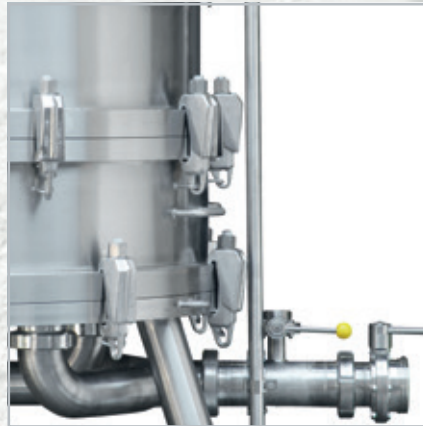




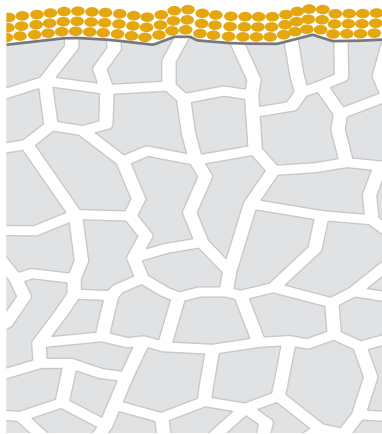
SWISS QUALITY.  
SINCE 1938.



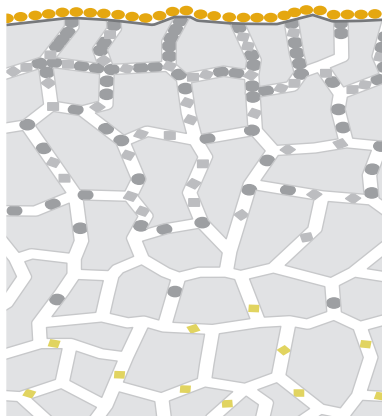
FILTRDISC™ depth filter module  
DISCSTAR™ housing

DEPTH FILTRATION FOR VALUABLE LIQUIDS.

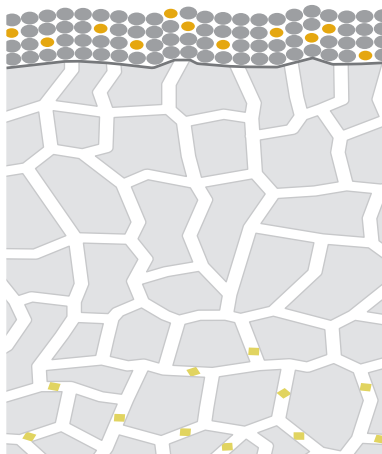
# Principles of depth filtration



Surface filtration



Depth filtration



Alluvial filtration

- = Particles > 5 µm
- = Filter aid > 10 µm
- ◆ = Particles < 5 µm
- ◆ = Particles < 1 µm

Depth filters are used to remove particles from a liquid. This means that liquids can be clear, fine or sterile filtered.

“Thick” filter media (2.5–4.5 mm) are used with depth filtration. The particles are retained using two filtration principles: 1. surface filtration and 2. depth filtration. The liquid flows through a three-dimensional, asymmetrical fiber network in the depth filter. The solid components are retained using mechanical and electrokinetic effects. This significantly increases the intake and adsorbing capacity.

The purpose of a filtration process is either to purify a liquid (filtrate) or to retain solids (retentate). Depth filtration is mainly concentrated on the production of liquid filtrate.

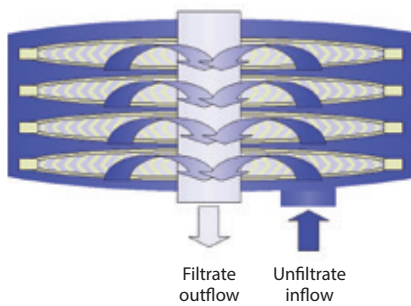
Filter sheets consist of a combination of especially receptive fibers (e.g. cellulose) and powdery, anorganic filter aids such as kieselguhr and/or perlite. The retention rate can be specified by the grinding method and the volume and type of base material used as the filter aid. Small quantities of polymer resin are added as a wet-strength agent. Depending on the type of polymer resin, a lesser or greater positive charge – also called the “zeta potential” – is produced when passing through the filter sheet. The positive charge improves the adsorption of small, negatively-charged particles or micro-organisms. The interior absorption volume of a typical depth filter sheet is up to 4 l/m<sup>2</sup> of filter surface. During the filtration process, multiple depth filter sheets are used one after the other in a sheet filter (NOVOX®). This enables a large filter area to be created in a relatively small space. Another method of using depth filter sheets in a less time-consuming and more effortless way is to use depth filter modules (FILTRODISC™).

With this method, a pre-loaded filter pack is installed in a filter housing (DISCSTAR™). Depth filters are exhausted when the inner matrix is filled with slurry particles. One indication of this is the increasing difference in pressure between the inlet (unfiltrate) and the outlet (filtrate) and a lower flow rate of the liquid. After a certain point, the capacity of the depth filter is exhausted (1.5 bar for sterile filtration; 2.5–3 bar for clarifying filtration). Under certain circumstances it is possible for the filter to be regenerated.

With high particle loads (approx. 1.5%), standard depth filters can blind fast.

By using a filter aid such as kieselguhr (alluvial filtration process), the capacity can be increased. With alluvial filtration, filter aids are suspended in a liquid and then floated onto a supporting sheet in a plate & frame filter to form a filter cake. When doing this, the FILTRODUR® supporting sheets themselves function not as filters, but merely as a support for the filter cakes, which is where the actual slurry removal takes place. The separation of particles in this process uses a mechanism similar to that with filter sheets. As with sheet filtration, an increase in the differential pressure indicates when the filter configuration is exhausted. As the filter cake is usually thicker than the filter sheets, alluvial filters have a longer lifetime due to their greater slurry absorption capacity. After filtration, the filter cake gets removed and disposed of depending on the nature of the slurry.

# Functional principle



FILTRODISC™ depth filter modules are used in a sealed housing (DISCSTAR™). The inner rigid core is connected to the filtrate side of the housing. The space between the housing and the module is filled with unfiltrate. During filtration, a differential pressure is produced between the unfiltrate and filtrate sides; this causes the solution to be forced through the depth filter sheets installed in the modules at a constant flow rate. The module has to be replaced or regenerated when the capacity of the filter sheet is exhausted and the differential pressure reaches 2–2.5 bar.

FILTROX FILTRODISC™ modules are constantly being re-developed to keep up with industry requirements. The design of the modules combines the advantages of conventional depth filtration with the positive properties of enclosed filtration in DISCSTAR™ housings.

# FILTRODISC™ modules

Depth filter modules enable large filter areas to be handled easily. The filtration takes place in an enclosed system (DISCSTAR™). The installed depth filter sheets have a high particle absorption capacity of up to 4 l/m<sup>2</sup>. In the filtration process itself, the particles are decelerated in the filter sheet and ultimately retained by their size or the electrokinetic forces. Because of the many different applications

and industries, FILTROX offers a correspondingly wide range of products. This means that the best possible product can be offered in each case as a result of testing on the customer's premises or in our laboratory.

All materials used are FDA approved. Any filter sheet in the FILTROX portfolio can be installed in the modules.



## **FILTRODISC™ TS**

Modules with technical sheets that have an open filter matrix and are ideally suited to viscous solutions, for example.

## **FILTRODISC™ AF**

Standard FIBRAFIX® depth filter sheets for a large number of applications.

## **FILTRODISC™ CH P**

Manufactured with our PURAFIX® sheets, with low ion and pyrogen values, for use in critical applications.

## **FILTRODISC™ SY**

Modules with layers reinforced with synthetic components.

## **FILTRODISC™ CARBOFIL™**

Filter modules with immobilized activated carbon in the filter sheet.

## Application examples

### **FILTRODISC™ TS**

- paints, ink and adhesives
- process water
- biodiesel
- highly viscous solutions
- ...

### **FILTRODISC™ AF**

- beverages (beer, wine, juice, liquor etc.)
- fine chemicals
- plant and natural extracts
- paints, inks and adhesives
- process water
- solvents
- ...

### **FILTRODISC™ SY**

- enzyme solutions (cellulase)
- chemical solutions

### **FILTRODISC™ CH P**

- APIs (active pharmaceutical ingredients)
- biotech
- enzymes
- plant and natural extracts
- distilled products (alcohol, spirits)
- pharmaceutical intermediates
- active agents
- plasma fractionation
- ...

### **FILTRODISC™ CARBOFIL™**

- decoloration
- odor removal
- for more applications, see the CARBOFIL™ special brochure

# FILTRODISC™ modules



## FILTRODISC™ HT

High temperature modules for use at up to 110°C.

## FILTRODISC™ UHT

Ultra-high temperature modules for use at up to 180°C.

## FILTRODISC™ CD

Fully conductible modules for the use in areas exposed to explosion hazards.

## FILTRODISC™ XL

Multi-layer lenticular filter modules for a higher dirt hold capacity or multi-step filtration.

## FILTRODISC™ PLUS<sup>2</sup>

Backflushable lenticular filter modules.

## Application examples

### FILTRODISC™ HT

- synthetic products
- heat transfer liquids
- process/operation liquids
- solvents
- ...

### FILTRODISC™ UHT

- synthetic products
- heat transfer liquids
- process/operation liquids
- solvents
- ...

### FILTRODISC™ CD

- for use in ATEX environment
- ...

### FILTRODISC™ XL

- wine filtration
- APIs
- solvents
- ...

### FILTRODISC™ PLUS<sup>2</sup>

- beer filtration
- other beverages

FILTRODISC™ modules are available for all sheets in the FILTROX portfolio.

## Available module types

	12"	16"
Diameter (mm)	287	398
Max. filter area/module (m <sup>2</sup> )	1.8	3.6
Height (mm) (DOR adapter)	330	330
Height (mm) (DOE adapter)	272	272

DOE = flat adapter; DOR = bayonet adapter

Standard is 16 lenses/module; fewer lenses are possible on request.

## Operating conditions

Max. operating temperature	82°C
Max. high temperature (HT) operation	110°C
Max. ultra-high temperature (UHT) operation	180°C
Max. differential pressure (modules)	2.4 bar
Recommended flush volume	50 l/m <sup>2</sup>
Recommended sterilization	Hot water, chemical or steam (HT/UHT)

Note: With chemical sterilization using oxidizing reagents, do not exceed the recommended contact time. Inline steam sterilization requires careful handling to prevent counter-

pressure. More information can be found in the specific brochures and validation guidelines.

# DISCSTAR™ housing

The DISCSTAR™ is a highly precise stainless steel filter housing for filter modules, developed and manufactured for everyday use. The enclosed system enables depth filtration to be carried out without drip loss. The large number of variants makes it possible to find the ideal solution for the relevant filtration application.

The DISCSTAR™ is available with two attachment options for the modules: flat gasket (DOE) and double O-ring gasket (DOR). The DOR gasket with bayonet adapter guarantees the highest level of safety.



## DISCSTAR™ G

DISCSTAR™ for food and beverage applications

- wine
- tea
- juice
- distilled products
- beer
- sugars
- ...



## DISCSTAR™ P

- cosmetics (hair lotion, perfumes, aftershave etc.)
- chemicals (hazardous liquids, filtrations that require EX protection)
- F&B applications in EX protection zones
- process solutions (coolants)
- biotech applications (biomass removal)
- APIs
- injection solutions
- ...

## DISCSTAR™ Special

Besides the standard housing, special housings are required for special applications. Over the years FILTROX has worked with its customers to develop a diverse range of variants. If a version is not available, it can be developed in collaboration with our design department if necessary. Examples of special housing types:

- hastelloy-coated housing
- split cover
- base plate with higher edge (prevents hazardous process solutions leaking out)
- housing on wheels
- customer-specific adaptations possible



Double-jacketed housing for tempering filtration solutions during filtration

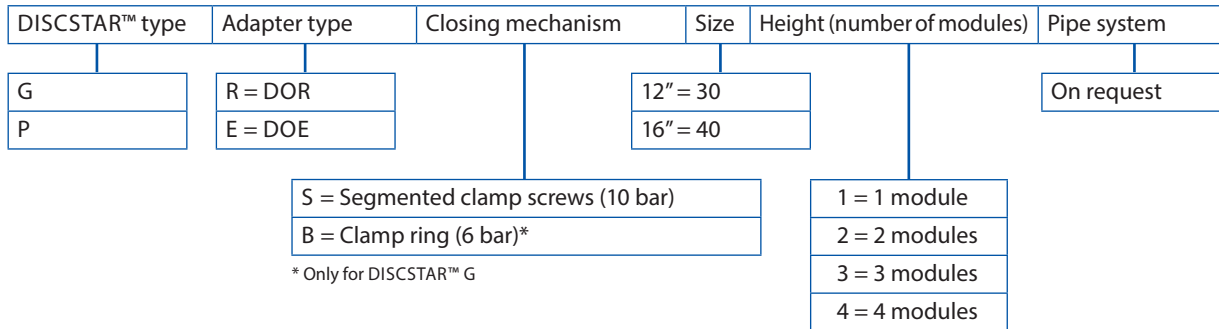


Housing mounted on a skid, combined with other housings (e.g. SECUROX™) and appropriate controls



DISCSTAR™ Jumbo: housing with up to 16 x 16" modules under one cover

### DISCSTAR™ ordering code



Examples: DISCSTAR™ P RS 30/1 = DISCSTAR™ P industrial version with DOR adapter for a 12" module, segmented clamp screws for closing

DISCSTAR™ G only available in the 6 bar version  
Not all combinations are possible.



## FILTROX. DEPTH FILTRATION FOR VALUABLE LIQUIDS.

As a global market leader in depth filtration, FILTROX offers complete solutions for filtration of high value liquids.

We are experts in development, manufacturing and supply of Swiss top quality products for a wide range of applications in pharmaceuticals, biotechnology, chemicals and cosmetics as well as in food and beverage. Since 1938, we have been developing and manufacturing both filter

media as well as filtration equipment in-house. Based on this experience, we can offer our customers a complete range of products.

FILTROX's worldwide distribution network and comprehensive technical support will help you optimize your filtration process.

Visit us online at [www.filtrox.com](http://www.filtrox.com) for more information.

### **FILTROX AG**

Moosmühlestr. 6  
CH-9001 St. Gallen / Switzerland  
Phone: ++41 071 272 91 11  
Fax: ++41 071 272 91 00  
E-mail: [sales@filtrox.ch](mailto:sales@filtrox.ch)

FILTROX Southern Europe  
Ramón Viñas, 4  
08930 Sant Adrià de Besòs / Spain  
Phone: ++34 934 626 700  
Fax: ++34 933 810 258  
E-mail: [filtrox.Espana@filtrox.com](mailto:filtrox.Espana@filtrox.com)

FILTROX UK & Northern Europe  
Butts Mill  
Barnoldswick  
Lancashire  
BB18 SHP / United Kingdom  
Phone: ++44 1282 811000  
Fax: ++44 1282 811001  
E-mail: [filtrox.UK@filtrox.com](mailto:filtrox.UK@filtrox.com)

FILTROX France s.a.r.l.  
1 Rue du Claire Matin  
F 21200 Beaune / France  
Phone: ++33/380 222 915  
Fax: ++33/380 241 856  
E-mail: [contact@filtroxfrance.com](mailto:contact@filtroxfrance.com)

FILTROX North America  
9805 NE 116th Street  
PMB A-200  
Kirkland WA 98034 / USA  
Phone: Toll free 800 473 4526  
Phone: ++1 425 820 4850  
Fax: ++1 425 820 2816  
E-mail: [info@filtercorp.com](mailto:info@filtercorp.com)

FILTROX MICROFILTRACIONES SA DE CV  
Circuito Circunvalación Poniente 4B  
Cd. Satélite  
53100 Naucalpan de Juárez  
Estado de México / Mexico  
Phone: ++52 55 2628 1691  
E-mail: [info@filtrox.com.mx](mailto:info@filtrox.com.mx)

FILTROX (Shanghai) Filtration System Co., Ltd.  
7 # Building no. 1855  
TianChen Rd. QingPu  
Shanghai 201712 / P.R. China  
Phone: ++86 021 5922 7508  
Fax: ++86 021 5922 7511  
E-mail: [info@filtroxchina.cn](mailto:info@filtroxchina.cn)

FILTROX Asia-Pacific Pte Ltd  
25 International Business Park  
#02-14 German Center  
Singapore 609916 / Singapore  
Phone: ++65 933 88645  
E-mail: [sales\\_apac@filtrox.com](mailto:sales_apac@filtrox.com)