Oenological tannins are derived from several botanical species, the oldest of which are the oak apple, chestnut wood and oak wood. In addition, other tannin-rich species can be used, such as grape skin and seeds, tea leaves, artichokes and many others.

To extract tannins, only water and/or alcohol are used according to the Oenological Codex. It is the proportion of water and/or alcohol used, together with the extraction temperature, that makes it possible to obtain the best extraction yields and select certain specific tannin structures (for example, low, medium or high polymerisation in the case of tannin extraction from grape seeds).

The first factor that differentiates tannins is the chemical family to which each tannin belongs. Each family is characterised by a specific chemical structure that governs their properties. There are three families:

- **GALLOTANNINS**
- **ELLAGITANNINS**
- **PROANTHOCYANIDIC TANNINS, ALSO CALLED CONDENSED TANNINS.**

To fully understand the use of tannins it is above all necessary to understand their properties and their significance for musts and wines.
Tannins can thus be classified according to their different botanical origins.

- SOURCES OF GALLOTANNINS ARE:
  - oak apples (historically the first source) and tara, whose tannins are derived from the fruit.
- SOURCES OF ELLAGITANNINS ARE:
  - chestnut wood and oak wood.
- SOURCES OF PROANTHOCYANIDIC OR CONDENSED TANNINS ARE:
  - grape skins and seeds, quebracho, mimosa, tea, etc.

A second factor is the chemical structure of the different families, which governs the principal oenological properties of tannins.

1. The presence of many alcohol functional groups (OH) as well as an important number of double carbon bonds (C=C) gives them a strong ability to oxidise and therefore consume and trap any oxygen that may be present in the environment. Following this rule, families of tannins can be classified according to their increasing antioxidant and oxygen-consuming capacity.

2. The bonds in the stacked structure are all the stronger when the carbon rings are aligned. The different families can be classified in order of increasing interaction force in these structures, and therefore in their increasing capacity to protect the anthocyanins during vinification.

<table>
<thead>
<tr>
<th>Gallotannins</th>
<th>Ellagitannins</th>
<th>Proanthocyanidic tannins</th>
</tr>
</thead>
</table>

3. The ability of different tannin families to affect the wine’s redox potential makes it possible to limit strong oxidation (appearance of ethanal notes in the wine) as well as strong reduction (appearance of notes of cabbage, rubber, etc.). This is the case for the ellagitannin family to which oak tannins belong.
A specific technique: **MICRO-OXYGENATION**

with \( \text{OENO}_2 \)

This technique consists in supplying pure oxygen in controlled amounts over time. This is a first-rate tool and supplements the use of tannins for stabilisation of colour and ‘maturation’ of tannins. This is because, although uncontrolled input of oxygen can lead to organoleptic ‘disasters’ in wines, targeted, controlled input of molecular oxygen can accelerate polymerisation of tannins and anthocyanins in wine. Input of oxygen causes oxidation of the polyphenols (tannins) in quinone, producing a molecule of hydrogen peroxide \( (\text{H}_2\text{O}_2) \). The hydrogen peroxide oxidises alcohol molecules to ethanal molecules, molecules that are then bound by the tannins forming ethanal bridges. These bridges encourage the formation of covalent bonds between the tannins and/or anthocyanins, which in the case of a tannin-tannin reaction leads to less hardness and astringency in the tannins in the wine, and in the case of a reaction between anthocyanins and tannins to stabilisation of colour. It is important to note here that these reactions can only take place with tannins derived from grapes that are endogenous (those naturally present in the wine) or exogenous (those supplied in the form of tannins from grape seeds or skins). In no way can other tannins derived from other botanical species react in this way.

**1st stage:**
In an oxidising environment the tannins oxidise, forming quinones and hydrogen peroxide \( (\text{H}_2\text{O}_2) \)

\[
\text{H}_2\text{O}_2 + \text{CH}_3\text{CH}_2\text{OH} \rightarrow \text{CH}_3\text{CHO} + 2\text{H}_2\text{O}
\]

**2nd stage:**
The ethanal formed then forms ethyl bridges \(-\text{CH}_2\text{CH}_2-\) between the tannin molecules

Formation of a new, more highly polymerised grape tannin
As a result of our knowledge and expertise regarding these various properties, Martin Vialatte has formulated specific tannin preparations in order to meet the challenges facing winemakers. A very detailed analysis of these challenges has enabled Martin Vialatte to select and adjust optimum combinations of tannin families as well as their botanical origins, thus making use of their most valuable properties.

Presentation of two specific tannins in the Martin Vialatte range

SUBLISTAB and SUBLIRED are two tannin blends specifically developed for the production of modern red wines characterised by intense fruitiness, a strong red colour and a supple tannin structure.

SUBLISTAB protects colour through the copigmentation effect and maintains optimum redox potential, while SUBLIRED preserves the aromatic component and permanently stabilises colour. SUBLISTAB and SUBLIRED work in synergy.

To obtain this style of wine, winemakers often make use of thermovinification processes so as to obtain very coloured, fruity and supple wines. If this process is not accompanied by the appropriate tannins there is a risk that it can lead to a loss of colour related to a deficiency of tannins during vinification. Reduction notes may also appear, especially if thermovinification is carried out on reducing grape varieties such as Syrah, Gamay, Pinot noir, etc.

Below, we show the result of a tannin addition trial on a Cabernet Sauvignon wine that has undergone thermovinification. SUBLISTAB and SUBLIRED were added at the start of vinification at respective doses of 20 g/hL and 10 g/hL. Alcoholic fermentation lasted eight days. Analyses were carried out on the wine at the end of alcoholic fermentation following racking and stabilisation with SO₂.

Impact on taste of a tannin addition trial (20 g/hL SUBLISTAB + 10 g/hL SUBLIRED) during fermentation of a wine that has undergone thermovinification.

Impact on colour of a tannin addition trial (20 g/hL SUBLISTAB + 10 g/hL SUBLIRED) during fermentation of a wine that has undergone thermovinification.
# Martín ViaLatte Solutions

## GalloTannins

### Vitanil B

Vitanil B is made up of tannins from tara pods (a leguminous tree found in South America). It is a gallotannin extracted with alcohol, and is perfectly suited for fining white wines. On must, Vitanil B plays a role in racking and clarification by binding the proteins in musts and wines. It eliminates, among other substances, natural grape oxidases (tyrosinase and laccase secreted by Botrytis).

**Packaging:** 1 kg  
**Application rate:** On must: 10 to 20 g/hL - On wine: 2 to 10 g/hL

### Tanigal

Tanigal is an oak gall tannin intended for the clarification and fining of white wines. Tanigal plays a role in racking and clarification by binding the proteins in musts and wines. It preserves the organoleptic properties and structure of the wine. Tanigal is essential in white wines when fining with a moderately hydrolysed gelatin (GELISOL). Tanigal is also used for clarifying bottled sparkling wines produced in the traditional manner.

**Packaging:** 1 and 25 kg  
**Application rate:** 2 to 8 g/hL

## Ellagitannins

### Tanixel

Tanixel is a pure chestnut tannin, which can be added during the wine-making phase but also during the ageing phase of red wine. Tanixel protects color and participates in the organoleptic balance of red wines by providing structure while reacting strongly to must and wine proteins.

**Packaging:** 1 kg, 12.5 kg  
**Application rate:** 5 to 50 g/hL

### Subli’Oak

Subli’Oak reveals the potential of red, white and sweet wines. Subli’Oak develops the aromatic complexity and fruit notes while providing roundness, volume and structure. Subli’Oak reveals vanilla and subtle roasting notes and removes the vegetal and bitter character. Subli’Oak provides freshness.

**Packaging:** 500 g  
**Application rate:** 1 to 50 g/hL

## Condensed Tannins

### Subliprotect

Subliprotect is a complex of grape tannins and inactive dry yeasts. This tannin contributes to balance in the mouth and a feeling of freshness. It prepares wines for maturation in barrels. Subliprotect strengthens resistance to oxidation and preserves redox potential.

**Packaging:** 1 kg  
**Application rate:** 5 to 20 g/hL

### Sublistab

Sublistab is a blend of ellagiques and proanthocyanidiques tannins weakly polymerized. Sublistab was specifically developed for protecting and definitively stabilizing wine color. This is a top choice tannin for thermo-vinification type procedures.

**Packaging:** 1 kg  
**Application rate:** 10 to 40 g/hL
**PROANTHOCYANIDIC TANNINS**

**VITANIL VR**

VITANIL VR is essentially made up of proanthocyanidin-type condensed tannins. VITANIL VR acts in synergy with wine tannins to provide optimum stabilization of coloring matter. It protects anthocyanins from oxidation.

**Packaging:** 1 kg and 10 kg

**Application rate:** On harvest: 15 to 25 g/100 kg - On must: 10 to 20 g/hL

**On wine:** 5 to 10 g/hL

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**SUBLITAN VINIF**

SUBLITAN VINIF promotes the clarification and stabilization of red wine. It participates in making livelier colored red wine, less oxidized and more balanced. SUBLITAN VINIF has antioxidant capacity and protects the coloring matter by co-pigmentation and against reduction flavors.

**Packaging:** 1 kg and 5 kg

**Application rate:** On harvest: 10 to 40 g/100 kg

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**PROANTHOCYANIDIC TANNINS**

**SUBLIFRESH**

A specific preparation of proanthocyanidic tannins and gallotannins, SUBLIFRESH is formulated in order to refresh and enhance aromatic perception of white and rosé wines. It can be used on musts and wines.

**Packaging:** 1 kg

**Application rate:** 2 to 15 g/hL

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**SUBLIWHITE**

SUBLIWHITE is a blend of grape tannins selected for their antioxidant character and yeast derivatives. Experiments carried out over several years have enabled to develop SUBLIWHITE, a product adapted to white wine-making. SUBLIWHITE preserves the yellow-green color and enables an optimized clarification of white wine following alcoholic fermentation. It develops a fruity, floral and fresh character nose. SUBLIWHITE provides roundness, structure and a unique balance for wine tasting and removes any vegetal character.

**Packaging:** 1 kg and 5 kg

**Application rate:** 5 to 15 g/hL

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**SUBLIRED**

A preparation of proanthocyanidic tannins, SUBLIRED was specifically developed for the preservation and enhancement of fruity-type aromas. A premium tannin, SUBLIRED can be used for the production of modern, fruity, supple wines.

**Packaging:** 1 kg

**Application rate:** 2 to 15 g/hL

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**TANIRAISIN**

Due to its specific production method, TANIRAISIN conserves the natural properties of grape skin tannins selected for their quality. As such, these highly reactive tannins will interact with other macromolecules found in wine. These multiple interactions have a positive impact on wine. TANIRAI-SIN has a clarification role (ideal supplement for fining). It promotes the stabilization of color (by forming tannin-anthocyanin stable complexes) and improves the organoleptic balance. TANIRAI-SIN likewise has a reinforced protective action against oxidation (anti-oxidant effect of polyphenols).

**Packaging:** 500 g

**Application rate:** On harvest: 10 to 30 g/100 kg - On must: 5 to 15 g/hL

**On wine:** 3 to 20 g/hL

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**TANIPEPIN**

TANIPEPIN is a pure grape seed tannin adapted to red wine-making. By its very nature, it is efficient for promoting « tannin-anthocyanin » complexes thus enabling the good stabilization of the color of red wines. Presented in granulated form it facilitates and improves its implementation in the wine cellar. In addition TANIPEPIN improves the antioxidant capacity and the evolution of wine. It reinforces wine balance by providing a supplement to the tannin structure while limiting oxidase action. TANIPEPIN participates in the protein stability of white and rosé wines.

**Packaging:** 500 g

**Application rate:** On harvest: 5 to 15 g/100 kg - On must: 5 to 10 g/hL

**On wine:** 1 to 15 g/hL

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**SUBLIWHITE**

SUBLIWHITE is a specific preparation of proanthocyanidic tannins and gallotannins. SUBLIWHITE is essentially made up of proanthocyanidin-type condensed tannins. SUBLIWHITE acts in synergy with wine tannins to provide optimum stabilization of coloring matter. It protects anthocyanins from oxidation.

**Packaging:** 1 kg

**Application rate:** 2 to 15 g/hL

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**TANIRAISIN**

Due to its specific production method, TANIRAISIN conserves the natural properties of grape skin tannins selected for their quality. As such, these highly reactive tannins will interact with other macromolecules found in wine. These multiple interactions have a positive impact on wine. TANIRAI-SIN has a clarification role (ideal supplement for fining). It promotes the stabilization of color (by forming tannin-anthocyanin stable complexes) and improves the organoleptic balance. TANIRAI-SIN likewise has a reinforced protective action against oxidation (anti-oxidant effect of polyphenols).

**Packaging:** 500 g

**Application rate:** On harvest: 10 to 30 g/100 kg - On must: 5 to 15 g/hL

**On wine:** 3 to 20 g/hL