



CIDER HANDBOOK



enartis

Inspiring innovation.

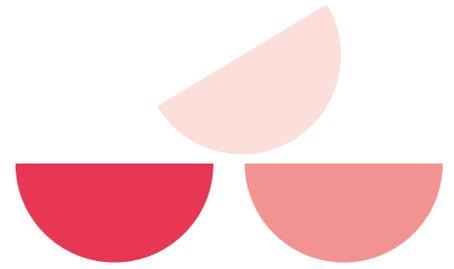
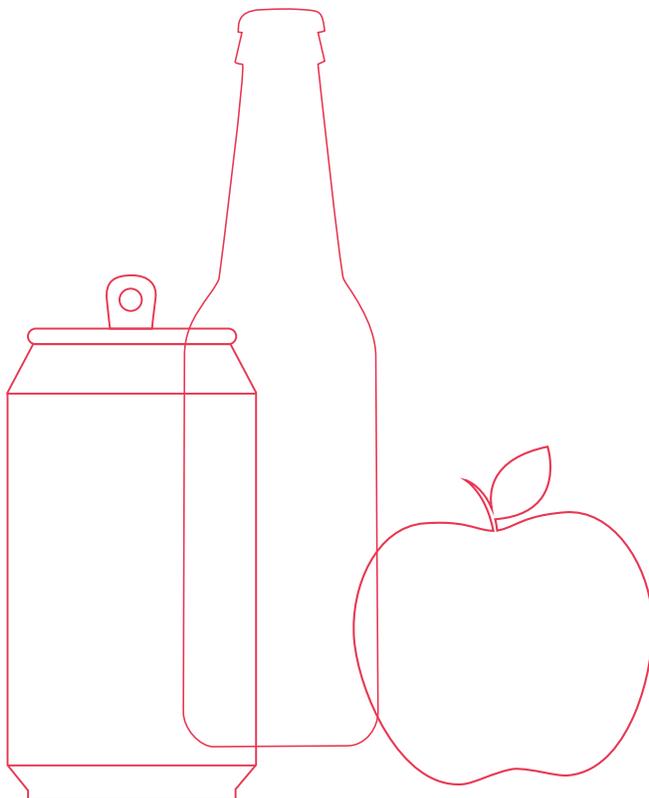


TABLE OF CONTENTS

BENEFICIAL ANALYSIS	3	DESIGNING AROMAS AND IMPROVING MOUTHFEEL	13
ENSURING ANTIOXIDANT AND MICROBIAL STABILITY	4	Polysaccharides and Gums	13
Sulfiting agents	4	During fermentation	13
Microbial stability	5	During maturation and pre-bottling	13
PROCESSING FRUIT AND JUICE	7	Tannins	15
Enzymes	7	During fermentation	15
		During maturation and pre-bottling	15
		EnartisTan UNICO Range	17
		Oak Alternatives	18
		INCANTO Range	18
		INCANTO NC Range	20
FERMENTATION	9	CLARIFICATION AND ADJUSTING MOUTHFEEL	22
Yeast	9	Clarification Aides	22
Non- <i>Saccharomyces cerevisiae</i> Yeast	10		
Yeast Nutrition	11		
		INDEX	24



CHECK OUT OUR
PROTOCOLS



BENEFICIAL ANALYSIS

High-quality cider making greatly benefits from understanding the chemistry of juice prior to fermentation as well as monitoring certain analytical parameters throughout the cider making process. Performing analysis is recommended during reception and processing of fruit and juice, throughout fermentation, post-fermentation into maturation and prior to bottling. Each parameter has specific target values that are essential to craft a high-quality product which is stable over time until consumption.

°Brix is a measure of percentage of sugar in an aqueous solution (1°Brix is 1 gram of sucrose in 100 grams of solution). °Brix provides information on sugar content in apple juice, giving an estimation of potential alcohol after fermentation. It is important to measure °Brix prior to fermentation to know the starting point and again throughout fermentation to follow fermentation kinetics. Apples contain roughly 11-16 °Brix at harvest, depending on the cultivated variety, with some ranging higher or lower.

Specific Gravity is another form of dissolved solids measurement. At the end of fermentation, measuring **Glucose + Fructose** is recommended (often referred to as residual sugar) to confirm the completion of fermentation (fermentation considered complete when G+F<100 mg/100 mL).

pH has an important impact on microbial stability, oxidative stability and organoleptic profile of apple juice and cider. pH greatly impacts the texture and balance of ciders, especially with varying degrees of sweetness. Lower pH conditions help prevent development of spoilage microbes due to more effective microbial protection from SO₂ at lower pH levels. At the juice stage, pH is usually between 3.3 and 3.7, which is one of the reasons a blend of different apples is key to the final balance in quality ciders.

Titrateable Acidity (TA) is the measure of organic acids and has an important impact on cider balance. It is expressed as g/L of malic acid and levels vary between 3-8 g/L average.

Yeast Assimilable Nitrogen (YAN) is a calculation of the total yeast assimilable organic and inorganic nitrogen. A successful fermentation requires 100-200 mg/L. Insufficient or too high levels of YAN may cause stress to yeast, affecting fermentation kinetics and leading to the production of off-flavors such as hydrogen sulfide (H₂S).

Acetic Acid can be produced by yeast, spoilage microorganisms and oxidation reactions. If above 0.080 mg/100 mL, it can have a detrimental perception to the quality of cider. Also known as Volatile Acidity.

Malic Acid is the main organic acid present in cider. It contributes to pH, mouthfeel and organoleptic profile of cider. Additionally, it can be metabolized by lactic acid bacteria to produce lactic acid, a softer textured acid. Malolactic fermentation can be desirable to increase softness, roundness and creaminess, often found in barrel-aged ciders though it's typically considered undesirable and a potential fault.

Lactic Acid can be used to track and understand the status of malolactic fermentation. While this can be desired to soften the acid texture in certain cider styles, it is often attributed to microbial development, leading to spoilage. Verifying lactic acid content regularly (at least twice) during cellar ageing, is a proactive way to minimize unwanted microbial development and off-flavors.

Pectin Test provides information on the residual content of pectin in cider. If pectins are present, clarification and filtration may be difficult. **Glucan Testing** is also recommended to reduce issues during filtration. Tip: For a quick pectin test, take 25 mL of juice, add 50 mL of acidulated 95% alcohol and wait ten minutes. Formation of gel indicates pectin presence.

Microscopic Scans give a snapshot of the microbial health of juice or cider. They are often used throughout cider making as quick quality control. Microscopic Scans provide valuable information for understanding microbial flora of a cider and ensure microbial stability during maturation.

PCR (Polymerase Chain Reaction) or **Culture Plating** can be used to precisely identify and quantify microorganisms present in cider.

Alcohol content is important for TTB and FDA labeling, as well as for stability reasons. The lower the alcohol content, the more sensitive to spoilage the cider will be.

Maintaining appropriate levels of **Molecular SO₂** will help prevent spoilage and protect from oxidation reactions. Molecular SO₂ is calculated with **Free SO₂** and **pH** values. Recommended molecular SO₂ for ciders during cellar storage is 0.8 mg/L, and at packaging it is important to adjust based on package material. Canned ciders require lower levels of Free SO₂ to minimize degradation of liner material.

Turbidity is an important measure of the visual quality of cider. Unless the cider is intended to be cloudy, turbidity levels at bottling should be under 2 NTU.

Copper and **Iron** are utilized by polyphenoloxidase enzymes, such as laccase and tyrosinase, to enzymatically oxidize phenols in cider leading to premature browning. In canning, low copper and iron levels are extremely important to ensure long shelf life of packaged product. Removal of these metals with CLARIL HM prior to packaging can contribute to reduced levels of H₂S and extended shelf life.

ENSURING ANTIOXIDANT AND MICROBIAL STABILITY

Ensuring antioxidant and microbial stability is fundamental for quality and economic reasons. Microbial contaminations can have major negative effects on cider quality. Spoilage microbes are opportunist organisms and capable of developing at any time during the cidermaking process, making them difficult to control and eliminate.

SULFITING AGENTS

AST

- Blend of potassium metabisulfite, ascorbic acid and hydrolyzable tannin.
- Lower total sulfur addition and polyphenolic extraction due to synergistic action of ingredients.
- Provides antibacterial and antioxidant protection.
- Protects aromatic precursors.
- Very effective in preventing atypical ageing off-flavors.

Dosage: 100-200 g/ton of apples; 15-20 g/hL (1.2-1.7 lb/1,000 gal) in juice; 10 g/hL of AST (0.8 lb/1,000 gal) provide approx. 28 ppm SO₂ and 30 ppm ascorbic acid

Packaging: 1 kg

WINY

- Pure and high quality potassium metabisulfite.
- Capable of scavenging oxygen, reducing oxidation, killing unwanted micro-flora, rendering polyphenols more soluble.
- Acts as an antioxidasic agent against oxidases (laccase and tyrosinase) throughout cider making.

Dosage: 1 g of WINY contains approx. 0.56 g of SO₂
1 g into 1 L contains approx. 560 ppm SO₂

Packaging: 1 kg - 25 kg

$$\frac{(\text{ppm Total SO}_2 \text{ desired}) \times (\text{Liters of Cider})}{(0.56 \times 1000)} = \text{grams WINY to add}$$

POTASSIUM METABISULFITE ADDITION GUIDELINES

	SO ₂ addition (mg/L)	g/hL	g/barrel	g/1,000 gal	lbs/1,000 gal
WINY	5	0.9	2	33	0.07
	10	1.8	4	65	0.14
	30	5.4	12	196	0.43
	50	8.9	20	326	0.72
	60	10.7	24	392	0.86

EFFERGRAN

- Effervescent, granulated potassium metabisulfite.
- Rapidly dissolves, assuring a homogeneous and rapid distribution of SO₂ without requiring pump-overs in tank volumes of up to 50,000 L (13,200 gal).

Dosage: 125 g packet of EFFERGRAN (50 g of SO₂) for 4-5 tons gondolas or 25 hL of wine; 250 g packet of EFFERGRAN (100 g of SO₂) for 8-10 tons gondolas or 50 hL of wine

Packaging: 125 g - 250 g - 1 kg

$$\frac{(\text{ppm Total SO}_2 \text{ desired}) \times (\text{Liters of Cider})}{(0.42 \times 1000)} = \text{grams EFFERGRAN to add}$$

POTASSIUM METABISULFITE ADDITION GUIDELINES

	SO ₂ addition (mg/L)	g/hL	g/barrel	g/1,000 gal	lbs/1,000 gal
EFFERGRAN	5	1.25	2.7	46	0.10
	10	2.4	5.4	93	0.21
	30	7.1	16.1	278	0.63
	50	11.9	26.8	463	1.04
	60	14.3	32.1	556	1.25

SORBOSOL K

- Blend of potassium sorbate, potassium metabisulfite and L-ascorbic acid.
- Controls growth of yeast.
- Use immediately before bottling of cider with residual sugar.

Dosage: 20-40 g/hL; 10 g/hL will provide approx. 67 ppm potassium sorbate, 12 ppm SO₂ and 10 ppm ascorbic acid

Packaging: 1 kg

MICROBIAL STABILITY

EnartisStab MICRO M

INDUSTRY
CHOICE

- Allergen-free, vegan alternative to lysozyme and SO₂ for antimicrobial properties.
- Preparation of pre-activated chitosan from *Aspergillus niger* and purified yeast hulls.
- Designed for treatment of juice or other turbid media prior to or during fermentation.
- Interacts with a wide spectrum of microorganisms (lactic acid bacteria, acetic acid bacteria and yeast), reduces their activity and growth and precipitates them.
- Reduces sulfide defects, VA and off-flavor production.
- Improves clarification and filterability.

Dosage: 5-20 g/hL (0.4-1.7 lb/1,000 gal)

Packaging: 1 kg

EnartisStab MICRO

- Allergen-free, vegan alternative to lysozyme and SO₂ for antimicrobial properties.
- Preparation of pre-activated chitosan from *Aspergillus niger*.
- Removes spoilage organisms through fining.
- Recommended after fermentation and clarification for cider with low turbidity.
- Interacts with a wide spectrum of microorganisms (lactic acid bacteria, acetic acid bacteria and yeast), reduces their activity and growth and precipitates them.
- Improves clarification and filterability.

Dosage: 3-15 g/hL (0.25-1.25 lb/1,000 gal)

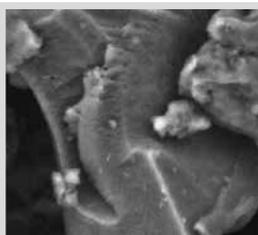
Packaging: 0.5 kg

WHAT IS CHITOSAN?

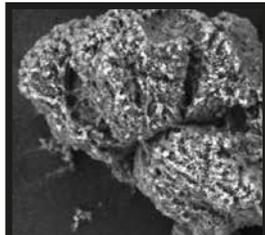
Produced from the partial de-acetylation of Chitin (from *Aspergillus niger*), chitosan is a cationic polysaccharide that interacts with a wide spectrum of microorganisms, alters their cell wall permeability, inhibits cell growth and leads to cell death. The antimicrobial activity of chitosan is attributed to its positive charges (NH³⁺ groups) that interfere with the negatively-charged residues of macromolecules on the microorganism's cell wall surface.

WHY IS ENARTIS' CHITOSAN MORE EFFICIENT?

It's pre-activated. Enartis developed a pre-activation process which increases the molecular charge, solubility and contact surface of chitosan. Pre-activated chitosan is very effective in eliminating potentially harmful microorganisms such as acetic acid bacteria, *Pediococcus*, *Lactobacillus*, *Oenococcus*, *Brettanomyces*, *Zygosaccharomyces*, *Schizosaccharomyces* and some other non-*Saccharomyces* yeast. Pre-activated chitosan-based products, EnartisStab MICRO M and EnartisStab MICRO react faster and at lower concentrations than standard chitosan available on the market.



Standard chitosan



ENARTIS ACTIVATED CHITOSAN
(EnartisStab MICRO
and EnartisStab MICRO M)

“

“With Enartis products and pasteurization we have been able to effectively produce a can-stable product without sulfites.” - Trey Holt, Black Apple Crossing (USA)

”

CANNED CIDER: EnartisStab MICRO can help reduce the need to use SO₂, minimizing the potential for hydrogen sulfide development in canned packaging.

APPLICATION OF EnartisStab MICRO AND EnartisStab MICRO M

WIDE SPECTRUM ANTIMICROBIAL AT ANY TIME

EnartisStab MICRO & EnartisStab MICRO M are used:

- To control a wide spectrum of microbes: *Acetobacter*, *Lactobacillus*, *Pediococcus*, *Oenococcus*, *Brettanomyces*, *Zygosaccharomyces* and some other non-*Saccharomyces* yeast (Figure 1).
- As a treatment to remove/reduce high populations of microbes.
Dosage: 10-20 g/hL followed by racking
- As a preventive measure to eliminate small populations before they become spoilage.
Dosage: 3-4 g/hL
- As an alternative to SO₂ for microbial control.

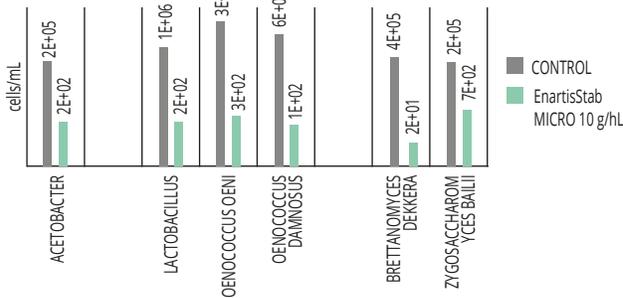


Figure 1: EnartisStab MICRO can reduce populations of the main spoilage microorganisms present in wines.

PREVENT VA PRODUCTION DURING COLD SOAK AND FRUIT TRANSPORT

EnartisStab MICRO M on fruit, during crushing, in the juice pan, or in must reduces wild non-*Saccharomyces* yeast and bacteria populations, thus limiting VA production during the first stages of the cidermaking process (Figure 2). Dosage: 20 g/hL

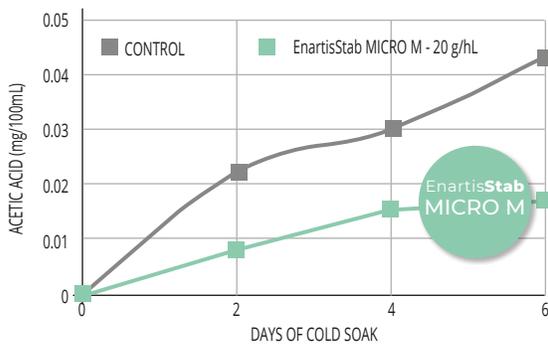


Figure 2: The addition of EnartisStab MICRO M on grapes controls VA production during cold soak.

REDUCE VOLATILE PHENOLS

After fining with EnartisStab MICRO, wines and cider appear cleaner, fresher and often fruitier. EnartisStab MICRO can reduce volatile phenols (Figure 3), treat "reduction" issues and remove other off-flavors. Dosage: 2-15 g/hL

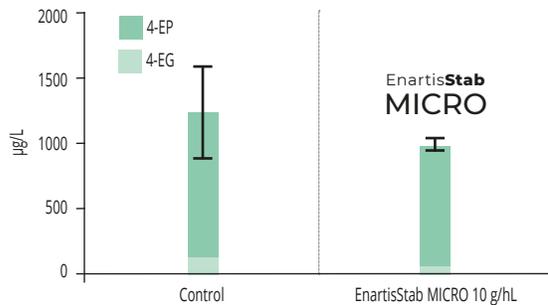


Figure 3: EnartisStab MICRO can reduce volatile phenols (4-EP/4-EG) concentration in wine. Results from 15 wines.

CONTROL MLF AN ALLERGEN-FREE ALTERNATIVE

EnartisStab MICRO and EnartisStab MICRO M are allergen-free and vegan-friendly fining agents that can prevent, delay, or stop MLF. They can control *Oenococcus Oeni* development in any condition. These bioregulators' antimicrobial activity is not influenced by pH, unlike sulfur dioxide (Figure 4).

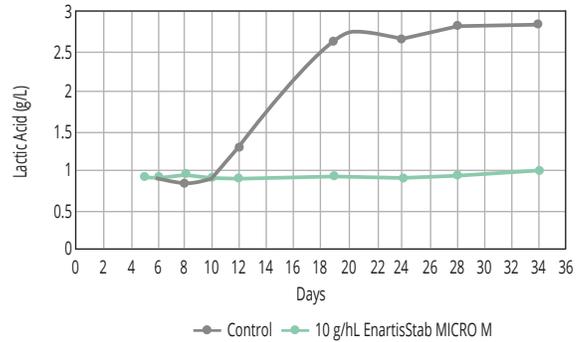


Figure 4: Difference of microbiological coverage between low SO₂ protection versus the addition of 10 g/hL EnartisStab MICRO M in a cider with a high pH (3.9). The wine was inoculated with 1 g/hL of Enartis bacteria (EnartisML SILVER).

LIMIT STUCK FERMENTATIONS

PROMOTE CLEAN AND COMPLETE FERMENTATIONS

EnartisStab MICRO M:

- Improves fermentation kinetics and ensures completion by removing spoilage microbes that inhibit yeast (Figure 5). Dosage: 10 g/hL
- Improves the start native fermentations by reducing microbial competition. Dosage: 5 g/hL
- Does not impact fermentation kinetics of *Saccharomyces cerevisiae*

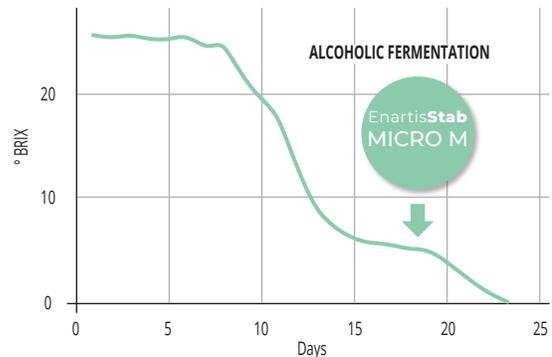


Figure 5: The addition of EnartisStab MICRO M to a sluggish fermentation helps complete fermentation.

PROCESSING FRUIT AND JUICE

Using pectolytic enzymes on milled apples prior to pressing increases juice extraction rates, especially for cold storage apples with high pectin level due to the breakdown of cellular walls. After pressing, it is important to apply clarification enzymes to improve settling and dramatically improve filterability. Pectins make up 1-1.5% of total solids in apple juice and are usually the cause of difficult clarification and pre-bottling filtration issues. Glucans, formed by microbial colonies, are chained polysaccharides which negatively impact filtration and clarification, and require β -glucanase enzymes to cut the bonds to allow for removal.

ENZYMES

EnartisZym EZFILTER

IMPROVES
FILTRATION

- Liquid pectolytic enzyme with betaglucanase activity.
- Exceptional breakdown of glucans and pectins.
- Use for juice clarification and improvement of filterability post fermentation.

Dosage: 3-6 mL/hL (114-227 mL/1,000 gal) for juice and cider

Packaging: 1 kg - 20 kg



“We’ve filtered hundreds of thousands of gallons of cider over the years and there is no question that ciders treated with both a pectinase and a glucanase filter more easily than those that are not. If the dosing and timing is right, we’ve literally seen a 40-50-60% increase in filtration speeds. EnartisZym EZFILTER alone worked just as well as what we’ve seen from separate pectinase and glucanase enzyme treatments.” - **Allan Whetstone, Director of Operations for Cascade Wine Services (OR)**



“My initial impressions of EnartisZym EZFILTER from Enartis are very promising. Cider is notorious for being difficult to filter. I am trying to turn over 8,500 gallons of cider in a 25 day period (fermentation to bottle ready cider) with one assistant and two plate and frame filters. One dose with EnartisZym EZFILTER pre-fermentation and we were able to move from 8 microns to .4 microns with great efficiency in a short amount of time.” - **Justin Paolicelli, Production Manager for Three Brothers Wineries & Estates (NY)**

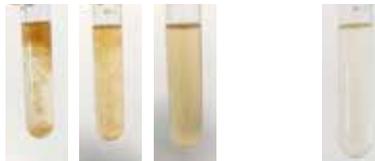
EnartisZym RS

- Liquid pectolytic enzyme with hemicellulasic and other side activities to break down the “hairy zone” of pectins.
- Intense and rapid depectinization reaction.
- Reduces solids content and improves filtration dramatically.

Dosage: 3-6 mL/hL (114-227 mL/1,000 gal) for juice and cider

Packaging: 1 kg

PECTIN DETERMINATION TEST



Must with residual
pectin

Must without
pectin

Materials: Ethyl alcohol, hydrochloric acid 37%, test tubes

Method:

- Prepare one liter of acidified 96% v/v hydroalcoholic solution: 950 mL ethyl alcohol, 5 mL hydrochloric acid 37%. Add demineralized water to reach 1 L.
- In a test tube, mix 2 parts of the acidified alcohol solution with 1 part must or wine.
- If the must or wine is rich in pectins, the appearance of floccules or haze is observed.
- If the must or wine is pectin-free, no visual changes are observed.

TIP: If your cider analysis comes back POSITIVE for pectins or glucans, try our EnartisZym EZFILTER!

ABOUT ENOLOGICAL ENZYMES

WHY USE ENOLOGICAL ENZYMES?

Enzymes are essential for improving press yield, clarification, flotation, cider filterability, aroma and polyphenol extraction, as well as enhancing aromatic expression, improving mouthfeel, contributing to protein stability and helping to stabilize color.

WHAT ARE ENZYMES EXTRACTED FROM?

Enological enzymes are produced by diverse species of fungi such as *Aspergillus*, *Rhizopus* and *Trichoderma*.

WHY SO MANY PECTOLYTIC ENZYMES?

Pectolytic enzymes include enzymes (Figure 1) that break down homogalacturonan chains and enzymes that break down other pectin components such as rhamnogalacturonans I, II and their side chains. The balance between these pectolytic activities impacts the performance of the enzyme preparation.

- Pectin lyase (PL) randomly separates the pectin chain and releases midsize polymers. This activity promotes a fast depectinization and fast reduction of viscosity.
- Polygalacturonase (PG) separates galacturonic acids only when they are not esterified.
- Pectin methyl esterase (PME) de-esterifies galacturonic acid, allowing PG to perform.
- Rhamnogalacturonase, arabinanase and galactanase break down "branched pectins," commonly referred to as the "hairy zone." These activities are especially important to improve settling or filtration of difficult juices.

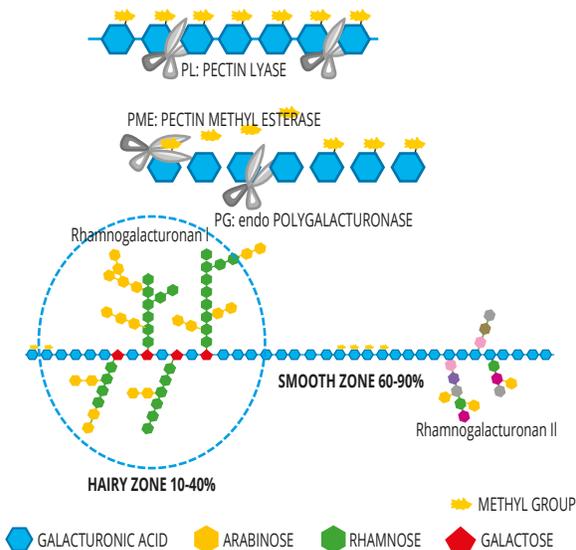


Figure 1: Representation of main pectolytic activities on pectin chains.

WHAT ARE THE DIFFERENCES BETWEEN POWDERED AND LIQUID FORMS OF ENZYMES?

Powdered enzymes are easy to store, have a long shelf life with limited risk of contamination and require no preservatives. Liquid enzymes are convenient to use and dose. They require cold storage and have a shorter shelf life due to possible microbiological contamination after opening.

HOW LONG WILL POWDERED/GRANULAR ENZYMES REMAIN ACTIVE AFTER REHYDRATION?

Rehydrated powdered/granular enzymes should not be kept in liquid form for more than a few hours at room temperature.

HOW DOES TEMPERATURE AFFECT ENZYMATIC ACTIVITIES?

Most enzymes are denatured at temperatures above 60°C (140°F) and inactivated at temperatures below 5°C (40°F). Optimum temperature for enological enzymes is around 40°C (104°F).

DOES SO₂ AFFECT ENZYME ACTIVITY?

Even with an addition of 2000 ppm of SO₂, the enzymatic activity of EnartisZym RS, for example, is not affected (Figure 2). Using SO₂ and enzymes is fine, however timing is important. Add enzymes after SO₂ has adequately dispersed or vice versa. Do not add SO₂ and enzymes at the same time.

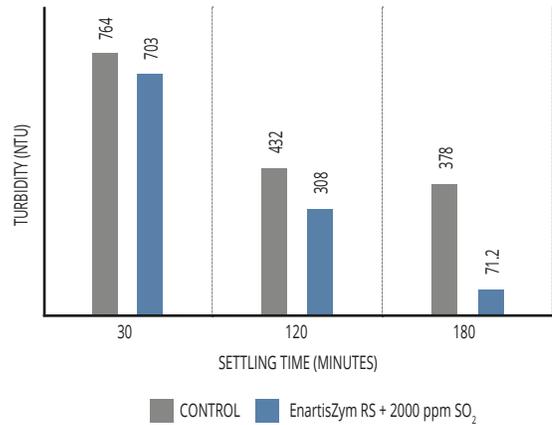


Figure 2: Impact of SO₂ addition on EnartisZym RS effect.

HOW DO TANNIN OR BENTONITE ADDITIONS INTERFERE WITH ENZYME ACTIVITY?

As shown, the addition of bentonite or tannin does not have a significant effect on the clarification capacity of EnartisZym RS (Figure 3). We recommend waiting 30 minutes after the complete homogenization of the enzyme before adding tannin or bentonite.

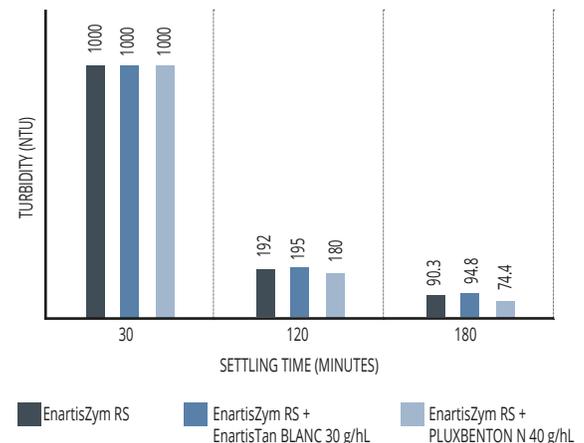


Figure 3: Impact of tannin and bentonite addition on EnartisZym RS effect.

HOW DO I DECIDE WHAT DOSAGE OF ENZYME TO USE?

Dosage is related to the desired effect, contact time, temperature and inhibiting factors. Cold temperatures, short contact times or alcohol presence can be compensated for by higher dosages.

FERMENTATION

The choice of yeast is critical for the final quality of cider. In addition to ensuring complete conversion of sugar into alcohol, the selected yeast has an impact on aromatics, mouthfeel and flavor profile. Among the Enartis yeast portfolio, nine yeast strains have been selected for cider production. While ensuring clean and complete fermentations, these yeast strains produce appealing aroma and flavor profiles.

YEAST

EnartisFerm WS

BEST SELLER

ZINFANDEL ISOLATE FROM WILLIAMS SELYEM WINERY, CALIFORNIA

- Fast fermenter.
- High alcohol tolerant (up to 18%).
- Low nutrients requirements.
- Produces elegant, clean, fresh, fruity and spicy cider with a round and smooth mouthfeel.

Dosage: 20-40 g/hL (1.7-3.3 lb/1,000 gal)

Packaging: 0.5 kg - 10 kg



“

“EnartisFerm WS is reliable in all fermentations, even on the most difficult ones. It is a concentration of quality and efficiency in every aspect.” - **Matteo Corazzolla, Cider Producer at L.M. di Maria Lucia Melchiori & C (Italy)**

”

EnartisFerm PERLAGE

BEST SELLER

- Fast fermenter.
- Alcohol tolerant (up to 17%), resistant to SO₂ and low pH.
- Wide range of fermentation temperatures (10-30°C).
- Low nutrient requirements.
- Low VA, H₂S and SO₂ production.
- Produces clean, elegant, delicate and complex cider with round and balanced mouthfeel.

Dosage: 20-40 g/hL (1.7-3.3 lb/1,000 gal)

Packaging: 0.5 kg - 10 kg

EnartisFerm Q CITRUS

- Fast fermenter.
- Medium nutrient requirements.
- Low VA production.
- Expresses terpenes and norisoprenoids (β-glycosylase activity)
- Produces complex ciders with intense zesty, citrus, grapefruit, tropical fruit, peach, pear and pineapple aromas.

Dosage: 20-40 g/hL (1.7-3.3 lb/1,000 gal)

Packaging: 0.5 kg

TIP: Aroma production is increased by using in combination with EnartisTan CIT during fermentation.

EnartisFerm ES FLORAL

- Blend of *S. cerevisiae* and *S. bayanus*.
- Moderate speed fermenter.
- Medium nutrient requirements.
- Low VA and SO₂ production.
- Produces intense fresh aromas of peach, pear, apricot, white flowers, violet and roses.

Dosage: 20-40 g/hL (1.7-3.3 lb/1,000 gal)

Packaging: 0.5 kg - 10 kg

EnartisFerm SB

- Fast fermenter.
- Short lag phase.
- Wide fermentation temperature range (10-30°C).
- Low nutrient requirements.
- Low VA, H₂S production.
- Produces clean wines and ciders.

Dosage: 20-40 g/hL (1.7-3.3 lb/1,000 gal)

Packaging: 0.5 kg - 10 kg

EnartisFerm ES181

- Fast fermenter.
- Low nutrient requirements.
- Low VA, H₂S and SO₂ production.
- Expresses thiols (β-lyase activity) in reductive conditions and produces intense varietal and fermentation aromas.
- Produces complex wines and ciders with grapefruit, tropical fruit, passion fruit and fresh fruit aromas.

Dosage: 20-40 g/hL (1.7-3.3 lb/1,000 gal)

Packaging: 0.5 kg - 10 kg

EnartisFerm ES123

- Medium speed fermenter.
- Medium lag phase.
- Medium/high nutrients requirements.
- Low VA, H₂S and SO₂ production.
- Expresses thiols (β-lyase activity).
- Fermentation at 15-17°C favors fresh citrus and mineral.
- Fermentation at 18-21°C favors tropical and stonefruit aromas.

Dosage: 20-40 g/hL (1.7-3.3 lb/1,000 gal)

Packaging: 0.5 kg

Non-Saccharomyces cerevisiae Yeast

EnartisFerm Q TAU FD

- Freeze-dried strain of *Torulasporea delbrueckii*.
- Slow fermenter.
- Low nutrient requirements.
- Very low VA, H₂S and SO₂ production.
- Produces ciders with high levels of esters and terpenes for increased aromatic intensity and complexity.
- Can be used as a single yeast in the fermentation of ciders up to 12% alcohol or in sequential inoculation with *Saccharomyces* strains.

Dosage: 20-30 g/hL (1.7 -2.4 lb/1,000 gal)

Packaging: 0.5 kg

EnartisFerm Q RHO

- *Saccharomyces uvarum* strain.
- Low temperature tolerance.
- Preserves and increases total acidity.
- Low alcohol yield.
- Low production of volatile acidity.
- Produces high amounts of glycerol and phenylethanol (rose aroma).

Dosage: 20-40 g/hL (1.7-3.4 lb/1,000 gal)

Packaging: 0.5 kg - 10 kg

YEAST NUTRITION

The understanding of nutritional requirements for yeast is fundamental to accomplish successful fermentations and prevent stuck fermentations. Managing nutrient requirements allows for regular and complete fermentations, as well as minimizing sulfur compound production, such as H₂S, while enhancing positive sensory qualities. Enartis recommends a two-step nutrient addition; providing amino acids and micro-nutrients at inoculation and inorganic nitrogen with survival factors at 1/3 sugar depletion.

See our presentation from CiderCon 2019 or watch one of our webinars on our website for more information about yeast nutrition and cider production!



NUTRIFERM ULTRA

- Autolyzed yeast, thiamine hydrochloride (vitamin B1).
- Supplements the must with all nutritional factors necessary for yeast fermentative metabolism: amino acid nitrogen, long chain fatty acids, sterols, vitamins and microelements.
- Stimulates a regular and complete fermentation leading to the production of wines without defects, flawless both in the mouth and nose.
- Granulated nutrient that is less powdery, easier to dissolve and safer to use.
- Easytech direct inoculation yeast nutrition.

Dosage: 10-30 g/hL (0.4-1.3 lb/1,000 gal)

Packaging: 1 kg - 10 kg

NUTRIFERM AROM PLUS

INCREASES
AROMATICS

- Autolyzed yeast with an elevated content of free amino acids and thiamine.
- Elevated content of selected amino acids used by yeast as precursors of aromatic compounds to strongly increase intensity, freshness and complexity.
- Provides survival factors to improve yeast viability and ensure successful fermentations.

Dosage: 10-30 g/hL (0.8-2.5 lb/1,000 gal)

Packaging: 1 kg - 10 kg

NUTRIFERM ADVANCE

PREVENTS
H₂S

- Complex additive containing DAP, inactivated yeast and cellulose.
- Prevents irregular fermentation kinetics while maintaining efficient sugar transport.
- Improves yeast alcohol tolerance, prevents H₂S formation and exerts detoxifying action.

Dosage: 20-40 g/hL (1.7-3.4 lb/1,000 gal)

Packaging: 1 kg - 10 kg

NUTRIFERM NO STOP

- Inactivated yeast and autolyzed yeast.
- Helps maintain yeast membrane integrity, prevents and corrects fermentation anomalies.

Dosage: 20-40 g/hL (1.7-3.4 lb/1,000 gal)

Packaging: 1 kg - 10 kg

ENARTIS NUTRIENTS AND FERMENTATION AIDS MAIN FEATURES

	NUTRIFERM AROM PLUS	NUTRIFERM ULTRA	NUTRIFERM ADVANCE	NUTRIFERM NO STOP
APPLICATION	Supply of precursors for the synthesis of fermentation aromas	Reinforce fermentation capacity of yeast	Help for a complete and clean fermentation	Prevention and treatment of stuck fermentation
NITROGEN FROM AMINOACIDS	◆◆◆◆◆	◆◆◆◆◆		
INORGANIC NITROGEN			◆◆	
AROMATIC PRECURSORS	◆◆◆◆◆	◆◆◆◆		◆
STEROLS & FATTY ACIDS	◆◆◆	◆◆◆◆	◆◆◆	◆◆◆◆◆
MINERALS	◆◆◆	◆◆◆	◆◆	◆◆
VITAMINS	◆◆◆	◆◆◆◆	◆◆	◆◆◆
ADSORPTIVE EFFECT	◆◆◆◆	◆◆◆◆	◆◆◆	◆◆◆◆◆
TIMING OF ADDITION	Yeast inoculation	Yeast inoculation	1/3 sugar depletion	Second half of fermentation and in case of sluggish or stuck fermentation
RECOMMENDED DOSAGE	15-30 g/hL	10-30 g/hL	20-40 g/hL	20-40 g/hL
MAXIMUM LEGAL DOSAGE (EU REGULATION)	40 g/hL	40 g/hL	250 g/hL	q.s.
SUITABILITY FOR ORGANIC WINE (EU REGULATION)	YES	YES	NO	YES

THE IMPORTANCE OF BALANCED NUTRITION FOR YEAST HEALTH

Balanced nutrition is essential for optimal status and biomass production. Nitrogen availability, regardless of the origin (amino acids or ammonia), will affect fermentation performance as well as the production of secondary metabolites and aromatic compounds during fermentation.

- **Amino acids** are assimilated by the yeast without consuming a large amount of energy. Yeast can store them for later or use to synthesize proteins, enzymes and other amino acids.
- **Ammonia** requires a large amount of time and energy (long transformation process) to synthesize proteins and enzymes.

ENARTIS NUTRIENTS RECOMMENDATION FOR A BALANCED NUTRITION

NUTRIFERM AROM PLUS	Rich in aromatic amino acids precursors to promote the synthesis of esters.
NUTRIFERM ULTRA	Rich in essential amino acids to ensure optimal yeast growth.
NUTRIFERM ADVANCE	Maintains the vital activity of yeast until complete sugar depletion and detoxifies the juice.
NUTRIFERM NO STOP	Rich in survival factors regenerating the cell membrane. Auto-detoxifies the juice. Prevent or treat sluggish and/or stuck fermentations.

DESIGNING AROMAS AND IMPROVING MOUTHFEEL

The cultivated variety of apples used for cider making determine the aromas, flavors and mouthfeel characters of the final product. For apples that are lacking in textural tannins or acidity balance, it is possible to help build a great cider through the addition of certain products. The use of polysaccharides, gums, tannins and yeast derivatives rich in mannoproteins helps to design the organoleptic profile and balance mouthfeel during fermentation and maturation.

POLYSACCHARIDES AND GUMS

During fermentation

EnartisPro BLANCO

- Yeast derivatives rich in sulfur-containing peptides obtained by thermal treatment.
- Releases large quantities of readily-soluble mannoproteins which improve mouthfeel and body.
- Ensures strong antioxidant protection.
- Enhances production of tropical and spicy aromas.
- Produces fresher, more intense and lasting aromas.
- Softens astringency and balances bitterness.

Dosage: 10-30 g/hL (0.8-2.5 lb/1,000 gal)

Packaging: 1 kg

EnartisPro FT

CANNED CIDER
APPROVED

- PVI/PVP (polyvinylimidazole/polyvinylpyrrolidone) and yeast derivatives rich in sulfur-containing amino acids that release large quantities of readily-soluble mannoproteins.
- Removes heavy metals at the early stage of cider making and limits the damaging effects of copper and iron responsible for oxidation of fermentation aromas.
- Increases expression of thiols, protects against oxidation and helps preserve fresh aromas.
- Improves resistance to oxidation.
- Allows for production of different product profiles from the same juice by modulating the aromatic profile.

Dosage: 10-50 g/hL (0.8-4.2 lb/1,000 gal)

Packaging: 1 kg

During maturation and pre-bottling

CITROGUM

- Gum Arabic solution extracted from Acacia Seyal. The most filterable gum on the market! No membrane filter clogging effect.
- Prevents precipitation of tartrates.
- Improves balance and organoleptic features.
- Reduces bitterness and astringency while increasing softness and body weight.

Dosage: 0.5-2 mL/L (1.9-7.6 L/1,000 gal)

Packaging: 1 kg - 25 kg - 20 kg - 1,000 kg

CITROGUM PLUS

- Solution of gum Arabic extracted from Acacia Seyal and yeast mannoproteins.
- Prevents precipitation of colloids, pigments and tartrates.
- Reduces bitterness and astringency perception, increases softness and volume perception.
- Low filter clogging effect.

Dosage: 100-300 mL/hL (3.8-11.3 L/1,000 gal)

Packaging: 20 kg

AROMAGUM

- Gum Arabic solution.
- Stabilizes aromas, intensifies fruit aroma perception and maintains freshness over time after bottling.

Dosage: 0.5-1 mL/L (1.9-3.8 L/1,000 gal)

Packaging: 10 kg - 25 kg

SURLÌ ONE

- Enzymatically treated inactivated yeast.
- Contributes to protein, tartrate and polyphenol stabilization.
- Improves aromatic complexity and longevity.
- Enhances natural sensation of volume and roundness, builds-up mid-palate and improves wine length.
- Mimics lees ageing, with the security of microbial stability.

Dosage: 0.5-1 mL/L (1.9-3.8 L/1,000 gal)

Packaging: 2.5 kg

SURLÌ VELVET

BEST SELLER

- Completely soluble yeast cell wall mannoproteins.
- Enhances aromatic complexity and intensity, increases volume and roundness and reduces the sensation of astringency.
- Improves colloidal structure and stability.

Dosage: 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

Packaging: 0.5 kg

FERMENTATION POLYSACCHARIDES	ANTIOXIDANT	AROMATIC CLEANLINESS	MOUTHFEEL IMPROVEMENT	VISCOSITY	SOFTNESS	AROMA INTENSITY	TIME OF ADDITION	COMPOSITION
EnartisPro BLANCO	★★★★★	★★★★	★★★★	★	★★★	★★★	Fermentation	Inactivated yeast rich in antioxidant sulfur-peptides
EnartisPro FT	★★★★★	★★★★	★★★★	★	★★★	★★★	Fermentation	PVI/PVP and yeast cell walls rich in antioxidant sulfur-peptides

PRE-BOTTLING POLYSACCHARIDES AND GUMS	AROMATIC CLEANLINESS	MOUTHFEEL IMPROVEMENT	VISCOSITY	SOFTNESS	AROMA INTENSITY	TIME OF ADDITION	COMPOSITION
AROMAGUM	★★	★★★★★	★★★★★	★★★★	★★★★	Pre-Bottling	Verek Arabic gum medium hydrolysis
CITROGUM	★★	★★★	★★★★	★★★	★★	Pre-Bottling	Seyal Arabic gum high hydrolysis
CITROGUM PLUS	★★★	★★★★★	★★★★	★★★★★	★★	Pre-Bottling	Seyal Arabic gum high hydrolysis and yeast mannoproteins
SURLÌ ONE	★★	★★★★	★	★★★★	★	Maturation	Inactivated yeast
SURLÌ VELVET	★★	★★★★	★★★	★★★★	★	Pre-Bottling	Completely soluble yeast mannoproteins

When using polysaccharides during maturation or pre-bottling, bench trials are recommended to determine the correct product and addition rate.

TANNINS

During fermentation

EnartisTan CIT (CITRUS)

- Gallic and condensed tannins extracted from exotic species of wood.
- Provides terpenes and norisoprenoids to enhance floral, citrus and fruit notes.
- Enhances floral and citrus aromas, prevents oxidation during fermentation.

Dosage: 2-15 g/hL (0.17-1.3 lb/1,000 gal)

Packaging: 1 kg

EnartisTan BLANC

IMPROVES
FILTRATION

- Gallic tannins.
- High antioxidant activity and inhibits microbial activity.
- Protects cider from browning and improves filterability.

Dosage: 5-20 g/hL (0.17-0.4 lb/1,000 gal)

Packaging: 1 kg - 12.5 kg

EnartisTan ELEGANCE

- Condensed tannins extracted from white grape skins.
- Antioxidant, protects from browning and preserves aromatic freshness.
- Enhances fruit and floral notes, balances mouthfeel and increases length.
- Improves aromatic stability and freshness throughout ageing.

Dosage: 5-15 g/hL (0.4-1.3 lb/1,000 gal)

Packaging: 1 kg

During maturation and pre-bottling

EnartisTan MAX NATURE

- Condensed and ellagic tannins extracted from exotic species of wood.
- Designed for mouthfeel and aromatic improvement.
- Removes reductive characters, masks herbaceous notes and increases aromatic freshness and complexity.
- Contributes to mouthfeel by increasing roundness and filling mid-palate.

Dosage: 3-15 g/hL (0.25-1.3 lb/1,000 gal)

Packaging: 1 kg - 10 kg

EnartisTan ELEVAGE

- Ellagic tannins extracted from oak staves aged in open air.
- Good antioxidant protection and treats reductive characters.
- Imparts elegant vanilla, caramel and licorice notes.

Dosage: 2-15 g/hL (0.17-1.3 lb/1,000 gal)

Packaging: 1 kg

EnartisTan SLI

- Ellagic tannins extracted from long-seasoned, untoasted oak with a unique process which avoids high temperatures.
- Extraordinary capability to scavenge oxygen and radicals, chelate metals and reduce redox potential.
- Eliminates reductive notes due to mercaptans.
- Protects from oxidation, strengthens action of SO₂ and improves shelf life throughout maturation and at bottling.

Dosage: 3-15 g/hL (0.25-1.3 lb/1,000 gal) during maturation
0.5-3 g/hL (0.04-.25 lb/1,000 gal) at bottling

Packaging: 0.5 kg

EnartisTan UVASPEED

- Condensed tannins extracted from unfermented white grape skins.
- Provides intense fruit notes, freshens wines, increases wine structure and softness.

Dosage: 3-20 g/hL (0.25-1.7 lb/1,000 gal)

Packaging: 1 kg

EnartisTan FF (FRESH FRUIT)

- Condensed tannins extracted from lemon trees and white grape skins.
- Excellent antioxidant capacity.
- Freshens apple aromas and imparts fresh apple texture in ciders with low tannins.

Dosage: 3-10 g/hL (0.25-0.8 lb/1,000 gal)

Packaging: 1 kg

EnartisTan SKIN

- Condensed tannins extracted from white grape skins.
- Improves aromatic cleanliness, improves mouthfeel.
- Expresses thiolic character.

Dosage: 3-20 g/hL (0.25-1.7 lb/1,000 gal)

Packaging: 1 kg

HIDEKI

CANNED CIDER
APPROVED

- Blend of gallic, ellagic and condensed tannins with the most effective antioxidant and antimicrobial activity.
- Natural and allergen-free SO₂ replacement.
- Bacteriostatic properties limits the growth of bacteria.
- For use at pre-bottling/canning stage.

Dosage: 1-3 g/hL (0.08-0.25 lb/1,000 gal) as an antioxidant; 5-10 g/hL (0.4-0.8 lb/1,000 gal) as microbiostatic

Packaging: 1 kg

EnartisTan UNICO Range

Enartis is constantly looking for new botanical species and raw materials (wood, leaf, seed, etc.) to obtain tannins with unique sensory characteristics. Developed by Enartis, the EnartisTan UNICO range is a unique line of tannins with no close matches in the market.

Why are EnartisTan UNICO tannins different from other tannins?

The extraction, as well as the spray-drying, is made at low temperatures (approx. 20°C or 68°F) and low pressure. This unique process, proprietary to Enartis, extracts flavors of the raw material and prevents loss of aromatic compounds and formation of off-flavors caused by high temperatures. Unico tannins have intense, distinct aromas that account for the lower addition rates compared to normal enological tannins.

EnartisTan UNICO #1

- Ellagic tannins extracted from toasted oak selected for the quality and richness of its aromas.
- Intense and delicate vanilla, chocolate and toasted oak aromas.
- Contributes to volume and structure of cider.

Dosage: 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

Packaging: 0.25 kg

EnartisTan UNICO #3

- Condensed and hydrolyzable tannins extracted from exotic species of wood.
- Freshens cider aroma, enhances citrus, botanical and floral notes.

Dosage: 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

Packaging: 0.25 kg

EnartisTan UNICO #2

- Condensed tannins extracted from of red fruit tree wood.
- Significantly enhances red fruit aromas such as cherry, fresh berries and black currant.
- Increases softness, structure and “sweetness”.

Dosage: 0.5-5 g/hL (0.04-0.4 lb/1,000 gal)

Packaging: 0.25 kg

FERMENTATION TANNINS	ANTIOXIDANT	AROMATIC CLEANLINESS	STRUCTURE ENHANCEMENT	ASTRINGENCY	SOFTNESS	AROMA INTENSITY	GRAPE DERIVATE	WOOD DERIVATE	AROMA CONTRIBUTION
EnartisTan BLANC	★★★★★	★★★★	★	★	★★	★★		•	Apple, Blossoms, Varietal character
EnartisTan CIT (CITRUS)	★★★★	★★	★★	★★	★★	★★★★★	•	•	Citrus, White flowers, Orange blossom
EnartisTan ELEGANCE	★★★★	★★★	★★	★	★★★★	★★★	•		Stonefruit, White flower
MATURATION TANNINS	ANTIOXIDANT	AROMATIC CLEANLINESS	STRUCTURE ENHANCEMENT	ASTRINGENCY	SOFTNESS	AROMA INTENSITY	GRAPE DERIVATE	WOOD DERIVATE	AROMA CONTRIBUTION
EnartisTan ÉLEVAGE	★★★	★★★★	★★★	★★★	★★	★★★		•	Toasted Oak, Caramel
EnartisTan FF (FRESH FRUIT)	★★★	★★	★★	★★★	★★★★	★★★★	•	•	Lemon, Citrus, Fresh fruit
EnartisTan MAX NATURE	★★	★★★★	★	★	★★★★★	★		•	Chamomile
EnartisTan SLI	★★★★★	★★★★	★★	★	★★★★	★★★		•	Oak, Coconut, Vanilla
EnartisTan UVASPEED	★★	★★★	★★	★	★★★★	★★★	•	•	Grape, Honeydew, Flowers
EnartisTan SKIN	★★	★★★	★★★	★	★★	★★★	•		Fresh fruit, Stonefruit, Passion fruit
HIDEKI	★★★★★	★★★★	★★	★	★★★★	★		•	Neutral
UNICO TANNINS	ANTIOXIDANT	AROMATIC CLEANLINESS	STRUCTURE ENHANCEMENT	ASTRINGENCY	SOFTNESS	AROMA INTENSITY	GRAPE DERIVATE	WOOD DERIVATE	AROMA CONTRIBUTION
UNICO #1	★★	★★	★	★	★★★★	★★★★★★	•	•	Vanilla, cocoa, toasted wood, spices
UNICO #2	★★★	★★	★★	★	★★★★	★★★★★★	•	•	Red fruit, wild berries, cherry
UNICO #3	★★★★	★★★★★	★★	★	★★★★	★★★★★★	•	•	Flower, lemon, mint

When using tannins during maturation or pre-bottling, bench trials are recommended to determine the correct product and addition rate.

OAK ALTERNATIVES

Enartis offers a diverse portfolio of oak chips and mini-staves to meet all cider needs and expectations. Utilizing the INCANTO NC range, cider makers can quickly integrate oak flavor profiles during fermentation or throughout tank maturation. With INCANTO Chips and Barrel Boost, cider makers have ultimate control over their oak program and can create a unique signature for their brand or label.

INCANTO Range

INCANTO Chips and Barrel Boost Ministaves are produced from French and American oak aged 18-36 months and toasted using a unique process to ensure high quality products. The convection toasting with a progressive heating scheme allows for a deep, homogeneous and consistent toast. The process of oak selection, leaching, drying and toasting time/temperature are defined based on the final aromatic profile of the product and the consistency across lots and quality.

INCANTO Oak Alternatives are available as:

INCANTO CHIPS

Size: 2-4 mm

Dosage: 1-6 g/L for ciders

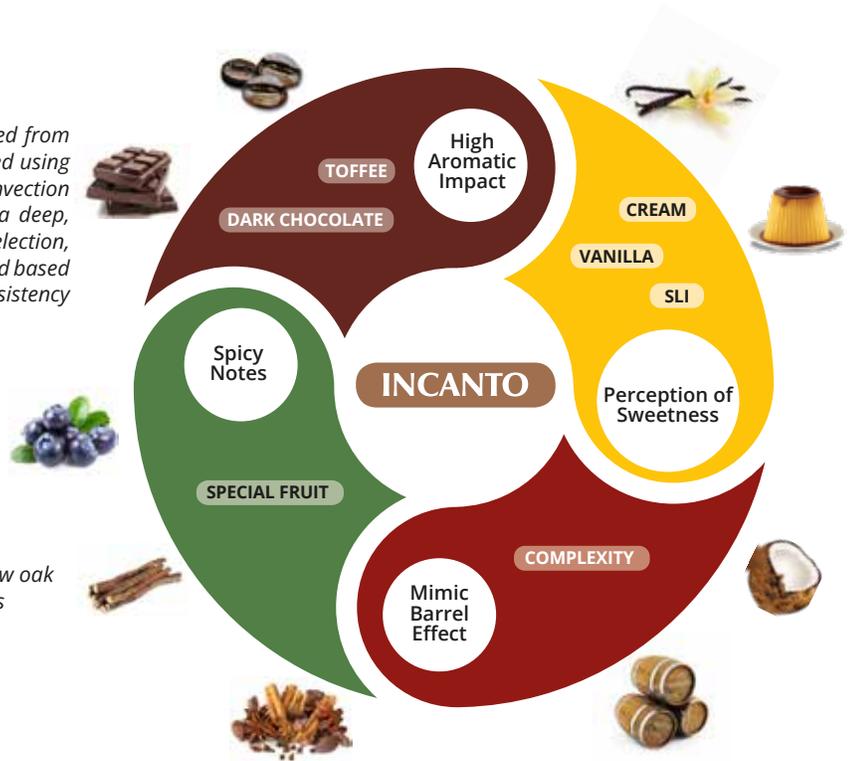
Contact time: Minimum of 4 weeks

BARREL BOOST MINI-STAVES

Size: 25 cm x 2.7 cm x 0.9 cm

Dosage: 1 Barrel Boost per barrel is equivalent to 25% new oak

Contact time: Minimum of 3 months, optimal at 4 months



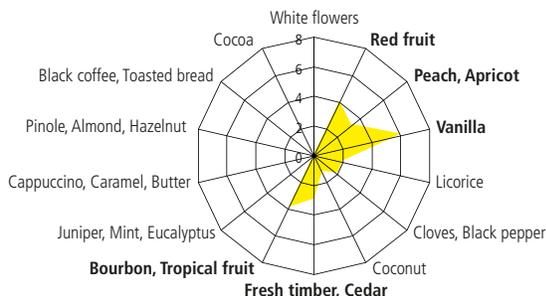
PERCEPTION OF SWEETNESS

INCANTO SLI

CANNED CIDER APPROVED

- American oak, untoasted.
- Respects aromatic characters of apples and enhances freshness and fruitiness.
- Increases volume, roundness and softens tannin structure
- Increases ageing potential.

Packaging: 10 kg Chips



INCANTO VANILLA

- American oak, medium-toasted.
- Vanilla, coconut, Bourbon, honey, tropical fruit, hazelnut, toasted almond, butter.
- Increases smoothness, volume and freshness without imparting excessive tannins.

Packaging: 10 kg Chips - Barrel Boost

INCANTO CREAM

- French oak, medium-toast.
- Vanilla, coconut, butter, cappuccino, and licorice.
- Increases smoothness, volume and sweetness without imparting excessive tannins.

Packaging: 10 kg Chips - Barrel Boost

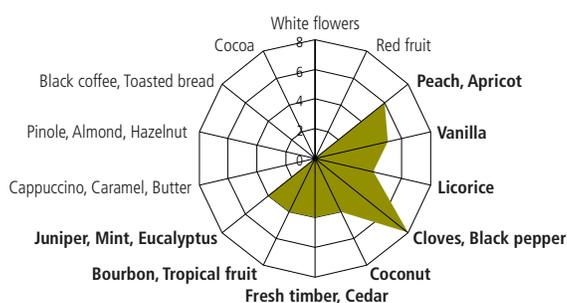
ENHANCE SPICY NOTES

INCANTO SPECIAL FRUIT

ENHANCE FRUIT & APPLE CHARACTER

- French oak, medium-toast.
- Spicy, black pepper, caramel, licorice, vanilla and coconut notes. Enhances freshness, fruitiness and complexity.
- Increases smoothness, volume and structure without imparting excessive tannins.

Packaging: 10 kg Chips - Barrel Boost

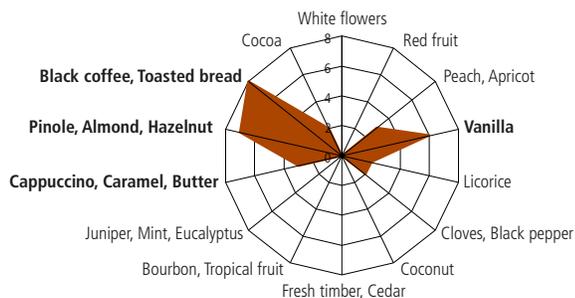


HIGH AROMATIC IMPACT

INCANTO TOFFEE

- French oak, medium plus toast.
- Café macchiato, toasted bread, toasted almond, hazelnut, vanilla, and apricot.
- Very smooth, sweet and complex.

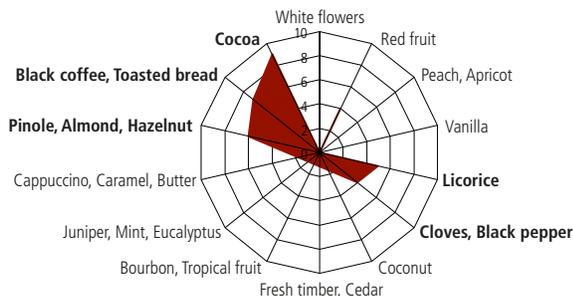
Packaging: 10 kg Chips - Barrel Boost



INCANTO DARK CHOCOLATE

- French oak, medium plus toast.
- Dark chocolate, cocoa, black coffee, toasted almond, toasted hazelnut and licorice.
- Increases volume, structure and tannins.

Packaging: 10 kg Chips - Barrel Boost



MIMIC BARREL EFFECT

INCANTO COMPLEXITY

- French oak, medium to heavy toast.
- Complex and subtle aromatic impact: coffee, caramel, vanilla, coconut.
- Increases structure, softness and sweetness perception.

Packaging: 10 kg Chips

OAK ALTERNATIVE SUMMARY

INCANTO RANGE	OAK	TOAST	AROMATIC IMPACT	MOUTHFEEL
INCANTO SLI	US	Untoasted	Fruit, fresh, neutral	Sweetness, round, soft
INCANTO VANILLA	US	Medium	Vanilla, coconut, bourbon, butter	Sweetness, fresh, round
INCANTO CREAM	FR	Medium	Vanilla, stone fruit, coconut, cedar	Sweetness, soft, round, length
INCANTO SPECIAL FRUIT	FR	Medium Plus	Spice, chocolate, fruit, complexity	Smooth, structure, length
INCANTO COMPLEXITY	FR	Medium Plus	Coffee, caramel, vanilla, fruit, complexity	Round, structure, length
INCANTO TOFFEE	FR	Medium Plus	Toffee, café macchiato, toasted bread, hazelnut	Smooth, soft, length
INCANTO DARK CHOCOLATE	FR	Medium Plus	Cocoa, coffee, toasted almond, licorice	Volume, structure

INCANTO NC Range

INCANTO NC (No Chips) products are soluble wood extracts containing only the active molecules used in oak powder:

- Wood tannins to protect against oxidation, improve color stability and enhance structure
- Polysaccharides to increase volume and soften tannins
- Aromatic compounds derived from wood and toasting

Dosage:

5-30 g/hL for cider fermentations

Applications of INCANTO NC

- Increase complex oak aromas
- Highlight fruit and floral notes
- Improve mouthfeel and structure
- Increase sweetness perception
- Minimize herbaceous notes in underripe grapes
- Decrease reductive characters during fermentation

Why use the INCANTO NC Range?

- Low dosage
- Easy-to-use for facility staff
- Better integration in cider
- NO color adsorption by solids
- NO microbial contamination
- NO solids = NO damage to facility machinery

INCANTO NC WHITE

- Inactivated yeast and tannins.
- Mimics the effect of untoasted oak powder.
- Protects juice from oxidation and prevents the appearance of reductive odors.
- Additionally, it provides light floral and vanilla notes, increases fresh fruit aromas and enhances softness and volume.

Dosage: 5-50 g/hL (0.4-4.2 lb/1,000 gal)

Packaging: 2.5 kg - 10 kg

INCANTO NC DARK CHOCOLATE

- Oak tannin and inactivated yeast.
- Mimics the effect of French oak, heavy-toast oak powder.
- Enhances toasted oak aromas and aromatic complexity, increases volume, structure and balance.
- Masks herbaceous notes.
- Improves color stability.

Dosage: 10-50 g/hL (0.8-4.2 lb/1,000 gal)

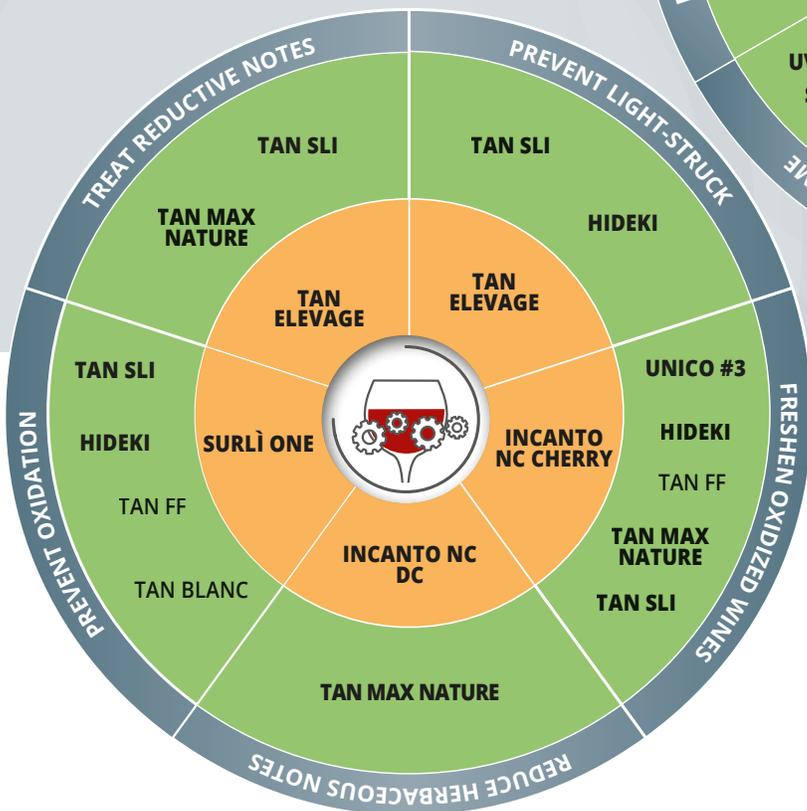
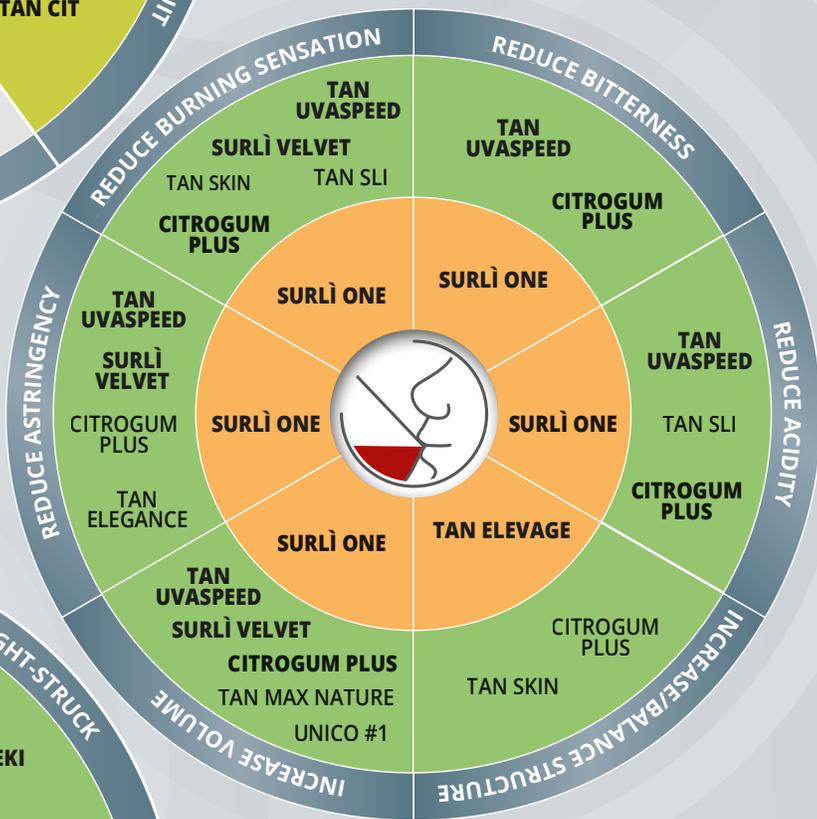
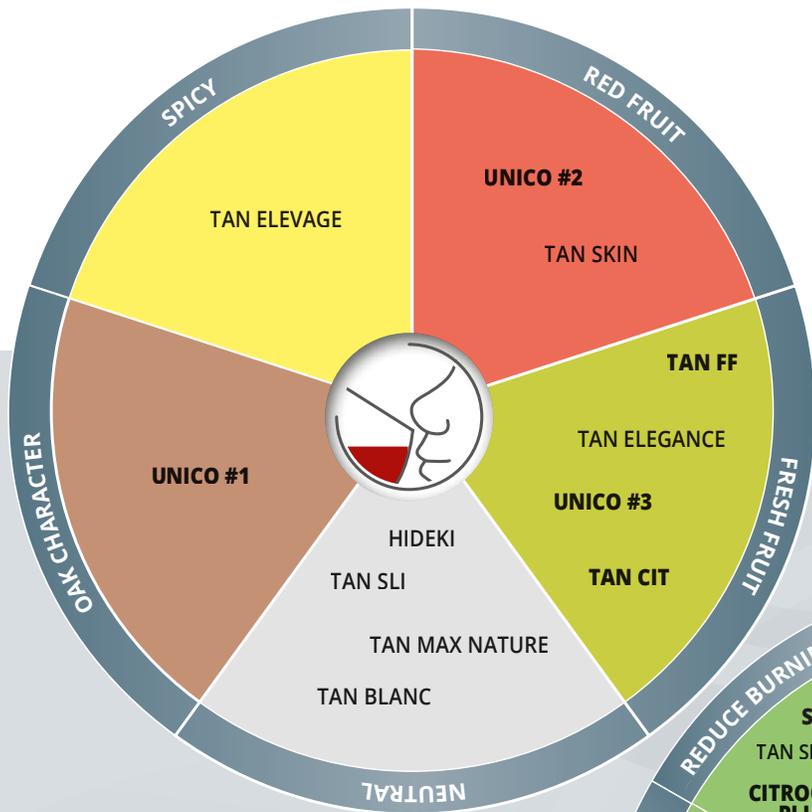
Packaging: 2.5 kg - 10 kg

INCANTO NC CHERRY

- Inactivated yeast and tannins.
- Mimics the effects of oak powder.
- Promotes color stabilization, prevents oxidation, enhances fresh red fruit notes and increases cider mouthfeel volume, structure and length.

Dosage: 5-50 g/hL (0.4-4.2 lb/1,000 gal)

Packaging: 2.5 kg - 10 kg



LEGEND

- Maturation
- Anytime from maturation to bottling



Perfecting aroma



Perfecting mouthfeel



Correcting or preventing defects

+ INTENSE/EFFECTIVE

CLARIFICATION AND ADJUSTING MOUTHFEEL

CLARIFICATION AIDES

The final steps before bottling a cider may include fining. Enartis has developed several fining blends targeting different aspects of preparation for bottling such as improving clarity, treatment/prevention of oxidation and removal of bitterness and astringency.

SIL FLOC

- Pure silica dioxide in solution.
- Typical addition is 10-15 times the amount of gelatin addition.
- Enhances clarification properties of protein fining agents.

Dosage: 25-100 mL/hL (0.95-3.8 L/1,000 gal)

Packaging: 5 kg - 25 kg

PLANTIS AF

- Allergen-free, pure plant protein.
- Gluten-free and vegan.
- Removes catechins and short chain-length polyphenols responsible for oxidation and bitterness.
- Reduces astringency and some off-flavors present in wine.
- Alternative to gelatin, casein and potassium caseinate.

Dosage: 10-30 g/hL (0.8-2.4 lb/1,000 gal)

Packaging: 20 kg

PLANTIS AF-Q

- Allergen-free preparation made of pea protein and activated chitosan.
- Activated chitosan and hydrolyzed vegetable protein work synergistically to increase flocculant efficacy in improving clarity.
- Assures clarification while forming small, compact lees, especially when used during flotation.
- Improves juice and wine resistance to oxidation by removing pro-oxidant metals and low molecular weight polyphenols.
- Helps preserve young color, increases aromatic cleanliness and freshness, reduces bitterness and astringency, and increases wine longevity.

Dosage: 10-30 g/hL (0.8-2.4 lb/1,000 gal)

Packaging: 20 kg

PLANTIS AF-P

- Pure and gluten-free potato protein. Alternative to gelatin, isinglass and potassium caseinate.
- Removes catechins and small molecular weight polyphenols responsible for oxidation and astringency.

Dosage: 5-30 g/hL (0.4-2.5 lb/1,000 gal)

Packaging: 1 kg - 12.5 kg

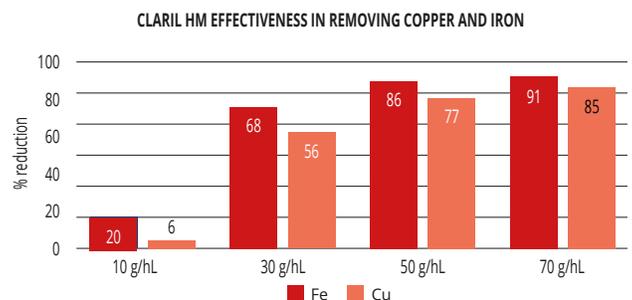
CLARIL HM

CANNED CIDER
APPROVED

- Co-polymer of PVI/PVP (polyvinylimidazole/polyvinylpyrrolidone) and pre-activated chitosan.
- Adsorbs heavy metals (Cu, Fe, Al) and removes hydroxycinnamic acids and low molecular weight catechins.
- Prevents oxidation, browning and oxidation of aromas.

Dosage: 20-50 g/hL (1.7-4.2 lb/1,000 gal)

Packaging: 2.5 kg - 10 kg



CLARIL HM effectively reduces wine copper and iron content, preventing oxidations and haze. The combination of PVI/PVP and chitosan helps to increase its action on iron removal.

PLUXCOMPACT

- Granulated calcium bentonite sodium activated.
- Generates limited quantity of highly compact lees.

Dosage: 20-120 g/hL (1.7-10 lb/1,000 gal)

Packaging: 1 kg - 20 kg

ENOBLACK PERLAGE

- Vegetal activated carbon in pellet form (reduces spread of carbon dust).
- High decolorizing capacity.
- Removes ochratoxin A (OTA).

Dosage: 5-100 g/hL (0.4-8.4 lb/1,000 gal)

Packaging: 1 kg - 15 kg



ENOBLACK PERLAGE

KNOW MORE ABOUT FINING

WHY FINING?

Fining agents can be used for many purposes in cidermaking including clarification, filterability improvement, prevention of haze and sediment formation, sensory and color improvement, and removal of undesirable elements from wine.

HOW DOES FINING WORK?

Each fining agent has specific properties and reacts with various fruit wine and cider molecules depending on its origin, density of charge, molecular weight and chemical properties. Fining is based on two main principles:

- Flocculation: Molecular interactions based on charge, chemical bonds, absorption or adsorption of compounds and formation of flocculates.
- Sedimentation: Since the flocculates formed are not soluble and heavier than wine/juice, they settle.

WHAT ARE THE MAIN FACTORS THAT INFLUENCE FINING EFFECTIVENESS?

Product preparation and addition, temperature, pH, wine redox potential and previous fining treatments are factors that can influence the effectiveness of fining.

PLANTIS: A NEW RANGE FOR ALLERGEN-FREE AND PLANT-BASED WINES

CAN PLANT-BASED FINING AGENTS BE AS EFFECTIVE AS ANIMAL PROTEIN-BASED FINING AGENTS?

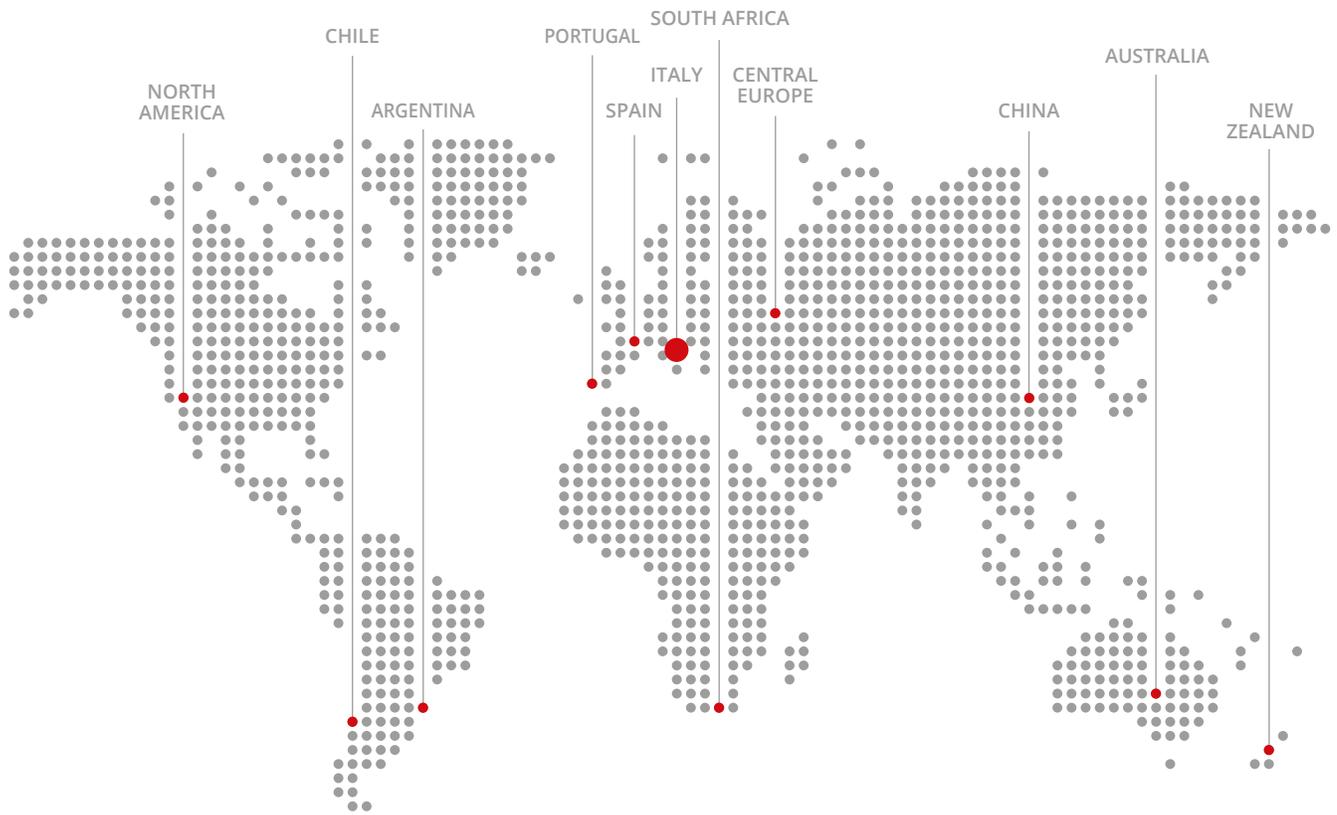
Enartis has developed a range of plant-based adjuvants, based on pea and potato proteins, which allow the replacement of animal proteins such as gelatin, casein, and egg albumin. They achieve comparable results while adhering to labeling standards and consumer demands that are becoming stricter around the world.

The benefits of using plant based fining agents:

- Fast clarification, reduce suspended solids, and eliminate unwanted compounds that can alter the quality of the cider.
- Reduce oxidized or easily oxidizable polyphenols that cause darkening of color, dull appearance, and bitter flavors.
- Efficiency in reducing oxidized color (OD 420nm), primarily with pea protein-based products (**PLANTIS AF**, **PLANTIS AF-Q**).
- Decrease the concentration of heavy metals involved in oxidation reactions. **PLANTIS AF-Q** is especially effective in removing iron.
- Improve sensory quality through cleanliness and aromatic freshness, plus greater preservation of youthful and brilliant colors with less oxidized tones.

PAGE	PRODUCT
ENSURING ANTIOXIDANT AND MICROBIAL STABILITY	
4	AST
4	EFFERGRAN
5	EnartisStab MICRO
5	EnartisStab MICRO M
4	SORBOSOL K
4	WINY
PROCESSING FRUIT AND JUICE	
7	EnartisZym EZFILTER
7	EnartisZym RS
FERMENTATION	
9	EnartisFerm ES Floral
9	EnartisFerm ES181
9	EnartisFerm ES123
9	EnartisFerm PERLAGE
9	EnartisFerm Q CITRUS
10	EnartisFerm Q TAU FD
10	EnartisFerm Q RHO
9	EnartisFerm SB
9	EnartisFerm WS
FERMENTATION	
11	NUTRIFERM ADVANCE
11	NUTRIFERM AROM PLUS
11	NUTRIFERM NO STOP
11	NUTRIFERM ULTRA
DESIGNING AROMAS AND IMPROVING MOUTHFEEL	
13	AROMAGUM
13	CITROGUM
13	CITROGUM PLUS
13	EnartisPro BLANCO
13	EnartisPro FT
13	SURLÌ ONE
13	SURLÌ VELVET

PAGE	PRODUCT
DESIGNING AROMAS AND IMPROVING MOUTHFEEL	
15	EnartisTan BLANC
15	EnartisTan CIT (CITRUS)
15	EnartisTan ELEGANCE
15	EnartisTan ELEVAGE
16	EnartisTan FF (FRESH FRUIT)
15	EnartisTan MAX NATURE
16	EnartisTan SKIN
15	EnartisTan SLI
17	EnartisTan UNICO #1
17	EnartisTan UNICO #2
17	EnartisTan UNICO #3
16	EnartisTan UVASPEED
16	HIDEKI
DESIGNING AROMAS AND IMPROVING MOUTHFEEL	
19	INCANTO COMPLEXITY
18	INCANTO CREAM
19	INCANTO DARK CHOCOLATE
20	INCANTO NC CHERRY
20	INCANTO NC DARK CHOCOLATE
20	INCANTO NC WHITE
18	INCANTO SLI
19	INCANTO SPECIAL FRUIT
19	INCANTO TOFFEE
18	INCANTO VANILLA
CLARIFICATION AND ADJUSTING MOUTHFEEL	
22	CLARIL HM
23	ENOBBLACK PERLAGE
22	PLANTIS AF
22	PLANTIS AF-P
22	PLANTIS AF-Q
23	PLUXCOMPACT
22	SIL FLOC



CIDER ASSOCIATIONS WE SUPPORT!





www.enartis.com

orderdesk@enartis.com