

Instructions on how to produce whisky with our best-in-class enzymes

Single malt whisky is a spirit made from cereal grains providing starch and that is then converted into alcohol. Its production can be facilitated using **modern biotechnology enzymes**. Furthermore, **blended whisky** is a mixture of **single malt whisky** and **grain neutral spirit** that is distilled in still pots. Follow our special instructions to easily implement our **enzymes** into your distilling process

Disclaimer: Please note that this is a general dosing guidance and that you can fine tune the dose further. Furthermore, enzymes are process aids and will not be present in the finalized spirit.

Recipe for single malt whisky

Enzymes needed

- **Ultraflo® XL** - *A viscosity-reducing enzyme*
- **Termamyl® Classic** - *A Gluco Amylase*
- **Amylase® AG300 L** - *A Gluco Amylase*

Step 1: Start with 200gm of Ultraflo® XL (per ton of grain)

To get the desired dry substance, cereal flour is mixed with water in the slurry mixing tank. This typical ranges from 22 to 32% w/w. By adding 200gm of **Ultraflo® XL**, you will greatly reduce the viscosity of your production during the mixing stage. Indeed, viscosity reducing enzymes hydrolyze arabinoxylans and NSPs (Non-Starch Polysaccharides), which are major components of small grains like wheat and triticale.

Step 2: Add up 150 to 250gm of Termamyl® Classic (per ton of grain)

Next, we recommend adding up 150-250gm of **Termamyl® Classic**. Because this enzyme is an Alpha Amylase, it will reduce the viscosity of your production by breaking down starch into small dextrans. To ensure full conversion, the dosing must be followed by an increase in slurry temperature up to 85-87°C, for at least two hours

Step 3: Add up 500 to 700gm of Amylase® AG 300L (per ton of grain)

Then, the resultant liquefact is cooled down and transferred to the saccharification or fermentation vessel. At this stage of fermentation, we recommend adding up 500 to 700gm of **Amylase® AG 300L**. This enzyme is a glucoamylase and will break down dextrans into glucose.

Recipe for blended whisky

Enzymes needed

- **Viscoferm®** - *A viscosity-reducing enzyme*
- **Liquoflow® GO 3X** - *An Alpha Amylase*
- **Saczyme® Plus 2X** - *A Gluco Amylase*

Step 1: Start with 50 to 100gm of Viscoferm® (per ton of grain)

First, we would recommend adding around 50-100gm of **Viscoferm®** per ton of grain. To get the desired dry substance, cereal flour is mixed with water in the slurry mixing tank. This usually ranges between 18 to 28% w/w. By using a viscosity-reducing enzyme such as **Viscoferm®**, you will greatly reduce the viscosity of your production during the mixing stage. This is due to the properties of this type of enzyme that hydrolyzes arabinoxylans and NSPs (Non-Starch Polysaccharides) which are major components of small grains like wheat and triticale.

Step 2: Add up 100gm of Liquoflow® GO 3X (per ton of grain)

Next, roughly add 100gm of **Liquoflow® GO 3X** per ton of grain. Because this enzyme is an Alpha Amylase, it will reduce the viscosity of your production by breaking down starch into small dextrins, thus preventing starch from becoming gelatinized.

Step 3: Add up 250gm of Saczyme® Plus 2X (per ton of grain)

Then, the resultant liquefact is cooled down and transferred to the saccharification or fermentation vessel. At this stage of fermentation, we recommend adding up 250gm of **Saczyme® Plus 2X**. This enzyme is a glucoamylase and will break down dextrins into glucose.

Grain neutral spirit is produced

Now that your grain neutral spirit is produced, you will need to add it with single malt whisky to obtain a high-quality blended whisky.

Let's get in touch

As the world leading enzymes producer, Novozymes offers products that are optimized for distilling. Experience optimal results first-hand and benefit from our expert consulting and enzyme samples -for free.

Contact our team of distilling experts and start your enzymatic journey with us, today.