DistiGuide

Passionate about good aroma

ERBSLÖH

Progress is our future

www.erbsloeh.com

A good distillate conveys the flavour and aroma of the processed base product to your customers in a concentrated form. Outstanding quality depends on the raw material's properties and faultless processing. We trust to nature and farming for the quality of the fruit from tree, bush and field. Where processing and raw material yield are concerned, our range and customised advice are there to help.

ERBSLÖH's DistiGuide offers you a compilation of all our products. You can also discover how our products should be used to achieve optimum results. These pages contain what you need to know, be it for mash, fermentation, distillation or maturation.

Would you like to contact ERBSLÖH's test laboratory with a specific product query? We, our expertise and experience are also available to you at any time. Simply contact us.

Enzymes in the distillery

Enzymes are already present in low concentrations in many raw materials. These proteins, also known as biocatalysts, accelerate biochemical processes. Every enzyme has a substrate-specific action, though, and usually influences just one specific reaction.

Often the enzyme's function can be inferred from its name: a pectinase, for example, is a pectin-cleaving enzyme. In this case, the enzyme and substrate often fit together like jigsaw puzzle pieces. This is how natural reactions are accelerated. As a rule the process does not consume the enzyme.

Choice of the appropriate enzyme preparation provides the opportunity to address a specific job in processing of your raw materials. This easy-to-use tool makes it easier to process the raw materials and also simultaneously ensures high quality and a good yield.

ERBSLÖH's portfolio contains enzymes for a wide range of applications. The majority of these products contain one or more enzyme activities which are used to support the fruit's own enzymes for a faster biochemical process.

Compliance with a specific temperature and pH range is important for the enzyme's functionality, as well as an adequate dosage. Like all proteins, enzymes are denatured at high temperatures and lose their efficacy as a result.

An unfavourable environmental pH makes the enzyme too sensitive to elevated temperatures and also impairs efficacy. Temperatures that are too low, on the other hand, slow down biochemical reactions or bring them to a complete stop.

It is therefore important to know and adhere to the correct pH and temperature ranges at which the enzymes are correspondingly effective.

StabiMash

Combination of acids for acidulation of distilling mashes

A pH value between 4 and 5 is the target for optimum enzyme function. **StabiMash** can be used here to take corrective action. Another reduction to an approx. pH of 3.2 is possible after enzymation, to prevent undesirable microbiological influences and to create good conditions for clean fermentation.

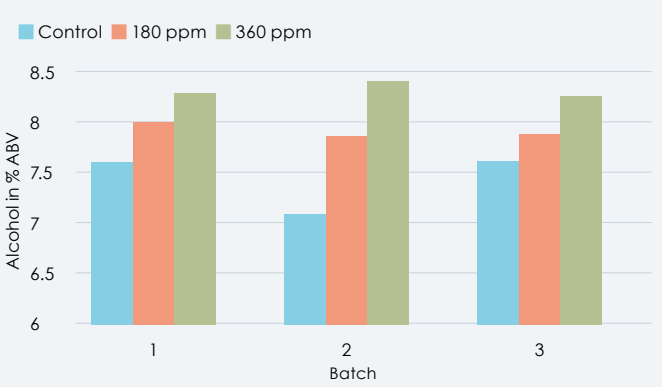
Whisky, vodka, Calvados and grain spirit

Amylases

Nowadays, amylases are used almost exclusively in grain and potato distillation, instead of malt, to liquefy and saccharify raw materials containing starch. Compliance with a suitable temperature cycle is necessary for optimum degradation. Only on this condition is it possible to achieve maximum saccharification of the starches in the enzymated mash and therefore achieve the optimum yield. Complete starch degradation increases process efficiency and guarantees optimum utilisation of the raw materials.

In fruit distillation, amylases are used as a supplementary enzyme when processing starchy fruits, such as apples. Use of special amylases in whisky distillation appears to be unusual, as malts containing powerful enzymes are already used here. The malts' own amylases (mainly α- and β-amylases) are often insufficient, to fully degrade the starches into fermentable sugar. Use of a glucoamylase product can be helpful in this case.

Larger dextrins and oligosaccharides are broken down into glucose. The yeast can optimally utilise this sugar, which has a favourable effect on the alcohol yield of each individual batch. A trial with three batches of malt whisky wort (20.37 kg malt/hL) repeated three times shows that marked increases in yields of up to 10.7% can be achieved with a dosage of 180 ppm or 360 ppm **Enerzym HT** compared to unenzymated worts.



Yield increase through the use of Enerzym HT in a malt whisky wort compared to the control group

The above figure illustrates the trial results. In this case the enzyme was added to the cooled wort with the yeast.

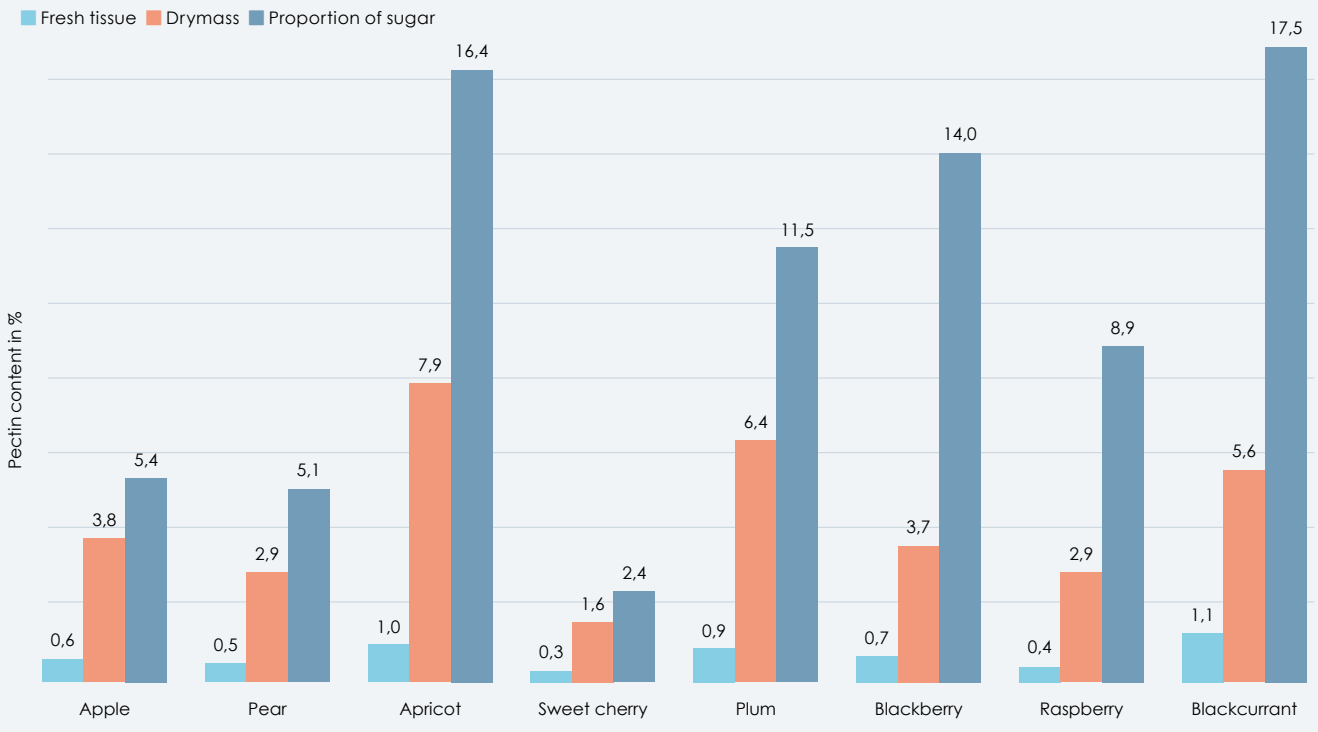
Pear, apple, quince & Co

Pectinases

Pectins are the supporting substance in fruit and are therefore present in virtually all types of fruit. Apricots, plums and blackcurrants have the highest absolute pectin content. Where sugar content is concerned, fruits such as blackberries and raspberries have a higher pectin content than apples and pears. This can cause increased methanol content in the distillate. Due to different pectin contents and different side chains, the need for pectolytic enzymes varies depending on the fruit and degree of ripeness. Fruit softening during ripening also indicates the action of enzymes naturally contained in the fruit. In the case of fruit placed in cold storage for a long time, the fruit's own enzyme activity is no longer sufficient to even begin to ensure adequate liquefaction of the mash. Low viscosity mashes facilitate efficient processing and offer numerous other advantages.

Your benefits

- Better additive distribution
- Faster fermentation onset
- Lower blanket formation
- Less expansion space required
- Improved pumpability
- Optimum heat transfer



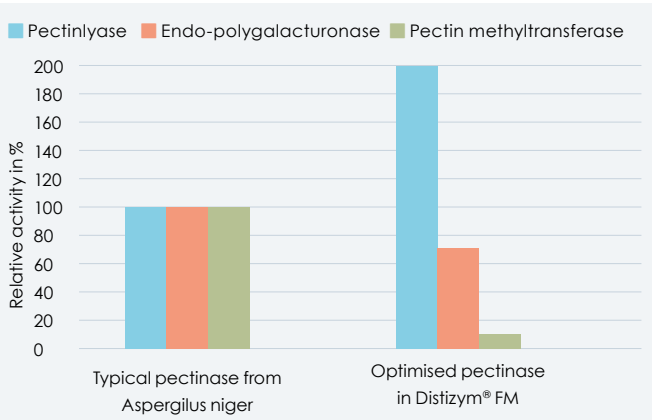
Pectin content of selected varieties of fruit based on fresh tissue, dry mass and proportion of sugar

Methanol

Strategic avoidance with pectinlyase

Methanol is like red rag to a bull for fruit distillers because it is toxic and also has a uniquely pungent smell. As a methyl group it is already attached to the fruit's own pectin and in this form is not prevalent in the aroma or problematic.

Different fruits have greatly varying degrees of methylation, with another major variation in terms of the total quantity of pectin. The potential for a problematic methanol content in the distillate therefore has to be assessed individually for every fruit processed. EU Regulation 2019/787 specifies maximum distillate contents at 1000 g/hL pure alcohol for fruit distillates, 1350 g/hL pure alcohol for hard-fleshed fruits and those with a very high pectin content and 1500 g/hL pure alcohol for fruit pomace brandy.



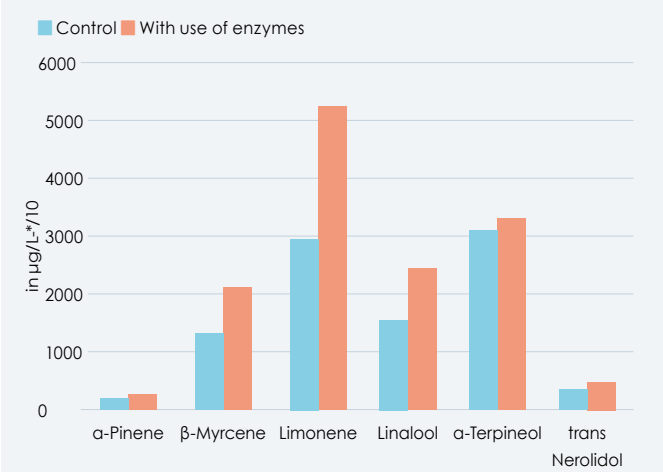
Pectinase fractions of Distizym® FM versus conventional pectinase

The methanol reserve is released when the fruit becomes overripe or when it ripens further during storage and continues during fermentation and interim storage of the fermented mash. The pectin esterases added during mashing use this natural process. These enzymes run smoothly along the pectin chain and release the methanol.

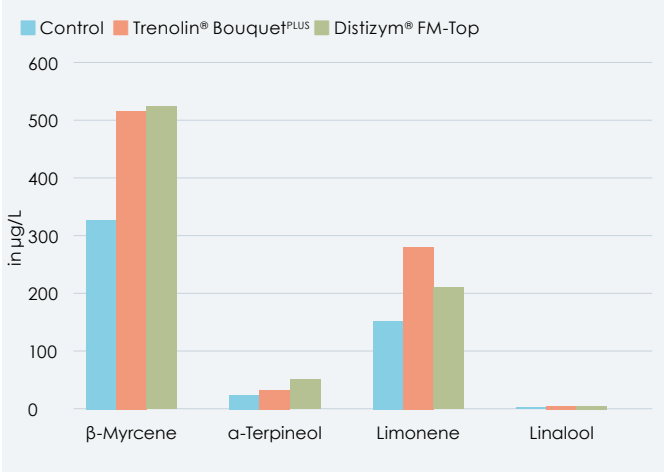
Polygalacturonases cleave the main pectin strand and ensure visible mash liquefaction. Enzyme doses and contact times can be controlled in order to limit methanol release. Rapid fermentation also minimises the phytoenzyme's influence. Furthermore, there are very hard-fleshed fruit, such as quince and service tree. For these the mash has to be liquefied so that there is sufficient mobility, in other words optimum access for the yeast to the fruit sugar, and to ensure expulsion of the resulting carbonic acid from fermentation. This occurs most efficiently using macerating enzymes such as **Distizym® FM-TOP**.

The use of pectin lyase represents a different approach to pure pectin degradation. Like polygalacturonase, it attaches directly to the pectin's chain structure and prefers the links that are methylated. As a result, the lyase itself does not release any methanol and reduces the efficiency of the fruit's own esterases. These can now no longer work along the pectin chain, but first have to find their substrate. Accordingly, proven special pectinase **Distizym® FM** has now been reformulated into an almost pure pectin lyase.

During the fermentation period of at least one week, the mash's viscosity is sufficiently lowered to ensure rapid alcohol formation and to avoid stubborn deposits in the still. The low volume of methanol released can then be removed by distillation, as in the classic process.



Typical aroma components in Italian bitter oranges



Typical aroma components in Italian juniper berries

Aroma boost for fruits and botanicals

Beta-glucosidases

Each fruit and botanical has its own distinctive aroma potential. These are the typical volatile compounds released when cutting open or squeezing fruit.

There is, however, always a pool of non-volatile compounds present, which are available as potential aromatics. These substances are glycosidically bonded with a residual sugar, making them too heavy to be volatile, in other words, effective for aroma.

These compounds are disposed of, unused, with the spent wash. Strongly macerating enzymes, such as **Distizym® FM-TOP**, make access to the compounds easier, however, so that glycosidically acting enzymes such as **Trenolin® Bouquet PLUS** can cleave the bonded aromatics from the residual sugars.

The ß-glucosidases, which specifically cleave terpene residual sugars, are particularly interesting. This group of aromatics only occurs in low concentrations in grapes from aromatic grape varieties (Muscatel, Gewürztraminer) and in yellow stone fruits (apricots, mirabelle plums), but still help to intensify the aroma.

They also release aromas from the phenol group, such as eugenol from berries (raspberries) and stone fruits (plums), which contribute to a more complex aroma. The enzyme therefore accelerates the natural ripening process, without having to accept the usual loss of quality due to overripe fruit.

> This effect is not limited to just the fruits' aromatic compounds; roots and spices, in other words botanicals for producing gin, bitters and herb-based spirits, can benefit from its use too.

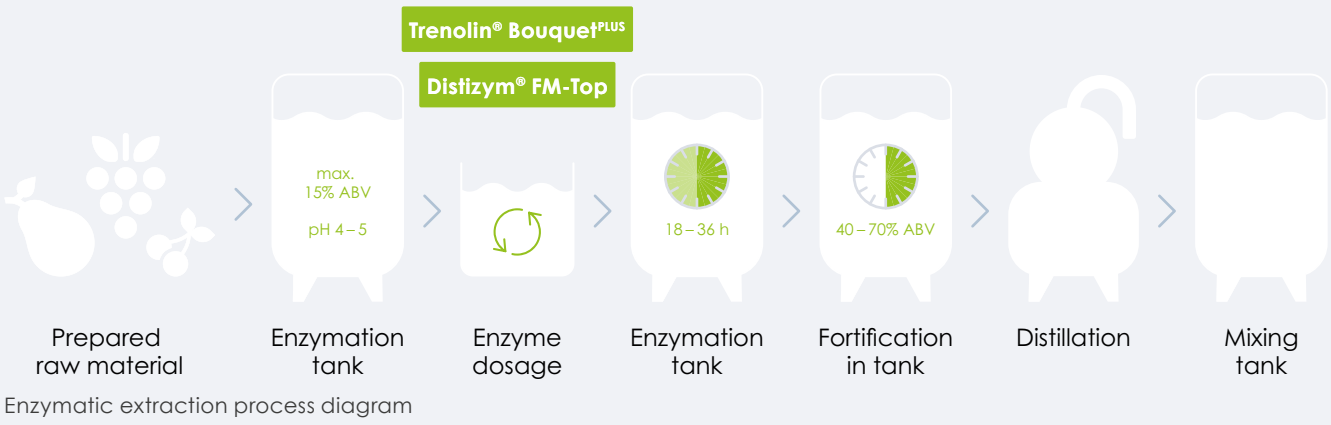
Benefit from the new process for producing spirits and infusions.

If you want to obtain the maximum aroma from your raw materials, then use our enzymatic extraction process.

First carry out enzymatic maceration at a maximum alcohol content of 15% ABV with **Trenolin® Bouquet^{PLUS}** and/or **Distizym® FM-TOP**. At this point you should adjust the pH value to pH 4-5 with **StabiMash**.

Used in this way the enzyme develops its full activating effect on raw materials such as juniper berries and orange or lemon peel.

After 18 to 36 hours the now volatile aromas are dissolved in your infusion as a result of subsequent fortification. You can continue the rest of processing as normal.



Enzymatic extraction process diagram

Correct use of enzymes

Enzymes work best at optimum pH and temperature ranges. These conditions (pH = 4-5 and T = 40-50 °C) are not helpful for clean, aroma-preserving fermentation. Ideally enzymation therefore takes place before acidity and yeast are added, so the conditions present are almost ideal for the enzyme.

Enzymatic liquefaction takes place within three to four hours for fruit harvested warm and at the natural pH value. Afterwards, after acidulation to a pH value of around 3.2 and possible cooling, fermentation can then be induced by inoculation with yeast and, if necessary, with nutrients. The fermentation tanks must be equipped with an agitator so the acid and starter yeast can be mixed in.

If an agitator is not available, the enzymes can also be added during mashing-in with all the other additives. A comparable liquefaction effect can be achieved through an increased quantity (20-30% more) and a suitably extended reaction time. The mash temperature should not fall below 15 °C.

Our distillery enzymes at a glance

	Function	Application	Dosage (mL/t)
Enerzym Amyl	Starch liquefier	Farinaceous raw materials such as grain and potatoes	200 – 400 (Starch)
Enerzym Alpha	Starch saccharification	Starchy raw materials such as grain, potatoes and apples	150 – 300 (Starch)
Enerzym HT	Breaks starches and dextrins down into fermentable sugars	Starchy raw materials such as grain (including malt), potatoes and apples	500 (Starch) 50 – 150 (Juice)
Enerzym Visco	Glucan degradation to reduce viscosity	Grain mashes from barley, oats or rice	50 – 150 (raw material)
Enerzym P7	Protein degradation in a neutral environment Reduction in overfoaming Supply of yeast with amino acids	Distillery mashes from grain or potatoes	75 (raw material)
Distizym® Protacid	Degradation in acidic environments Foam reduction Supply of yeast with peptides and amino acids	All protein-containing fermentation substrates inclined to foam during fermentation and distillation	30 – 50 (raw material)
Distizym® FM	Low methanol liquefaction of distilling mashes	Berries and stone fruit	200 – 500 (raw material)
Distizym® FM-Top	Liquefaction of distilling mashes from hard fruit Aroma release	Pome fruit, stone fruit, beets/ turnips/roots, juniper berries	20 – 300 (raw material)
Distizym® GL	Viscosity degradation	Grain raw materials such as rye	50 (raw material)
Trenolin® Bouquet^{PLUS}	Aroma release by splitting glycosidic bonds	Berries, stone fruit and botanicals	300 (raw material)
BactiCare	Suppression of Gram(+) bacteria in the mash	Raw materials contaminated with bacteria	250 – 500 (mash)

Yeast in the distillery

Small effort, big impact

Choosing the right yeast is a key decision in the production process because in addition to producing ethanol, it can do a whole lot more for you.

Yeast can also unlock unused aromatic potential. Individual fermentation management and choice of yeast strain are important artisanal methods of achieving expressive distillates.

A basic supply of **Vitamon® Combi** for the yeast flora is generally recommended for guaranteed complete fermentation.

Vitamon® Combi

Nitrogen and thiamine that can be used by yeast

Under problematic conditions vitamin and mineral-rich nutrient complex **VitaFerm® Ultra** can be used.

VitaFerm® Ultra

For low fermentation onset temperature or diluted batch

Correct use of yeast

- Rehydrate in lukewarm water (37-42 °C) or a water-must/mash mixture.
- Stir into the mash within 30 minutes.
- Dilute 1:1 with mash at low mash temperatures (< 20 °C).

As a rule, pure yeasts for malolactic fermentation are selected from wine yeasts and habituated to higher alcohol contents through targeted adaptation.

All ERBSLÖH yeasts ferment to at least 12% ABV in appropriate fermentation conditions.

If the supply of nutrients is good, high-performing yeasts such as **Spiriferm Arom** can generate 15% ABV and more.

For products like whisky, which are made from malt, yeasts that can handle maltose well are important. In this case **Oenoferm® C2** provides

Yeast rehydration

complete fermentation, even for high gravity worts, whilst simultaneously forming exciting, fruity aromas.

Different yeast strains vary with regard not only to formation of fermentation by-products, such as higher alcohols and esters, but also in fermentation behaviour and tolerance of unfavourable external conditions. These include low temperatures or a poor nutrient supply. Fermentation yeasts of the saccharomyces *bayanus* type are particularly tolerant of adverse conditions.

Some yeasts have higher glycosidic enzyme activity and are therefore able to split off bonded aromatics, such as terpenes. These are also known as bouquet yeasts which, in addition to these properties, are also characterized by increased formation of aromatic active substances, such as higher alcohols and esters.

Aims of fermentation using cultured yeasts

- Rapid onset of fermentation
- Greatest possible alcohol yield and associated conservation
- Preservation of raw material's quality and aroma
- Potential formation of additional aromas
- No undesirable off-flavours
- Suppression of secondary flora (bacteria, wild yeasts)
- Reliable results even at cold temperatures (saccharomyces *bayanus*)
- Guaranteed complete fermentation

Yeast activator and nutrient complex

Various preparations are available to adequately supply the yeast with nutrients.

VitaDrive®

Yeast activator for optimised rehydration

A suitable dose of **VitaDrive®** added directly to the batch may provide assistance even at the rehydration stage. As a result, an adequate nutrient concentration is established in the liquid, which prevents nutrients in the yeast cell being soaked in the liquid phase. **VitaDrive®**'s low ammonium content is particularly important here, as excessive concentrations at this juncture would have a negative effect on the yeast.

For guaranteed complete fermentation, addition of 25–40 g **Vitamon® Combi** yeast nutrition to 100 kg fruit is recommended, in order to ensure an adequate nutrient supply during fermentation.

Four steps for a safe fermentation process

Rehydration

Thoroughly stir the yeast into lukewarm water (37-42 °C). Prevent clumps forming. Alternatively, use a water-mash mix.

Yeast activator

Addition of **Vita*Drive*®** direct to the rehydration batch. Use the same dosage as for the yeast.

Nutrient

Thoroughly stir the yeast into the fermentation substrate. Use **Vitamon® Combi** yeast nutrient (25–40 g/100kg) at the start of fermentation.

Monitoring

Monitor fermentation progress daily, reduce cooling if fermentation slows.

The fermentation tank must only be cooled during the first fermentation phase (2-3 days). Thereafter, the speed of fermentation self-regulates at a moderate level and continued cooling would be counterproductive. When providing external cooling by exposing the tanks to a stream of water, attention must be paid to thorough mixing, as temperatures inside can far exceed 20 °C.

Incorporate additional doses of **Vitamon® Combi** if necessary.

Cold fermentation – lots of aroma

Fermentation below 20 °C is known as cool fermentation, fermentation below 15 °C is cold fermentation. The temperature should not fall below 12 °C, as this entails a great risk of stuck fermentation.

Delayed or interrupted fermentation usually impairs yield and aroma. The positive effect of a cool or cold fermentation is that it can protect the delicate aromas of berries, Williams pears or wild fruits, in order to prevent strong CO_2 formation during rapid fermentation.

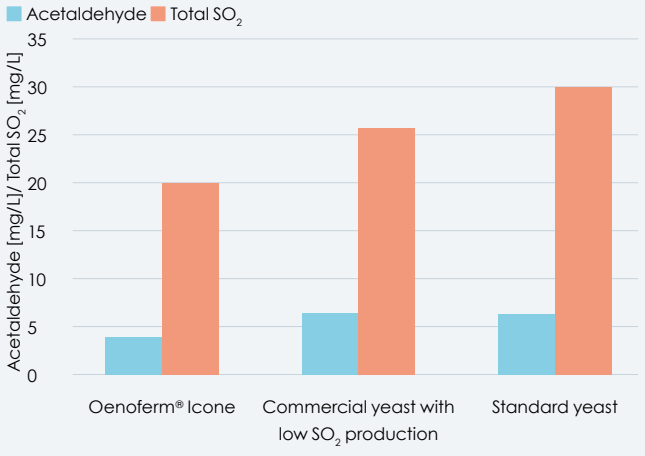
This effect benefits from the use of *Bayanus* yeasts, such as **Oenoferm® Freddo** or **Oenoferm® X-treme**. These yeast strains exhibit a high temperature tolerance and produce only a moderate quantity of CO_2.

Yeast selection as part of sulphur management

Depending on the initial substrate, varying levels of sulphur-containing components are available for the yeast. These are metabolised differently depending on the yeast strain.

Some yeast strains can produce much more SO_2 than others. These contents are familiar from wine-making, where they play a subordinate role, as they are not perceptible. Concentration during distillation causes the sulphuric acid to be perceptible, so that consumers describe it as pungent and unpleasant.

Coated or black surfaces in the still can be seen after distillation of mashes and wines with a high sulphur content.



Acetaldehyde and total SO_2 content after fermentation with Oenoferm® Icone, compared to conventional yeasts

Chemical cleaning of the still must then be carried out so that reactive copper is once again available, in order to produce a high-quality distillate from the next batch.

As this is scarcely achievable from an economic viewpoint, subsequent batches will exhibit much higher sulphur contents from the same raw materials and suffer in sensory terms due to the absence of a reactive copper surface.

If the intention is to distil products with low sulphur contents, it is recommended that a yeast that demonstrably forms less sulphuric acid be used during fermentation.

In the wine industry **Oenoferm® Icone** and **Oenoferm® wild & pure** have already exhibited these characteristics for years. They are now increasingly finding their way into the distillery.

Oenoferm® Icone is an alcohol-tolerant, strongly fermenting yeast that ferments reliably even at heavier must weights.

Oenoferm® wild & pure is a mixture of *Torulaspora delbrueckii* and *Saccharomyces cerevisiae*, which has the exciting property of spontaneous fermentation, whilst simultaneously offering reliable fermentation.

Protect before it's too late!

Metschnikowia in fruit mash

Light fermenting yeasts of the genus *Metschnikowia* are an asset for fruit distillation. These yeasts are already used under certain conditions in wine production and to improve soft fruit's shelf life.

Oenoferm® MProtect offers innovative protection against undesirable microbiological activity. It exploits the fruits' natural aroma activation to the maximum under reliable storage conditions.

Early use of **Oenoferm® MProtect** effectively suppresses proliferation of acetic acid bacteria, mould spores and apiculatus yeasts.

In principle it can be used on the whole fruit in a storage container or during mashing without simultaneous onset of fermentation. Controlling temperatures at 5-15 °C is recommended to assist this.

Oenoferm® MProtect is fertile and biologically fully effective, without forming the typical off-flavours and signs of spoiling, such as lactic or acetic acid. The yeast attracts large quantities of iron ions from its environment and in this way suppresses growth of wild flora like yeasts and bacteria.

At the same time **Oenoferm® MProtect** exhibits aroma-enzymatic activity. As a result this further enhances the aromatic potential of many types of fruit. The yeast's own proteases facilitate the onset of fermentation for the subsequent cultivated yeast. The main yeasts can now bring fermentation to a successful conclusion unimpeded.

Oenoferm® MProtect has been significantly improved again as a result of our continuous development. Consequently a small quantity is sufficient for successful bioprotection. Just 2–7 g/hL of this improved yeast strain are sufficient to protect the harvest effectively against micro-organisms during transport and standing times. Even faster colonisation with *Metschnikowia pulcherrima* is possible due to a particularly high reproduction rate. Harmful organisms don't stand a chance!

Our distillery yeasts at a glance

Spiriferm

0,5 kg

Universal fermentation of distilling mashes

Product and effect

- Rapid fermentation onset
- Low SO_2 and H_2S formation
- Universally suitable for every fruit

Recommended fermentation temperature	16 – 22 °C
Alcohol tolerance	14% ABV

Dosage

25 – 30 g/hL

Spiriferm Classic

0,5 kg

Rapid fermentation of distilling mashes and musts

Product and effect

- Rapid fermentation onset
- Low SO_2 and H_2S formation
- Suitable for pome fruit, cherries, grain and molasses

Recommended fermentation temperature	18 – 25 °C
Alcohol tolerance	12% ABV

Dosage

20 – 30 g/hL	(for fruit)
40 – 60 g/hL	(for grain)

Spiriferm Arom

0,5 kg

Optimum aroma development for distilling mashes

Product and effect

- For production of intensely aromatic distillates
- Low SO_2 and H_2S formation
- For yellow stone fruit, grapes and pomace

Recommended fermentation temperature	18 – 25 °C
Alcohol tolerance	15% ABV

Dosage

20 – 30 g/hL

Oenoferm® C2

0,5 | 10 kg

Fermentation of whisky mashes and worts

Product and effect

- Reliable onset and fermentation, even under adverse conditions
- Moderate nutrient requirement
- Subtle formation of fermentation aromas
- High alcohol yield

Recommended fermentation temperature	14 – 38 °C
Alcohol tolerance	16% ABV

Dosage

20 – 40 g/hL	(for fruit)
40 – 80 g/hL	(for whisky and rum)

Oenoferm® Champ

0,5 kg | 10 kg

Bayanus yeast for grape and pomace distillates, and rum molasses

Product and effect

- Originally selected as a sparkling wine yeast in the province of Champagne
- Rapid, uniform fermentation speed
- Formation of delicate fruity to nutty, yeasty aromas

Recommended fermentation temperature	14 – 26 °C
Alcohol tolerance	16% ABV

Dosage

20 – 40 g/hL	(for fruit)
40 – 60 g/hL	(for rum)

Oenoferm® Freddo

0,1 kg | 0,5 kg | 10 kg

Bayanus yeast for diverse cold fermentations of fruit and grain

Product and effect

- Complete final fermentation from 10 °C
- Emphasises an expressive fruit aroma
- Very strongly fermenting, low foam
- Marked killer properties counteracting corrupting yeasts and bacteria

Recommended fermentation temperature	13 – 17 °C (possible from 10 °C)
Alcohol tolerance	15% ABV

Dosage

20 – 40 g/hL	(for fruit)
40 – 60 g/hL	(for grain)

Oenoferm® Icone

0,5 kg

Cerevisiae yeast for fruit mashes and molasses

Product and effect

- Strongly fermenting yeast, even under difficult conditions
- Fruity-floral fermentation aroma
- Avoids sulphurous notes in subtle distillates
- Particularly alcohol tolerant

Recommended fermentation temperature	18 – 33 °C
Alcohol tolerance	16,5% ABV

Dosage

20 – 40 g/hL

Oenoferm® MProtect

0,5 kg

Metschnikowia pulcherrima yeast for bioprotection

Product and effect

- Suppresses wild yeasts and mould during the harvest
- Bioprotection of raw materials and fermentation batch
- Aromatic enzyme activity for developing the intrinsic fruit bouquet

Recommended fermentation temperature	5 – 15 °C
Alcohol tolerance	6% ABV

Dosage

2 – 7 g/hL

Oenoferm® wild & pure

0,5 kg

Blend of *Saccharomyces cerevisiae* and wild yeast *Torulaspora delbrueckii* for whisky, grain and fruit brandy and rum molasses

Product and effect

- Exotic aroma profile with a guaranteed fermentation result
- Creation of a unique product style
- Low SO_2 formation

Recommended fermentation temperature	16 – 33 °C
Alcohol tolerance	14% ABV

Dosage

20 – 40 g/hL	(for fruit)
40 – 80 g/hL	(for whisky and rum)

Oenoferm® X-treme

0,5 | 10 kg

Hybrid yeast for fruit brandies and molasses

Product and effect

- Extremely fast fermentation ability at low temperatures
- Spicy-fruity fermentation aroma
- Can also be used without rehydration

Recommended fermentation temperature	10 – 17 °C
Alcohol tolerance	17% ABV

Dosage

20 – 40 g/hL

BrewMasters FruitAle

0,5 kg

For grain brandies that emphasise fruit and esters

Product and effect

- Very rapid fermentation speed
- High-quality fermentation
- Increased production of fruity aromas at temperatures > 22 °C
- Also suitable for co-fermentation, with wine yeasts, for example

Recommended fermentation temperature	16 – 28 °C
Alcohol tolerance	10% ABV

Dosage

50 – 100 g/hL

Gentle on your distilling equipment

Sulphite separation using Kupzit

Copper is an ancient, yet current tool in the distillery. Despite the availability of steel and glass, modern distillation equipment still tends towards copper.

In order to fully exploit the fermented fruit's aromatic potential, modern distillation equipment has rectifiying columns, dephlegmators and catalysts. These are all made from copper to favour a good aroma. In addition to the obvious effect, copper also offers technical advantages.

Copper primarily binds sulphur compounds that have a negative sensory impact on the fermentation bouquet. This is mainly H_2S, formed to a varying extent as a by-product of every yeast.

e.AntiFoam

Silicon defoamer for the distillery

If H_2S contents are very low, the smell of rotten eggs, or the "off" impression is masked by the fermentation bouquet. If contents are higher, it is possible to detect this off odour in the mash or wine itself.

As copper bonds with these problematic negative sulphur compounds, it is still the material of choice for producing aromatic distillates.

During longer distilling cycles, or fruit mashes with sulphur-based aromas, a film can quickly form inside the still and the parts through which vapour passes. Catalytic copper is therefore unavailable for subsequent distillations. In sensory terms these batches are usually dull and boring.

Kupzit® provides the distiller with a copper citrate treatment agent which binds sulphurous compounds at the mash stage and makes it possible to exploit all of the distillate's potential aroma.

Kupzit®

Copper citrate preparation to treat off-flavours

20-50 g/100 kg **Kupzit®** is added to the mash just before distillation and is evenly distributed with the mixer running during the distillation process.

H_2S and other substances that impair the sensory properties are bound at the liquid phase and the distillation equipment copper is available as a reaction partner for longer. At the same time this reduces the need for frequent chemical cleaning with acid in order to restore the still's surface. This cuts down the general need for cleaning agents, protects your still's material and increases longevity. Overall, the use of **Kupzit®** saves effort, time and money.

Sustainable alternatives to barrels

e.Staves and e.Bois®

Your distillate is given the finishing touch by refining the product with lengthy barrel maturation. The product gains visually and sensorially as a result. In this way you achieve a better quality that is worthwhile.

We offer the use of what are known as "staves" or "chips" as an alternative to the barrel. If barrel maturation is impossible for reasons of space or time, or if you want to lend an old, somewhat depleted barrel a helping hand, we recommend using chips in the tank and barrel or staves in the tank. Our **e.Staves** and **e.Bois®** product lines offer the right choice of wood for every application.

Usage

The product can be added direct to the wooden barrel or tank. It also possible to produce an alcoholic extract for subsequent use in the blend. Depending on the desired intensity, the quantities to be used are between 50 and 100 g/hL, or more for customary contact times of 5-30 days for chips and 2 to 6 months for staves.

Oxygenation is advisable for stronger oak and toasting aromas to develop. An appropriate flow of oxygen (air) should be ensured. Even pumping over, or stirring with air contact, causes the tannins and toasted aromas to be rounded off and balanced. The "infusion bag" packaging makes it easier for the user to add and remove the **e.Bois®** oak chips. They are made from food-safe polyamide.

Regular sensory checks should be conducted during application to monitor progress and to separate the chips at the right time.

e.Staves are equally straightforward to use; the staves can be simply placed in the tank first or added and removed through an opening in the headspace. Staves' scope of delivery also includes a polyamide cord with which the staves can be secured in the tank.

Fine tuning

Sometimes, despite every effort, the product does not fully meet one's high expectations. In this case use of chips and staves can help to polish colour and flavour and to add one or more layers of complexity to the product.

If the correction needs to be more subtle, you can always use **DistiPur** or **Granucol® GE**.

DistiPur

Mineral harmonisation of odour and flavour

DistiPur is a fine mineral granulate for odour and flavour harmonisation in clear spirits and distillates. Bitter, spirituous notes are smoothed out and even removed completely. As a result, the desired aromas once again come to the fore and the product is able to develop fully aromatically.

Granucol® GE

Granulated activated charcoal for sensory treatment and colour correction

Granucol® GE are selectively acting, activated charcoal pellets made from plants. These can be used to adsorb undesirable flavours and aromas in the distillate.

Overview of our oak alternatives

e.Staves

	Description	Characteristic	Dosage	Pack size
e.Staves	Oak staves with light toasting	Acidity, fruit, structure and volume	0,5 – 3 Staves/100 L	10 Staves
e.Staves 70 %	Oak staves with medium toasting	Caramel, vanilla and toasted notes	0,5 – 3 Staves/100 L	10 Staves
e.Staves 80 %	Oak staves with heavy toasting	Coffee, intense wood, roasted notes	0,5 – 3 Staves/100 L	10 Staves

e.Bois®

e.Bois® Reglissa	French oak chips with medium plus toasting	Aromas of liquorice and smoke	0,5 – 5 g/L	2 x 5 kg infusion bag
e.Bois® Opéra	French oak chips with medium toasting	Caramel and roasted notes	0,5 – 5 g/L	2 x 5 kg infusion bag
e.Bois® Muffins	American oak chips with medium toasting	American medium	0,5 – 5 g/L	2 x 5 kg infusion bag
e.Bois® Vanilla	French oak chips with medium toasting	Vanilla and toast notes	0,5 – 5 g/L	2 x 5 kg infusion bag
e.Bois® Fondant	French oak chips with light toasting	Spicy and sweet	0,5 – 5 g/L	2 x 5 kg infusion bag
e.Bois® Macaron NEW	Sweetness and fullness, French oak, light toasting	Sweetness and mouthfeel	0,5 – 5 g/L	2 x 5 kg infusion bag
e.Bois® Sorbet	French oak chips, untoasted, for infusion	Freshness and mouthfeel	0,5 – 5 g/L	2 x 5 kg infusion bag
e.Bois® Fraîcheur	Same raw material as Sorbet, granulated, pumpable	Freshness and mouthfeel	0,5 – 5 g/L	10 kg bag for direct addition to the mash

ERBSLÖH Geisenheim GmbH · Erbslöhstraße 1 · 65366 Geisenheim · info@erbsloeh.com