



## NEW OPENINGS FOR CLEAR FRUIT JUICE CLARIFICATION

*Consumers have a strong preference for clear juices. In the fruit and berry juice industry, the clarification of the juice has previously been a bottleneck in the production set up.*

New membrane design and larger capacities points towards ultrafiltration as the production technology for the future of quality clear juices.

After extraction and depectinisation, the cloudy juice is continuously collected in a circulation tank before being pumped to the Tetra Alcross UF membrane filter module. The permeate – the clear juice – is bled off and collected in a buffer tank before further processing.

The retentate is continuously circulated over the membranes and circulation tank. When the insoluble solid level in the juice reaches a set value, it indicates that the retentate concentration in the circulation tank is high. Water is then added into the loop for washing out the remaining solids from the retentate in order to increase the juice yield.

The Tetra Alcross UF membrane filtration technique is proven in many installations worldwide. In China, for example, 24 high capacity Tetra Alcross UF membrane installations are in operation within the juice industry. It is an economic process which excludes or minimises adding of fining agents, filter aids, etc.

If the juice contains strong colour, microfiltration can be suitable for eliminating colour losses.

At Vallö Saft in the town of Lipnik in Poland they have two Tetra Alcross UF plants. With the newest type of membranes they can clarify up to 18 hours with apple juice before its time for dia-filtration or leaching with water.

“The capacity of the UF plant is around 10 tonnes per hour on clarifying apple juice,” says production manager Marek Szawelski. “We also use the Tetra Alcross plants for berries when the ordinary clarification does not work properly.”

The Tetra Alcross plants have been the obvious choice in a production line including Tetra Alvap evaporators and Tetra Spiraflo tubular heat exchangers.

A standard UF membrane set up consists of up to 14 parallel membranes assembled on a stainless steel frame together with frequency controlled pumps, valves and other control equipment.

The membrane is manufactured of an organic material with a specific pore size. One module can have an active filter area of up to 500m<sup>2</sup>. The capacity of a module is always designed to suit required feed capacity.

Larger membrane packages are on its way and will make it possible to produce Tetra Alcross modules with still higher capacities.

Essential for the membrane performance and its production up-time, is the trans membrane pressure. Normally it is higher at the inlet than at the outlet end of the membrane. Therefore Tetra Pak Design the module for an optimum range of trans membrane pressure which ensure a high capacity, long production time, easy cleaning and long life-time of the membrane.

The automation system on the module is designed for controlling relevant process parameters to optimise the transmembrane pressure.

Seasonal variations of the capacity in a membrane are quite normal. The constitution of the fruits may vary in terms of pectin, starch, polyphenol and DM contents during the harvesting period. This means that the process parameters must be adjusted during the season. This is easily made at the control panel of the Tetra Alcross UF module. There is no need to alter the membrane set up.

Developing focus is today on the membrane size design and new material combinations. The pressure in the membrane and the membrane mechanisms are other items that will be further developed in order to achieve lower energy consumption and a better processing performance when producing high quality clear juice from fruit and berries.