



**SEPARATION**

# **EFFICIENT CROSSFLOW FILTRATION**

**KRAUSS-MAFFEI  
DYNAMIC CROSSFLOW FILTER DCF**

**ANDRITZ**

**ENGINEERED SUCCESS**

# Krauss-Maffei dynamic crossflow filter DCF - efficient crossflow filtration

Crossflow filters are state-of-the-art for substances with poor filtration characteristics. The use of ceramic filter membranes is gaining popularity in successful implementation when other separation processes, besides cake-forming filtration, do not achieve the desired results.

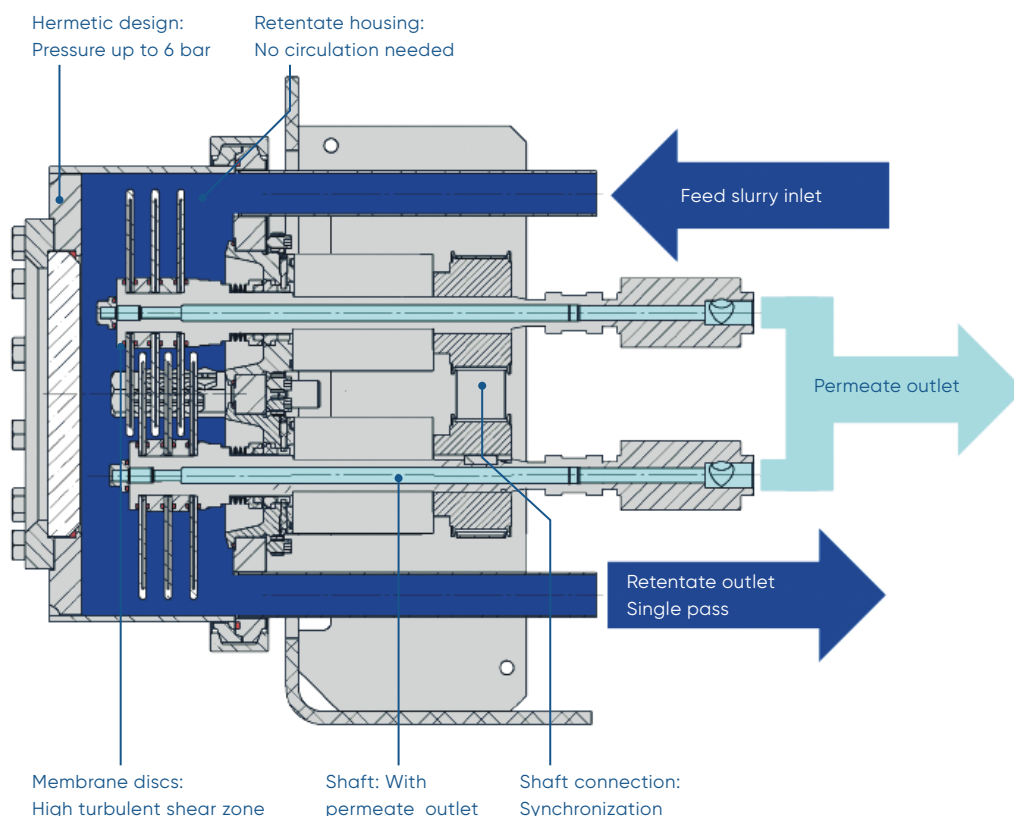
## INNOVATIVE, DYNAMIC CROSSFLOW FILTRATION FOR CHALLENGING SEPARATION TASKS

With the Krauss-Maffei dynamic crossflow filter DCF, ANDRITZ KMPT was able to successfully enhance dynamic crossflow filtration using two shafts. The improved process is especially suited for processing sensitive or viscous products. The DCF is able to concentrate the retentate to achieve a pasty or sludge consistency. As a result, it is more efficient in recovering valuable elements than any other crossflow filtration technology. Conventional, circulating crossflow filtration minimizes the formation of a clogging layer on the filter's surface by passing a process medium over the membrane. However, this procedure is inefficient when processing sensitive or viscous products and is generally

not advisable. Under these conditions, the feed cannot be concentrated into a high-viscosity retentate.

The technology of the Krauss-Maffei dynamic crossflow filter DCF generates a differential speed in the opposite direction between overlapping membrane discs rotating in the same direction.

This design generates a turbulent crossflow without using a pump to circulate the retentate. The wall shear stress generated is 50% higher than found in conventional crossflow filters. This greatly reduces formation of a clogging layer, while substantially improving the filtration rate at the same time. This advantage is most evident when dealing with high-viscosity retentates.





Krauss-Maffei dynamic crossflow filter DCF – an open design

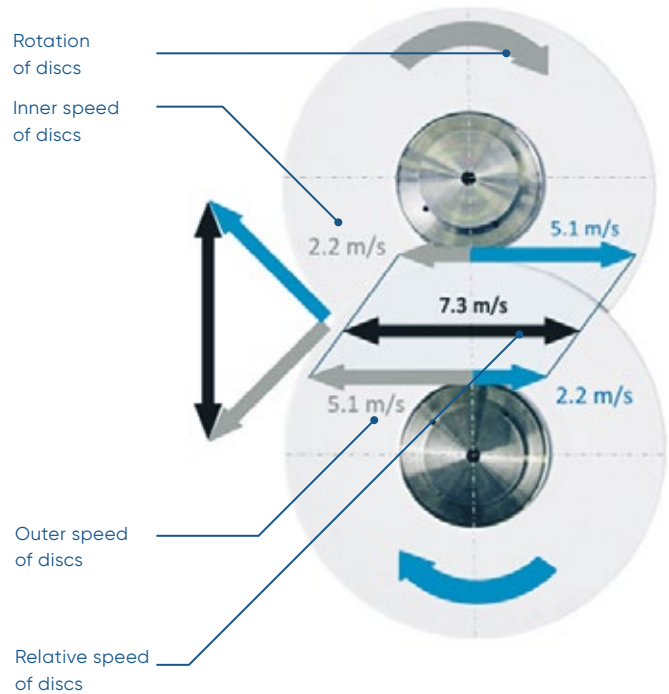


Illustration of wall shear stress

#### YOUR BENEFITS

- Higher permeate flux achievable
- Higher yield due to higher retentate concentration
- Processing of highly concentrated suspensions with viscosities of up to 5,000 mPas
- Reduced operating pressure thanks to more effective cleaning of the clogging layer (no pressure drop as in tubular membranes)
- Homogeneous trans-membrane pressure over the entire membrane surface
- Very low process volume in relation to the membrane surface
- Easy to inspect because the filtration surface is outside on the membrane
- Product subjected to low thermal load by reducing the energy input by 80% compared to conventional crossflow filters
  - Low or no cooling required
  - Low energy costs
- Substantial energy savings for subsequent drying processes

# Optimal process performance thanks to smarter and more compact crossflow filtration technology

Do you want to increase your throughput? Or intensify your process? Or perhaps reduce your energy costs? Regardless of the demands placed on your production, we can help you lower your operating costs and improve your product quality.

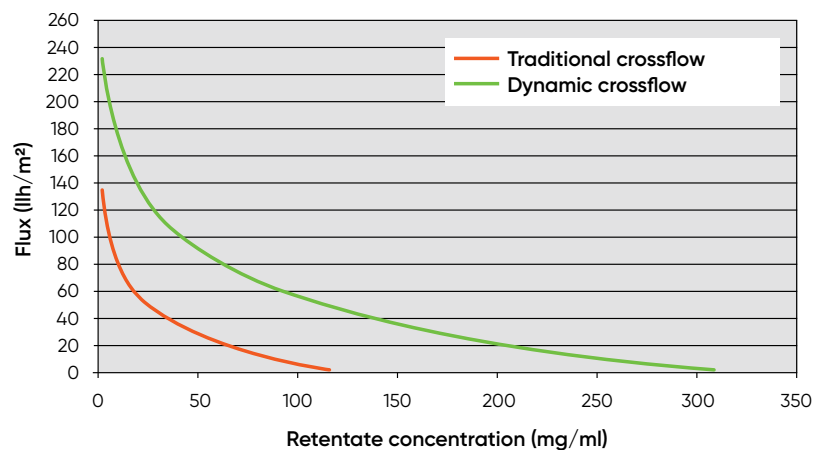
Generally, the main reason for installing a Krauss-Maffei dynamic crossflow filter DCF is to overcome capacity bottlenecks. The DCF represents compact technology that is straightforward to install. Retrofitting is possible in practically any building and is simpler than adding a larger dryer or a second one.

When it comes to existing, conventional crossflow filters, a downstream DCF steps up the process: energy consumption is decreased, while the yield and the throughput are increased. When preparing circuit flows, contaminating particulates can be reduced significantly. For example, the Krauss-Maffei dynamic crossflow filter DCF can be installed in the bypass of a separator.

“When we deliver our DCF with peripherals and control system in a skid-mounted format, we can put the unit into operation within two days after setting it up, thanks to the pre-configured design.”

#### **GUNNAR GRIM**

Product manager  
DCF crossflow filter  
ANDRITZ Separation



Performance operation



DCF skid





# For a wide range of applications: from biopharmaceuticals to beverages and the chemical industry

## PROCESSING OF SOLID MATERIALS

### BIOPHARMACEUTICALS



Cell harvesting, proteins, and enzymes

### FOOD AND BEVERAGES



Biomass and aromatics

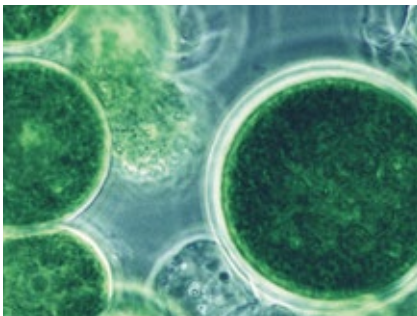
## PROCESSING OF LIQUIDS

### FOOD AND BEVERAGES



Wine, beer, juices, vegetable oils, gelatin, enzymes, water recovery in starch processes, and sterilization of juices

### ALTERNATIVE ENERGY SOURCES



Micro-algae, silicon-cutting slurry, and BTL (biomass to liquid)

### CHEMICAL INDUSTRY



Hydroxides, colloids, pigments, polymers, titanium oxide, and calcium carbonate

### ENVIRONMENT



Mineral oils

### CHEMICAL INDUSTRY



Recovery of solvents and valuable liquids

# Technical data and design

Model	Membrane ø [mm]	No. of membranes [mm]	Filter area [m <sup>2</sup> ]	Retentate volume [l]	Length [mm]	Width [mm]	Height [mm]	Operating weight [kg]	No. of shafts
DCF 152/S	152	1	0.03	0.4	500	400	600	30	1
DCF 152/0,14	152	4	0.14	2.5	900	700	500	150	2
DCF 152/0,8	152	24	0.81	12/8*	900	700	500	180	2
DCF 312/2	312	16	2.1	60/40*	1,700	1,500	1,800	1,200	2
DCF 312/4	312	32	4.2	100/60*	1,700	1,500	1,800	1,280	2
DCF 312/6	312	48	6.3	130/80*	1,300	1,500	1,900	1,350	2
DCF 312/8	312	64	8.4	170/100*	1,300	1,000	2,100	1,400	2
DCF 312/10	312	80	10.5	200/120*	1,300	1,000	2,300	1,450	2
DCF 312/16	312	128	16.4	300/180*	1,400	2,300	2,500	2,550	2
DCF 312/20	312	160	20.5	350	1,450	2,400	2,500	2,900	4
DCF 312/24	312	192	24.6	400	1,500	2,500	2,500	2,900	4
DCF 312/28	312	224	28.7	450	1,500	2,600	2,600	3,150	4
DCF 312/32	312	256	32.8	500	1,600	2,600	2,600	3,400	4

All technical data are approximate and subject to change without notice.

\* Housing available in round or oval version.



## TECHNICAL DATA (PER MODULE)

**Filter area** 0.03-32.8 m<sup>2</sup>

**Viscosity** up to 5,000 mPas

**Membrane pore size** 5 nm-2 µm

## CUSTOMIZED DESIGN

Normally, standard ceramic filter membranes are installed. Upon request, we also offer metal filter membranes.

Krauss-Maffei dynamic crossflow filter DCF – a fully enclosed design



# Intelligence for machine and process control

## Metris addIQ control systems

With Metris addIQ, you get a well-proven, intelligent control solution for industrial processes and machines. Our solid/liquid separation specialists use their in-depth expertise to provide scalable solutions that are individually tailored to regional and application requirements. Whether you're automating new equipment or upgrading to extend the lifecycle of existing systems, we find the ideal solution for you.



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ANDRITZ Separation is your true full-service provider. From initial consulting through to service agreements, process optimization, and training programs, we are always looking for ways to minimize downtime and increase predictability in operations while raising your overall production efficiency. Wherever you operate, our network of 550 service specialists and global service centers ensures we'll always be there to support you for many life cycles to come. Let's sit down and see how we could take your operations to the next level.



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REPAIRS & UPGRADES



SECOND-HAND & RENTALS



TRAINING



OEM SPARE PARTS



SERVICE AGREEMENTS



PROCESS OPTIMIZATION



LAB AND ON-SITE TESTS





## WHAT'S YOUR SEPARATION CHALLENGE?

ANDRITZ Separation is the world's leading separation specialist with the broadest technology portfolio and more than 2,000 specialists in 40 countries. For more than 150 years, we have been a driving force in the evolution of separation solutions and services for industries ranging from environment to food, chemicals, and mining & minerals. As the OEM for many of the world's leading brands, we have the solutions and services to transform your business to meet tomorrow's changing demands – wherever you are and whatever your separation challenge. **Ask your separation specialist!**

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