Preparing Wine for Bottling
(as presented in December 2015 edition of Canadian Grapes & Wine magazine)

Fining
Fining agents can be used on wine to deal with a variety of issues but it is important that treatments are done at the proper time. Fining can help enhance a wine’s clarity as well as improve filterability. In general, fining is recommended to take place 6-9 weeks prior to bottling.

Filtration
The cleaner your wine is before filtration, the more cost effective that filtration will be. Limited contact and settling time for fining agents may result in incomplete effect and higher clogging during filtration. More clogging leads to higher filtration and labor costs.

Finishing and Fine Tuning Wines
The best time to make final adjustments to a wine is 6-9 weeks prior to bottling. This can include blending as well as tannin additions for fine tuning of aroma, fruit or mouthfeel.

Heat and Cold Stabilization Prebottling
Once a wine is blended, clarified and/or adjusted, it is often protein stabilized with bentonite and tartrate stabilized by one of several methods. It is recommended to heat (protein) stabilize prior to cold (tartrate) stabilization as bentonite additions may alter tartrate stability. It is important to use a bentonite that has good protein removal capacity. Sodium-based bentonites have better protein removal capacity than calcium based bentonites, while calcium based bentonites compact lees better. Sometimes a blend of the two can produce the best results. Bench trials for stability and compaction can save time and money.

Bentonite is an effective adsorption tool that is also indiscriminate between desired and undesired proteins. Strategies can be employed to mitigate large bentonite adds. Small additions (2g/HL) of FT Blanc help form tannin protein complexes reducing instability. Colloidal silica, such as Gelocolle, works on high molecular weight proteins while bentonite works on low molecular weight proteins. Colloidal silica/Gelocolle can be used to reduce total bentonite requirements. Bentonite should be added first then Gelocolle. Bench trials should be run to determine correct additions.

Performing a rough filtration prior to heat stabilization whether the wine was fined or not, will help create a clearer product to stabilize. For rough filtration we recommend using a 3-10 micron range depth filter media.

Stabilization by Removal
Traditional tartrate stabilization involves removal of the unstable crystals and their precursors. The common methods used are cellar cold stabilization, electrodialysis and ion exchange. Cold Stabilization chills the wine to near freezing to lower the solubility of tartaric. Ideally micro-pulverized KHT (cream of tartar) is added to provide nucleation sites for crystal formation. Once the tartrate crystals have formed, the wine is racked and/or cold filtered. Cold stabilization often results in lower titratable acidity and may alter pH.

Electrodialysis machines pass wine through charged membranes that substitute stable ions for those that could cause instability such as K⁺ and HT⁺. This process lowers titratable acidity and may alter pH. Ion exchange machines use resin to substitute more stable ions (usually Na⁺) for the potassium in the wine. Both of these processes require special equipment and a great deal of water that results in salty effluent.
Tartrate Stabilization by Inhibition
Claristar is a mannoprotein derived from wine yeast. It does not change the charge of your wine. It will not remove KHT. It will inhibit nucleation and crystal growth while increasing the solubility of the KHT in your wine. No final blending, acid adjustments or concentration additions may be added after Claristar has been added. It is important to note that adding a mannoprotein to a protein unstable wine may only further exacerbate the protein instability.

CMC is a well known synthesized chemical for food products. It is a etherified cellulose obtained by alkaline carboxymethylation. It works on crystals by defacing them and restricting further growth. Generally the crystals are flattened. CMC should only be used in white wines. It may precipitate color in red and rose wines. If a wine is protein unstable, CMC may increase this instability and cause a haze. CMC should never be used in wines that have been treated with lysozyme as it will cause a protein precipitation haze. Bench trials should always be done for color loss and filterability.

Tartrate stabilizers such as Claristar or CMC are utilized just prior to bottling on protein stable wines.

- Prior to adding Claristar or CMC the following should be adhered to:
- Confirm protein stability using a hot bath and turbidity meter.
- Claristar or CMC should be added 48 hours prior to bottling so it has enough time to “seat itself” in the wine.
- Before adding Claristar or CMC, wine should be filtered through 1-2 micron depth filter media. The finer this filtration, the more crystal nuclei will be removed.

Colloidal Stabilization
Gum Arabic products act as colloidal stabilizers by using electrical charge attraction and repulsion. Gum Arabic is only effective in conditions of very low to no tartrate instability. They are often more effective at color stabilization by complexing with tannins and polyphenols.

When adding Gum Arabic the following should be considered:
- These products should be added 24-72 hours prior to bottling.
- Always check filterability after adding these products.
- Gum arabic should not be added to your wine immediately prior to filtration as it may clog membrane filters. Adding right before a crossflow filtration can also place undue pressure on the elements and cause long term damage.

Bottled Wine
Stabilizing your wine before bottling reduces the chance of haze or precipitation in the bottle. Wines that drop tartrates are subject to colloidal precipitation and vice versa. This can leave bottled wine prone to oxidation and microbial problems if filtration is not performed. For the final filtration, we recommend a .45 micron membrane filter.