



HAYWARD® FILTRATION

FILTER BAGS



HAYWARD

manufacturer of



HAYWARD®

A History of Innovation

In 1923, HAYWARD Industries began manufacturing specialty metal valves and industrial flow control products. Since then, HAYWARD has evolved through key acquisitions, technological advances and product innovations into two global business groups, HAYWARD Pool Products and HAYWARD Industrial Products. HAYWARD Pool Products is now the world's largest manufacturer of swimming pool equipment. HAYWARD Industrial Products is comprised of three divisions: HAYWARD Plastic Flow Control Systems, one of the largest industrial plastic valve manufacturers in the United States; HAYWARD Separation Systems, the largest manufacturer of metal pipeline strainers in the world; and HAYWARD Filtration, a leading manufacturer of industrial bag and cartridge filters for liquid filtration systems.

HAYWARD Industries entered the filtration market in 1994 with a specialized line of industrial and commercial filtration products. Acquiring the American Felt and Filter's Filtration Division in 1996 added bag filters and filter media to HAYWARD's product mix, while acquiring Germany's LOEFFLER® Filter-Technik in 1998 greatly expanded HAYWARD's bag filtration product line. In 1999, the acquisition of GAF® Filter Systems established HAYWARD as the world's premier supplier of liquid bag filtration products.

GAF Filter Systems developed the concept of liquid bag filtration over three decades ago, building it into the sophisticated filtration systems that are available today. In fact, every existing bag filtration system today is modeled on GAF Filter Systems' original patents.

For more than 40 years, LOEFFLER developed innovative advances in multi-bag filtration vessels for liquid filtration systems, including a unique quick opening cover that greatly reduced bag change-out times, and a tangential outlet which reduced vessel height, making it easier to access the filter bags. These companies' more than seven decades of bag filtration expertise have merged under the HAYWARD banner. As a result, HAYWARD now far exceeds the capabilities of any other manufacturer, and continues to evolve as one of the largest manufac-

turers of single and multi-bag filtration systems in the world. HAYWARD Filtration is a worldwide manufacturer of an innovative line of bag and cartridge filters for liquid filtration. Today, HAYWARD has seven manufacturing facilities located in North America, South America, Europe, and Asia, a total of 26 company-owned sales offices, and an independent distribution network that serves HAYWARD Filtration customers in 45 countries.

In 2000, HAYWARD introduced the merger of the LOEFFLER and GAF Filter Systems product lines as the "The Power of One." The combined know-how and experience of these two leading companies, backed by HAYWARD's resources, gives our customers an improved, ever-evolving product portfolio of the finest filtration systems available.

HAYWARD Precision in Filtration. A Whole New Way to Think About Bag Filtration Systems

Setting New Technology Boundaries

Demanding or critical liquid filtration applications require high performance filtration media. This media may have to be more efficient, stronger, longer lasting or conform to specific standards. Sometimes, a unique combination of these qualities can be required.

HAYWARD has developed a range of filter bags that meet these stringent media requirements. The convenience and economy of liquid bag filtration is now feasible for filtration applications that previously required other, more expensive systems.

Change the way you've been thinking about filter bags...and explore the range of filter bags described in this catalog. You may find solutions to your most difficult filtration challenges here. Today's bags are capable of performing in applications that, in the past, required more complex and expensive filtration systems.

After you have finished reading about these special filter bags, contact us. Because demanding or critical applications can be complex, a HAYWARD Applications Specialist is available to perform a no-obligation analysis of your process. Learn how one of these high performance filter bags can work in your system, whether your system already exists or is in the design stage, and the improvements you can expect...before you make any commitment.



PROGAF™, ACCUGAF™, LOFCLEAR™, DURAGAF™, HAYFLOW™
CLEARGAF™, SENTINEL®, SNAP-RING® and BANDSEAL™

TABLE OF CONTENTS

6 What's Behind Every HAYWARD Precision Filter Bag

A quick look at what makes a HAYWARD high performance filter bag and the technology behind it.



8 Applications

An overview of some of the thousands of filtration processes that can be improved and made more efficient or cost effective with HAYWARD High Performance Filter Bags.

10 PROGAF™ Filter Bags

A revolution in filter bags. PROGAF™ combines a high-efficiency media with a high capacity pre-filter for effective particulate removal down to the submicron level.



14 ACCUGAF™ Filter Bags

Highly efficient filter bags that have an extremely high particle retention efficiency. Applications that require this high filtration efficiency can now take advantage of bag filtration with HAYWARD's ACCUGAF™.

16 LOFCLEAR™ Filter Bags

Highly efficient filter bags with a special multi-layer construction that results in a better than nominal efficiency in demanding applications.



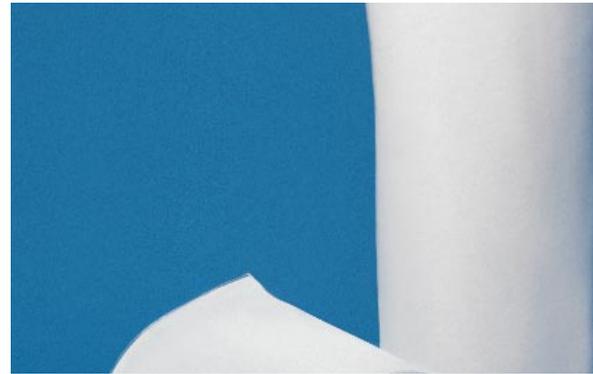


18 DURAGAF™ Filter Bags

Features increased media thickness with finer fibers for high pore volume. Reduced time between bag changings improves operating efficiencies and reduces operating costs. Discover how DURAGAF™ can work better in your application.

20 CLEARGAF™ Filter Bags

For food, beverage and pharmaceutical applications, most HAYWARD filter bags can be manufactured, packaged and stored to meet EEC and FDA requirements.



21 BANDSEAL™

Tie-on filter bags for filtration without a vessel.



22 SENTINEL®

All-welded construction bags for higher filtration efficiency. Patented ring seal with a positive click for worry-free sealing-assurance.

23 SNAP-RING®

Sewn construction filter bag for less demanding applications.



24 HAYFLOW™

HAYWARD's revolutionary new filter element.



FILTER BAG FEATURES

What Makes a HAYWARD Filter Bag Better?

State-of-the-art media ... advanced construction ... quality control ... customer service ... application specialists ... in short, the entire HAYWARD organization teams up to bring you the most advanced bag filtration solutions available. HAYWARD has applications specialists available around the world to help first-hand with difficult, demanding applications. On-site trials demonstrate the best filter bag for any new application. Expert system software makes system sizing and optimisation simple and effective. In short, commitment to our customers packs value-added quality into every product we sell.

Advanced Filter Design

Starting with unique element design and ending with patented sealing technology, HAYWARD products deliver performance in simple or complex applications. Multi-layer constructions, pleated extended surfaces, fully-welded constructions and pressure-activated seals are only some of the features which make HAYWARD filter bags the most advanced in the world. This range of design and construction offers filtration solutions over the full spectrum of fine filtration applications.

Advanced Filtration Media

No other range of filtration products can bring the wide range of filtration media and construction to either simple or demanding applications. Progressive structure media deliver efficiency and media life not available in any other technology. High-purity media styles permit filtration without contamination of the fluid. Heat-stabilized monofilament meshes deliver absolute filtration ratings in almost any fluid. High-quality felts deliver the most cost-effective filtration available today for straightforward applications. In short, full-spectrum performance.

Proprietary Fabrication Technology

Whether sewn or welded, simple or complex, HAYWARD filter bags are fabricated using the most advanced techniques and equipment in the world. Highly automated welding systems produce consistent, dependable

bag construction. HAYWARD's proprietary UNIWELD™ system produces bag seals which are, at the same time, strong and flexible to conform to restrainer baskets. Food-grade products are fabricated in facilities where both the environment and materials are controlled to assure cleanliness. Repeatable, robust, cost-effective... technology working for our customers.

Rigorous Quality Standards

Every HAYWARD filter bag carries its own promise of quality to our customers. The QC tag permits full traceability of both materials and processes throughout fabrication and into service. HAYWARD ISO 9001/9002 facilities produce filter bags and vessels to standards demanded by demanding industries. From the simplest sewn filter bag to the most complex multi-layer construction, the quality is the same. No compromise ... the HAYWARD promise to its customers.

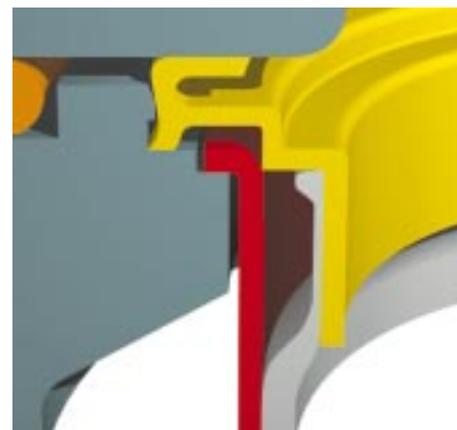
COMPASS™ Expert System Software

Select a filter ... size and optimise a system ...

search for your application. COMPASS brings over 30 years of application success to the fingertips of each HAYWARD Filtration Specialist. This breadth of experience is available in a customer's facility or over the phone, to provide rapid accurate estimates of system performance.

Worldwide Customer Support

HAYWARD has manufacturing facilities and customer support personnel located in North America, South America, Europe, Asia, Africa and Australia. There are 26 HAYWARD Regional Sales Offices and an independent, professional distribution network to serve the needs of our customers in 45 countries. Throughout



NOMINAL ABSOLUTE



In this brochure, an application key appears for each bag style. You can use this key to select a bag based on particle size range and flow rate, for size 02 bags made of standard filter bag material.

the purchase, installation, and start-up of your HAYWARD Filtration System, a HAYWARD representative is always available to ensure its performance.

THE CONTAMINANT SPECTRUM OF BAG DESIGN

Contaminant Particle Size				
Micro Filtration	Fine Filtration	Coarse Filtration		
0.1 micron	1 micron	10 micron	100 micron	1000 micron
			Monofilament Bags/SNAP-RING® Bags	
			SENTINEL® Felt Bags DURAGAF™ Felt Bags CLEARGAF™ Felt Filter Bags HAYFLOW™	
		ACCUGAF™ Filter Bags LOFCLEAR™ Filter Bags		
PROGAF™ Filter Bags				

THE CONTAMINANT SPECTRUM OF MEDIA

Contaminant Particle Size				
Micro Filtration	Fine Filtration	Coarse Filtration		
0.1 micron	1 micron	10 micron	100 micron	1000 micron
			Monofilament Mesh • Accurate, absolute • High precision	
			HAYWARD Precision Felts • Standard Needlefelt • DURAGAF™ extended life • CLEARGAF™ for purity • HAYFLOW™	
	Meltblown Precision Media • LOFCLEAR™ for purity and performance • ACCUGAF™ for absolute filtration • PROGAF™ for long life & unequaled filtration			



THE CONTAMINANT SPECTRUM OF FILTER SEALS

Contaminant Particle Size				
Micro Filtration	Fine Filtration	Coarse Filtration		
0.1 micron	1 micron	10 micron	100 micron	1000 micron
			BANDSEAL™ • Simple, effective	
			SNAP-RING® • Versatile, low-cost • Wide range of media	
	SENTINEL® CLICK-Seal • "The Best in the Business" • Seal improves with higher differential pressure • Wide fluid and temperature compatibility			



APPLICATIONS

Typical Applications for HAYWARD High Performance Filter Bags

Automotive

Filtration of pretreatment bath, filtration of E-coat, topcoat and clearcoat, primer, paint ring line filters, parts cleaning fluids, drawing compounds, lubricants, metal working fluids and pump intake filters.



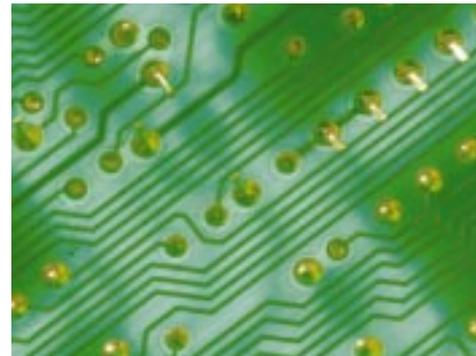
Chemical

Catalyst recovery, removal of pipe scale, polishing of aqueous process fluids, alkalis, acids and solvents, filtration of emulsions and dispersions, gel removal from resins. Activated carbon or catalyst removal in the fine chemicals industry is a typical example of a demanding application in chemical processing. HAYWARD Filter Bags meet these application requirements for high filtration efficiency coupled with long service life and reliability.



Electronics

Wafer and chip processing, electronic etching baths, photo-chemical polishing and high-purity water filtration and prefiltration of various membrane filtration processes to improve their cost effectiveness. HAYWARD Filter Bags demonstrate the required purity, efficiency and consistent performance.



Food and Beverage

Polishing filtration of wine, spirits and beer, removal of particles from edible oils, removal of carbon black from cellulose, slime removal in gelatins, liquid sugar, thick juice, corn syrup polishing, starch processing, milk processing and soft drinks. Many HAYWARD Filter Bags conform to FDA and even EEC food processing standards and can meet the unique and varied demands of these applications.



Metal Working

Filtration of hydraulic oil, pretreatment system filtration, precious metal recovery, metal working fluids, and drawing compounds. Parts cleaning machines use our filter bags for minimizing residual dirt on parts.



Petrochemicals

Filtration of lube oils, fuel additives, enhanced oil recovery, filtration of amine solutions, filtration of glycol fluids, gas purification processes, distillation and cracking processes, amine washers, off-shore filter stations, oil drilling and injection fluids.



Paint and Lacquer

Removal of agglomerates, removal of paint coagulates, solvent filtration, removal of storage contaminants, filling lines, and paint mixing lines, monomer purification.

Pharmaceutical

Recovery of expensive active ingredients, catalyst recovery, active carbon purification and removal, filtration of gelatins, hormones, vitamin extracts, polishing of herbal mixtures, protein removal from plasma, filtration of saline solutions.



Resins, Plastics, Inks and Coatings

Oil and polymer filtration, dispersions, polymerization batches, resins for can coatings, plastics compounding, printing ink, plastics processing, paper coatings, high purity ink-jet fluid filtration.



Water Treatment

Well water filtration, water treatment plants, silt removal, pipe scale removal, sand and algae removal from sea water, ion exchange resin recovery, calcium deposit removal, filtration of chemicals used for water treatment, dust removal from cooling tower installations. Surface water filtration is an area traditionally dominated by cartridge filtration. Now, the high efficiency and long life of HAYWARD High Performance Filter Bags are a cost-effective alternative to expensive cartridges.



PROGAF™

The Filter Bag that Works Better Than a Filter Cartridge



The SENTINEL plastic step-ring provides a seal between the filter vessel and the PROGAF Filter Bag. As the pressure differential rises inside the vessel, the seal becomes more efficient.

PROGAF filter bags bring a new, high-performance alternative to applications requiring absolute filtration. PROGAF's progressive density depth filtration delivers high efficiency (>99.98%) and long life with all the convenient features of a bag filter. In comparison with other filtration technologies, PROGAF delivers lower operating costs while retaining the ease of change-out typical of a bag filter.

Welded Construction for Superior Performance

All PROGAF High Performance Filter Bags feature 100% welded construction for better filtration performance. This construction ensures that nothing bypasses the process media through holes in the fabric created from sewing the material. HAYWARD's proprietary welding technology produces a super-strong seam that stands up to the most demanding applications.

PROGAF™ Filter Bags Seal Better in Critical Applications

The patented SENTINEL provides a flexible, chemically-resistant seal which adapts to any filter vessel. This unique design employs a pressure-activated sealing lip which responds to increases in differential pressure. As the pressure increases, the seal of the ring improves, guaranteeing bypass-free performance over all ranges of pressure, temperature and micron rating. The elevated bag handles make removal quick and easy.

Unique Progressive Density Media Structure

PROGAF filter bags utilize an advanced media structure developed specifically to deliver both long life and absolute filtration. PROGAF's progressive density design uses up to 12 layers of media which become finer and finer as fluid passes through. The result is a gradual removal of contaminant without any single layer blinding prematurely. Application

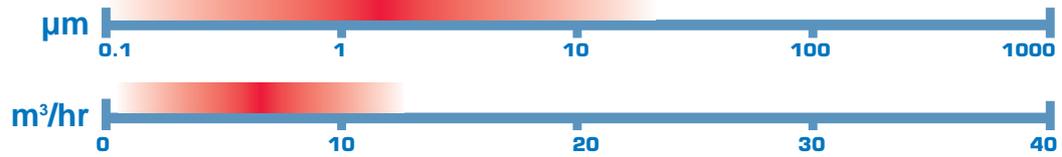


PROGAF™ Filtration Ratings

Filter Model	Particle Size at Common Removal Efficiencies (µm)					ΔP (bar) Size 02 @10m³/h
	>60%	>90%	>95%	>99%	>99.9%	
PGF 50	-	-	.15	.45	1	0.25
PGF 51	>80@0.15	.3	.45	.5	2	0.17
PGF 55	1	3	6	10	12	0.06
PGF 57	8	13	16	20	25	0.02

Filtration efficiency confirmed by independent test laboratory

ABSOLUTE



and laboratory tests confirm that PROGAF bag filters deliver longer service life and lower operating costs than any other renewable filter element. The 100% polypropylene construction provides pure, silicone-free materials in an economic, self-contained, easily disposable filter bag.

Filtration Efficiencies Of Up To +99,98%

PROGAF High Performance Filter Bags from HAYWARD have performance efficiencies of over +99,98%....true absolute filtration. In many filtration applications of 1 micron and above, PROGAF Filter Bags can replace expensive cartridge filtration systems and provide better performance while saving time and money. Ask your HAYWARD Filtration Specialist for “real world” documented case histories, illustrating how PROGAF Filter Bags have performed in applications similar to yours.

The PROGAF™ Difference

Ordinary standard filter bags are made from needled felt media that has a fiber structure that is not as fine and precise as the filtration grade melt blown media used for PROGAF Filter Bags. The needled fibers are much larger in size and spaced much further apart, yielding a lower efficiency. PROGAF Filter Bags have been designed to deliver calibrated fractional efficiency on very small particles, down to less than one micron. The bags feature a completely welded construction and the unique, patented SENTINEL Sealing Ring. And all PROGAF Filter Bags have a round bottom shape for increased pressure stability.



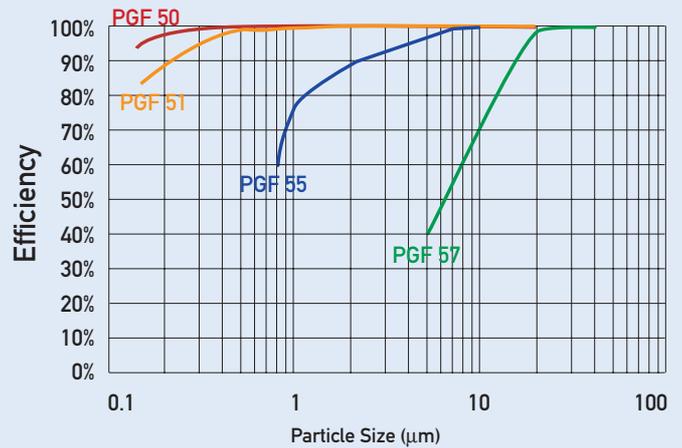
Unique layered construction structure

Choose Just the Filtration Efficiency Your Application Needs

PROGAF Filter Bags are available in efficiency codes of 50, 51, 55 and 57. To select the perfect PROGAF Filter Bag for your application, choose the micron retention efficiency level you need on the left side of the chart at particle size in microns at the bottom. Next, locate the bag efficiency code (identified by the colored lines) that is closest to that point. There you have it: the most cost effective filter bag for your critical filtration application.

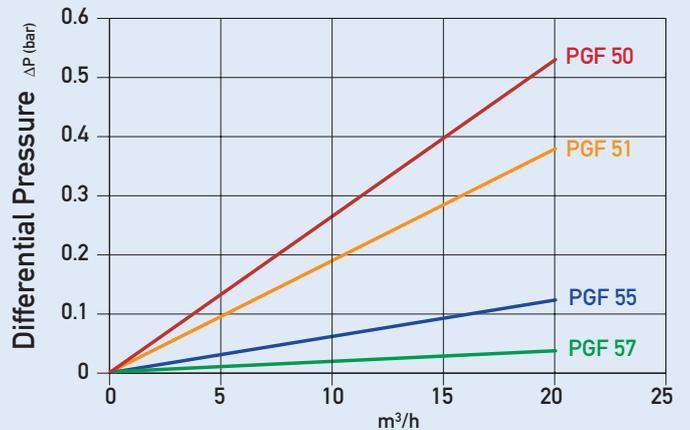
Fractional Efficiency of PROGAF™ Filter Bags

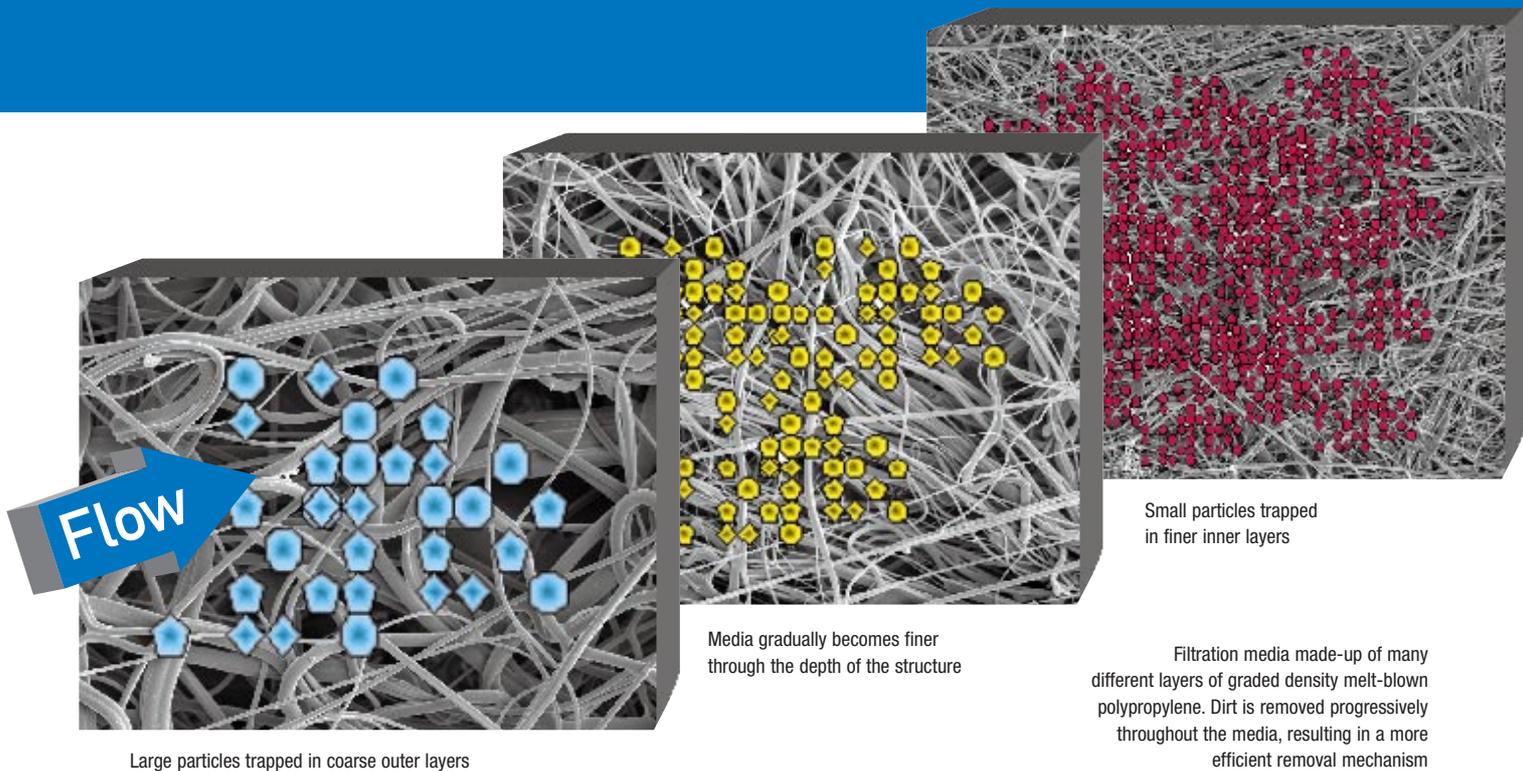
(ISO Fine in water at ambient conditions @ 10m³/h)



CleanΔP of PROGAF™ Filter Bags

(Water at ambient conditions)





Large particles trapped in coarse outer layers

Media gradually becomes finer through the depth of the structure

Small particles trapped in finer inner layers

Filtration media made-up of many different layers of graded density melt-blown polypropylene. Dirt is removed progressively throughout the media, resulting in a more efficient removal mechanism

Some Typical PROGAF™ Applications

All materials used in the construction of PROGAF Filter Bags, including the multilayer melt-blown polypropylene media, are FDA/EC listed materials that meet their requirements for food contact applications. But food or beverages are not the only applications that can take advantage of PROGAF's high filtration efficiencies and capacity retention. The pharmaceutical, micro-electronics, chemical, food, ink and paint, and water treatment industries can also use PROGAF High Performance Filter Bags.

Chemical and Pharmaceutical Industries

Demanding filtration in high-purity industries are the applications PROGAF was made for. Media capable of removal to 2 µm absolute with long service life is essential for activated carbon removal or catalyst recovery. Gel removal requires a deep matrix of fine fibers. A PROGAF bag is ideally suited for each of these applications. Available in four filtration ratings, one of the PROGAF bags will deliver just the needed performance.

Water Filtration

Water filtration applications have traditionally been dominated by cartridge filtration. Following extensive worldwide trials, PROGAF 51 has demonstrated a log 3.5 reduction of impurities in these demanding applications.

Micro-Electronics

These applications typically require chemicals that are constantly filtered to extremely low levels of particle contaminant. PROGAF's special profile, with its high efficiency media and graded density structure, provides performance characteristics superior to that of traditional cartridge type filtration. PROGAF out-performs cartridges in terms of dirt-holding capacity, service life, and cost. Membrane prefiltration significantly reduces the SDI values in water filtration.

Compare PROGAF™ to Filter Cartridges and See the Difference

The two charts on the next page graphically illustrate the advantages of PROGAF High Performance Filter Bags over different types of filter cartridges. PROGAF Filter Bags and filter cartridges come in many shapes and sizes. Compare PROGAF Filter Bags with their cartridge equivalent in material, micron rating and industry qualifications. Progressive structure of PROGAF filter bags delivers operating differential pressure which starts and remains lower during filter life than other comparable filters. The chart shown here illustrates the results of actual comparison tests made against two common styles of cartridge filters: depth-loading and pleated polypropylene. During laboratory loading tests, the PROGAF filters remained at the lowest differential pressure of any of the three over

the life, illustrating the effectiveness of the progressively structured media.

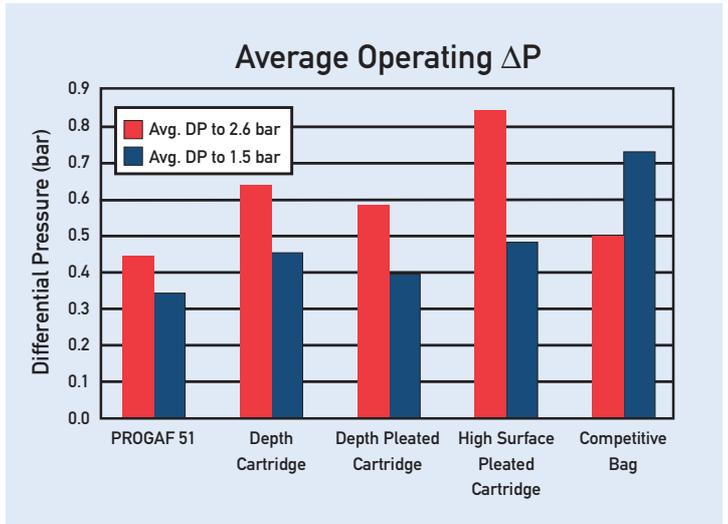
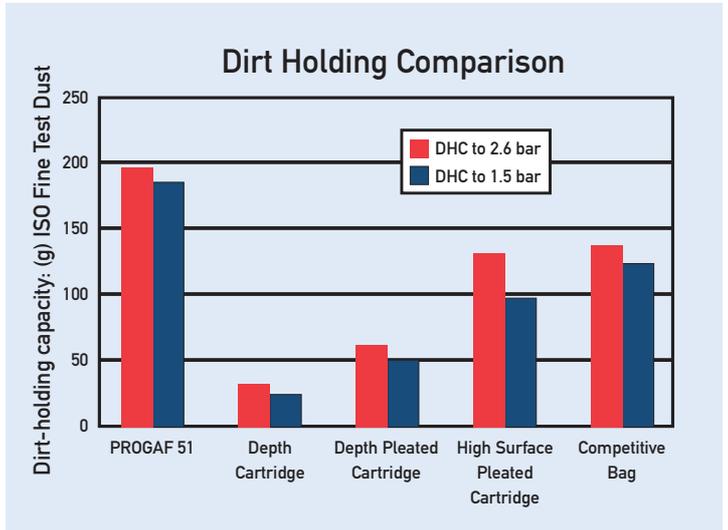
OPERATIONAL CONSIDERATIONS

Bag Positioner

To ensure proper performance, PROGAF Filter Bags must be used with the HAYWARD Bag Positioner. Using them together aids bag insertion into the filter vessel and assures correct alignment of the bag inside the restrainer basket, prevents the bag from being pushed out of the restrainer basket in case of reverse flow, and makes bag removal easier.

Pre-Wetting in Aqueous Solutions

PROGAF filter bags are fabricated from fine polypropylene filtration media. This material is hydrophobic, which means that water will not wet the surface of the fibers. Therefore, a fluid with lower surface tension must first be used to wet the fibers, as well as cartridge filters made from this material. Prior to installation, you must first immerse the bags for a few minutes in a wetting solution compatible with the process fluid. After the fibers are wet, water is drawn in by capillary action. Full details about how to install and pre-wet PROGAF Filter Bags are provided in the installation instructions.



PRODUCT CODES



ACCUGAF™

ACCUGAF™, Filter Bags for Applications Demanding Efficiency >99%

The ACCUGAF filter bag from HAYWARD pushes the boundaries of bag filtration technology far beyond traditional designs. With efficiencies >99%, each ACCUGAF model provides cost-effective filtration solutions for demanding applications. The five models assure users that particles from the range of 1-25 microns can be removed effectively while delivering long service life

High-Efficiency Performance

ACCUGAF filter bags feature:

- 100% welded seams
- HAYWARD patented SENTINEL seal ring
- Meltblown filtration media in polypropylene or polyester
- No additives, such as resins, binders or surface treatments

FDA Compliant Materials

ACCUGAF filter bags are constructed entirely of materials compliant to FDA requirements for materials in contact with food. All materials conform to US Code of Federal Regulations 21 CFR Part 177 and EC Directive 90/128/EEC.*

Applications

Although ideally suited for food and beverages, ACCUGAF filter bags will deliver equal performance in a wide range of demanding applications such as:

- Beer, wine, spirits and beverage filtration
- Fine particle removal in parts cleaning
- Final filtration of lacquers
- Final filtration of vinegar
- Activated carbon removal in process systems
- Final filtration of hydraulic oils and lubricants

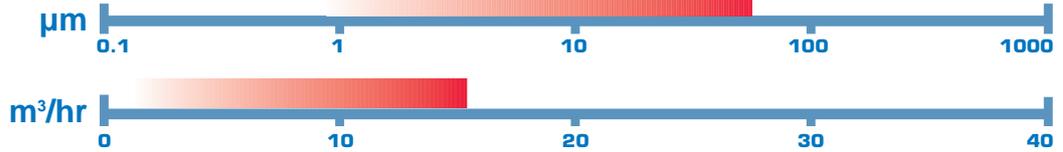
ACCUGAF Filtration Ratings

Material	Filter Model	Particle Size at Common Removal Efficiencies (µm)					ΔP (bar) Size 02 @10m ³ /hr	Max Op. Temp (°C)
		>60%	>90%	>95%	>99%	>99.9%		
Polypropylene	AGF 51	0.2	0.6	0.8	1.5	5	0.09	90
	AGF 53	0.8	1	2	3	4	0.22	90
	AGF 55	1	2	3	5	15	0.05	90
	AGF 57	2	4	5	10	25	0.04	90
	AGF 59	10	25	30	25	35	0.03	90
Polyester	AGFE 51	0.2	0.6	0.8	1.5	5	0.09	150
	AGFE 55	1	2	3	5	15	0.05	150
	AGFE 57	2	4	5	10	25	0.04	150

Filtration efficiency confirmed by independent testing laboratory.

*Polypropylene only

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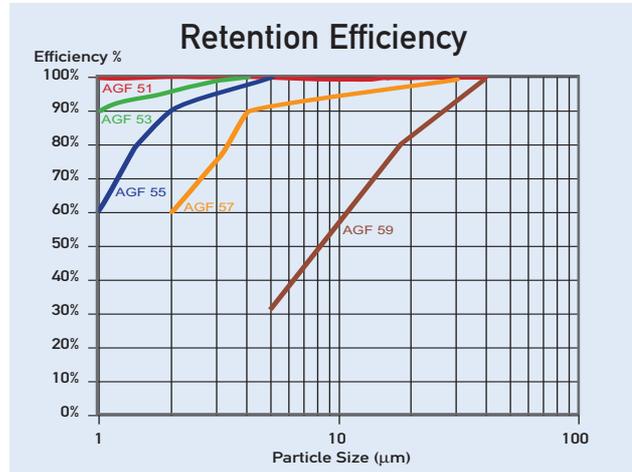
OPERATIONAL CONSIDERATIONS

Bag Positioner

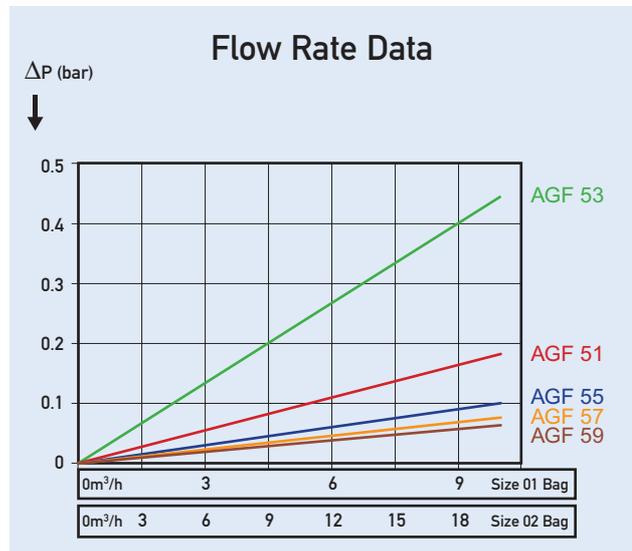
ACCUGAF filter bags must be used with the HAYWARD bag positioner. This eases insertion and assures correct alignment of the filter bag inside the restrainer basket. In addition, the filter bag will be protected against damage to inadvertent back-flow.

Pre-Wetting in Aqueous Solutions

ACCUGAF polypropylene filter bags are fabricated from microfiber filtration media. These materials are hydrophobic, indicating that water will not wet the fiber surfaces. As will all other fine polypropylene filters, a lower surface tension fluid (wetting agent) must be used to wet the media prior to introducing water. Prior to service, the filter bags must be immersed in a wetting solution compatible with the process fluid. After wetting, an aqueous fluid will be drawn into the media through capillary action. Full details about installation and wetting are provided with every box of ACCUGAF filter bags.



ACCUGAF Filter Bags, are available in retention codes of 51, 53, 55, 57, and 59. To select the perfect ACCUGAF Filter Bag for your application use the chart and choose the retention efficiency level you need on the left side of the chart at particle size in microns at the bottom. Next find which bag efficiency code (identified by the colored lines) is closest to that point. There you have it, the most cost effective filter bag for your critical filtration application.



PRODUCT CODES

ACCUGAF™ AGF: polypropylene melt-blown AGFE: polyester melt-blown		E: Polypropylene Mesh R: Polyester Mesh		E: PP SENTINEL® Ring H: Hytrel SENTINEL® Ring		Bags/Box 10/15	Box Size M/L
AGF Bag Material	53 Micron Rating	E Bag Cover Layer	02 Bag Size	E Collar/Ring Type	0 Bottom Shape	10M Packaging	
AGF	AGFE		Code	Size	Area	round bottom	
51	51		01	ø 180 mm x 435 mm L	0.24 m²		
53	-		02	ø 180 mm x 810 mm L	0.48 m²		
55	55						
57	57						
59	-						

LOFCLEAR™

Cost Effective Filter Bags for Absolute Filtration Applications

LOFCLEAR filter bags now make absolute filtration viable in many applications where only standard bags could be used due to cost constraints. Made from 100% pure polypropylene materials compliant with food requirements, LOFCLEAR filter bags contain no leachables or lubricants such as silicone oils. In addition, their excellent oil adsorbancy makes LOFCLEAR filter bags ideally suited to the oil removal needs of the paint and coatings industries.

Two Series to Match Filters to Applications

LOFCLEAR filter bags are available in two styles, Series 100 and Series 500. These two styles make it possible to match the requirements of a wide range of applications, depending on the needs for efficiency and long life. The Series 100 filters use a multi-layer construction for applications where high efficiency is of prime importance. The Series 500 filters utilize a patented pleated construction to increase surface area for applications requiring high dirt capacities and long life.

Perfect for Removal of Gelatinous Materials

LOFCLEAR filter bags have proven to be highly effective in the removal of gelatinous contaminants. The combination of deep microfiber filtration media breaks up gels and



retains them within the media depth. These features prevent surface blockage and breakthrough typical of standard filter bag materials.

LOFCLEAR™ Series 100 Filter Bags

LOFCLEAR Series 100 Filter Bags feature a proven three-layer construction with a sewn filter welded to the HAYWARD SENTINEL seal. They feature efficiencies >99% over a wide range of particle sizes, with dirt capacities up to 250 g. The seven models feature:

- Polypropylene prefilter
- Meltblown polypropylene microfiber final filter
- Polypropylene outer migration barrier

LOFCLEAR Series 100 filter bags are an excellent choice for application such as high-purity fluids with low particulate concentration, first-pass guard filtration, oil adsorption and activated carbon removal.

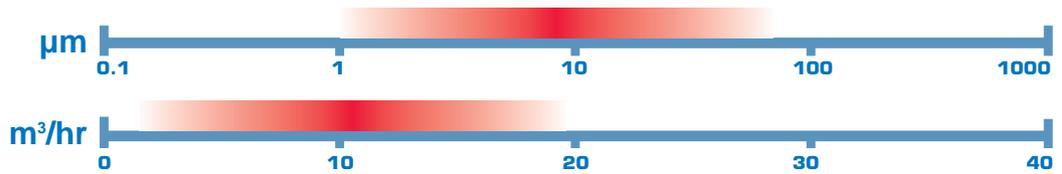
The LOFCLEAR 128 and 129 were especially developed for the filtration of electro-coatings in the automotive industry. The filtration design allows pigments to pass through the filtration layers, while retaining impurities and removing silicones and other crater-forming substances. The LOFCLEAR 130 filter bag adds extra adsorption capacity for retaining high amounts of oils or other crater-forming substances. The LOFCLEAR 135 delivers high removal of particulate and oils for clearcoat applications where pigment removal is not an issue.

LOFCLEAR™ Filtration Ratings

Filter Model	Particle Size at Common Removal Efficiencies (µm)				ΔP (bar) Size 02 @10m ³ /hr
	>60%	>90%	>95%	>99%	
113/123	0.5	1	2	4	0.025
114/124	0.75	2	3	5	0.02
115/125	1.5	3.5	8	10	0.01
116/126	2	6	13	15	<0.01
118/128	9	20	24	30	<0.01
119/129	15	25	30	50	<0.01
130	6	14	15	20	0.05
135	1	6	8	10	0.02
522	0.5	1	1.5	2.6	0.13
525	1	2	3.5	6	0.08
527	2	5	9	13	0.008
529	10	20	23	32	<0.005

Filtration efficiency confirmed by independent test laboratory.

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LOFCLEAR™ Series 500 Filter Bags

LOFCLEAR Series 500 Filter Bags have an all-welded multi-pleated construction for high efficiency and long life. This series of bags has a pleated prefiltration layer and a complex design of final filtration layers, allowing the removal of difficult-to-filter gels and deformable particles with a high capacity of solids loading. The outer web covering eliminates any downstream fiber migration.



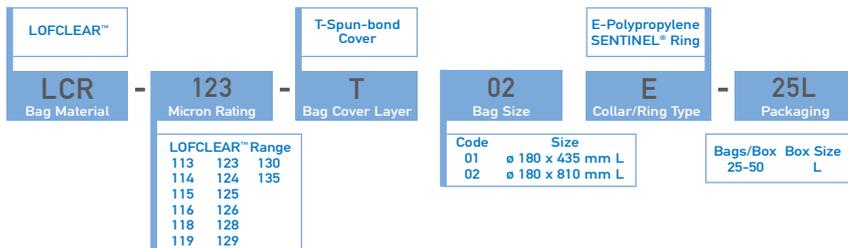
LOFCLEAR Series 500 Filter Bags are available in four different efficiency ratings so you can choose your exact required filtration efficiency. LOFCLEAR Filter Bags have filtration efficiencies from 95 to 99%, with a dirt-holding capacity of over 1000g.



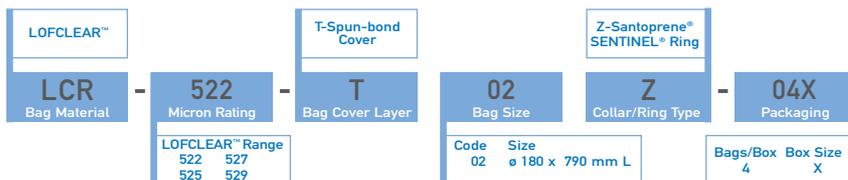
Among the many applications for LOFCLEAR Series 500 Filter Bags are oils, slurries, dilute oil removal, re-circulating batch systems, and systems with heavy contamination.

A pleated prefilter provides a very large surface (about 3m²) to collect gels and solids before it reaches the final filter layers.

PRODUCT CODES 100 series



PRODUCT CODES 500 series



DURAGAF™

Extended Life Filter Bags Can Improve Your Filtration Process and Save You Money

DURAGAF™ for High Performance

Extended Life Filter Bags Designed to Save You Money
DURAGAF filter bags represent the state-of-the-art in needled felt bag filter media. Their unique structure delivers equal filtration performance with lifetimes 2-5 times longer than ordinary felt media. The result is reduced operating costs due lower bag consumption, downtime, change-out labor, storage and disposal.

Why DURAGAF Filter Bags Last Longer

DURAGAF filter bags are available in two extended life materials: polypropylene (code POXL) or polyester (code PEXL). These two materials utilize a fiber blend with a finer fiber diameter and a higher weight than ordinary media. The result is a dramatically higher dirt holding capacity at the same efficiency and differential pressure. Processes run longer and need fewer bag changes with DURAGAF filter bags.

All-Welded Construction for Superior Performance

All DURAGAF filter bags feature 100% welded fabrication and the HAYWARD SENTINEL seal. This construction eliminates the bypass which can occur in standard sewn filter bags. HAYWARD proprietary welding technology produces a super-strong seam that will stand up to even the most demanding applications without failure.

DURAGAF Filter Bags Seal Better in Critical Applications

The patented SENTINEL seal is standard on all DURAGAF filter bags. The unique, pressure-actuated ring actually improves its seal as differential pressure increases.

No Downstream Fiber Contamination

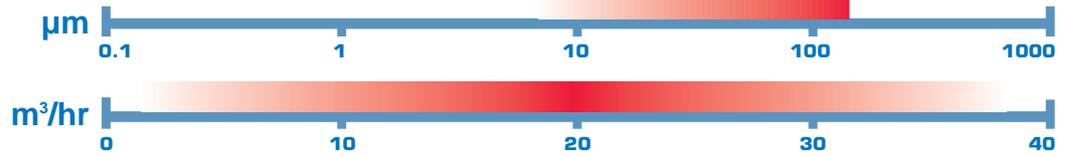
All DURAGAF filter bags are manufactured with a proprietary downstream surface treatment to prevent fiber migration. A special finish is obtained by glazing the surface, melting fibers together to form a tight, secure downstream matrix. In addition, the weld seams are heat bonded to eliminate loose fibers which might result during fabrication.

Food and Beverage Applications

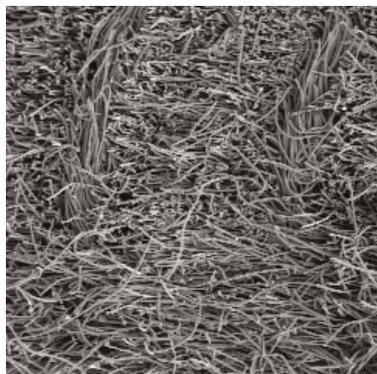
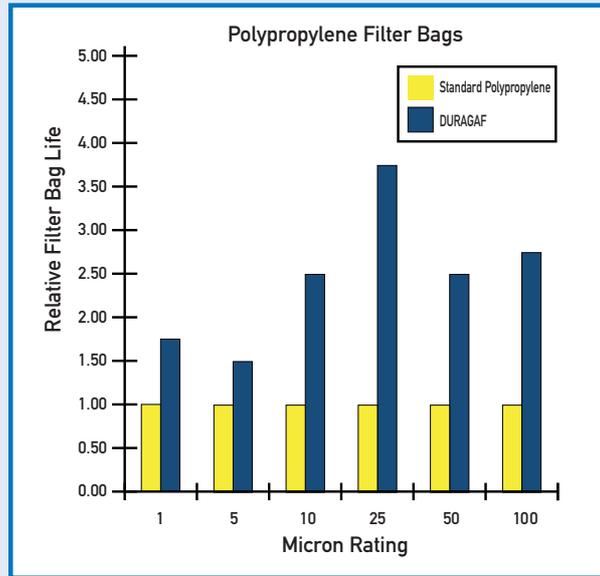
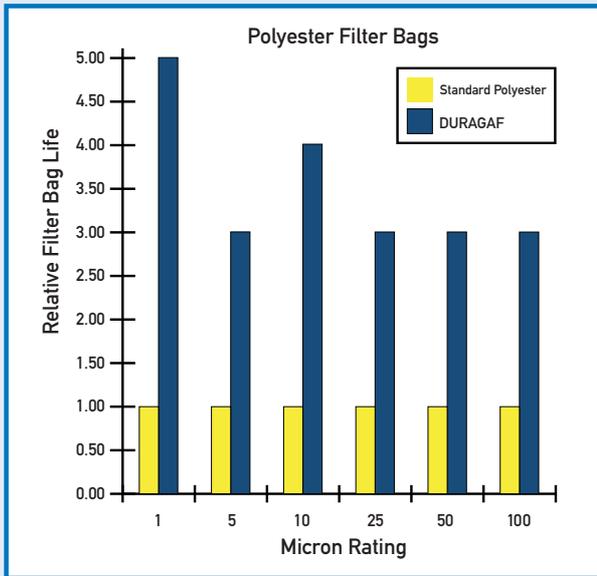
DURAGAF filter bags are available in models (POXLF, PEXLF) which are compliant with FDA and EC requirements for food contact.



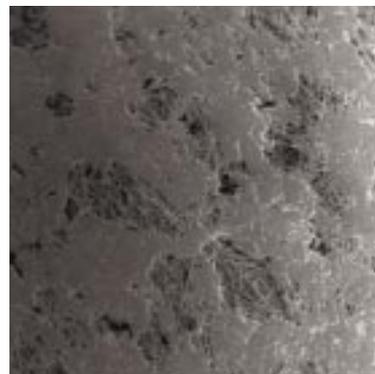
NOMINAL



How much longer will a DURAGAF™ Filter Bag last in your application?



Extended Life Felt
finer fibers
more pores
thicker media



Surface of Extended Life Felt
no fiber release
full flow through surface channels

PRODUCT CODES

DURAGAF™ POXL: Polypropylene PEXL: Polyester POXLF: Polypropylene Food Grade PEXLF: Polyester Food Grade		P: Plain	E: Polypropylene SENTINEL Ring, Welded (POXL)/(POXLF) H: Hytrel SENTINEL Ring, Welded (PEXL) Z-WW: Santoprene SENTINEL Ring, Welded (PEXLF)																			
POXL Bag Material	50 Micron Rating µm	P Bag Cover Layer	01 Bag Size	E Collar/Ring Type	30L Packaging																	
<table border="1"> <thead> <tr> <th>POXL/PEXL</th> <th>PEXLF</th> <th>POXLF</th> </tr> </thead> <tbody> <tr> <td>1 5</td> <td>1 5</td> <td>5 10</td> </tr> <tr> <td>10 25</td> <td>5 10</td> <td></td> </tr> <tr> <td>50 100</td> <td>10</td> <td></td> </tr> </tbody> </table>			POXL/PEXL	PEXLF	POXLF	1 5	1 5	5 10	10 25	5 10		50 100	10		<table border="1"> <thead> <tr> <th>Code</th> <th>Size</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>ø 180 x 430 mm</td> </tr> <tr> <td>02</td> <td>ø 180 x 810 mm</td> </tr> </tbody> </table>		Code	Size	01	ø 180 x 430 mm	02	ø 180 x 810 mm
POXL/PEXL	PEXLF	POXLF																				
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10 25	5 10																					
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			<table border="1"> <thead> <tr> <th>Bags/Box</th> <th>Box Size (mm)</th> </tr> </thead> <tbody> <tr> <td>30</td> <td>L: Large</td> </tr> </tbody> </table>			Bags/Box	Box Size (mm)	30	L: Large													
Bags/Box	Box Size (mm)																					
30	L: Large																					

CLEARGAF™



CLEARGAF™ Fully Compliant and Approved for Food and Beverage Service

CLEARGAF™ Features Deliver Advanced Benefits

- Compliant materials assure compatibility with all food applications. Sewn bags use special lubricant-free thread
- Independent verification guarantees conformity to EC and FDA requirements
- Low-migration media minimizes substances introduced to fluids
- SENTINEL® Ring Bag Seals eliminate fluid bypass
- All-welded construction eliminates fluid bypass through needle holes on felt and multi-layer filter bags
- Controlled production eliminates contamination from handling and environmental conditions
- Single packaging keeps bags free from contamination during shipping, storage and installation
- Special handling & storage ensures that there is no contamination after packaging

CLEARGAF is the first and only series of filter bags specifically designed for the requirements of the food, beverage and pharmaceutical industries. Comprised of several filter styles, CLEARGAF is the only filter bag to deliver:

- Fully FDA compliant materials per 21CFR177
- Fully EC compliant per 90/128/EEC
- Independent testing and certification
- Special single packaging and warehouse control

CLEARGAF™ Filter Bags for Direct Contact with Foodstuffs

Filter Bags are widely used for the filtration of fluids that are directly or indirectly used as foodstuffs. In most applications, these types of filters must be carefully selected to ensure that foodstuffs are not contaminated from their use. Most materials used to manufacture disposable filters, including bag filters and cartridge filters, are polymers, which are generally selected for their purity in the application. Many of these materials, however, contain materials that can diffuse out of the plastic into the process fluid. This effect, known as migration, can lead to foodstuff contamination. For this reason, the use of polymers is often limited to products such as CLEARGAF Filter Bags, which are made from materials that have been documented as safe in food applications. CLEARGAF Filter Bags conform to both US FDA and European EC regulations. The difference between the FDA and EC regulations is one of degree. FDA regulation

limits on migration are proportional to weight. EC limits, however, are based on area, and must be demonstrated in tests on finished articles. For heavy material, the EC limits can be up to 50 times more restrictive than the FDA ones.

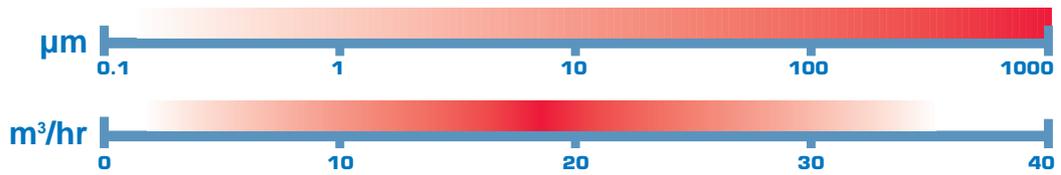
Independent Verification

You can be sure all CLEARGAF Filter Bags meet these requirements, because they have been evaluated, tested and certified for EC migration performance by an independent food research institute. CLEARGAF Filter Bags are also made only from materials listed in the US Code of Federal Regulations Title 21 Part 177. No other materials are added during fabrication.

Special Manufacturing and Packaging

CLEARGAF Filter Bags are manufactured under special conditions to ensure that they contain no contamination. Immediately after manufacture, each bag is individually sealed in protective plastic packaging to keep them contamination-free. HAYWARD has special warehousing facilities for CLEARGAF Filter Bags to further protect them during storage. No other manufacturer goes to these lengths to ensure the quality of their food grade filter bags. For less demanding food and beverage applications, HAYWARD offers a line of cost effective filter bags that are appropriate for many applications.

ABSOLUTE/ NOMINAL



Selection Chart

	Max. Temp (°C)	Sizes				Available Grades											Ring Style			
		01	02	03	04	1	5	10	25	50	80	100	150	200	250	400		600	800	
PEF	140	█	█			█	█	█	█											Z
PEXLF	140	█	█			█	█	█												Z
POF*	90	█	█			█	█	█	█	█		█								E
POXLF*	90	█	█			█	█													E
NMOF	140	█	█	█	█					█	█	█	█	█	█	█	█	█	█	Z
AGF*	90	█	█																	E
PGF*	90	█	█																	E

*Products subject to MPQ in Europe applications. See Technical Bulletin TB990801 for full details.

PRODUCT CODES

- PEF: polyester needelfelt
- PEXLF: extended life polyester needelfelt
- POF: polypropylene needelfelt
- POXLF: extended life polypropylene needelfelt
- NMOF: nylon monofilament
- AGF: polypropylene meltblown
- PGF: polypropylene meltblown

CLEARGAF™

PEF
Bag Material

25
Micron Rating µm

CLEARGAF Range
1, 5, 10,
25, 50, etc.

P
Bag Cover Layer

E: Extruded mesh (for AGF, PGF)
P: Plain (no cover) (for needlefelts)

E: PO SENTINEL® Ring
Z-WW: SANTOPRENE®
SENTINEL® Ring

01
Bag Size

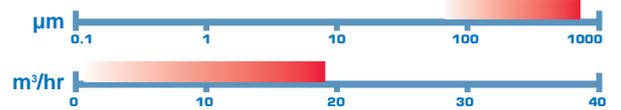
Z-WW
Collar/Ring Type

40L
Packaging

Code	Size
01	ø 180 mm x 430 mm L
02	ø 180 mm x 810 mm L
03	ø 100 mm x 230 mm L
04	ø 100 mm x 380 mm L

BANDSEAL™

NOMINAL



For simple, minimal-pressure non-critical open filtration applications (that is, filtration without a vessel), HAYWARD's line of BANDSEAL Filter Bags offers many

cost-effective choices. These filter bags are available with a drawstring that permits them to be installed directly on the end of a pipe, without the need of an adapter.



PRODUCT CODES

BANDSEAL™
NMO: Nylon Monofilament

NMO
Bag Material

100
Micron Rating µm

BANDSEAL Range
25-800

P: Plain

P
Bag Cover Layer

R: without ring

R
Collar/Ring Type

01
Bag Size

R
Draw String

R: tie on band
none: without band

Bags/Box
50

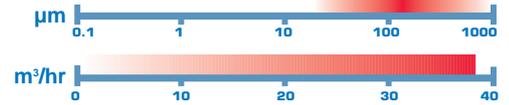
Size
S

50S
Packaging

Code	Size
01	ø 180 mm x 430 mm L
43	width 140 mm x 300 mm L
45	width 140 mm x 500 mm L

SNAP-RING®

NOMINAL



Sewn Construction Filter Bags

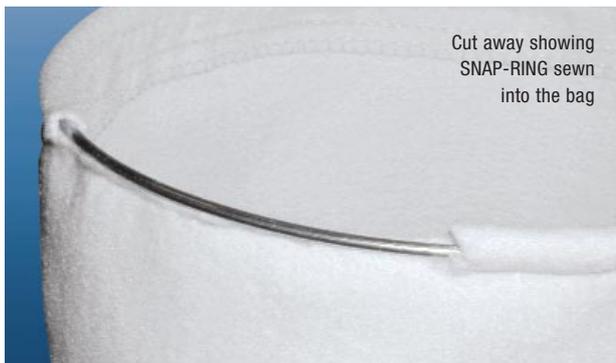
For over 30 years, HAYWARD SNAP-RING® filter bags have been critical components of filtration systems world-wide. The wide range of media materials, affordable price, and reliability of construction have made them the ideal choice for applications in nearly all process industries.

Superior, Consistent Quality

SNAP-RING filter bags are manufactured to the highest standards of fabrication available. Materials must satisfy stringent specifications for filtration performance and media purity. Production under ISO 9002 quality systems results in order to order, year to year, reliability and repeatability.

Adaptable to All Vessels

SNAP-RING filter bags are designed and constructed to fit the widest range of filter vessels, whether from HAYWARD or from another supplier. Special geometries are available to fit most non-standard vessels. No matter what the vessel, there is a HAYWARD SNAP-RING bag to fit it.



Application Versatility

SNAP-RING filter bags are available with several ring materials, six different media materials and eleven micron ratings. SNAP-RING filter bags can handle corrosive chemicals, aggressive solvents and even elevated temperatures. With this many choices, the right HAYWARD filter bag is available for every application.

PRODUCT CODES

Multifilament Mesh
PEMU: Polyester

Monofilament Mesh
NMO: Nylon
PMO: Polypropylene

PEMO: Polyester
PTMO: PTFE

Needlefelt
PE: Polyester
PO: Polypropylene
NY: Nylon

HT: Nomex®
PT: PTFE
W: Wool



HAYFLOW™

HAYWARD's Revolutionary New Filter Element



The concentric media layers are welded onto a top and a bottom ring

HAYFLOW™ – The Next Generation of Filtration Systems

With this new, patent pending filter element HAYWARD technology has combined the best of both bag and cartridge filters into one single filtration element for outstanding filtration performance. Because HAYFLOW's surface area is up to 70% greater than a similar size filter bag, existing systems that use HAYFLOW experience longer filter element life and less changing, resulting in reduced running costs. With HAYFLOW, designers of new bag filtration systems can opt for reduced running costs or, because of the high flow rates possible with HAYFLOW, reduce filter vessel size by up to 50% thus lowering the initial cost of the system.

What Makes the HAYFLOW™ Element Better

The heart of HAYWARD's HAYFLOW filter element is two concentric cylinders of high-quality extended life HAYWARD filter media. These cylinders are formed using unique welding technology to create a no by-pass seam. The diameter of the cylinder is the same size as a standard filter bag, so retrofitting into existing systems is easy. The HAYFLOW element is fitted with HAYWARD's patented SENTINEL® sealing ring, ensuring a positive seal with the filter vessel to protect against bypass of the process media.

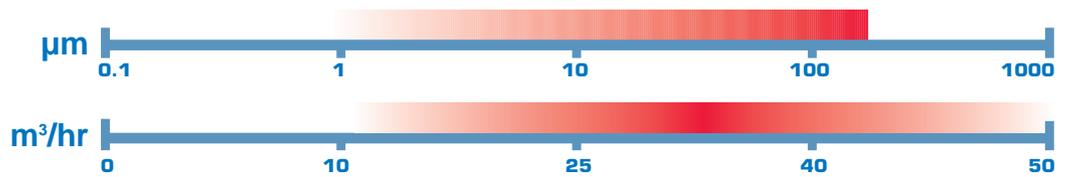
How the HAYFLOW™ Element Works

The process fluid enters the inside of the element, passes through it, and exits through the vessel outlet. Like a filter bag, the filtered-out material stays inside the HAYFLOW element. The HAYFLOW element is unlike a filter cartridge, where the residue of the filtered material remains on the outside of the cartridge, complicating the changing process.

An All-Around Better Choice

Changing a HAYFLOW filter element can actually be easier than changing a filter bag, because HAYFLOW's revolutionary design only retains 25% of the residual liquid volume of a similarly sized filter bag. When you need to change the element, it weighs up to 75% less than a filter bag. A full bag can weigh up to 15 kg, so weight is an important

NOMINAL RATED



Easy installation of HAYFLOW into existing bag filter housings



retained in the element. All of these advantages result in superior filtration performance.

The Choice is Yours

HAYWARD's HAYFLOW filter element can be adapted to a wide range of applications through the use of different filter media. Basically, any weldable filtration media can be used to construct a HAYFLOW element. Multilayered construction is also possible for applications that require it. Using melt-blown polypropylene media, HAYFLOW elements are available with high micron retention ratings, and with selective absorption characteristics as well. Standard HAYFLOW filter elements are available in both polypropylene and polyester construction. These two materials are very versatile and will perform in a majority of applications over a wide range of temperatures. HAYWARD uses a high-quality, extended life DURAGAF™ needlefelt media with extremely fine fibers and higher pore volumes for superior performance. Both feature either polypropylene or polyester SENTINEL sealing rings.

consideration for the system operator. The lower retention volume of HAYFLOW means less sale-able product has to be thrown away. This important HAYFLOW feature can provide considerable savings over time. HAYFLOW's cylindrical construction offers strength unrivaled in other similar products. The all welded filter element is fit to a matching restrainer basket, allowing the filtration media to be replaced easily and quickly. The close-tolerance fit of the filter and the restrainer basket provide ease of installation and worry-free performance. This combination of fully-welded seams and a rigid, cylindrical geometry provides strength over a full range of operating differential pressure. The HAYFLOW element is always smooth and fits to the basket walls without crimps or pleats, guaranteeing a quick and easy installation. Batch system operators often do not want to stop a batch process and change a filter bag. Using HAYFLOW, system operators have found up to 5 times the life over a similar size filter bag and experienced reduced operating costs.

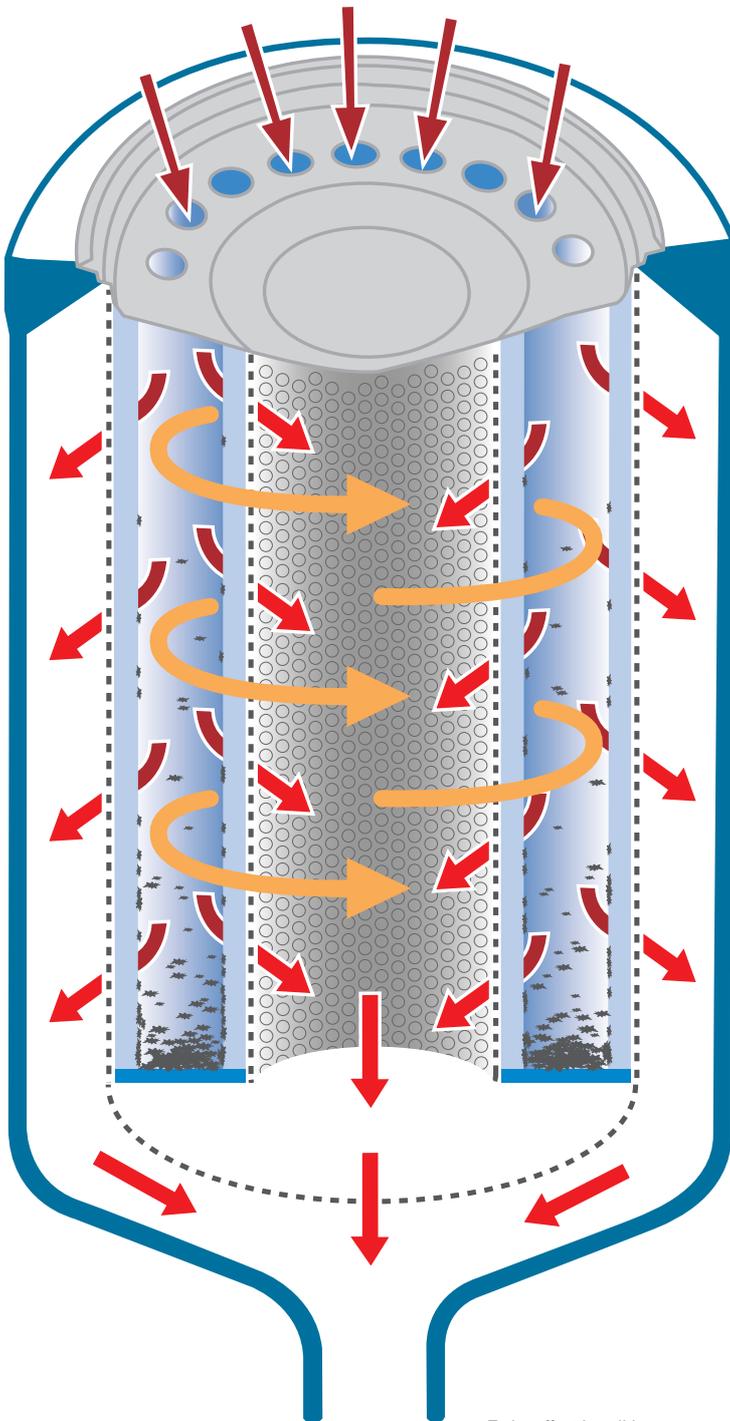
Usually, bag filters are bigger than cartridge filters but are easier to handle and more cost effective. HAYFLOW brings the best of both systems together...high flow rates in compact vessels, or a longer lifetime and extended changing cycles. HAYFLOW combines highly efficient filter media, enlarged surface area, better dirt-holding capabilities and a reduction of the residual liquid volume

Cut open element from an E-coat tank filtration after being in service for eleven weeks



Metal fines collected from parts washer

The HAYFLOW Effect



Turbo effect in solids collection helps to extend life of filter element

Features:

- Higher flow rates - smaller, less costly vessels can be used
- Up to five times greater life over filter bags
- Liquid losses are 25% of similar size filter bag
- SENTINEL sealing ring and 100% welded construction for no by-pass
- Up to 35 times more effective than standard filter cartridges
- Low pressure differential results in less energy consumption of pumps
- Very cost-effective in comparison to similar systems
- Rugged cylindrical construction
- Easier maintenance with reduced costs
- Easy retro fit to existing filter vessels

And...HAYWARD's superior support, before, during and after system installation.

Take Advantage of HAYFLOW™ Now

You can easily change over from ordinary bag filtration to the revolutionary new HAYFLOW filter element. Existing bag filter vessels need only to be fitted with a new HAYFLOW restrainer basket for instant compatibility with the HAYFLOW element. No tools, special equipment or modification to the vessel are required. Just drop in the new basket, and you are ready to take advantage of all the benefits offered by a HAYFLOW filtration system.

Still Not Sure if HAYFLOW™ is Right for You?

Contact us. We can show you how you can save money and improve your filtration process using HAYFLOW filter elements.

Application:

- ✓ Automotive
- ✓ Sugar Processing
- ✓ Paints, Coatings, Inks, Dispersions
- ✓ Resins
- ✓ Water and Waste Water Treatment
- ✓ Solvents
- ✓ Lubricants and Metalworking Fluids
- ✓ Aqueous and Solvent Based Cleaners in Parts Washing Equipment
- ✓ Pulp and Paper
- ✓ Oil and Gas Exploration and Processing
- ✓ Pharmaceutical
- ✓ Food Processing
- ✓ Chemical Process Industries
- ✓ Potable Water, Beer and Wine
- ✓ Edible Oils

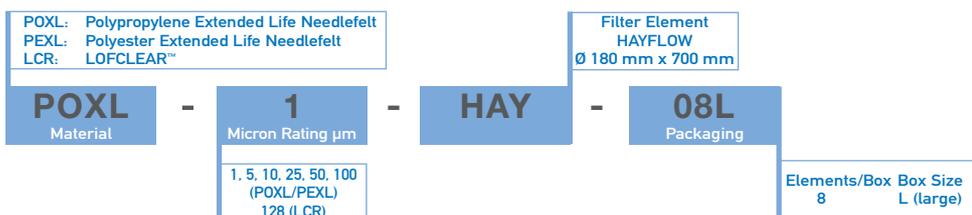
Remember “Filter Cost” and “Filtration Cost” are Not the Same Thing

We can explain the difference and demonstrate the HAYFLOW advantage in your application.



PRODUCT CODES

HAYFLOW™



VESSELS

HAYWARD is the leading manufacturer of bag filter housings. Creative innovations have been the logic for a highly diversified range of vessels to meet the most demanding as well as standard applications. From single to multibag housings, from stainless steel to engineered plastic vessels.



◀ **TOPLINE™**
The best filter vessel for the most demanding applications. Cast construction. Over the top entry, low pressure drop design for optimum filtration results. Quick and easy bag changing make TOPLINE ideal for batch filtration applications. CE/ASME code stamped version available with the exclusive HAYWARD Five-Year Warranty.

SIDELINE™ ▶
Mid-priced, heavy duty construction, side entry filter vessel for most industrial and commercial filtration applications. Choice of DN50 or DN80 flanged connections for application versatility. CE/ASME code stamped version available with the exclusive HAYWARD Five-Year Warranty.



MAXILINE™ ▼
Multi-bag filters for high flow rate applications for over 900m³/h in sizes for up to 24 bags. CE/ASME code stamped version available. Five cover designs for all applications—economical davit, easy-opening spring hinge and quick opening (the quickest opening cover of any multi-bag vessel)—only 15 seconds for reduced downtime between bag changes.



◀ **ECOLINE™**
High quality, low cost fabricated filter vessels for applications to 6 bar. V-clamp cover closure makes bag changing fast and easy. Lightweight for simple installation, ECOLINE is your best choice for cost-sensitive applications without sacrificing quality.



FLOWLINE™ ▲
Lightweight, cost effective fabricated filter vessel. Hinged cover with swing bolt closures for easy bag access. Ideal for heavy duty industrial and OEM applications.

HAYWARD offers the right vessel for any application and budget.

Manufacturing plants in five different locations around the globe allow for adaptations to local specifications in a standard design.

MINILINE™ ▶

Small, side entry vessels in two sizes. Fabricated construction for light weight, self-supported installation. Perfect for trap/polish filters to protect spray nozzles, pumps and flow meters, or as a filter prior to filling operations such as tanks, bottling or canning lines.



POLYLINE™ ▲

All-plastic glass fibre-reinforced polypropylene or pure PVDF construction for corrosive and contamination-sensitive applications. One-piece, seamless plastic body rated up to 10 bar. Hand-removable, spin off cover. Integral mounting flange for easy, rock-solid installation.

Log On to the HAYWARD Web Site

Get expanded product information, dimensional drawings, chemical resistance tables and other useful calculators for determining pressure loss and water hammer figures.

Look for new and useful features updated monthly.

www.haywardindustrial.com



FILTER BAGS

Available Size / Maximum Flow (m³/h)							Rings			Weld/Sewn			Media			Max op. Temp (°C)
01	02	03	04	43	45	SENTINEL	SNAP-RING	Band	Ring	Side	Bottom	Material	Type	Surface Finish		
	10					E			W	W	W	Polypropylene	Meltblown		90	
8	15					E			W	W	W	Polypropylene	Meltblown		90	
8	15					H			W	W	W	Polyester	Meltblown		150	
8	15					E			W	S	S	Polypropylene	Meltblown		90	
	10					E			W	S	S	Polypropylene	Meltblown		90	
	12					Z			W	W	W	Polypropylene	Meltblown		90	
20	40					E			W	W	W	Polypropylene	Felt	singed	90	
20	40					Z			W	W	W	Polyester	Felt	singed	140	
20	40					E			W	W	W	Polypropylene	Felt	glazed	90	
20	40					Z			W	W	W	Polyester	Felt	glazed	140	
20	40					Z			S	S	S	Nylon	Mesh		140	
15	30					E			W	W	W	Polypropylene	Felt	glazed	90	
15	30					H			W	W	W	Polyester	Felt	glazed	150	
20	40	6	12			E			W	W	W	Polypropylene	Felt	singed	90	
20	40	6	12			H			W	W	W	Polyester	Felt	singed	150	
20	40	6	12			Z			S	S	S	Nylon	Mesh		125	
20	40	6	12			S			S	S	S	Polypropylene	Felt	singed	110	
20	40	6	12			S			S	W	S	Polyester	Felt	singed	190	
20	40	6	12			S			S	S	S	Nylon	Felt		190	
20	40					A			S	S	S	Nomex®	Felt	singed	245	
20	40					A			S	S	S	PTFE	Felt		260	
20	40					S			S	S	S	Wool	Felt		135	
20	40	6	12			S			S	S	S	Nylon	Mesh		190	
20	40					A			S	S	S	Polypropylene	Mesh		110	
20	40					S			S	S	S	Polyester	Mesh		190	
20	40					A			S	S	S	PTFE	Mesh		260	
20	40					S			S	S	S	Polyester	Mesh		145	
20				6	12			R	S	S	S	Nylon	Mesh		190	
									S	S	S	Nylon	Mesh		190	
	40					E			W	W	W	Polypropylene	Felt	glazed	90	
	40					H			W	W	W	Polyester	Felt	glazed	150	
	40					E			W	S	W	Polypropylene	Meltblown		90	



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manufacturer of



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