

# LOW OR NO SO<sub>2</sub> WINEMAKING

Facing climate challenges and market demand with allergen-free solutions

## EFFECTIVE ALTERNATIVES TO SO<sub>2</sub>, REGARDLESS OF WINE pH

1

### ACTIVATED CHITOSAN

Prevents and removes spoilage microorganisms, limits chemical and enzymatic oxidation reactions, among other benefits.

2

### TECHNICAL TANNINS

Prevent oxidation of phenolic compounds and, consequently, browning and loss of aromatics. Increase microbial protection by using a bacteriostatic tannin to inhibit microorganism growth.

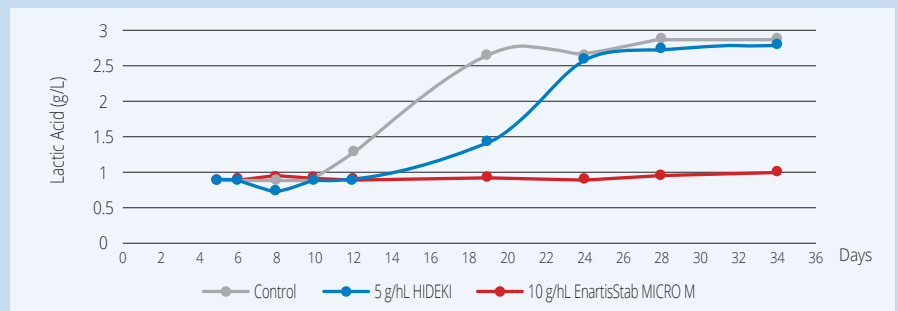
3

### SELECTIVE FINING AGENTS

Reduce the catalysts (metals such as copper and iron) and substrates of oxidation reactions (oxidizable polyphenols), preventing and treating possible changes in the bottle.

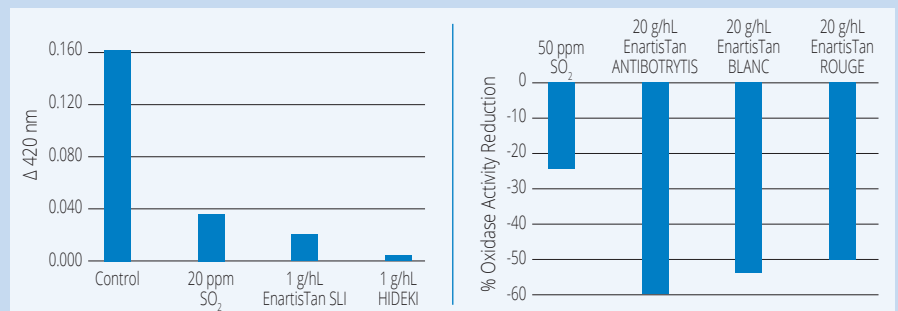
Sulfur dioxide (SO<sub>2</sub>) is the additive most currently used to preserve, protect, and stabilize wine due to its antioxidant, antioxidasic, and antimicrobial activities. Increasing demand for allergen-free wines and the challenges of climate change are leading winemakers to seek more sustainable alternatives to achieve the same wine quality and shelf-life. In addition, the increase in pH in must and wine makes SO<sub>2</sub> less effective, which requires much higher doses to obtain the same result, sometimes even to inconceivable levels.

## ANTIMICROBIAL & BACTERIOSTATIC EFFECT

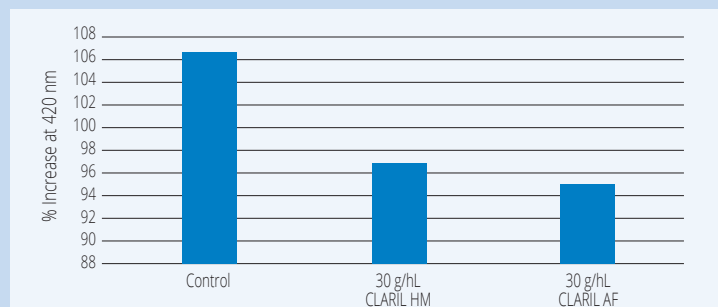


The use of ACTIVATED CHITOSAN (EnartisStab MICRO M) and a blend of selected technical tannins (HIDEKI) offers a solution to control microorganisms. Whether the wine has high pH, low molecular SO<sub>2</sub>, or a highly resistant strain of *Oenococcus oeni*, this strategy is highly effective for microbial suppression.

## ANTIOXIDANT & ANTIOXIDASIC EFFECT



The use of TECHNICAL TANNINS with high antioxidant activity prevents color degradation in wines with high oxidation potential due to high catechin content, low SO<sub>2</sub> and/or excessive exposure to oxygen. To obtain the same laccase inhibitory effect of technical tannins, large amounts of SO<sub>2</sub> are necessary.



SELECTIVE FINING AGENTS contribute to the antioxidant protection of wine that has a high content of heavy metals, potentially oxidizable polyphenols, and/or excessive exposure to air.

# LOW OR NO SO<sub>2</sub> WINEMAKING

## LOW OR NO SO<sub>2</sub> WINE PRODUCTION PROTOCOL

Enartis SO<sub>2</sub>-free winemaking protocol showed good wine quality results post-fermentation, increased aromatic intensity and complexity, good mouthfeel and structure, and no faults.

WINEMAKING PHASE		RECOMMENDED DOSAGE	WHITE & ROSÉ WINE	RED WINE
GRAPE RECEPTION/CRUSHER		10-20 g/100 kg	AST	
		15 g/100 kg	EnartisTan BLANC or EnartisTan AROM	EnartisTan ROUGE or EnartisTan COLOR
		5-10 g/100 kg	EnartisStab MICRO M (Recommendation if performing a coinoculation: add activated chitosan only after completion of MLF)	
PRESS/MACERATION		2 g/100 kg	EnartisZym AROM MP	EnartisZym COLOR PLUS
JUICE CLARIFICATION		2 g/hL	EnartisZym RS	
		15-20 g/hL	PLANTIS AF or PLANTIS AF-Q	
		20-40 g/hL	Metal removal: CLARIL HM	
		40-80 g/hL	Polyphenol removal: CLARIL AF	
TANK FILLING		5 g/hL	INCANTO NC SLI	
YEAST (Select yeast with low SO <sub>2</sub> production)		20 g/hL	EnartisFerm ES181or EnartisFerm Q9	EnartisFerm ES454 or EnartisFerm ES488
NUTRITION	YEAST INOCULATION	20 g/hL	Enhance aroma: NUTRIFERM AROM PLUS Respect varietal aroma: NUTRIFERM ULTRA	
	1/3 AF	20 g/hL	NUTRIFERM ADVANCE	
	2/3 AF	20 g/hL	NUTRIFERM NO STOP	
POST AF			Rack off gross lees	
		1-2 g/hL	EnartisTan SLI	
		10-20 g/hL	EnartisStab MICRO M	
			Adjust SO <sub>2</sub> content 15 days after completing alcoholic fermentation, to avoid H <sub>2</sub> S and acetaldehyde formation.	
		1-3 g/hL	HIDEKI	
PRE-BOTTLING		20-50 g/hL	CITROSTAB rH	

Protocol suitable for ZERO SO<sub>2</sub> wine production (red text is for LOW SO<sub>2</sub>).

ANTIOXIDASIC ACTIVITY	ANTIOXIDANT ACTIVITY	ANTIMICROBIAL ACTIVITY
	<ul style="list-style-type: none"> <li>CLARIL HM</li> <li>CLARIL AF</li> <li>EnartisTan SLI</li> <li>INCANTO NC SLI</li> </ul>	
<ul style="list-style-type: none"> <li>EnartisTan ANTIBOTRYTIS</li> <li>EnartisTan ROUGE</li> <li>EnartisTan BLANC</li> </ul>		
	<ul style="list-style-type: none"> <li>HIDEKI</li> <li>CITROSTAB rH</li> </ul>	
	<ul style="list-style-type: none"> <li>EnartisStab MICRO M</li> </ul>	

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