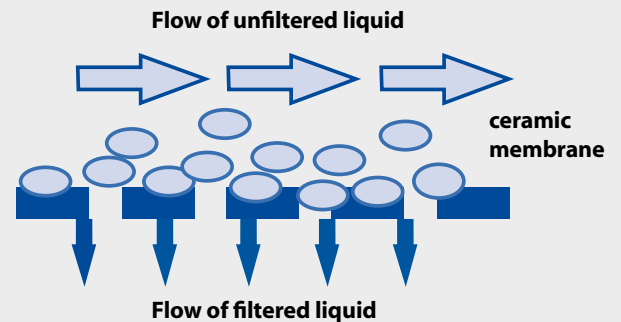


CROSS-FLOW FILTRATION PLANT WITH CERAMIC MEMBRANES

For wine, cidre, fruit juice, vinegar and other food products



Characteristics

The CERINOX® is a compact cross-flow filtration plant equipped with ceramic tubular membranes. There are standard units available as well as custom-designed installations. Different automation levels are available, from manually controlled units up to fully automated plants.

The special design of the so-called dual-flow modules allows high packing density of filter surface, which leads to small footprints and lower heights of CERINOX® plants. Especially because of the latter, the CERINOX® is easy to maintain. Due to the compactness of the plant, its inner volume is small compared to the installed filter area. This leads to low water and energy consumption as well as low product losses. Tailor-made ceramic membranes guarantee high economical benefit and high filtrate quality. The high durability of the membranes, together with a well proven process based on 15 years of experience with more than 50 plants installed worldwide, lead to very reliable systems with very low demand for operator presence and maintenance. This makes the CERINOX® a standard solution for micro filtration of food products.

Working principle

The cross-flow principle as shown on the following picture is characterised by the flow directions of the unfiltered and filtered liquid, which are perpendicular to each other.

The preferably-turbulent flow of the unfiltered liquid, which is parallel to the membrane's surface, prevents particles from depositing on the membrane or carries away already deposited substances. Hence the throughput of filtered liquid through the membrane is kept high.

A pressure gradient across the membrane forces the filtered liquid to penetrate the membrane.

Characteristics of the membranes

For every specific process tailor-made ceramic membranes in tubular multi channel elements have been developed:

Channel diameter	2.4 – 8 mm
Pore size	0.2 – 0.8 µm
Pressure resistance	30 bar
Temperature	> 90°C
pH	0~14



The robustness of the ceramic materials guarantees long lifetime of the membranes, high availability of the plants, low membrane replacement costs and low maintenance costs.

Applications

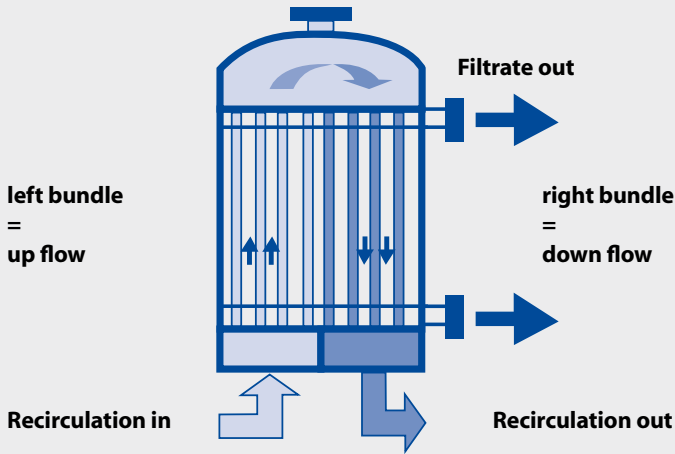
There have been systems sold for various applications all over the world:

Product	Membrane type	Size
Wine	2.4 mm	45/110 m ²
Cidre	2.4 – 2,8 mm	30 – 150 m ²
Fruit juice	2.4 – 6 mm	30 – 200 m ²
Vineger	2.4 – 6 mm	60 – 250 m ²
Food products	2.4 – 8 mm	36 – ... m ²

The CERINOX® with ceramic membranes is very well suited for new applications, which cannot be served with other membrane materials.

The dual-flow module

The name of the dual-flow-module is derived from the two different flow directions – upwards and downwards – of the unfiltered liquid in the channels of the installed ceramic elements.



Thanks to this concept, a maximum of packing density and a minimum of pipe connections are achieved. Complete venting and draining is guaranteed by discharging the liquid through the top and bottom plate.

This concept allows easy maintenance by simply taking away the top cover of the housing.

With two different sizes of dual-flow modules, filtrationsurface from 30 m² filter up to 200 m², and hence by modularly increasing filter area, an optimal plant design for all required application is possible in one module.

Space requirements

The maximum height of these plants amounts to 3.3 metres. The required floor space depends on the number and type of dual-flow modules installed. Some typical values for plants with the bigger type of module are:

No. of modules	1	1	2
Filter area / m ²	50	110	220
Module type	450	660	660
Space / m	2.2 x 2.0	3.0 x 2.0	3.0 x 3.0

Process

The CERINOX® for crossflow micro filtration works according to the «batch principle». While the unfiltrate is recirculated through the plant and the batch (feed) tank, filtrate is produced. Thanks to the batch tank, the concentration of the filtrate increases slowly so that the plant works only for a very short period with the maximum concentration. The specific flow rate is increased by this type of process. A semi-continuous operation can be achieved by substituting the volume of the filtrate by fresh feed slurry until the tank is filled with high-concentrate. Diafiltration can be applied for increasing extract yield and, hence, increasing the economical benefit. For this purpose, filtrate is substituted by deaerated water.

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The plant concept

