



ENARTIS STAB REVOLUTION PART 2: SHELF LIFE IMPROVEMENT (SLI)

March 2017

Enartis has developed a program dedicated to the improvement of wine shelf life that helps to prevent premature ageing when wine is stored for a prolonged period of time, before or after bottling.

What is premature ageing?

Wine premature ageing, mainly caused by oxidation, is characterized by browning, pinking, loss of varietal and fresh aromas, and loss of complexity, balance, identity and terroir.

Oxidation reactions in wine:

It is through redox reactions, catalyzed by transition metals such as Cu^+ and Fe^{2+} , that oxygen is converted into highly reactive radicals, capable of oxidizing a number of organic compounds.

The Enartis SLI program consists of adopting strategies that block these systems to elongate and improve wine shelf life. Each product developed for the SLI program works in synergy to protect wine from oxidation reactions, control redox potential, prevent premature ageing and extend wine shelf life.

The Enartis SLI program:

ENARTIS PRODUCT	COMPOSITION	DOSAGE (g/hL)	WHEN TO USE IT?	EFFECTS
ENARTIS PRO FT/XP	Yeast derivatives, PVI/PVP	30 -50	Fermentation	<ul style="list-style-type: none"> - Reduce catechin content of the wine - Remove heavy metals in juice - Improve mouthfeel - Improve wine oxidative stability
CLARIL HM	Chitosan, PVI/PVP	30-50	Juice fining Fermentation	<ul style="list-style-type: none"> - Remove heavy metals - Reduce catechin content of the wine - Prevent pinking - Improve wine oxidative stability
ENARTIS STAB SLI	Yeast derivative, PVPP, oak tannin	20-40	Ageing	<ul style="list-style-type: none"> - Reduce dissolved oxygen - Reduce catechin content of the wine - Prevent pinking - Mouthfeel improvement
ENARTIS TAN SLI	Tannin extracted from untoasted American oak	0.5-5	Ageing Pre-bottling	<ul style="list-style-type: none"> - Stabilize redox potential - Scavenge oxygen radicals - Chelate mercaptans
STABYL MET	PVI/PVP, silica sol	30-50	Fining	<ul style="list-style-type: none"> - Prevent copper or iron haze - Remove excessive residual metals - Prevent pinking
CITROSTAB RH	Ascorbic acid, PVPP, SO_2 , gallic tannin	10-50	Ageing Pre-bottling	<ul style="list-style-type: none"> - Prevent pinking, browning and premature ageing - Stabilize redox potential

LOSS FRESHNESS
LOSS VARIETAL
LOSS BALANCE
LOSS COMPLEXITY
LOSS STRUCTURE
CAMEL

HONEY
PINKING
COOKED FRUIT
PRUNE
BEE WAX
HONEY
BITTERNESS
BROWN HUES

LOSS VARIETAL
DRIED FRUIT
LOSS STRUCTURE
BITTERNESS
PINKING
COOKED FRUIT
LOSS COMPLEXITY
LOSS FRESHNESS
PORT

Reduce and protect substrates of oxidation - catechins:

Catechins, highly reactive polyphenols, are precursors of oxidation. In the presence of metals and oxygen, catechins can form quinones, and start oxidation chain reactions.

Fining is the most effective treatment for removing catechins and improving the oxidative stability of wine.

Enartis Stab SLI (Figure 1 and 2): Blend of yeast derivative, PVPP and oak tannin, Stab SLI is made of "active" lees that maintain a low redox potential, consume dissolved oxygen, participate to color stabilization in red wine and reduce catechin content to improve wine shelf life.

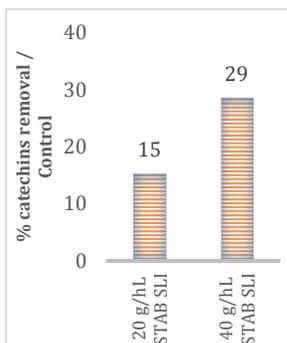


Figure 1: Decrease of catechin content (%) after addition of Enartis Stab SLI

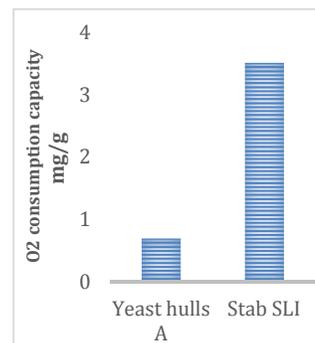


Figure 2: O₂ consumption from Stab SLI comparing to yeast hulls.

Remove catalysts of oxidation - metals:

PVI/PVP is an adsorbent polymer (copolymers of vinylimidazole and vinylpyrrolidone) capable of removing metals in wine such as copper (Cu), iron (Fe) and aluminum (Al) by chelation. Also, PVI/PVP binds with phenolic compounds, substrates of oxidative reactions.

Claril HM (Figure 3): This fining agent benefits from the synergistic actions of chitosan and PVI/PVP to reduce the concentration of iron, copper, hydroxycinnamic acids and catechin, which are key players in the process of oxidation.

Control redox potential:

What is redox potential?

Redox reactions involve the transfer of electrons from a reductant to an oxidant. Redox potential refers to the tendency to gain or yield electrons of a specific atom, molecule or solution.

Wine redox potential is impacted by its composition (phenolic compounds, metals compounds, ethanol, pH ...) and its "life story", the presence of microorganisms, lees ageing, etc.

During ageing, the redox potential of the wine tends to increase, which facilitates a higher the risk of oxidation. Stabilizing redox potential is an essential key to 'slow' down oxidation reactions and preserve the young, vibrant, fresh and stable wine over time.

Enartis Tan SLI (Figures 4): Extracted from long-seasoned and untoasted American oak with a unique and specific process. Tan SLI is a unique oak tannin that stabilizes/reduces the wine redox potential. Tan SLI has a strong ability to scavenge oxygen and metals and block their oxidizing effect while maintaining wine redox potential low. Tan SLI protects wine from oxidation that may happen during racking. Tan SLI can be used as an alternative to SO₂ to protect against oxidation.

Prevent oxidation after bottling:

Pinking, caused by phenolic instability, may occur in conjunction with rapid exposure to air during bottling. Certain varieties, and especially wines made under reductive winemaking techniques, are prone to these alterations, and in most cases these changes are not reversible.

How can Vinquiry Laboratories by Enartis USA help?

- The **Pinking Potential test** evaluates the presence of precursors that can lead to color issues in the bottle, particularly for white and rosé wines.
- Evaluate the sensitivity of your wine regarding oxidation and browning with the **Oxidative Stability test**.

Citrostab rH (Figure 5) is a pre-bottling coadjunct developed to prevent pinking in the bottle. With a balanced formulation of ascorbic acid, citric acid, SO₂ and gallic tannin, it stabilizes redox potential and protects wine from undergoing oxidation alterations, pinking, and premature ageing.

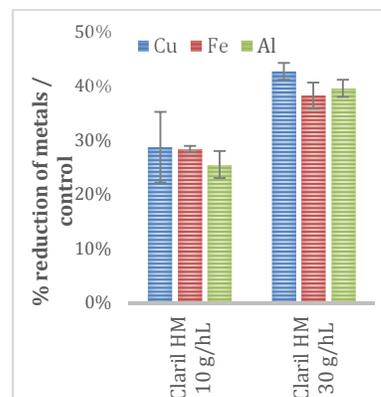


Figure 3: Average reduction (%) of metals - Al, Fe, Cu - after fining with Claril HM

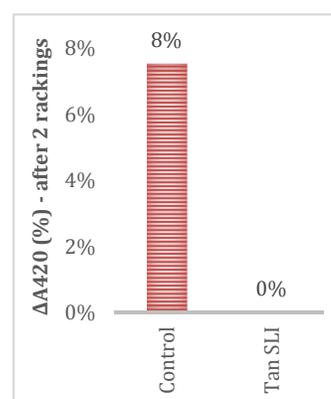


Figure 4: Tan SLI limits the increase of yellow color due to oxidation. (ΔA420, 6 days after 2 rackings). Wine with no SO₂, and 5ppm of Fe added.

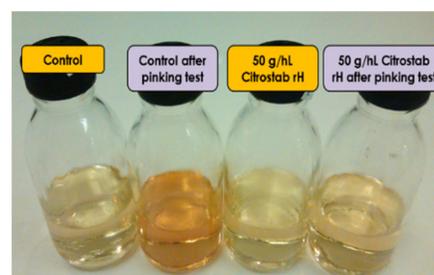


Figure 5: The addition of 50 g/hL of Citrostab rH at bottling reduces pinking risk.

For more information, please call Enartis USA at (707) 838-6312.