

WINEMAKING GUIDELINES

SMOKE TAINT – WHITE WINES

How are grapes and vines affected by bushfire smoke?

Numerous volatile phenols are present in bushfire smoke and can be absorbed by grape berries and vine leaves during a smoke event. Vineyard and grape exposure to smoke may result in wines with undesirable aromatic characteristics such as smoky, burnt, bacon, medicinal or ash, as well as distinct bitterness and drying sensation in the throat.

What compounds are responsible for smoke taint?

The known compounds which contribute to smoke taint are free forms volatile phenols (guaiacol, 4-methylguaiacol, o-cresol, p-cresol, m-cresol, etc) which are produced when lignin in wood is burnt. These compounds are absorbed by the vine and which then glycosylates, or adds one or more sugars to the compounds. These sugar bound compounds are released in the mouth by enzymes in saliva, which leads to an ashy aftertaste.

How can I assess the level of smoke taint risk?

In grapes, we recommend measuring the **Total Smoke Taint Markers** as the “free” (volatile) fraction is almost non-existent with grapes and not representative of the smoke taint risk. Testing grapes two weeks prior to harvest is recommended.

Which factors affect smoke uptake by vines?

To assess the risk of smoke taint in wine, we recommend testing for Free and Total Smoke Taint Markers as this gives a more complete picture for the status of free and bound fractions within the wine. For red wines, samples can be tested just after pressing a red must and at any point during the ageing process.

Constant, regular sensory monitoring recommended especially when close to bottling time – release of bound compounds rather unpredictable and does not follow a trend/pattern.

Key winemaking steps when dealing with smoke tainted grapes:

1. **Hand harvest** and sort out **leaf material** that can release smoke-related compounds
2. Process fruit **cold** to limit extraction
3. **Limit skin contact** to reduce extraction of off-aromas: whole cluster press, no crushing, no destemming
4. **Separate press fractions** and clean hard presses with **carbon fining**
5. **Fast and strong clarification**: solids are bound to off-flavors, green characters and toxins that can alter fermentation and wine quality
6. Select an aromatic and complex yeast strain
7. Mask smoke aromas by enhancing aromatic precursors via yeast nutrition or tannins
8. Rack off lees early: some off-aromas bound to lees and can be eliminated by racking off early
9. **Mask** smoke related off-aromas with untoasted oak chips or tannins with aromatic precursors. Oak chips can reduce intensity of smoke characteristics through increased wine complexity

*The above is achieved to the best of our knowledge and experience.
The industrial application of the advice provided does not imply any responsibility on the part of our company.*

10. Balance wine mouthfeel with mannoproteins and fermentation tannins
11. Market for early release: smoke-related characteristics can evolve in bottle as wine ages

| WINEMAKING STAGE | OBJECTIVE | ENARTIS RECOMMENDATIONS | DOSAGE |
|---|--|--|------------|
| Harvest/ Vineyard | Antioxidant | AST is a blend of ascorbic acid, gallic tannins and SO ₂ for complete antioxidant protection. 100ppm of AST = 28 ppm SO ₂ | |
| | <i>Reduce skin contact - keep low temperature – gentle press cycle – limit rotation - separate press fractions. Recommended analysis: Juice Panel, Smoke Taint Markers</i> | | |
| Press Pan | Settling Enzyme | Enartis Zym RS: Pectinase and hemicellulase developed for difficult settling. Rapid settling and intense clarification. | 2-3 mL/hL |
| | Fining Agent | Fenol Free: Activated carbon fining agent with high affinity for volatile phenols responsible for smoke taint. Recommended for press fractions. | 30-50 g/hL |
| <i>Recommended turbidity < 150 NTU</i> | | | |
| Inoculation | Nutrients | At inoculation, adjust YAN>150 ppm with complex nutrient Nutriferm Arom Plus provides essential nutrients for proper yeast development: amino acids, vitamins and mineral salts and aromatic precursors to enhance fermentation aromas. | 30 g/hL |
| | Yeast (select one) | Enartis Ferm ES181: <i>S.cerevisiae</i> strain with a short lag phase, fast fermenter and low nitrogen need that produces a large amount of secondary aromas. Enartis Ferm Aroma White: <i>S. cerevisiae</i> with β-lyase and β-glycosidase activities. Increases varietal aroma production and produces high amount of secondary aromas. | 20 g/hL |
| | Polysaccharides | Enartis Pro Blanco: Yeast cell wall polysaccharides rich in sulfur-containing peptides. Promotes varietal aromas production, balances mid-palate and reduce green characters. | 40 g/hL |
| <i>Fermentation temperature: 14-18°C (57-64°F) – not higher than 20°C (68°F) Rack wine from gross lees early toward end of fermentation</i> | | | |
| 1/3 Fermentation | Yeast Nutrients | Nutriferm Advance: Organic and inorganic nitrogen, yeast cell walls rich in sterols and fatty acids and cellulose. Helps yeast with stress resistance, detoxifies wine, ensures complete fermentation and reduces production of H ₂ S. | 2-3 mL/hL |
| | Oxygen | Via Enartis MicroOx or pump-over to improve yeast membrane health. | 30-50 g/hL |
| | Oak Alternative | Incanto NC White: Soluble oak extract (untoasted oak tannin, acacia tannins and yeast polysaccharides). Mimics the effect of untoasted oak chips. Decreases off-flavors, protects against oxidation, prevents reduction and increases wine volume. | |
| 1/2 Fermentation | Yeast Protection | Nutriferm No Stop: Yeast cell walls rich in fatty acids and sterols to improve yeast cell membrane fluidity, yeast resistance and | 20 g/hL |

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| | | fermentation activity. Highly recommended in high temperature fermentations. | |
| <i>Recommended analysis: Alcohol, Residual Sugar, pH, TA, Malic Acid, Microscan</i> <i>Rack from fermentation lees + add SO₂</i> <i>For ageing, use 20 g/hL of Surli One</i> | | | |

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