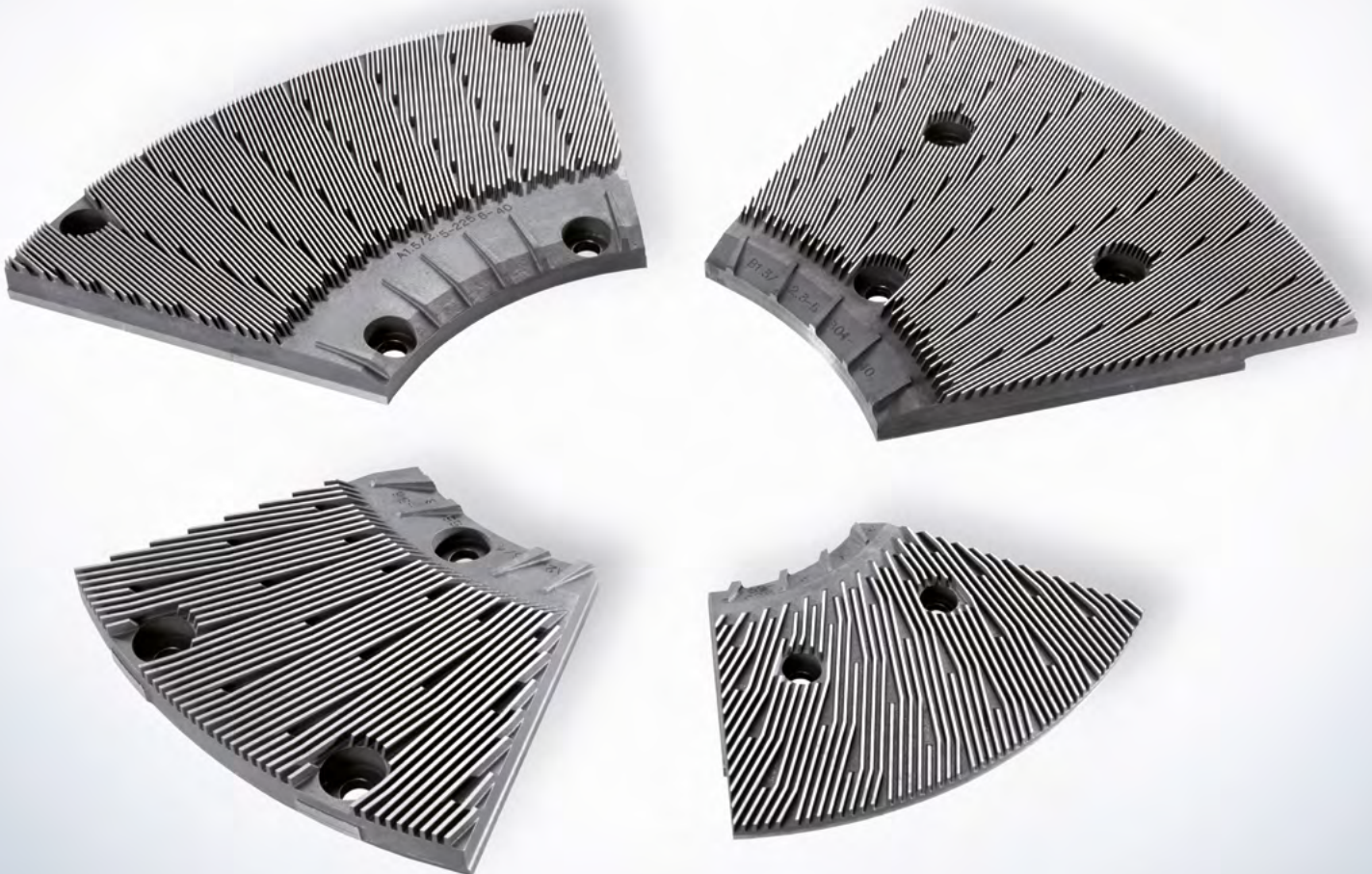


Saving energy with the optimal filling for your type of fiber

Pluralis Line





The Pluralis Line from Voith benefits your energy balance

The process of refining fibers has a profound effect on the energy balance of the production process. Refiner fillings optimally adapted to the fiber characteristics substantially increase the potential for energy and raw material savings. Many years of experience, well-founded knowledge and the proven use of Pluralis SF for short fibers and Pluralis LF for long fibers are the basis for the development of the Pluralis Line.

Gentle refining with Pluralis

Pluralis refiner fillings are characterized by a very high cutting edge length (CEL) and a flow-optimized design with sectors connected to one another. A larger number of sectors increases the homogeneity of the filling cutting angle. This facilitates strength-oriented refining, taking into account the optimal specific edge load.

Area of application

The fillings are suitable for nearly all types of raw material and paper qualities. Since 2006 more than 1 000 refiners worldwide have been equipped with these fillings. The Pluralis Line fillings are available for both Voith refiners as well as for refiners from other manufacturers. An analysis of the actual machine and operating conditions helps in the selection of suitable Pluralis products.

Benefits Pluralis Line

- + Reduction in the number of refiners possible
- + High hydraulic capacity with low no load
- + Increased tensile strength of the paper web
- + Less fines
- + Reduction of raw material costs by optimizing the potential of the fibers
- + Proven reduction of energy costs
- + Longer service life of the refiner fillings due to gentle refining (low-intensity refining)
- + Easy maintenance

Area of application Pluralis Line

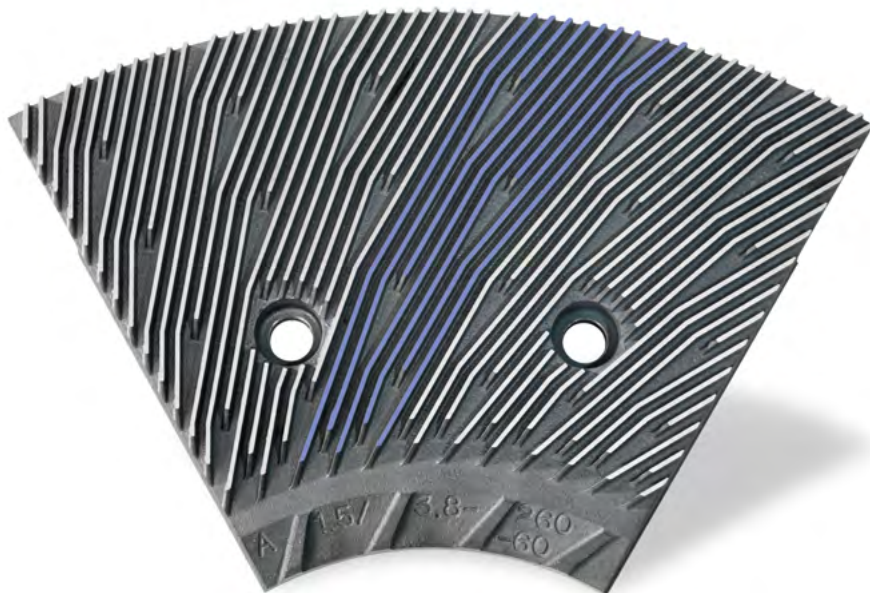
- Voith TwinFlo refiners TF1x – TF4x
 - Escher Wyss DSR refiners DSR1 – DSR3
 - Voith SDM refiners (05 SDM – 3 SDM)
 - And many standard refiners from other manufacturers
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Pluralis Line – the optimal filling for every type of fiber

Pluralis Line	Description	Typical stock composition	Recommended spec. edge load
Pluralis SSF	Super Short Fiber	“Never dried” short fiber pulp 100 % short fiber pulp	0.3 – 0.6 J/m
Pluralis SF	Short Fiber	Short fiber pulp with up to 10 % long fiber pulp (reinforcement fibers)	0.5 – 0.8 J/m
Pluralis IF	Intermediate Fiber	Pulp mixtures with up to 30 % long fiber content Secondary fiber (short to medium fiber lengths)	0.7 – 1.1 J/m
Pluralis LF	Long Fiber	Long fiber pulp Secondary fiber (medium to long fiber lengths)	1.0 – 1.6 J/m
Pluralis AO	American OCC	100 % AOCC Mixtures with AOCC portion > 50 %	1.0 – 1.6 J/m
Pluralis CF	Coarse Fiber	Unbleached long fiber pulp High kappa pulp	1.8 – 3.0 J/m

Pluralis LF

The blue areas show the three characteristics of the Pluralis line:
sectorized structure, continuous bars for best flow guidance, open groove design





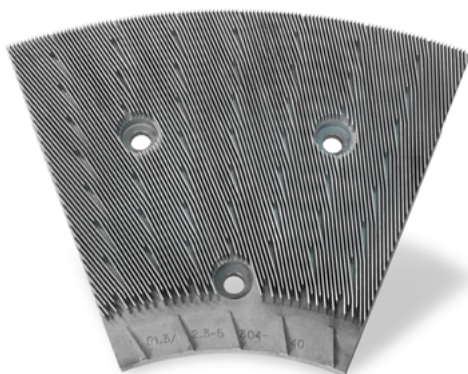


Pluralis SSF and Pluralis SF for sensitive and short fibers

Sensitive and short fibers Pluralis SSF and Pluralis SF

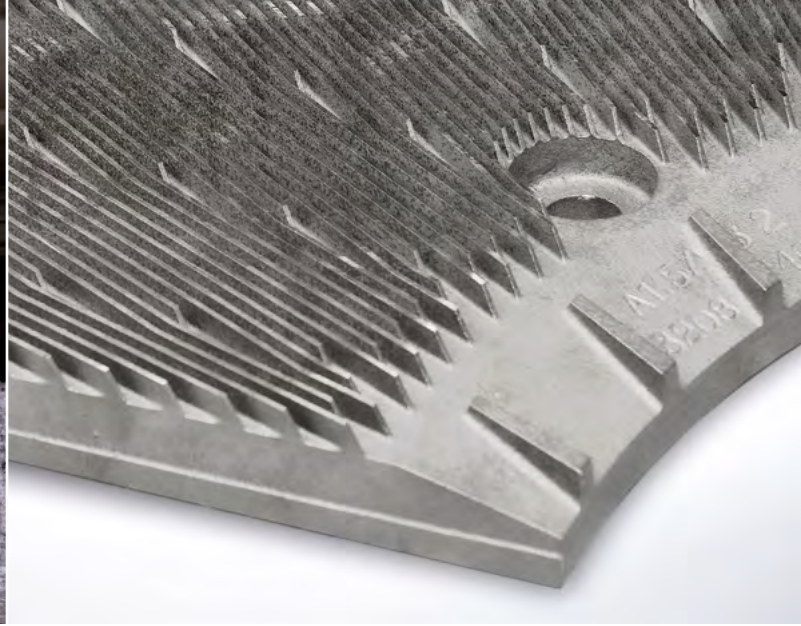
“Never dried” pulp from integrated pulp production is particularly sensitive. It thus requires extremely gentle raw material refining with a low edge load. Hence Pluralis SSF is equipped with narrow 1.3 mm bars. This is a unique characteristic in the market for casted refiner fillings. Pluralis SF is equipped with 1.5 mm bars and used for short fiber market pulps.

Pluralis SSF – Super Short Fiber



Pluralis SF – Short Fiber





Pluralis IF for medium length and recycled fibers

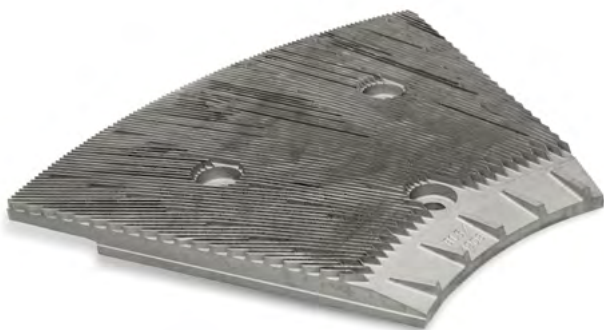
Medium length and recycled fibers

Pluralis IF

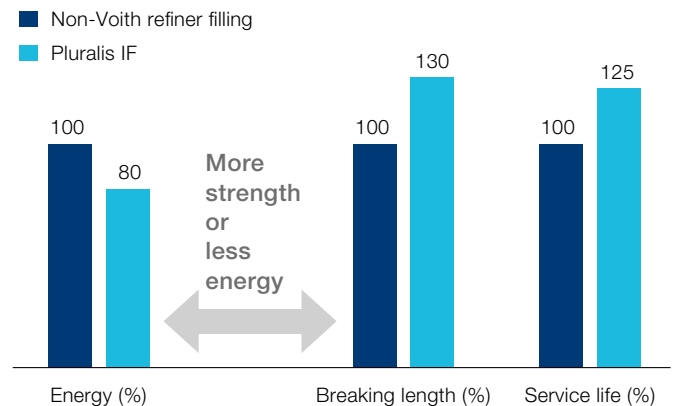
Pluralis IF covers the fiber range between Pluralis SF and Pluralis LF. The specific bar and groove design is especially suitable for mixtures of raw materials that consist of up to one third long fibers. Medium-length fibers, like most of bamboo pulp and recycled fibers can be optimally treated with Pluralis IF.

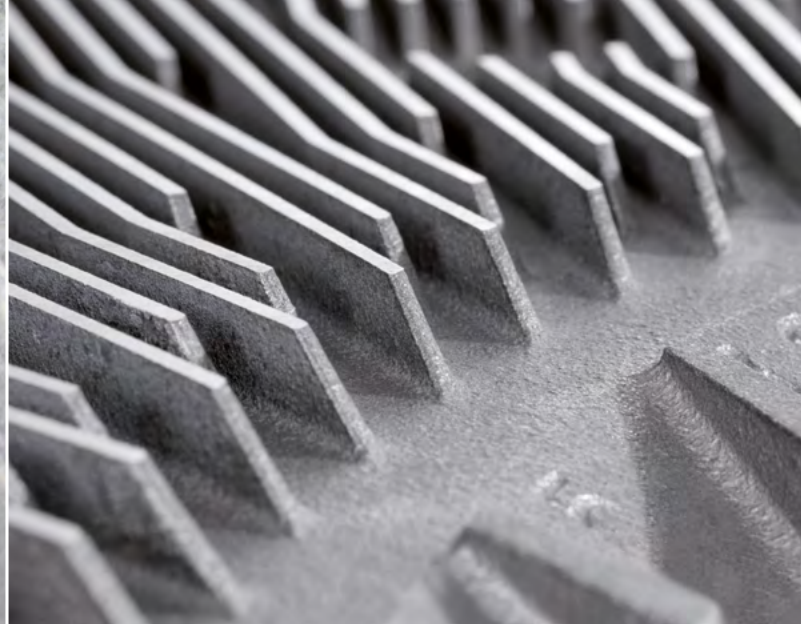
Depending on the desired result, this leads to energy savings or increases in strength potentials. In addition, the service life of the filling can be extended due to the low intensity refining.

Pluralis IF – Intermediate Fiber



Case study – cost saving 250 000 EUR/year





Pluralis LF for long fibers

Long fibers Pluralis LF

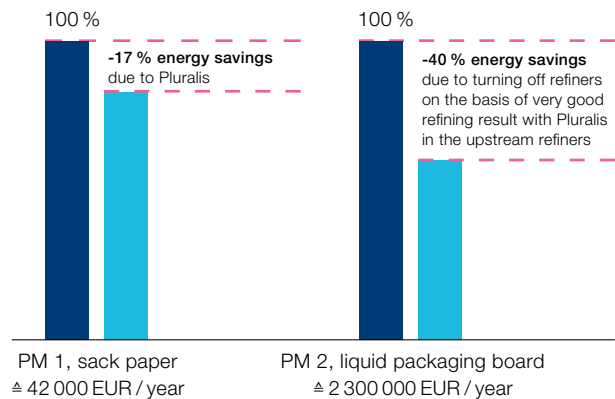
Many of the refiners operated worldwide are equipped with Pluralis LF. On the basis of these positive and extensive references, Pluralis LF was able to establish itself in the market many years ago. The Pluralis LF fillings have proven themselves for refining bleached and unbleached long fiber pulps and for BCTMP.

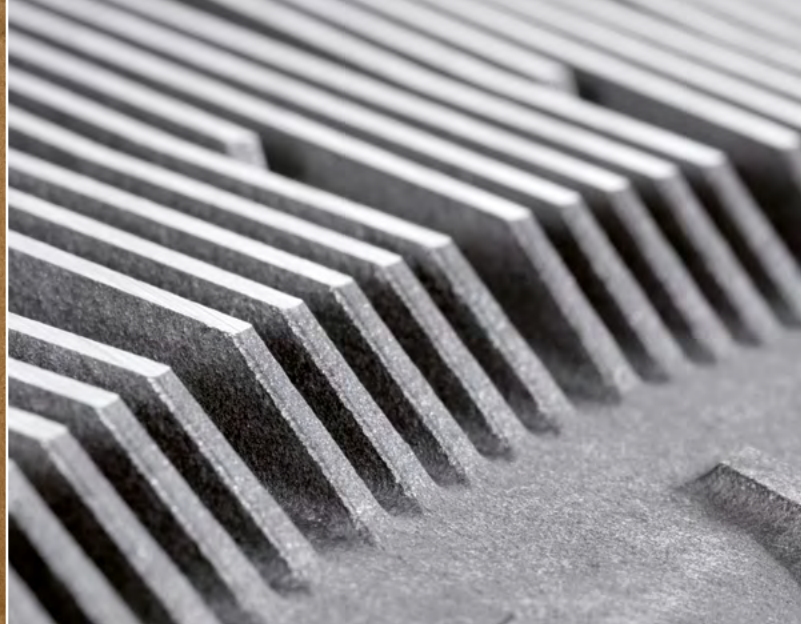
Depending on the application, the number of refiners in operation can be reduced due to the transmission of high refining outputs per machine to the raw material.

Pluralis LF – long Fiber



Case study – cost savings EUR/year





Pluralis AO and Pluralis CF for OCC raw material and coarse fibers

OCC raw material and coarse fibers

Pluralis AO and Pluralis CF

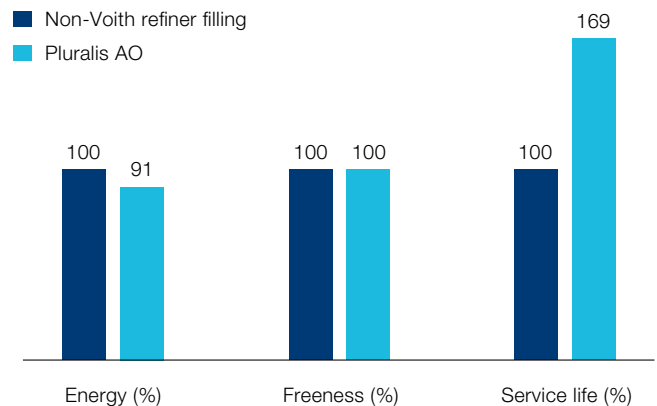
The specific requirements for OCC raw material, in particular for the American market, are met with Pluralis AO. All bars of the filling begin at the same radius thus plugging by contamination of the filling is prevented. We designed the filling especially for contaminant-rich raw materials. Contaminants that enter the groove are discharged through the filling due to the groove shape that widens toward the outside.

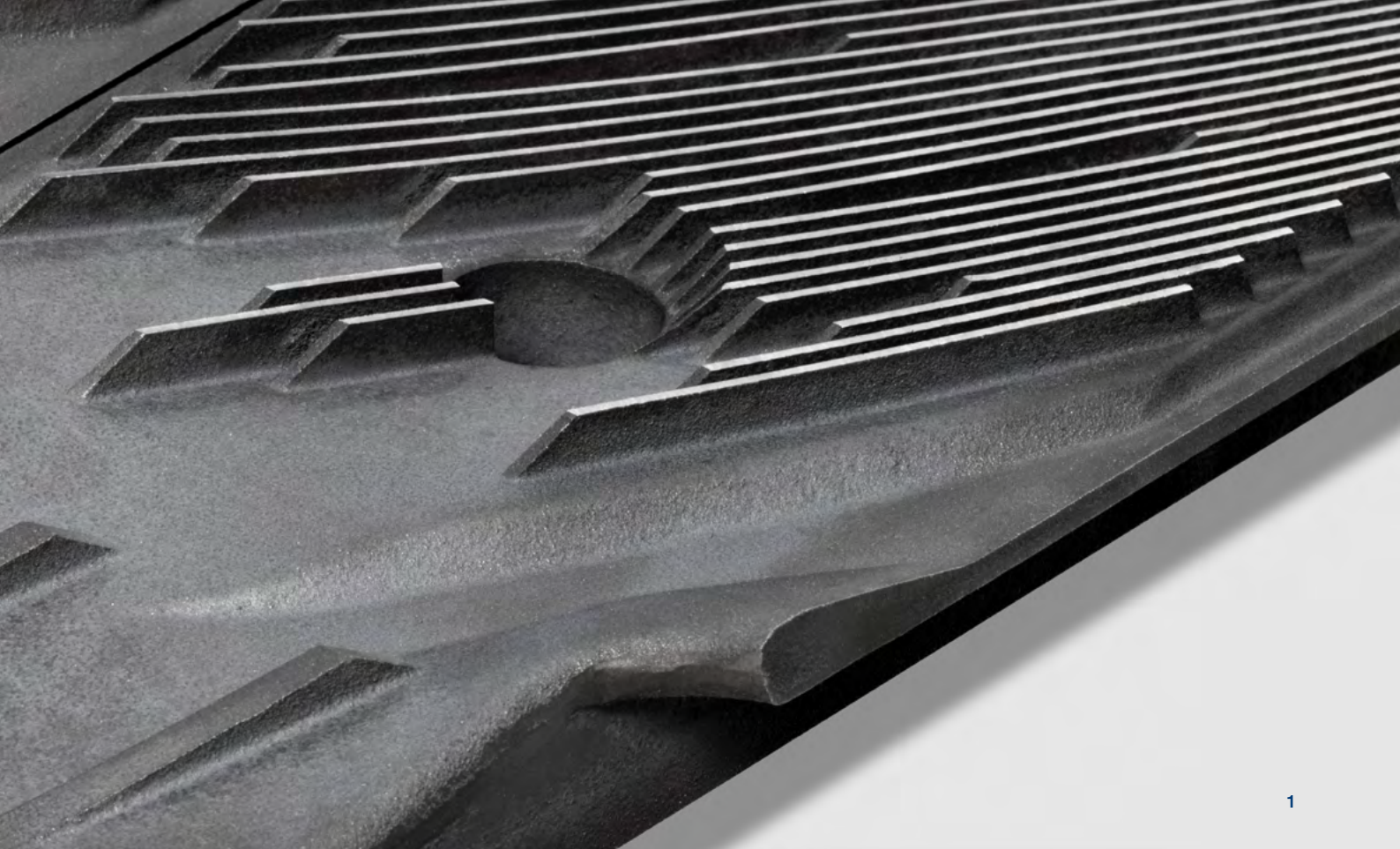
Pluralis CF is used with raw materials with high kappa numbers. They require energy-intensive treatment and have to be treated with high edge loads.

Pluralis AO – American OCC



Case study – cost saving 34 000 EUR/year





Proven design transferred to the conical geometry Pluralis Conical

Pluralis Conical completes the existing Pluralis Line. Pluralis Conical refiner fillings have all the advantages of our proven Pluralis technology and thereby produces an optimal fiber quality. These fillings were specially designed for conical refiners. Thus, this we have transferred our trusted Pluralis design to the conical shape and added so-called backflow channels.

These channels lead to an internal recirculation and thereby increase the treatment probability of the fibers in your existing machine. To complete the offering we provide a service converting your existing machine from full cone fillings to our segmented refiner fillings. If you already have an existing OEM segment holder our segments will fit its dimensions.



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1 Feeding channel for direct feed into the Pluralis grooves

2 Backflow channel of Pluralis Conical

Stator segments of Pluralis Conical



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