag lifetime. All constituent materials conform to FDA and EC requirements for food and pharmaceutical contact applications.

The Allipure series can be steam sterilised or hot water sanitised. It is also compatible with many sanitising agents or alternatively can be Gamma sterilised.

OA Series



The OA Series filter bags have a high oil and hydrocarbon adsorption capacity, and are available rated at 1-25 micron, at particle removal efficiencies >90%.

The filter bag has 3 or 4 layers depending on micron rating, and includes a central polypropylene microfibre layer with enhanced oil and hydrocarbon adsorption properties, and an outer cover to eliminate fibre migration and give added support to the filter media. It is constructed with sewn seams, with a choice of any ring type, including our **Welseal** polypropylene collars.

Originally designed to remove silicones and fluorocarbons from electrocoat paints in the automotive industry, like all our filter bags, the OA Series is manufactured under silicone free conditions.

The OA Series has excellent particle removal efficiencies, and therefore is not only used in applications requiring the oil absorbent properties of the filter media. For example, the OA Series is well suited to applications requiring an increase in filtration efficiency compared to using standard 1-25 micron felt bags which perform to an efficiency of around 60% or industrial filter cartridges.

To give longer service lifetimes, the OA filter media can also be combined with a prefilter layer of our standard needlefelt or extended life filter media.

500 Series

The 500 Series filter bag from Allied Filter Systems Ltd contains in excess of 5m² of materials, and provides a very high oil and dirt holding capacity at high efficiency. It is constructed from 100% meltblown polypropylene microfibre filter media, giving a broad chemical compatibility.

The constituent media has enhanced oil absorbent properties, and coupled with the high surface area, the 500 Series is most commonly used for applications where a high amount of oil absorbance is required. For example, it is widely used in the automotive industry for heavily contaminated electrocoat baths.

The multi layered construction provides an exceptional depth of filter media, around 50mm. The layers of oil absorbent media are separated by drainage layers, ensuring a good flow of liquid and minimising the pressure drop across the filter bag. The outer layers of the filter provide an effective final filtration of the process fluid, retaining very high levels of solids. Particle retention is >95% at the stated micron rating.

The depth of the filter media makes the 500 Series very effective at filtering fluids containing gels or deformable particles.

The 500 Series is manufactured with either fully welded seams and our **Santaseal** ring for optimum performance, or sewn seams with steel or stainless steel ring.

It is available rated at 1-25 micron in size 1 and size 2 only.

Filter Bag Size	Maximum Recommended Flow Rate	Dirt Holding Capacity	Oil Absorption Capacity	Clean Differential Pressure Drop
1	6m³/hr	0.5kg	2.5kg	0.025 Bar @ 6m³/hr
2	12m³/hr	1kg	5kg	0.05 Bar @ 12m³/hr

Filter Bag Housings

Allied Filter Systems Ltd offers a wide range of filter bag housings, to meet all application requirements and budgets. Most commonly constructed from Stainless steel 304 or 316L, they are available in all standard sizes with a variety of connection types and orientations.

All housings are manufactured and designed to meet current European Pressure Equipment Directives.

Whilst universally fitting traditional sewn steel ring type bags, best performance is achieved with Welseal plastic collar filter bags. For detailed information on our range of filter bag housings, see separate brochure.

HD Series

Top entry filter housing manufactured from investment cast components. Suitable for the most demanding applications and gives 360º filter bag sealing. Compact heavy duty design, giving ease of use and ability to have inline connections.

RBF Series

Side entry, recessed basket filter housing with heavy duty internal basket seating ring. Suitable for a wide range of applications, and especially recommended for filtration of viscous fluids.

RBF Profile series

Side entry, mid priced recessed basket filter housing suitable for a wide range of applications. Features our unique profiled body to seat filter basket and filter bag.

RBFD Series

Side entry, economically priced vessel, featuring v-clamp band closure system.

RBFS series

Unique mini series filter bag housing featuring easy to use screw on lid.

Dual and multi bag housings

For higher flow rate applications, ranging from our twin bag filter housings through to 24 bag vessels with a variety of designs and closure systems. Housings containing 4 bags or more can be provided with our quick closure system, with 'weightless feel' counterbalanced lid.

Modular and manifolded systems

For applications requiring a number of housings which can be selectively isolated for bag changeout whilst leaving others operational, a variety of manifolded and valved systems are available which can be designed to be modular for future expansion.

Allied Filter Systems Ltd

The UK's leading manufacturer and supplier of filter bags and equipment for process industries



Allied Filter Systems Ltd recognise environmental management as among the highest priorities within our business. Our working practices minimise waste generation and resource consumption to safeguard the environment. We continually assess and improve the environmental impacts of our business and work with our suppliers and customers to help develop more environmentally friendly processes and products.

Allied Filter Systems Ltd

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