



The best enzymes for distilling

To find out all there is to know about how enzymes can benefit your distilling process check out the topics below.

The best enzymes for
liquefaction
in distilling

The best enzymes for
saccharification
in distilling

The best enzymes for
viscosity reduction
in distilling

Adding enzymes in your ethanol distilling process can improve the result and reduce the number of problems. If you don't use quality enzymes in your distillery you risk missing out on the benefits.

The best enzymes for liquefaction in distilling

To begin the distilling process, we need to make our solid starch into liquid mash, so the yeast has the best working conditions and it doesn't get stuck in the process. No matter which production facilities you are operating, enzymes can help get the mash ready. Alpha amylase enzymes help cut the complex carbon structure into smaller pieces and thereby making it a liquid ready for further saccharification/SSF.

Are all Alpha amylase enzymes for distilling the same?

No, the best are optimized for distilling and have the following properties:

Higher ethanol yield: The best enzymes for liquefaction and saccharification maximize starch and dextrins conversion to sugars for yeast fermentation to ethanol. The result is higher ethanol yield, the reason is that it optimizes the whole production process and solves problems that might arrive

Wide pH range tolerance: Allows you to get more out of your mash and reduces the need to adjust pH levels (less work, problems, cost, chemicals and wider pH range)

Lower viscosity: You want to have a high level of dry solids and at the same time keep a production without problems like channelling the mash through the stirred tanks and reduce wear of pumps, heat exchangers, jet cookers and agitation all run better at low viscosity. This is possible to obtain with our best-in-class alpha amylases.

No-jet-cooking: No problem, with aggressive enzymes you still get hydrolysis and high viscosity reduction

More efficient conversion: You get 0,5-5% more alcohol, use 20% less CO₂ with more efficient enzymes and it all adds up to less cost for the same output

The Maillard reaction: With lower pH you lose less sugars to the Maillard reaction and therefore get more alcohol

Thermostable: Quality enzymes still perform well at high temperatures (even at 95°C)

Infection: Low risk of infection because of low pH and high temperature tolerance

Faster: Work up to double as fast

Better: Convert up to double as many starts

Organoleptic: Increased organoleptic properties with best-in-class enzymes.

Equipment: Less wear and investment in equipment

There is a big difference between natural and low quality, compared to optimized Alpha amylase enzymes. Basically, you get less problems and use less time in the production, need less equipment, save energy and money, get a bigger output in higher quality.

How to use enzymes for liquefaction in distilling?

There is a lot of science that goes into developing and producing the best liquefaction enzymes, but it is straightforward to use it. You just mix liquefaction enzymes directly into the slurry tank / mixing tank. Make sure the temperature and pH are optimized for the enzymes used.

Which kind of enzymes work best for my starch?

The enzymes work on all starch. Different grains have different characteristics and accessibilities of starch.

Storage

The ideal storage conditions is in sealed packaging, in a dry environment, protected from the sun and in cool conditions (0–10°C/32–50°F). Just put it in the fridge.

Extended storage and/or exposure to adverse conditions such as higher temperatures or increased humidity may lead to a higher dosage requirement. The best enzymes can handle more extreme exposure without losing significant effect.

Dosage

As you probably know, enzymes aren't alive and therefore don't grow. Therefore, you need enough enzymes to convert the starch to fermentable sugars, so it is easy to digest for the yeast and move easily through the factory. Depending on the quality and the concentration of the enzymes you may need a different amount.

You don't have to be a scientist to use enzymes, you just need to add it. Don't take our word for it. Get free enzymes, expert advice and test it for yourself.



The best enzymes for saccharification in distilling

When distilling, you want to convert as much starch into sugar, to let the yeast develop as much alcohol as possible. Distillers have traditionally been heating up starch to decompose it into sugar.

The biggest improvements in distilling are now done with specialized enzymes that improve starch for the best conditions for yeast. It is done by maximize starch and dextrans conversion to fermentable sugars

Are all enzymes for saccharification in distilling the same?

No, the best are optimized for distilling and have the following properties:

Higher ethanol yield: The best enzymes for liquefaction and saccharification maximize starch and dextrans conversion to sugars for yeast fermentation to ethanol. The result is higher ethanol yield, the reason is optimizing the whole production process and solving problems that might arrive

Fast fermentation rates: Faster ethanol production early in fermentation means you get a higher production capacity from the same facility

Reduce bacterial infection: Bacteria reproduces much faster than yeast and will consume sugar. By increasing temperature and lowering pH you can inhibit bacterial reproduction. Whereas enzymes will work effectively

Effective on varying types and quality of raw materials: The best enzymes for saccharification have been tested with success on a large range of raw materials, difference qualities, conditions and have provided reliable top performance

Wide pH range tolerance: Allow you to get more out of your mash and reduces the need to adjust the pH (less work, problems, cost, chemicals and wider pH range)

Lower viscosity: You want to have a high level of dry solids and at the same time keep a production without problems like channeling the mash through the stirred tanks and reduce ware of pumps, heat exchangers, jet cookers and agitation all run better at low viscosity

More efficient conversion: You get 0,5-5% more alcohol, use 20% less CO2 with more efficient enzymes and it all adds up to less cost for the same output

Faster: Work up to double as fast

Better: Convert up to double as many starts

Organoleptic: Increased organoleptic properties with best-in-class enzymes.

Equipment: Less wear and investment in equipment

You get less problems and use less time in the production, need less equipment, save energy and money, get a bigger output in higher quality with our innovative solutions.

The best enzymes for viscosity reduction in distilling

Even with good liquefaction and saccharification, you can end up with mashes that are too viscous. It can cause problems in production and reduce the longevity of the machinery.

This is especially a problem with “small grains” such as rye, wheat, barley and triticale. The cause is water-binding non-starch polysaccharides (NSPs). In "small grains" these are challenging to extract and solubilize.

Viscosity-reducing enzymes break down NSPs so you can run your process at a high DS level and get more flexibility in your choice of raw materials.

Are all enzymes for viscosity reduction in distilling the same?

No, the best is optimized for distilling and have the following abilities:

Reduce viscosity: Viscosity reduction is one of the most important processes in ethanol production

High dry solids (DS): With a High Dry Solids (DS) mix you can increase production and decrease fouling, cleaning and wear of equipment, improved mash flow and higher centrifuge and evaporator efficiency. The result is a lower energy and water spend and more cost-effective operations

Raw material flexibility: Can be used for many different raw materials, especially “small grains” such as rye, wheat, barley, and triticale

Lower viscosity: You want to have a high level of dry solids and at the same time keep a production without problems like channelling the mash through the stirred tanks and reduce wear of pumps, heat exchangers, jet cookers and agitation all run better at low viscosity

More efficient conversion: You get 0,5-5% more alcohol, use 20% less CO₂ with more efficient enzymes and it all adds up to less cost for the same output

Thermostable: Quality enzymes still perform well at high temperatures (even at 95°C)

Infection: Low risk of infection because of low Ph and high temperature tolerance

Faster: Work up to double as fast

Better: Convert up to double as many starts

Organoleptic: Increased organoleptic properties with best-in-class enzymes.

Equipment: Less wear and investment in equipment

You get less problems and use less time in the production, need less equipment, save energy and money, get a bigger output in higher quality with our innovative solutions.

Contact us

We offer expert consulting and enzyme samples all for free, so that you can experience the results first-hand.

As the world leading enzymes producer, Novozymes offers products that are optimized for distilling and, we hire some of the best experts to continually help our customers solve problems and get the best results.

What you can expect from our enzymes:

- > 0,5 - 5% higher ethanol output
- > Lower production costs
- > Avoid investment in expensive equipment

What our experts can do for you:

- > Send you free product samples
- > Give individual advice
- > Troubleshoot issues and support with product optimization

