



CLARIFICATION OF FRUIT JUICES

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# ADVANCED MEMBRANE FILTRATION TECHNOLOGY

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We're making the world safer,  
healthier & more productive.

The clarification is a crucial step of juice production. The aim is to make the juice clear while keeping its vitamins, minerals, proteins and antioxidants and ensuring proper shelf-life. PCI Membranes offers tubular membrane solutions that protects the nutrients while limiting the addition of preservatives. In addition, the quality and traceability of our products allow us to ensure the repeatability of the performance.

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## Fruit juice clarification

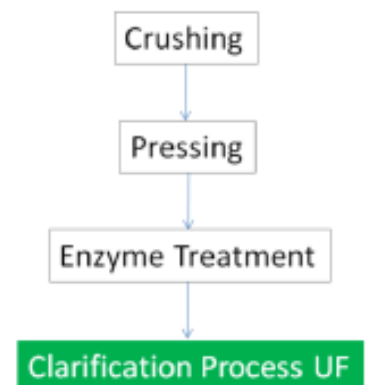
The consumption of fruit juices has significantly increased during last years and it is growing remarkably, since consumers are interested in healthy products which are practical and ready to be consumed. Thus, the global fruit and vegetable processing market was valued at USD 230.96 billion in 2016 and is projected to grow at a CAGR of 7.1% from 2017, to reach USD 346.05 billion by 2022. To produce juices, safety and quality improvement, nutritional value, product and process cost minimization are fundamental aspects.

Traditional methods for the production of single strength or concentrated juices involve several batch operations that are labor and time-consuming. Moreover those methods can't remove microorganisms and bacterias, which limits the product expiration time. Using tubular membrane brings several advantages: getting high clarification, keeping good flavor and nutriment, good maintenance of VC, retention of soluble protein as well as the small degree of browning, it is cost effective and requires low maintenance.

### The fruit juice clarification process in details:

The production of juices is divided into 4 major steps: crushing, pressing, enzyme treatment, clarification/ filtration by membranes, as well as a number of sub-steps.

- During the crushing of the fruit the solubilization of pectin's takes place, which has to be broken before the ultrafiltration/microfiltration process step. The depectinization process is done by adding synthetic or natural enzymes. It is one of the most important factors, together with the quality/type and quantity of activated carbon, bentonite or gelatin added to the process; that influence the membranes filtration capacity.
- The most recent method used for juice filtration is the use of ultrafiltration (UF) membrane process. Membranes used for this application has a nominal separation of 200,000 Dalton cut off (molecular weight) and is made with PVDF material. For the light juice ultrafiltration process, (apples, pears, light grapes and others) we recommend using our [FPA20](#) or [FPS20](#) tubular membrane (depending on the module configuration).
- For dark juices (beetroot, pomegranate, cherry and others), PCI Membranes recommends using the [LM02](#) microfiltration membranes with a nominal separation of 0.2 micron. They have a more opened membrane surface compared to the [FPA20](#)/[FPS20](#) membranes and are made of PVDF Copolymer material. This will help keep the color while maintaining a good quality product with low turbidity up to a maximum of 0.5 NTU. The PCI Membranes microfiltration (MF) membrane [LM02](#) can be operated in a batch system with or without top up.
- We also offer a 6, 8, 9 mm UF membrane for low solid fluids ranging from 20,000 to 450,000 Dalton nominal separations to cover all needs including aggressive fluids like Lemon and Lime juices.



## HOW TO CHOOSE THE RIGHT MODULE AND MEMBRANE?

### Choosing the right module:

For UF and MF, PCI Membranes recommend using either the [A19](#) or [A37](#) module. They both are comprised of a robust stainless steel housing and a replaceable core of 19 or 37 tubular membranes. They are manufactured with materials approved by the FDA, CFR21 and EU regulations. The open channel design of the [A19](#) and [A37](#) modules enable them to treat liquids with high suspended solids, without plugging and facilitate the highly effective CIP process. The compact design gives the module a high strength allowing a maximum operating pressure of 7 bar. Our unique in-situ replaceable core enables fast, easy and cost effective remembraning.



### Choosing the right membrane:

For UF, PCI Membranes recommend using either the [FPA20](#) or [FPS20](#) tubular membranes. The membrane offers greater membrane area per module with a minimum pressure drop, while maintaining the organoleptic characteristics of the treated product. PCI Membranes uses a robust stainless steel 316 for shroud, which makes it also suitable for citrus application.

For flexibility, when running multiple juices, LPA450/LPS450 an ultrafiltration membrane made of PVDF fluoropolymer material with a nominal separation of 450,000 Dalton cut off can be used.

For dark fruit juices, we recommend using our [LM02](#) tubular membranes. PCI membranes offer greater membrane area per module with a minimum pressure drop.

## ADVANTAGES TO WORKING WITH US

- Shortest lead times and highest value in the industry
- Made in Europe in a state of the art facility with highly trained production personnel and materials of the highest quality
- Over 50 years of cross flow filtration experience
- Ability to quickly adjust to your changing needs
- Technical support from initial conversations to implementation and beyond
- Products designed to maximize your productivity, product quality and bottom line
- Our expertise and product quality ensure the repeatability of then performance
- A service team trained to handle any problem, anywhere in the world

### CROSSFLOW MEMBRANE TECHNOLOGY



Reduces pollutants & contaminates while maintaining the organoleptic characteristics of fruit juices



Provides a cost effective method to treat fruit juices with minimal operator support



Designed to meet specific site demands including fluctuations in volumes & composition



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## ADDRESS

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