

Filterability testing

In the wine industry, the methods that we are using are mainly based on flow measurement. They are simple, quick and they can offer a very good consistency of the results. Two indices give an idea of the potential filterability of the wines :

- Clogging index.
- Maximum volume filterability test (Vmax).

CLOGGING INDEX (CI):

Filter the wine through a 3.9 cm² membrane (25 mm diameter), 0.65 µm of porosity, under a pressure of 2 bars.

Measure the necessary times to filter each 100 mL fraction.

- T₁ = Time from 0 mL to 100 mL.
- T₂ = Time from 0 mL to 200 mL.
- T₃ = Time from 0 mL to 300 mL.
- T₄ = Time from 0 mL to 400 mL.

T will be expressed in seconds:

$$C.I. = [T_4 - (2 \times T_2)] \times 1.66$$

This index number is an indication of the filterability of the wine. Your reference will be according the filtration material that you are using and your filtration techniques.

A measure made with Millipore membrane will be different from a measure made with a Pall or a Sartorius membrane and they are not to be compared.

MAXIMUM VOLUME FILTERABILITY TEST (Vmax):

PROTOCOL:

Filter the wine to check through a 3.9 cm² membrane (25 mm diameter), 0.65 µm of porosity, under a pressure of 1 bar.

Measure the filtered volume after 2 and 5 minutes of filtration.

V₁ = Filtered wine volume during 2 minutes.

V₂ = Filtered wine volume during 5 minutes.

$$V_{max} = \frac{3}{\frac{5}{V_2} - \frac{2}{V_1}}$$

N.B.: Wine samples must always be at the same temperature.

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PRACTICAL INTERPRETATION

To evaluate the filterability of the wine, we use the C.I. index and the Vmax index. Those indexes are average numbers and an indication of the filterability of the wine. We will always have to integrate different practical factors as the volume of wine to filter and the consistency of the membrane which can change the filtration results.

Applicability of a wine for a sterile membrane filtration:

- C.I. "reference":

Millipore C.I. : ~ 30 - 40.

Pall C.I.: ~ 50.

Sartorius C.I. : ~ 50.

If the calculated C.I. index is below this reference the filterability of the wine will be good.

- Vmax index "reference":

Millipore Vmax index : ~ 3 000.

Pall Vmax index : ~ 4 500.

Sartorius Vmax index : ~ 4 500.

If the calculated Vmax index is over this reference the filterability of the wine will be good.



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