



Flavy

Membrane solutions

- Cross-flow filtration of wines, juice lees and lees
- Reverse osmosis

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Your success is our priority



Flavy cross-flow filtration and reverse osmosis

For over 25 years, Bucher Vaslin has been innovating to develop its range of **Flavy cross-flow filters**. Today, Bucher Vaslin offers a wide array of applications designed to preserve treated products: filtration of wines, juice lees and tank bottoms.

Flavy reverse osmosis is a physical membrane process allowing the extraction under pressure part of the water contained in grape musts or wines. Efficient on both red and white wines, Bucher Vaslin reverse osmosis technology improves significantly the organoleptic quality of musts (structure, aromas, color). Its applications are controlled by the local legislations.

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With Flavy cross-flow filters, you make a reliable choice



Materials certified safe and health risks free for the consumers

- The membrane of Flavy filters are **free of GMO, phthalates** and titanium dioxide **nanoparticles** (TiO₂)^{*}. According to the ANSES (French Agency for Food, Environmental and Occupational Health & Safety), these substances are suspected of being dangerous for human health and must be removed from all the materials in direct contact with food products (law dated December 24th, 2012).

^{*} In accordance with the EU Regulation n° 10/2011, with the Recommendation of the European Commission regarding nanomaterials dated 03/10/2012 and with the requirements of the FDA (US Food and Drug Administration).

- **The stainless steel 316 L** used for juices and wines is adapted to food contact.
- Flavy filters meet the requirements of the **organic farming** regulation.



Operators' health is preserved

No risk of respiratory disease due to the handling of filtration soils and other adjuvants.

Contained maintenance costs

- A selection of components recognized for their **reliability** in all industries and full stainless steel materials.
- All the filter components are easily **accessible** for fast maintenance.
- Fully-controlled process to **sustainably** preserve the performance of the membrane.

Optimal serenity for the operators

- Reinforced operational **safety**: positional checking of all valves, full emptying (no zone of retention), controlled injection of cleaning products...
- Foolproof **reliability** and constant performances over time.
- With **Winect** application, you can track and receive alerts from various events (for instance end of cycle).



Optimal accessibility to the filtration loop



Pre-equipment to assemble options



Extreme user-friendliness

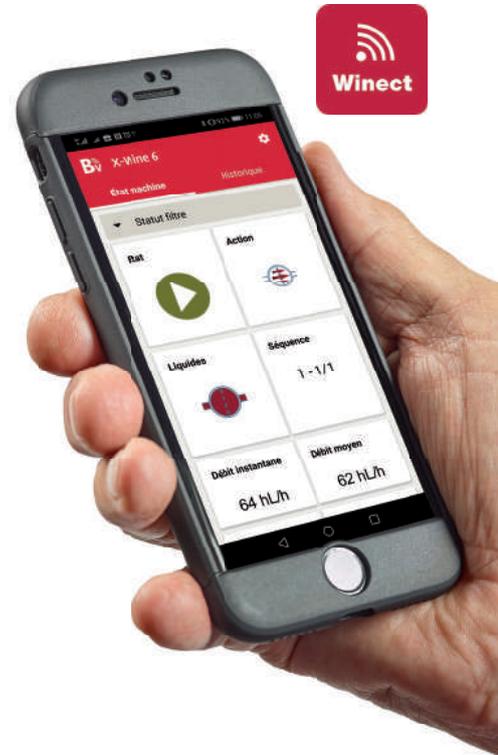


- **Intuitive**, large touch-screen, color tablet easy to understand by anyone.
- **No setting** or adjustment of the required parameters during the filtration.
- Full **autonomy** from the beginning of the filtration until the end of the cleaning.
- **Easy configuration**: you just have to fill out the volume, the type of product to be filtered and the end-of-filtration program.

Connectivity for optimal productivity

Filters fitted with a router allowing the access of a whole catalogue of **digital services**:

- Winect mobile application to remotely follow up the filtrations,
- receipt of text messages and emails,
- unlimited storage of filtration, cleaning and process data in a Cloud managed by Bucher Vaslin,
- hot line.



Remote data follow-up of the filtration in progress

Filtration of wines

Flavy FX ICS and Flavy X-Wine cross-flow filters for eXtra productivity

Due to many years of experience and innovative expertise in the cross-flow filtration of wines, Bucher Vaslin is widely recognized throughout the world. Over the years, they have proven their performance throughout their choices and technical developments:

- organic membranes in polyethersulfone specifically adapted to the filtration of wines,
- a unique filtration process to ensure stable flowrates,
- wine quality is preserved.

Today, Flavy cross-flow filtration is used in many prestigious wineries in France and abroad.



A unique versatility

- Flavy filters can be adapted to **all kind of wine**,
 - raw wine (one racking after fermentation) with high turbidity (up to 800 NTU),
 - thermovinified, raw red wine - end of malolactic fermentation,
 - fermentation blocking (mutage of rosé wines for example),
 - wines under ageing process,
 - wines after cold treatment (temperature – 4 °C),
 - wines before bottling,
 - sparkling wines (closed tank),
 - NSW, Port, cider.
- **7 modes of filtration** are available (pre-bottling, easy, standard, difficult, thermovinified red wine, very sweet wine, customized) and can be changed without stopping the filter to maintain stable and regular flowrates.

High, steady performance even on the most difficult wines

The highest flowrates on the market of cross-flow filtration:

- specific membrane for the filtration of wines with asymmetric structure of the pores and a very low retention of wine macromolecules (polysaccharides and polyphenols),
- filtration at a very low pressure (< 0.7 bar).

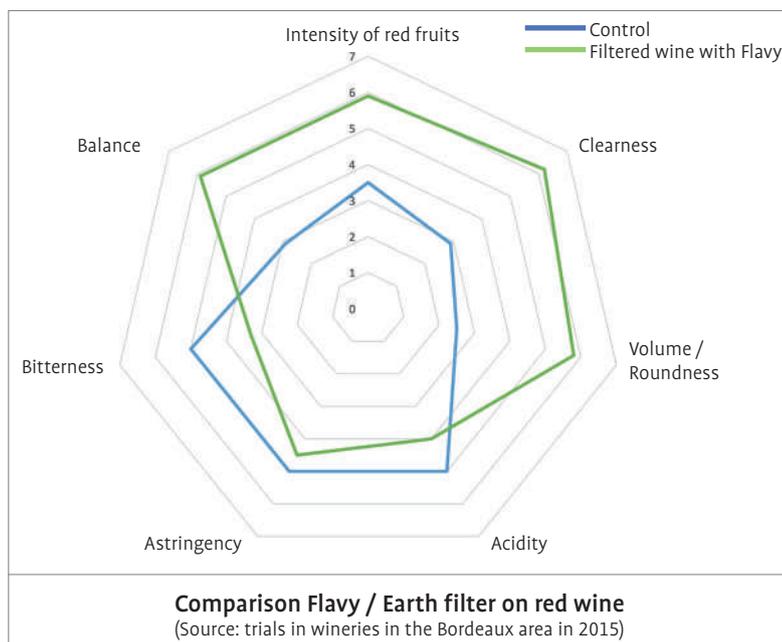
The guarantee of high-quality filtration

Contribution to the microbiological protection of wines

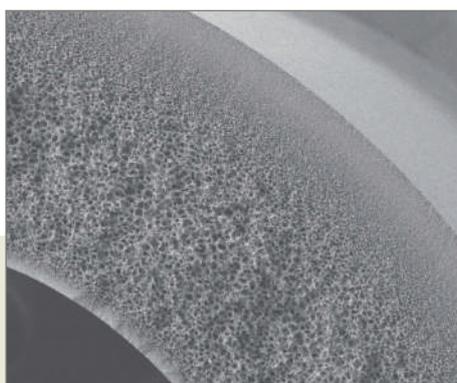
Significant decrease of microbial populations (example: *Brettanomyces* yeasts).

Wine properties are all preserved

- analytical criteria are preserved: color / nuance / IPT / O₂ and CO₂,
- organoleptic criteria are improved:
 - visual aspects (wines are limpid and brilliant (turbidity < 1 NTU), aromas and structure,
 - the beneficial effects of Flavy cross-flow filtration
 - are confirmed in wine tasting (see diagram on opposite page): more fruity, less vegetable, less bitterness, more fat,
 - no wine heating-up.



Flavy membrane



Asymmetrical membrane





Low environmental impact

- **Low volumes of water:** 1 to 1.5 liter/hl filtered,
 - no intermediate rinsing,
 - low volume of water per cleaning thanks to superficial clogging.
- **Minimized power consumption:** the ratio kWh/hl is the lowest of the market (from 0.25 to 0.7 kWh/hl filtered).

Significant reduction of operational costs

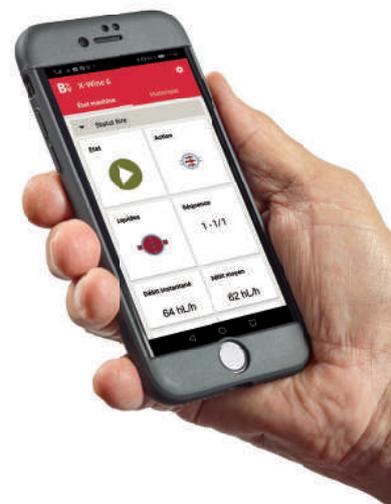
- Limited **labor** needed, a 100% self-contained and connected filter.
- **Washing** costs reduced (low volume of water and few cleaning products).
- **Ratio kWh/hl filtered** the lowest of the market: from 0.25 to 0.7 kWh/hl filtered.
- Higher **profitability** thanks to low wine losses: average rate of waste < 0.7% (0.5% as an average),
 - final emptying of the filter by injecting nitrogen for easy wine / standard modes
 - low dead volumes.
- Up to **30%** of reduction in the consumption of cartridges when bottling as the wines obtained have a low fouling index and are stable over time.

Flavy FX ICS 2 and Flavy X-Wine 3 – 10 filters range

| Wine profile flowrates in hl/h * | FX 2 ICS | X-Wine 3 | X-Wine 4 | X-Wine 6 | X-Wine 8 | X-Wine 10 |
|-------------------------------------|----------|----------|----------|----------|----------|-----------|
| Racked, fined, dry, white wine | 24 | 36 | 48 | 72 | 96 | 120 |
| Rough, dry, white wine | 18 | 27 | 36 | 54 | 72 | 90 |
| Rough, dry rosé wine | 16 | 23 | 32 | 47 | 64 | 78 |
| Rough red wine | 10 | 15 | 20 | 30 | 40 | 50 |
| Rough thermo red wine | 8 | 12 | 17 | 25 | 34 | 42 |
| Press red wine (600-800 NTU) | 6 | 9 | 12 | 18 | 24 | 30 |

| Dimensions (mm) | FX 2 ICS | X-Wine 3 | X-Wine 4/6 | X-Wine 8/10 |
|-----------------|----------|----------|------------|-------------|
| Width | 1060 | 1010 | 1472 | 1610 |
| Length | 1762 | 2055 | 2528 | 2889 |
| Height | 1890 | 1980 | 2192 | 2186 |

* Non contractual flowrates for information only.



Filtration of juice lees

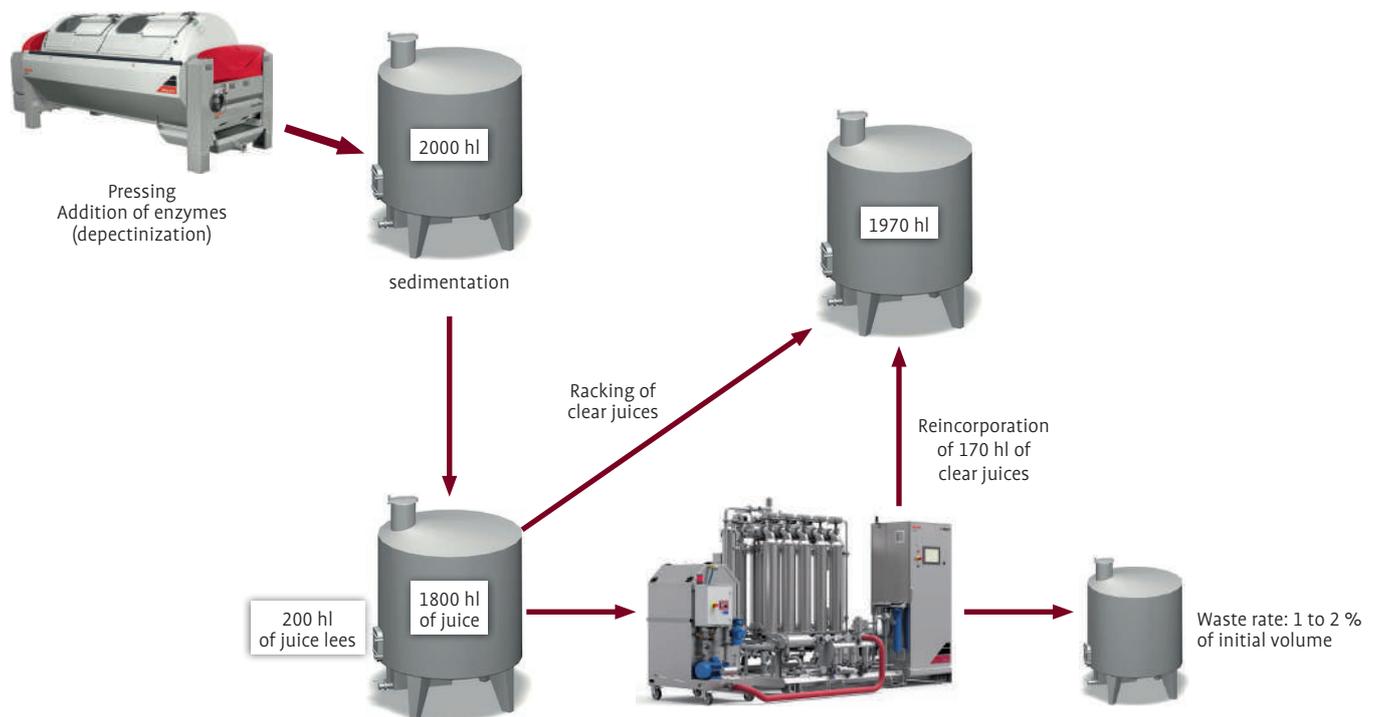
Flavy FX ICS and Flavy X-Treme cross-flow filters for eXtra performance

Thanks to their expertise in wine filtration, Bucher Vaslin patented more than 10 years ago a process which enables the development of the cross-flow filtration technique for juice lees. A very simple process which consists in treating juice lees in two, simultaneous operations:

- use of a Flavy DB rotary-drum pre-filter to eliminate big particles,
- the filtration with a cross-flow filter equipped with organic membranes specific to filtration of products with high solid contents.



Operating principle



A unique versatility

- Filters adapted to juice lees coming from **sedimentation, flotation** and **stabulation**.
- Rate of suspended solids up to **30%** accepted (centrifugation at 3000 rpm for 5 minutes).
- Most of the **oenological products** can be used:
 - Bentonite
 - Activated carbon
 - PVPP
 - Protein fining agents of vegetable origin
 - Pea protein
 - Vegecoll® (coming from the potato)
 - Gelatin
 - Casein

Unequaled profitability

Flavy juice lees filters with **higher performance** *:

- **Filtration 2 to 4 times faster with stable flowrate.**
- **2 to 3 times less wastes, recovery rate up to 90%.**
- **4 times less cleaning products.**
- **3 times less water consumed.**
- **Only one hour of labor per day** (autonomous filter, very simple configuration).

* Data based on the results collected on the field during the last three juice lees filtration campaigns.



The guarantee of high-quality filtration

Many **advantages** and **quality gains**:

- Juice lees can be gradually filtered lot by lot: no need to stock juice lees before filtration.
- No need to blend juice lees: no more downgrading of certain lots of juice lees.
- No oxidation of juices: the filter and pre-filter are inerted with nitrogen.

Flavy FX ICS 2 and Flavy X-Treme 3 – 10 filters range

| Model | Flowrate (l/h) * | Maximum volume to be treated per day (20h) |
|------------------|------------------|--|
| Flavy FX 2 ICS | 5 | 115 hl |
| Flavy X-Treme 3 | 7,5 | 175 hl |
| Flavy X-Treme 4 | 10 | 230 hl |
| Flavy X-Treme 6 | 15 | 350 hl |
| Flavy X-Treme 8 | 20 | 460 hl |
| Flavy X-Treme 10 | 25 | 580 hl |

| Dimensions (mm) | FX 2 ICS | X-Treme 3 | X-Treme 4/6 | X-Treme 8/10 | DB |
|-----------------|----------|-----------|-------------|--------------|------|
| Width | 1060 | 1010 | 1705 | 1805 | 716 |
| Length | 2006 | 2055 | 2528 | 2889 | 1219 |
| Height | 1890 | 1980 | 2304 | 2299 | 1460 |

* Non contractual flowrates (for information only).

Flavy DB pre-filter

Easy to use:

- 2 functions: pre-filtration / rinsing,
- automatic stop system when the tank to be filtered is empty,
- automatic unclogging of pre-filter grid.



Flavy DB pre-filter



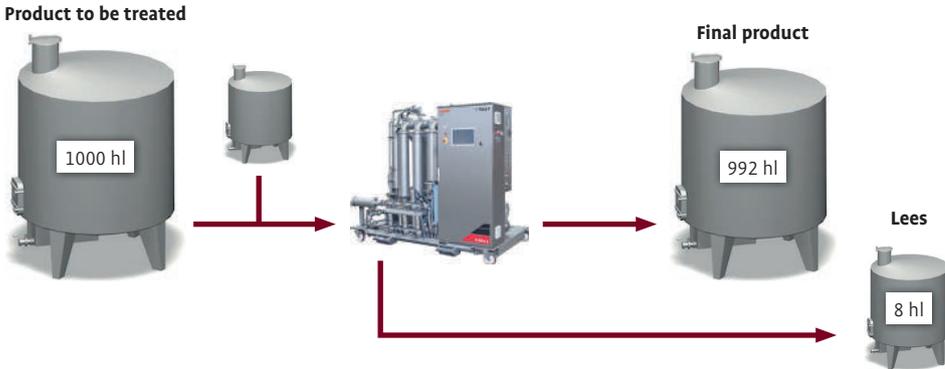
Filtration of juice lees treated with carbon

Optional accessories, equipment and additional solutions



In-line fining

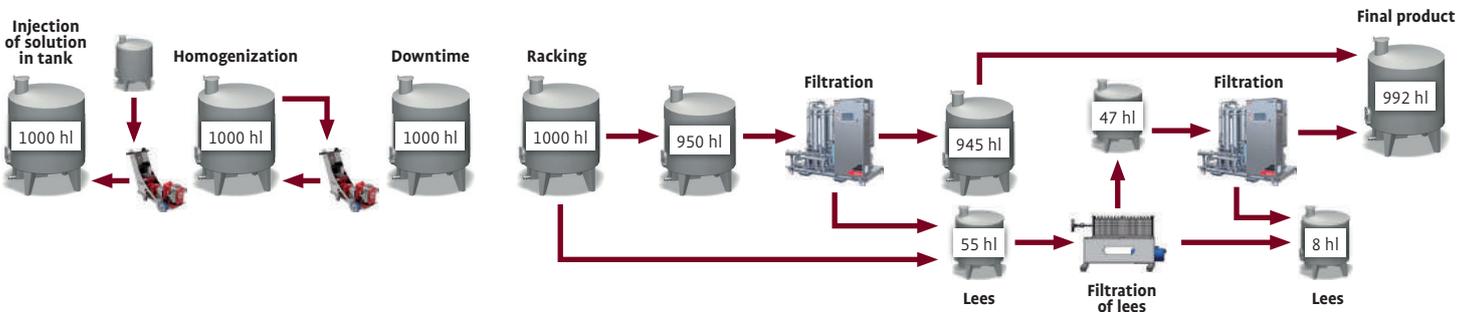
For the protein stabilization of white wines and stabilization of the coloring matter of red and rosé wines.



Many advantages compared to traditional fining:

- Simplification of wine treatment channel: One operation only = stabilization + clarification.
- No racking nor wine relocation, reduction of cleaning operations (pumps, pipes, tanks).
- Wines are treated without handling any additives.
- Wines are ready for bottling more rapidly
- No more management of tank bottoms (fining lees) that can represent 3 to 5% of the treated volume.
- Easy to use: the operator connects the product to be injected and programs the required dose. The filter manages the dosage automatically.

Traditional fining (below) multiplies the number of operations and the waste of time.



In-line injection of bentonite UF

For the protein stabilization of white and rosé wines with dosages between 10 and 100 g/hl.

In-line injection of VEGECOLL®

Vegecoll® is a protein fining agent coming from the potato that allows the coloring matter of red and rosé wines to stabilize. It is the only one able to ensure in-line treatment (high reactivity for the stabilization of coloring matter).



| Performance of filtration on wines (flowrates in hl/h) * | | | | | | |
|--|----------|----------|----------|----------|----------|-----------|
| | FX 2 ICS | X-Wine 3 | X-Wine 4 | X-Wine 6 | X-Wine 8 | X-Wine 10 |
| Injection of Bentonite or Vegecoll® | 7-10 | 12-15 | 15-20 | 25-30 | 30-40 | 40-50 |

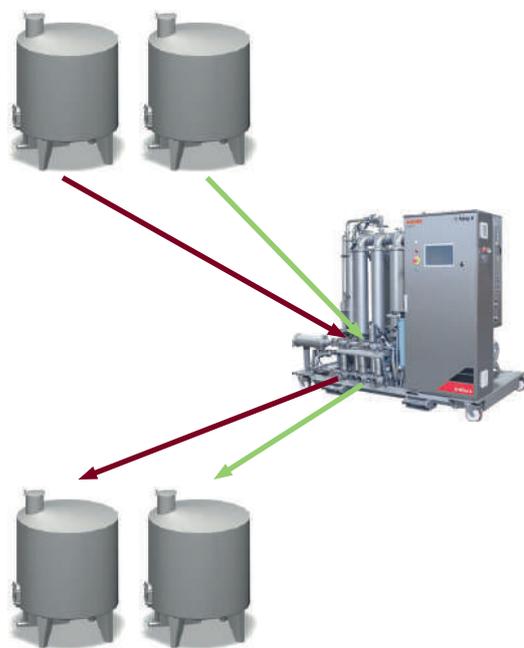
* Non contractual flowrates (for information only).

Other oenological products injection

- 2 to 3 **products** can be added **upstream** (RGMC, methatartaric acid...) and 2 to 3 **products downstream** the filter (gum arabic, CMC, SO₂,...).
- The operator connects the product(s) to be injected and programs the required dose, the filter manages the dosage **automatically**.
- The advantages:
 - oenological safety for a proper dosage,
 - easier way to work in the winery,
 - easy to use.

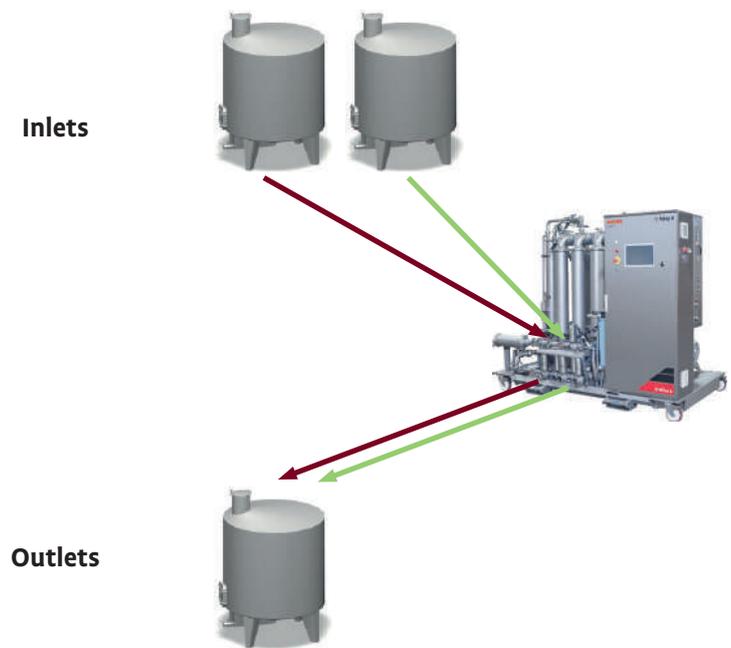
2 inlets - 2 outlets selector

Allows **automatic filtrations sequences** without the help of an operator.



Automatic sequencing

Direct blending during the filtration: time saving, easier way to work in the wineries.



Outlets

Blending

Separation of drain waters

As cleaning waters are separated (final rinsing), they can be recycled for another use (cleaning of tanks for example), which **reduces the environmental impact** of the filter.

Other equipment and solutions available

Turbidimeter

Safe filtration as the turbidity of the filtered wine is continuously indicated.

Conductivity probe

Conductivity is measured at the end of the cleaning cycle to make sure that residues of chemical products have been fully removed.

Tasting tap that can be sterilized

Sampling adapted tap for microbiological analysis.

Tared valve

Mounted on the permeate outlet, this equipment allows back pressure to be adjusted so that the filter can work efficiently when the filtered wine is sent to an underground tank or when wines with a high content of dissolved gas are being filtered.

Hot water line purge

For higher cleaning efficiency. When the hot water production is far from the filter, the purge ensures hot water supply at a temperature over 40°C.

Sparkling wines

Allows the filter to work under pressure (6.3 bars max.) for the filtration of sparkling wines.

Filtration of cleaning water

3 filtration layers (5.1 and 0.5 micron) to make sure that the filter is supplied with non-clogging water.

Injection of nitrogen

To degas filtered wines by injecting nitrogen.

Control of the wine pre-filter (Flavy X-Wine and X-Treme)

Continuous control of the clogging level of the pre-filter at the wine inlet.

Wine pre-filter grid 100 µm

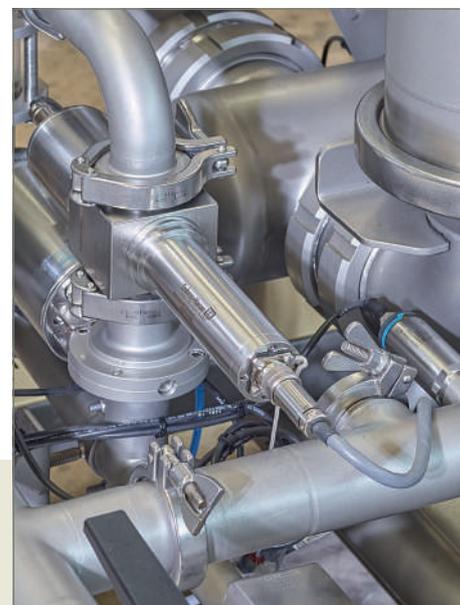
To filter wines after cold treatment. Allows the retention of the biggest tartar crystals.



Conductivimeter



Washing water filtration



Turbidimeter

Filtration of lees

Flavy Leestar cross-flow filters for eXtra profitability

Flavy Leestar is a cross-flow filter designed to filter high solid contents and especially clogging products, which represents on average 3% of the volume of the initial wine:

- fining lees or lees from sedimentation,
- retentates from cross-flow filters,
- centrifuge sludge.

Cost-effective, higher-quality, practical and eco-friendly, this filter is a good replacement for the RDV (rotary vacuum drum) filters.



Cost-effective solution

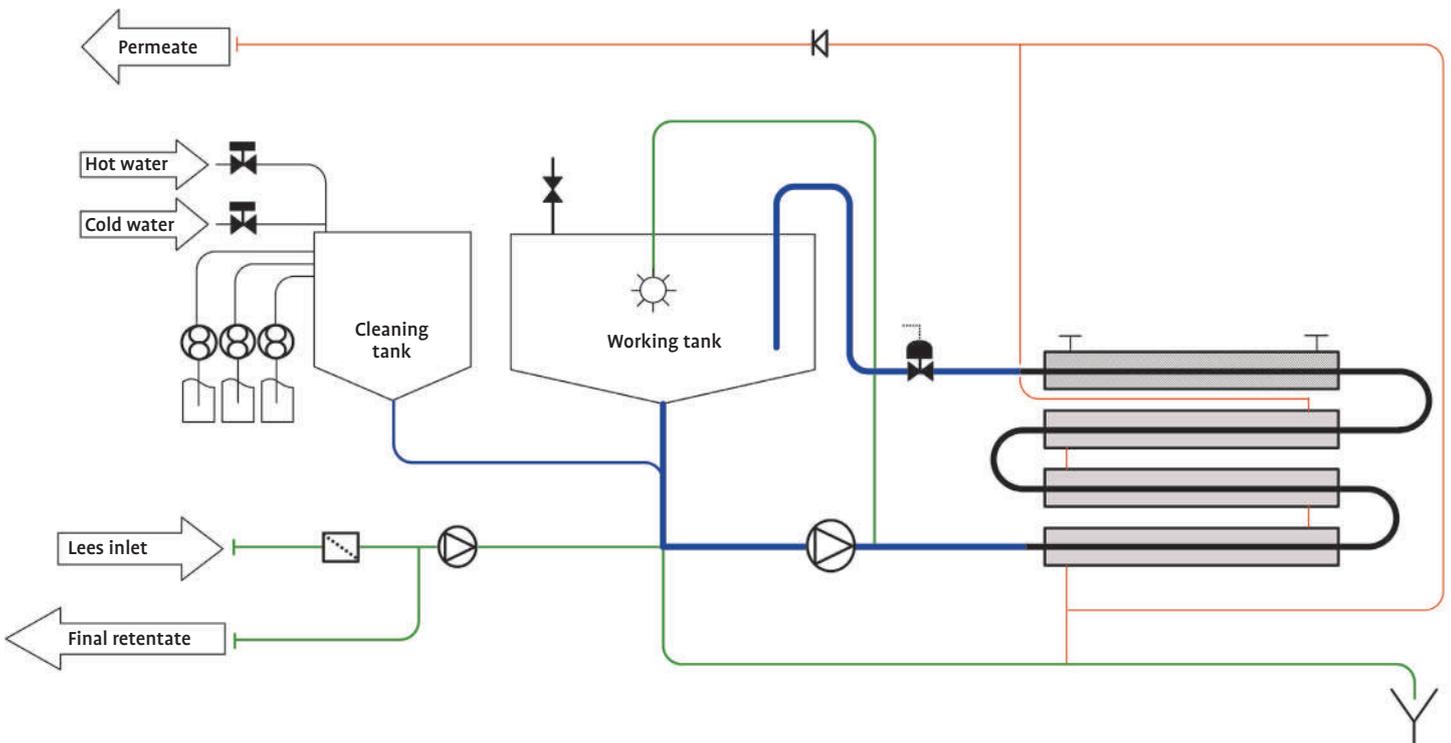
- Reduction of labor costs thanks to the **automated** process and autonomy of the machine.
- **Highly resistant**, tubular membranes in stainless steel. Resistance to abrasion, temperature (177 °C), pressure (70 bars) and chemical products.

More profitable

- Return on investment from 18 months to 3 years with **lower operating costs** compared to traditional methods:
 - Operating cost divided by 7 (by taking into account labor, electricity, water and cleaning products consumption, soils, waste treatment).
 - Higher value of the filtered wine due to higher quality:
 - protection against oxidation,
 - preservation of alcohol content.
 - With Flavy Leestar, the wine is brilliant and limpid (turbidity < 1 NTU) and can be blended with a wine ready to be bottled. Wines coming from traditional techniques must be re-filtered.
- Recovery rate of filtered product **up to 96%** on heavily-loaded products containing up to 45% of VSS.

More practical

- **Heavy-duty** equipment.
- Simple, **easy-to-use**, intuitive programming.
- Treatment lot by lot for **higher wine value**.
- Wines are **ready for bottling** right after being filtered with Flavy Leestar.
- **Upgradeable** machine without components changes, simply adding membranes.





Touch-screen automaton

Higher quality

- The **organoleptic qualities** of the initial product are preserved.
- **No loss** of alcohol content, no oxidation, guaranty of microbiological stability.
- The filtered wine is perfectly **brilliant and limpid** < 1 NTU, coloring intensity preserved.
- Reincorporation of the filtered wine to the initial lot **without prior treatment**.

Eco-friendlier

- The filtration retentates are **recoverable**.
- **No inputs** nor filtering agents. No need to re-treat.
- **Operators' health is preserved**: no soils of which use is controversial. The fine particles of crystalline silica they contain generate dangerous alveolar dusts for human health.

Flavy Leestar 3 – 6 filters range

| | Flavy Leestar 3 | Flavy Leestar 4 | Flavy Leestar 5 | Flavy Leestar 6 |
|-------------------|--|-----------------|-----------------|-----------------|
| Flowrate (l/h) * | 160 to 800 | 210 to 1070 | 270 to 1330 | 320 to 1600 |
| Daily volume (hl) | 30 to 160 | 40 to 210 | 50 to 260 | 60 to 320 |
| Dimensions (mm) | Height 2094 / Length 4608 / Width 1610 | | | |

* Non contractual flowrates (for information only).



Before filtration (tank bottom)



After filtration: permeate (wine)



After filtration: retentate (filtration lees)

Reverse osmosis

Flavy ML reverse osmosis units for eXtra versatility

The performance of Flavy ML reverse osmosis units is based on the long experience Bucher Vaslin has developed in membrane techniques over the past years. These units are very efficient for all types of wines and grapes musts whether red, white, dry, sweet or even syrupy.





Practical, upgradeable machine

- **Very compact**, the unit can be integrated in all types of wineries.
- The machine is **upgradeable** without changing the components just by adding tubes and membranes.

Easy, safe operation

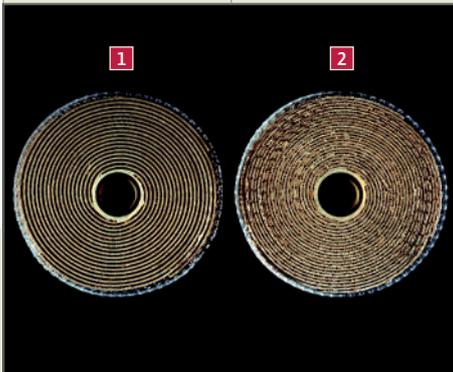
The most complete PLC of the market with the display of:

- working pressure (with safety device),
- temperature of treated liquid (with safety device),
- flowrate of water to be extracted (with safety device),
- volume of extracted water (with programming).

The least clogging membrane of the market

The membrane makes operations easier and ensures its durability.

| in comparison with our competitors' solutions | |
|---|---|
| 1 Bucher Vaslin | 2 Competitors |
| Double spacer: 1.2 mm | Single spacer: 0.75 mm |
| Possible juice turbidity: 400 NTU | Required juice turbidity: from 5 to 30 NTU |



Comparison between single and double spacer



Easy-to-use operation



Inlet valve with air bleeder

Multi-purpose equipment

Reverse osmosis applications are multiple (depending on the local legislation).

Concentration of grapes musts

This application is specifically interesting when the grapes have been diluted by heavy rains. Osmosis will allow the extraction of a certain quantity of water (permeate), which will increase sugar content while concentrating the structure.

Wine concentration

Wine concentration may be useful when its structure is poor despite an acceptable alcohol content. The extraction of a few liters of water by osmosis will improve wine intensity. Flavy membranes will achieve the concentration by modifying or not the alcohol content of wine.

Reduction of sugar content in musts

To decrease alcohol content in wines, reverse osmosis reduces the sugar content in musts before fermentation. Alcoholic fermentation will be then more consistent with no risk of stoppage nor acetic deviation.

Reduction of ethylphenols in wine

Volatile phenols come from the metabolism of a contaminating yeast: *Brettanomyces*. Excessive volatile phenols will give wines bad aromas: odors of leather, stable, horse sweat. With the Flavy ML reverse osmosis unit equipped with a specific Flavy EP accessory, these volatile phenols can be reduced under perception threshold without altering wine quality.

Flavy ML 2 – 12 reverse osmosis unit range

| | Flavy MLX-2 | Flavy MLX-4 | Flavy MLX-6 | Flavy MLX-8 | Flavy MLX-10 | Flavy MLX-12 |
|---------------------------|-------------|-------------|-------------|-------------|--------------|--------------|
| Average flowrates (l/h) * | 200 | 400 | 600 | 800 | 1000 | 1200 |
| Width (mm) | 630 | 630 | 630 | 630 | 800 | 800 |
| Length (mm) | 1244 | 1244 | 1244 | 1244 | 1244 | 1244 |
| Height (mm) | 1216 | 1216 | 1295 | 1455 | 1626 | 1786 |

* Non contractual flowrates (for information only) on musts with potential alcohol at 10-11°, temperature at 15°C and pressure at 70 bars.



Flavy EP



Flavy EP inlet



Flavy ML details

With our Serenity services, you get optimal productivity from your equipment



Connect

Connected services

Our Connect offers and solutions consist in connecting, supervising and monitoring Bucher Vaslin equipment. Thanks to a secure, real-time access, you can follow up all your works in progress, analyze the results and be informed in case of anomaly.



Assist

Assistance contracts

With Assist support and service programs, you get instantaneous answers to all your questions, you receive advices, you benefit from optimal machine productivity and minimize downtimes.



Master

Skills development

With Master, you benefit from over 40 years of experience and certification of our Training Center (DataDock and Veriselect). Our training sessions allow you to quickly develop useful skills in the use and maintenance of Bucher Vaslin equipment.

For any further information about our Serenity services,
please contact Bucher Vaslin or your distributor

Serenity
by **BUCHER**
vaslin



Bucher Vaslin is committed to providing you with utmost serenity

Bucher Vaslin Flavy department, having over 20 years of experience in filtration, provide you with high-quality services for your all project analyses, advice for the choice of the filter best adapted to your needs and regular follow-up to optimize your installation.

Bucher Vaslin design and manufacture all their products.

Local customer service is ensured by our worldwide network of Bucher Vaslin authorized distributors.

Bucher Vaslin guarantee fast availability of spare parts that remain available 20 years after a material stopped to be manufactured.

EC marking certifies the conformity of the filters in accordance with the European directives.

Bucher Vaslin is certified ISO 9001:2015 and OHSAS 18001:2007 by Bureau Veritas.

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