

Crossflow Filtration



Akticol FA-UF Blancobent UF Fructozym®

- Stable fruit juices and fruit juice concentrates
- Production of clear, stable apple juice concentrate
- Overview on UF treatment agents



Progress is our future

Stable

Stable fruit juices and fruit juice concentrates

With the introduction of microfiltration and ultrafiltration it was assumed that further stabilising measures are no longer necessary.

Especially for the production of particularly stable semi-finished products for the rapidly growing schorle and soft drink base concentrate market, a stabilising treatment with the classical fining agents is however compulsory.

For a safe and effective application in conventional crossflow filter plants, specially bentonite and activated carbon were further developed.

Blancobent UF – protein stabilisation during ultrafiltration

Bentonite withdraws protein and cloud-labile protein fragments from a base material in a targeted way. The special bentonite Blancobent UF is highly effective, has practically no sand portion (-> low abrasivity) and a defined grain size spectrum (-> no plugging of membranes). Consequently it provides for economic and careful, gentle on the production plant use in the course of crossflow filtration.

Particle size distribution of bentonite and activated carbon

Product	Particle fractions in %		
	≤45 µm	≥45 µm - 100 µm	≥ 100 µm
Ca/Na bentonites	93.6%	4.6%	1.8%
Activated carbon type FA	82.4 %	13.9%	3.7%
Blancobent UF	≥ 99.8%	≤ 0.2%	0%
Akticol FA-UF	≥ 99.9%	≤ 0.1%	0%

Akticol FA-UF – targeted colour correction and tannin reduction

Tannin or protein-tannin compounds frequently lead to undesirable precipitations and cloudiness. By its adsorbency, activated carbon significantly reduces phenolic compounds.

Together with the targeted reduction of the reaction partner protein this is the prerequisite for a low tendency towards cloudiness.

The high phenol adsorption of Akticol FA-UF enables to use small carbon amounts and still to obtain a high decolourizing effect.

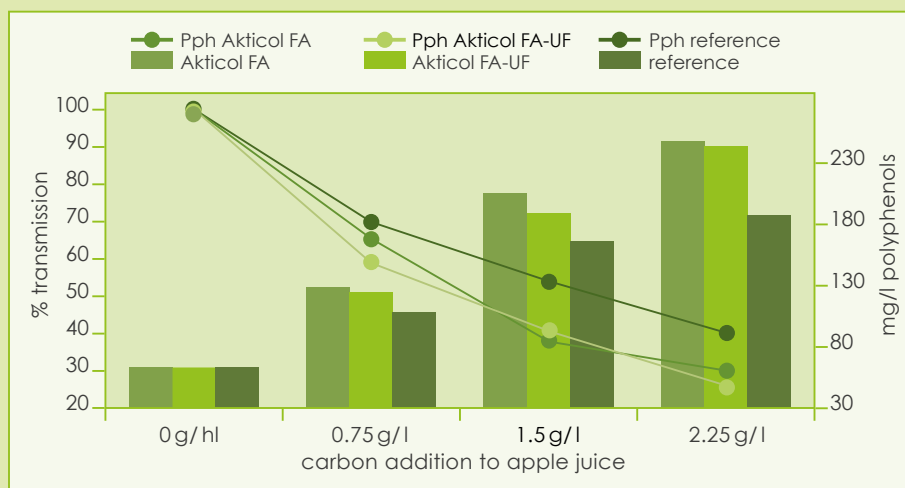
Thus low dosages and defined particle size allow economic proceeding and maintain membranes in good condition.

FloraClair® and Tannivin® Galléol – vegan stabilisation of semi-finished goods

As a filtration measure alone does not have a stabilising effect, for many juices simultaneous use of fining agents is an interesting option. Vegan fining using FloraClair® (purified pea protein) and Tannivin® Galléol (pure gall-nut tannin) has been tested in use of crossflow filtration equipment.

These preparations immediately react with each other and overfining, i.e. penetration to the filtrate side, is practically precluded. Both treatment agents are not at all abrasive and can be regarded as gentle on equipment.

Decoloration vs. phenol reduction



Akticol FA-UF

Chemically activated, highly effective powdered, plant-based charcoal. This activated charcoal's composition and purity allow particularly low wear and gentle use when combined with crossflow filtration systems.

Blancobent UF

High purity, effective powdered bentonite. Particularly low wear and gentle use when combined with crossflow filtration systems as a result of minimised grit.

Microscopic view of bentonite



Aktivit



Blancobent UF

Microscopic view of activated carbon



Ercarbon FA



Akticol FA-UF

Pectin degradation with flow effect

Filtration enzymes – the universal pectinase?

During crossflow filtration an overlay of minute pieces of fruit forms on the membrane surface (fouling effect). Filtration is increasingly inhibited and the desired filter stand times can no longer be achieved. A good part of these problematic colloids can be removed during pectin degradation by using specialised filtration enzymes. Special enzymes Fructozym® FLUX and Fructozym® FLOW-UF remain highly effective even whilst filtration is in progress, therefore significantly delaying formation of an overlay, or "fouling".

Fructozym® FLUX

To supplement normal enzymation with the aim of achieving good filterability. If there is a wholesale presence of mucilage (eg. from botrytis), for degrading particularly complex pectins (tropical fruits, various berry fruits), for optimum preparation of classic fining. Also perfect for enzymation of juices from pomace extraction.

Fructozym® FLOW-UF

Highly concentrated pectinase with hemicellulitic auxiliary activity, such as arabanase and rhamnogalacturonase. Juices from meadow orchard apples, pears and quinces particularly benefit from Fructozym® FLOW-UF.

Positive influence on stability

As only pectin degradation is routinely tested in practice, it is not unusual for there to be a critical residual araban content. Modern filtration enzymes, such as Fructozym® FLOW-UF or Fructozym UF, incorporate many activities to degrade arabans and can prevent the turbidity phenomenon of the same name.

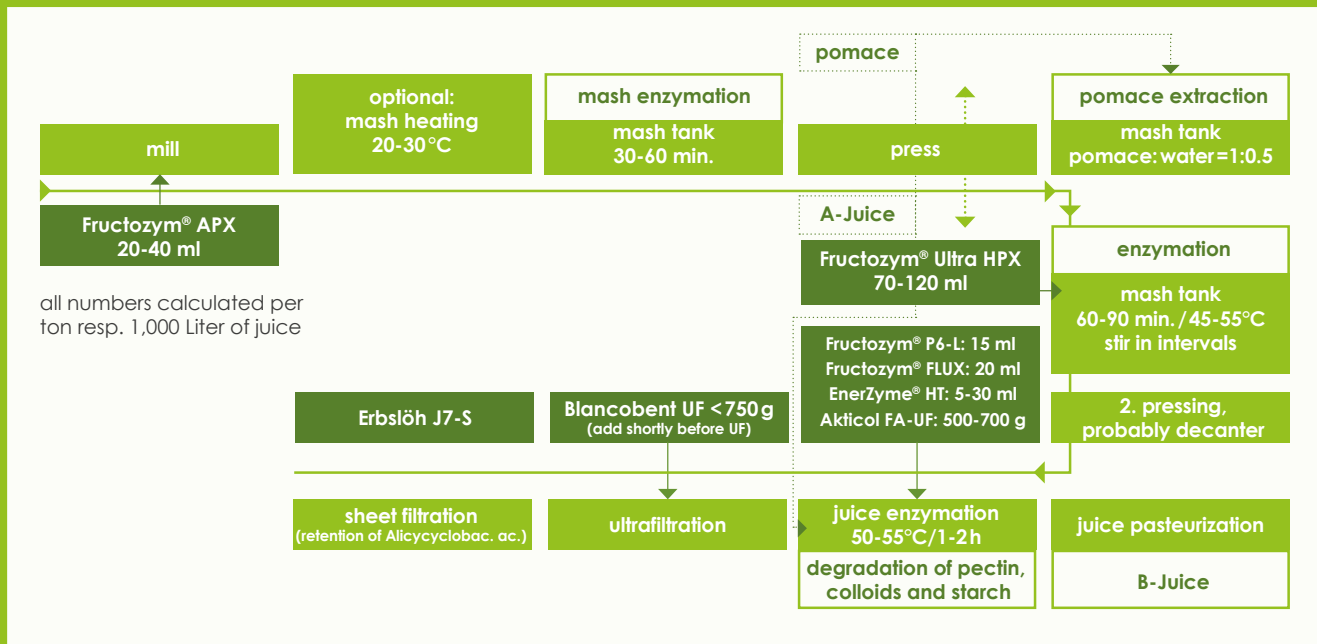
Improved enzymatic filter cleaning

The use of complex filtration enzymes is also beneficial for membrane cleaning. The key enzyme activities continue in the unfiltrate during filtration, thus preventing fouling. As a side effect the membrane is also ideally prepared for chemical cleaning.

Fructozym® UF

Acid protease and arabanase complex. Improved stability and colour yield in coloured juices with a high anthocyan content (sour cherry, blackcurrant, elderberry, purple carrot).

Production of clear, stable apple juice concentrate



Product	Specification	Application	Dosage (g or mL per 1000 L)
Fructozym® FLOW-UF	Concentrated pectinase and hemicellulase	Pectin breakdown and improved filtration for all fruit juices	10 – 40
Fructozym® FLUX	Broad spectrum pectinase, rich in glucanase	Optimized filtering of fruit juice and cider	10 – 50
Fructozym® UF	Pectinase and acidic protease	Improved stability for sour cherries, elderberries and fermented beverages	20 – 50
Fructozym® FLASH-C	Special pectinase for processing fruits with hard peels and coloured fruits with complex pectin structures	Concord and muscat grapes, chokeberry and sweet cherries	20 – 50
Beerzym Combi	Combination of Cellulases and Amylases	Enzymatical Cleaning of Membranefilter systems	0.2% dil.
Blancobent UF	Special bentonite, free from larger particles	In-line stabilisation in crossflow-filter plants	350 – 750
Akticol FA-UF	Activated carbon from plants for decolouration of beverages, free from coarse particles	Decolouration and stabilization in crossflow-filter systems	500 – 1000
FloraClair®	Plant protein for fining/clarification	Polyphenol adsorption, suitable for halal, kosher and vegan products	50 – 300
Tannivin® Galléol	Fully hydrolyzable tannin from oak apples	Beverage-finng	20 – 50