

# Brewing

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**Brewing solutions  
and innovations**

for beer, whisky, and hard seltzers

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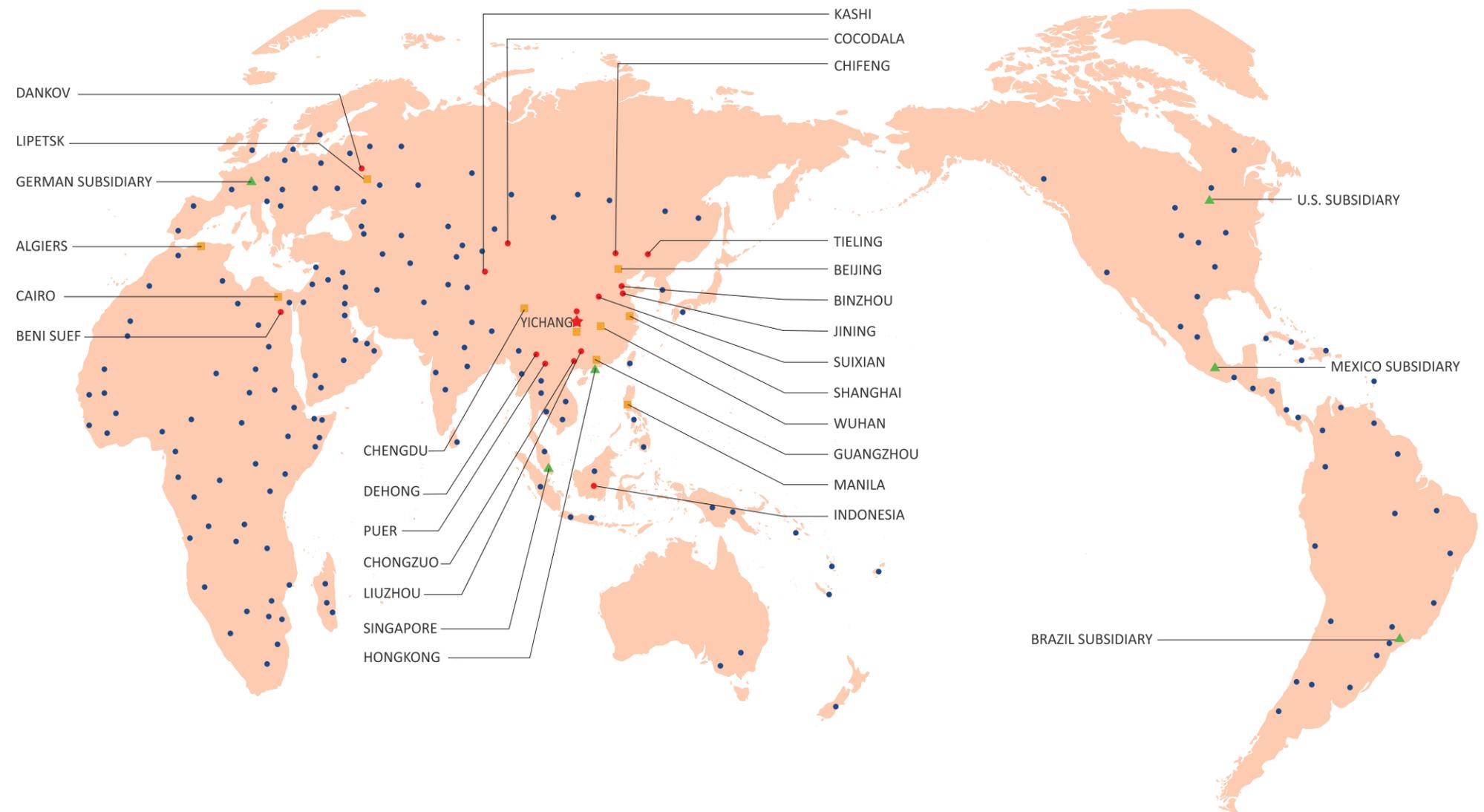
# Your Trusted Partner in Fermentation

As a biotechnology company with 33 global production bases, Angel Yeast is committed to developing innovative, differentiated, science-based functional ingredients and customized solutions.



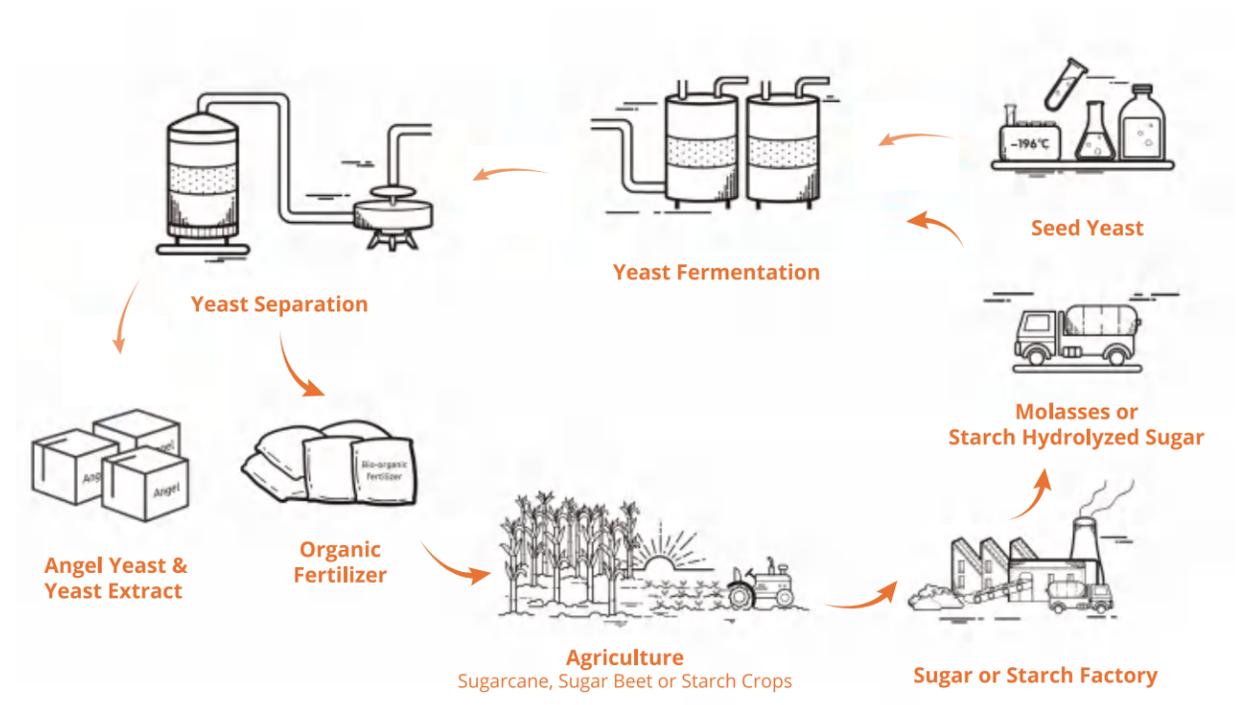
Angel is a leading fermentation and fermentation nutrition supplier, providing yeast and yeast products with best service and solutions for the production of beer, wine, fuel ethanol and alcohol beverages. All our products are natural, safe, and of high quality, creates value for breweries, wineries, ethanol plant and distilleries through continuous technical innovation and professional service.

- ★ HEADQUARTERS
- PRODUCTION BASE
- APPLIED SCIENCE SERVICE CENTER
- OVERSEAS CUSTOMER
- ▲ OVERSEAS SUBSIDIARY





# Yeast Production Resources Recycling



In past five years, we reduced **480,000** tons of COD (the main limiting pollutant emission)



In past five years, we saved **5.15** million tons of water, **63.84** million kilowatt hours of electricity



**25** projects of energy-saving and carbon reduction reducing carbon emissions by approximately **16,000** tons



# Sustainable Products and Solutions

Angel pursues sustainable development through our strict systems for environmentally friendly plants. We believe that good environmental protection is part of our competitiveness as a company. More of our budget is allocated every year towards waste water treatment, energy saving, and emissions reduction.

# Sustainable Innovation

Angel views innovation as the key to a sustainable global competitiveness. We continue investing in R&D, intelligent manufacturing and technological innovation, integrate resources and make technology breakthroughs to promote sustainable development of the company.



772  
R&D Experts

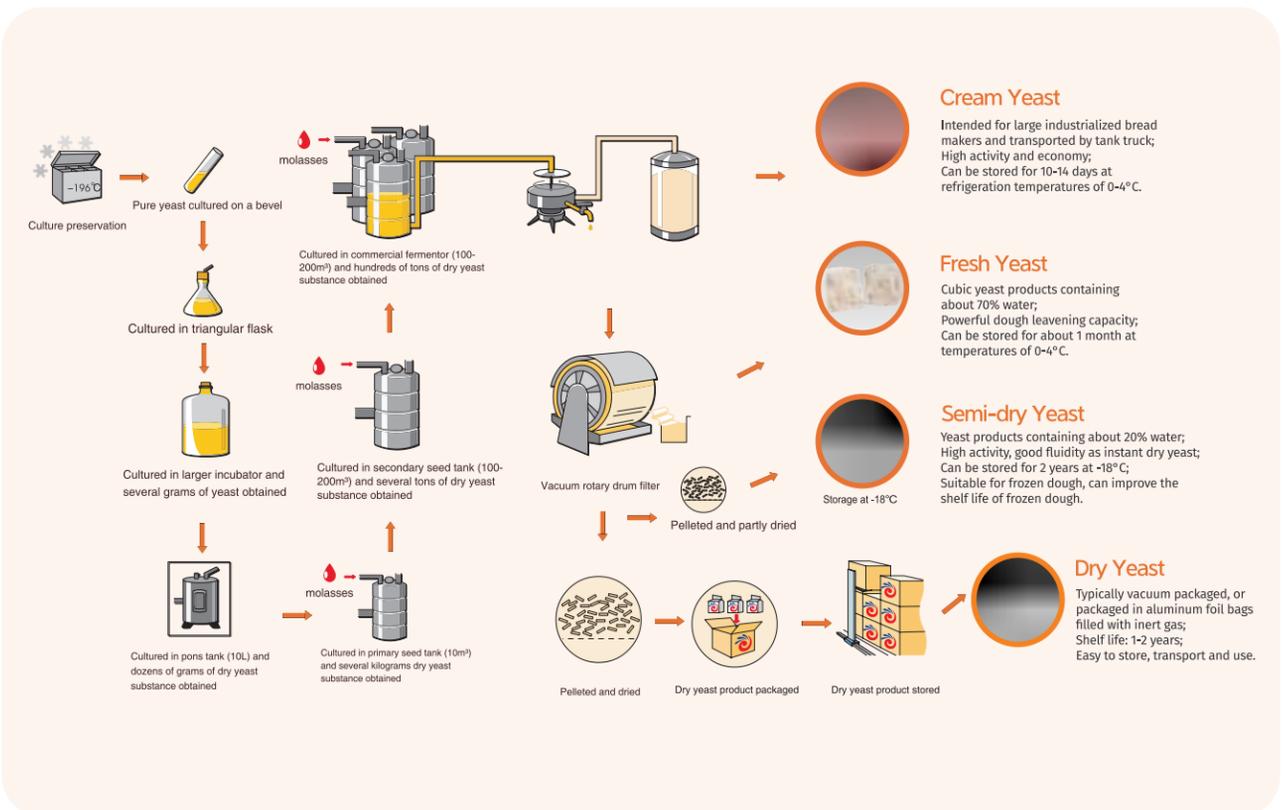


780 million  
RMB Innovation Investment



324  
Innovation Patents

# Process of Yeast Production



# Product Index

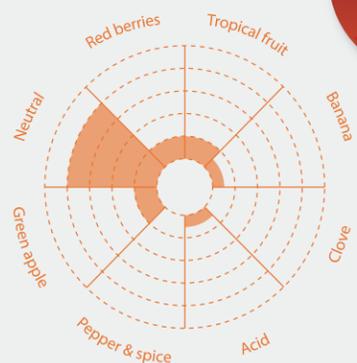
YEAST	SPECIES	BEER STYLES	FLOCCULATION	ATTENUATION	TEMPERATURE RANGE	ALCOHOL TOLERANCE	PITCHING RATE
A01	<i>Saccharomyces cerevisiae</i>	American Ale	Medium	75–83%	15–25° C (59–77° F)	10%ABV	50 to 100 g/hl
BF16	<i>Saccharomyces pastorianus</i>	Lager	High	80–84%	10–20° C (50–68° F)	10%ABV	80 to 150 g/hl
BF27	<i>Saccharomyces pastorianus</i>	Lager	High	80–85%	10–20° C (50–68° F)	10%ABV	80 to 150 g/hl
CN36	<i>Saccharomyces cerevisiae</i>	British Ale	High	77–86%	10–25° C (50–77° F)	13%ABV	50 to 100 g/hl
CS31	<i>Saccharomyces cerevisiae</i> var. <i>diastolicus</i>	Belgian Saison	Low	83–94%	18–30° C (64–86° F)	14%ABV	50 to 100 g/hl
CY115	<i>Saccharomyces cerevisiae</i>	British Ale	High	75–83%	14–25° C (57–77° F)	10%ABV	50 to 100 g/hl
FG11	<i>Saccharomyces cerevisiae</i>	Tropical IPA, New England IPA	Medium	75–82%	20–35° C (68–95° F)	15%ABV	50 to 100 g/hl
KO	<i>Saccharomyces cerevisiae</i>	Kölsch Beer	Medium to High	75–82%	12–25° C (54–77° F)	10–11%ABV	50 to 100 g/hl
LA03	<i>Saccharomyces cerevisiae</i>	New England IPA	Medium to High	71–75%	18–25° C (64–77° F)	11%ABV	50 to 100 g/hl
MA05	<i>Torulaspota delbrueckii</i>	Low and Non Alcohol Beer	Medium	13–17%	18–28° C (64–82° F)	–	50 to 100 g/hl
VOS	<i>Saccharomyces cerevisiae</i>	Kveik Ale	Medium to High	75–82%	20–35° C (68–95° F)	14%ABV	50 to 100 g/hl
W008	<i>Saccharomyces cerevisiae</i> var. <i>diastolicus</i>	Wheat Ale	Low	73–85%	18–24° C (64–75° F)	10%ABV	50 to 100 g/hl
WA18	<i>Saccharomyces cerevisiae</i>	Wheat Ale	Medium	73–85%	18–22° C (64–72° F)	10%ABV	50 to 100 g/hl

## Beer Yeast & Nutrients



# A01 American Ale Yeast

**NEW  
PRODUCT**



A01 is one of a typical strain of Chico or California Ale yeasts on the west coast of the US for brewing an American ale beer with clean, neutral and crisp flavor and medium to high attenuation, producing low fruity esters. This yeast is with wide adaptability for many kinds of American beers, highlighting the characteristics and style of malt and hops.

## BREWING PROPERTIES

**Temperature range**  
15–25°C (59–77°F)

**Apparent attenuation**  
75–83%

**Alcohol tolerance**  
10%ABV

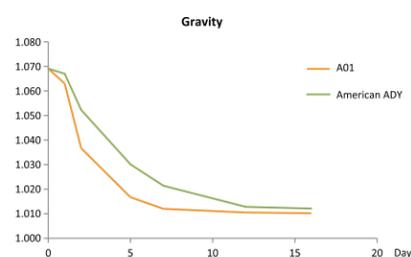
**POF Phenotype**  
Negative

**Diastaticus**  
Negative

**Flocculation**  
Medium

Produce very clean, crisp beers with low diacetyl

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces cerevisiae</i>
Dry weight	> 94%
Viable yeast	> 4.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

## USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.

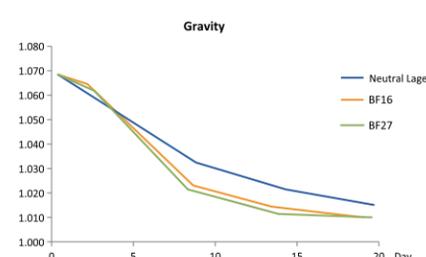
*The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.*

# Lager Yeast BF16



BF16 is a classic Swiss lager yeast to brew a wide range of lager and Pilsner beers. The characteristics of this yeast enable it to produce lagers with high drinkability. It exhibits excellent fermentation performance, with rapid fermentation initiation and high fermentation efficiency, resulting in clean and bright lagers with minimal diacetyl content, a crisp taste, and a subtle floral aroma.

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

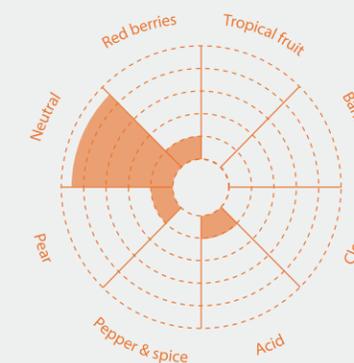
Species	<i>Saccharomyces pastorianus</i>
Dry Weight	> 94%
Viable Yeast	> 4.0*10 <sup>9</sup> cfu/g
Wild Yeast	< 1.0*10 <sup>3</sup> cfu/g
Total Bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

*The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.*



## BREWING PROPERTIES

**Temperature range**  
10–20°C (50–68°F)

**Ideally**  
10–15°C (50–59°F)

**Apparent attenuation**  
80–84%

**Alcohol tolerance**  
10%ABV

**POF Phenotype**  
Negative

**Diastaticus**  
Negative

**Flocculation**  
High

**Fermentation performance**  
Medium to high

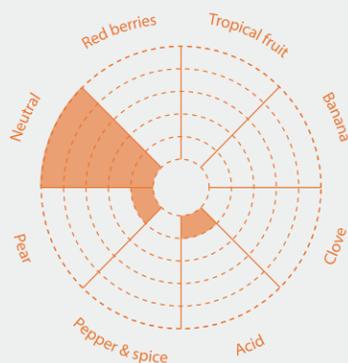
Reduces crisp and clean beers with subtle fruity character

*The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.*

# BF27 Lager Yeast



# British Ale Yeast CN36



BF27 is a classic Weihenstephan bottom-fermented beer yeast, widely used lager yeast in the world, and at cool temperatures it exhibits a short lag phase with strong steady kinetics. It produces very few esters during fermentation and has a balanced floral and fruity aroma, allowing the true characteristics of your chosen malt and hops to take centre stage. The beer produced with BF27 is very clean, crisp, and dry.

## BREWING PROPERTIES

**Temperature range**  
10–20°C (50–68°F)

**Ideally**  
10–15°C (50–59°F)

**Apparent attenuation**  
80–85%

**Alcohol tolerance**  
10%ABV

**Pof phenotype**  
Negative

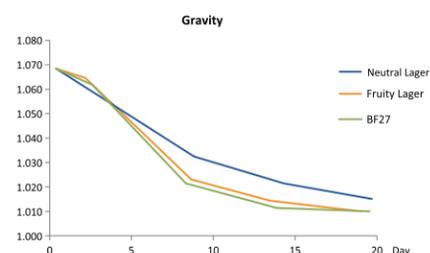
**Diastaticus**  
Negative

**Flocculation**  
High

**Fermentation performance**  
Medium to high

Dry fermenting with low residual sweetness  
Produces a crisp beer characteristic of the lager style

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces pastorianus</i>
Dry weight	> 94%
Viable yeast	> 4.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

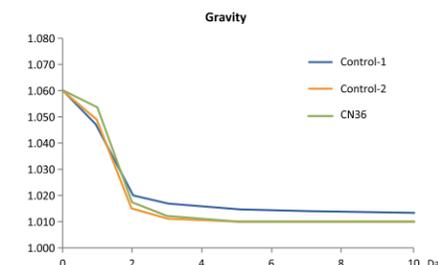
## USAGE

**Dosage:** 80 to 150 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

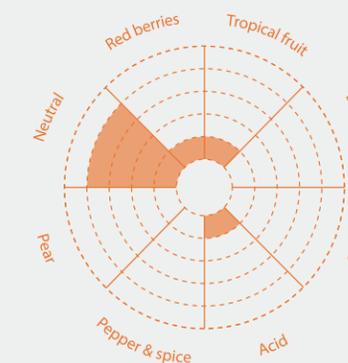
Species	<i>Saccharomyces cerevisiae</i>
Dry weight	> 94%
Viable yeast	> 4.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

CN36 is one of classic British ale yeasts with high flocculation and good attenuation. This yeast ferments dry and crisp, producing well-balanced beers with a clean and neutral finish. Excellent for all English style ales including pale ale, IPA, porter, brown ale, and high gravity beer. As a neutral ale yeast, CN36 produces slight fruity ester aromas that allows beer to develop the full flavor of malt and hops. High flocculation makes the beer bright, clear quickly.



## BREWING PROPERTIES

**Temperature range**  
10–25°C (50–77°F)

**Apparent attenuation**  
77–86%

**Alcohol tolerance**  
13%ABV

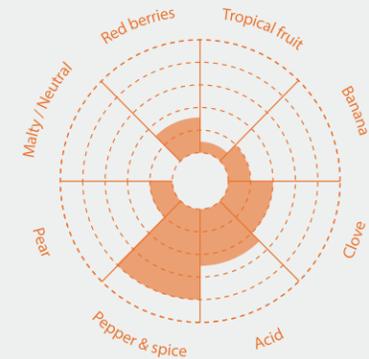
**POF Phenotype**  
Negative

**Diastaticus**  
Negative

**Flocculation**  
High

Produces subtle fruitiness and neutral flavor

# CS31 Belgian Saison Yeast



## BREWING PROPERTIES

**Temperature range**  
18–30°C (64–86°F)

**Apparent attenuation**  
83–94%

**Alcohol tolerance**  
14%ABV

**POF Phenotype**  
Positive

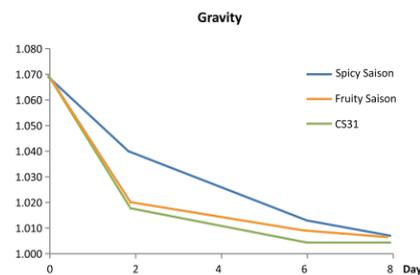
**Diastaticus**  
Positive

**Flocculation**  
Slow

Produces a dry refreshing beer with sweet fruit aromas and flavour such as pear, apple, and bubblegum

CS31 is a classic Belgian style saison yeast with high aroma intensity and very high attenuation levels due to its diastatic ability. It produces peppery and spicy aromas which are more prevalent at lower fermentation temperatures (< 20°C), whereas the fruity expression dominates at higher fermentation temperatures (27°C +). The flavour of CS31 will further develop during bottle conditioning. The diastatic ability of CS31 can lead to refermentation of packaged beer, care should be taken to ensure fermentation is fully exhausted prior to finished packaging into bottles and cans.

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

<b>Species</b>	<i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>
<b>Dry weight</b>	> 94%
<b>Viable yeast</b>	> 8.0*10 <sup>9</sup> cfu/g
<b>Wild yeast</b>	< 1.0*10 <sup>3</sup> cfu/g
<b>Total bacteria</b>	< 3.0*10 <sup>3</sup> cfu/g
<b>Lactic acid bacteria</b>	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature (≤ 10°C) and dry place, with the shelf life of 24 months.

## USAGE

**Dosage:** 80 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.

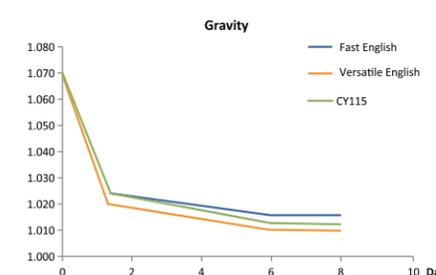
# British Ale Yeast

# CY115



CY115 is a beer strain selected for English ales with high flocculation and clarity. It produces mild sweet fruit esters characterized by apple and banana, but also allows malt character to be perceived. Produces beer with moderate body and soft mouthfeel. Perfect for English ales, pale ales and IPA's.

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

<b>Species</b>	<i>Saccharomyces cerevisiae</i>
<b>Dry weight</b>	> 94%
<b>Viable yeast</b>	> 4.0*10 <sup>9</sup> cfu/g
<b>Wild yeast</b>	< 1.0*10 <sup>3</sup> cfu/g
<b>Total bacteria</b>	< 3.0*10 <sup>3</sup> cfu/g
<b>Lactic acid bacteria</b>	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature (≤ 10°C) and dry place, with the shelf life of 24 months.

## USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.

## BREWING PROPERTIES

**Temperature range**  
14–25°C (57–77°F)

**Apparent attenuation**  
75–83%

**Alcohol tolerance**  
10%ABV

**Diastaticus**  
Negative

**POF Phenotype**  
Negative

Highly flocculent and forms a compact sediment on bottom of tank to help improve beer clarity  
Produces mild sweet fruit aroma and flavour characteristic of fruit aroma

# FG11

## Tropical IPA Yeast New England IPA

NEW  
PRODUCT



FG11 is a *Saccharomyces cerevisiae* strain from Framgarden. This strain is suited to any hop forward beers well, especially for Sabro, Strata and Galaxy. FG11 has the ability to tolerate high temperatures up to around 35°C without producing off-flavors such as fusel alcohols, acetaldehyde or diacetyl. It can ferment beers in 48 hours at a temperature around 30–35°C. The biotransformation of FG11 is high giving beer various fruity aromas and esters, such as citrus, mango, or tropical fruits.

### BREWING PROPERTIES

**Temperature range**  
20–35°C (68–95°F)

**Apparent attenuation**  
75–82%

**Alcohol tolerance**  
15%ABV

**POF phenotype**  
Negative

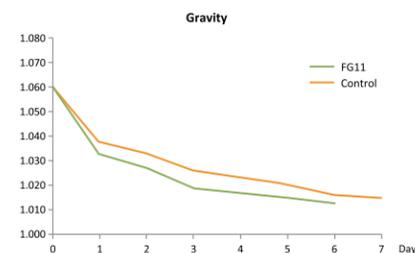
**Diastaticus**  
Negative

**Flocculation**  
Medium

**Fermentation rate**  
Moderate to high

**Biotransformation**  
Medium to high

### FERMENTATION PROFILE



### MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces cerevisiae</i>
Dry weight	> 94%
Viable yeast	> 8.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

### STORAGE

Store in low temperature (≤ 10°C) and dry place, with the shelf life of 24 months.

### USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.



# Kölsch Beer Yeast

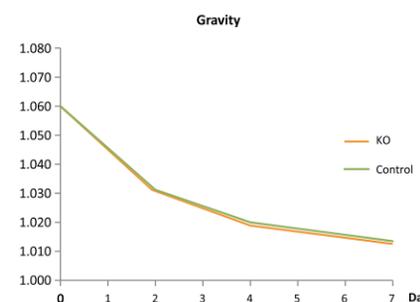
# KO

NEW  
PRODUCT



KO is a classic top fermenting yeast for Kölsch and Altbier beer styles, with a light floral and fruity note and mildly ester, giving beer its typical, slightly fruity traditional German ale aroma profile. The diacetyl of beer is low with subtle flavor of pear, citrus and apple. KO expresses hop flavor with a medium alcohol tolerance and high biotransformation. Beer in colder temperature will be more neutral in character, while warmer temperature will have a more fruit-forward profile.

### FERMENTATION PROFILE



### MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces cerevisiae</i>
Dry weight	> 94%
Viable yeast	> 8.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

### STORAGE

Store in low temperature (≤ 10°C) and dry place, with the shelf life of 24 months.

### USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.

### BREWING PROPERTIES

**Temperature range**  
12–25°C (54–77°F)

**Apparent attenuation**  
75–82%

**Alcohol tolerance**  
10–11%ABV

**POF phenotype**  
Negative

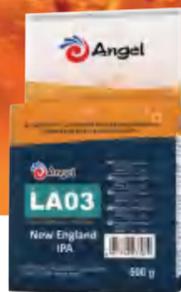
**Diastaticus**  
Negative

**Flocculation**  
Medium to high

**Fermentation rate**  
High

# LA03 New England IPA

**NEW PRODUCT**



LA03, originating from a Boddington brewery, is a popular choice for IPAs, especially for NEIPAs with fruity esters and balanced aroma with tropical fruit-forward hops. It is a low attenuation yeast that make the final beer with higher residual sugar to soften and smooth the mouthfeel. This yeast has a wonderful fermentation profile with a fruity, and light and soft palate. It is suit for making juicy or hazy IPAs, gets well with late and dry hop addition for tropical fruity flavor.

## BREWING PROPERTIES

**Temperature range**  
18–25°C (64–77°F)

**Apparent attenuation**  
71–75%

**Alcohol tolerance**  
11%ABV

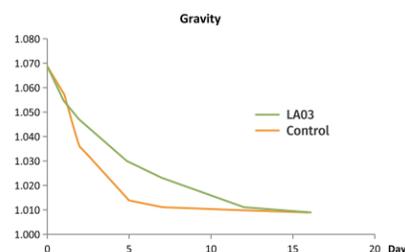
**POF phenotype**  
Negative

**Diastaticus**  
Negative

**Flocculation**  
Medium to high

**Fermentation rate**  
Moderate and quick start to fermentation

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces cerevisiae</i>
Dry weight	> 94%
Viable yeast	> 4.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

## USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.

*The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.*

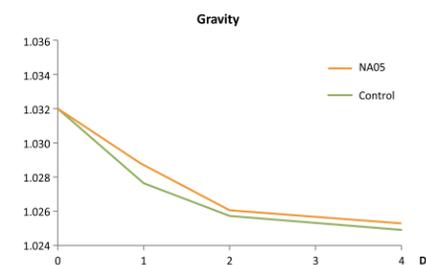
# Low and Non Alcohol Beer Yeast

**NEW PRODUCT**



NA05 is Non-*Saccharomyces* yeast that is selected for the production of low- and non-alcoholic beers. This yeast is a maltose and maltotriose negative strain and will assimilate glucose, fructose and sucrose, which allows beer with low alcohol with a subtle refreshing fruity aroma profile and sweet finish. Low attenuation of 13–17% making it ideal for styles like IPA or Pale Ale with less than 0.5% ABV.

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

Species	<i>Torulopsis delbrueckii</i>
Dry weight	> 94%
Viable yeast	> 4.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

*The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.*

## BREWING PROPERTIES

**Temperature range**  
18–28°C (64–82°F)

**Apparent attenuation**  
13–17%

**POF phenotype**  
Negative

**Diastaticus**  
Negative

**Flocculation**  
Medium

# VOS Kveik Ale Yeast

**NEW PRODUCT**



VOS is one of the most prominent and popular strains of Kveik which comes from Voss region in Norway with a wide fermentation temperature range. The fermentation can complete around 2–3 days at high temperature (30–35°C) with a clean finish and crisp flavor rather than weeks, which saves time and money. VOS shows a medium-high attenuation and a good alcohol tolerance (up to 14% ABV). The aroma profile of beer fermented by VOS is relatively clean with orange and citrus flavor. VOS is recommended for brewing West Coast IPA, American pale ales, Blonde ales and Barleywine.

## BREWING PROPERTIES

**Temperature range**  
20–35°C (68–95°F)

**Apparent attenuation**  
75–82%

**Alcohol tolerance**  
14%ABV

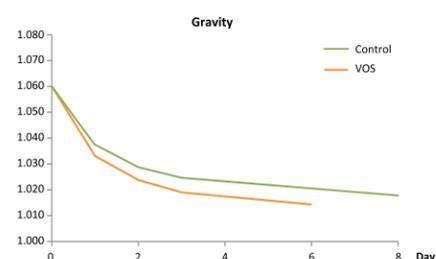
**POF phenotype**  
Negative

**Diastaticus**  
Negative

**Flocculation**  
Medium to high

**Fermentation rate**  
High

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces cerevisiae</i>
Dry weight	> 94%
Viable yeast	> 8.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature (≤ 10°C) and dry place, with the shelf life of 24 months.

## USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Direct Pitching:** Sprinkle the yeast directly onto the surface of the 25°C wort in the fermenter, ensuring that the yeast is evenly distributed across the entire surface of the wort to prevent clumping.

**Rehydration:** Sprinkle the yeast into 25–30°C (77–86°F) sterile water or sterile wort with added hops, which is 10 times the weight of the yeast. Leave at 25–30°C for 15–30 minutes, then gently stir and pitch the resultant cream into the fermentation vessel. The rehydration process must not exceed 30 minutes. The temperature difference between the wort to be inoculated and the rehydrated yeast must not exceed 10°C.

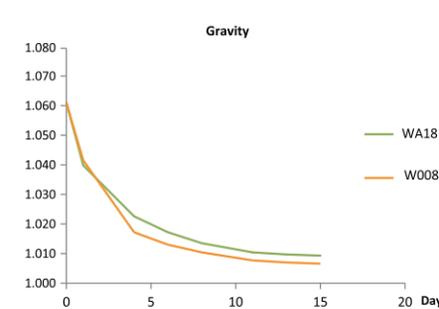
*The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.*

# Wheat Ale Yeast W008



W008 is a typical yeast used for brewing wheat beer characterized with fruity and phenol flavor notes. It has high attenuation and produces a balance of fruity esters and typical clove phenols of wheat beers. It exhibits low flocculation, slow sedimentation and the final beer finishes dry with a smooth mouthfeel.

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

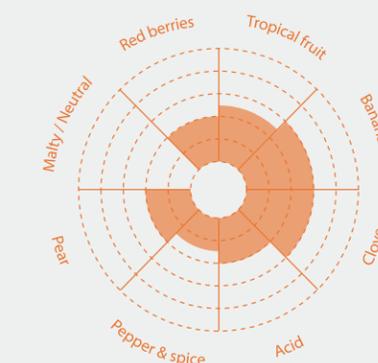
Species	<i>Saccharomyces cerevisiae</i> var. <i>diastaticus</i>
Dry weight	> 94%
Viable yeast	> 8.0*10 <sup>9</sup> cfu/g
Wild yeast	< 1.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>3</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature (≤ 10°C) and dry place, with the shelf life of 24 months.

*The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.*



## BREWING PROPERTIES

**Temperature range**  
18–24°C (64–75°F)

**Apparent attenuation**  
73–85%

**Alcohol tolerance**  
10%ABV

**POF Phenotype**  
Positive

**Diastaticus**  
Positive

**Flocculation**  
Low

**Fermentation rate**  
Moderate and quick start to fermentation

**Sedimentation**  
Slow



# BrewNutri-AZ Brewing Nutrient



# Brewing Nutrient BrewNutri-Z

**NEW  
PRODUCT**

## PRODUCT SPECIFICATIONS

### Appearance

tan color with yeast-like aroma

### Humidity

≤ 6.0%w/w

### Total nitrogen (on dry)

≥ 10.0%w/w

### Amino nitrogen (on dry)

≥ 4.5%w/w

### Zinc

1800–3500mg/kg

## MICROBIAL ANALYSIS

### Total bacteria count

10,000CFU/g

### Yeast and mold

< 100CFU/g

### Moulds

< 1000CFU/g

### E.coli

Negative

### Salmonella

Negative

## DOSAGE

15–30g/hl depending on wort composition

BrewNutri-AZ is a yeast autolysate with high nitrogen, amino acids, minerals and vitamins for yeast growth and health. As a complete and well-balanced nutrient, BrewNutri-AZ can be used in the stressed conditions, such as nutrient deficiency, high gravity to reduce off-flavors, improve yeast re-pitch ability and ensure beer fermentation with high quality. BrewNutri-AZ provides organic nitrogen, free amino acids and peptides as an effective supplementation of yeast and make fermentation more consistent and stable.

## USAGE

Dissolve in sterilized water. Add the solution to kettle 10-15 minutes prior to end of boil or to the wort in fermentation vessel directly.

Store in cool and dry environment.

Shelf life at the recommended storage temperature is 3 years.

## Quick Search Table of Angel brewing nutrients

	BrewNutri-Z	BrewNutri-AZ
<b>Description</b>	Inactive yeast with high zinc	Yeast autolysates with high nitrogen, amino nitrogen, and zinc
<b>Applications</b>	Improve beer fermentation For yeast re-pitching Avoid fermentation problems	For low nutrient wort or high gravity sugar Stuck fermentation or high stress conditions Yeast propagation
<b>Amino nitrogen</b>	Around 0.5%w/w	≥ 4.5%w/w
<b>Zinc</b>	5.50–6.50%w/w	1800–3500mg/kg

BrewNutri-Z is a complex nutrient with high zinc used to increase the health of yeast, improve yeast fermentation and re-pitching performance. Zinc is the important cofactor for protein synthesis and enzymatic reactions during yeast growth and alcohol fermentation and improves the uptake of maltose and maltotriose. The deficiency of zinc can cause fermentation and flocculation problems.

BrewNutri-Z is designed for using at the kettle or fermentation in all types of beer, especially high gravity wort, or in re-pitching yeast fermentation. The benefit of BrewNutri-Z is micronutrients (such as zinc, growth factor), which are absorbed by beer yeast during brewing. Adding BrewNutri-Z can improve fermentation profile, reduce fermentation time, enhance yeast viability and vitality, influence the production of higher alcohols and their corresponding esters.

In high-gravity, or serial repitching fermentations, BrewNutri-Z is necessary to help yeast get through the stressful environments. BrewNutri-Z is added either into the boil kettle or the wort in the fermentation vessel directly.

## USAGE

Dissolve in sterilized water. Add the solution to kettle 10-15 minutes prior to end of boil or to the wort in fermentation vessel directly.

Store in cool and dry environment.

Shelf life at the recommended storage temperature is 3 years.

## PRODUCT SPECIFICATIONS

### Appearance

tan color with yeast-like aroma

### Dry weight

> 93.0%w/w

### Zinc

5.50–6.50%w/w

## MICROBIAL ANALYSIS

### Total bacteria count

10,000CFU/g

### Yeast and mold

< 100CFU/g

### E.coli

Negative

### Salmonella

Negative

## DOSAGE

0.5–1g/hl depending on wort composition



# Product Index

## AW19

APPLICATION	PRINCIPAL USE	TEMPERATURE RANGE	ATTENUATION	ALCOHOL TOLERANCE
Whisky	Malt/Grain	25~35°C	> 100%	15%ABV
OSMO-TOLERANCE		HIGH GRAVITY SUITABILITY	PITCHING RATE	
High		High	50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity	

## AM-1

APPLICATION	PRINCIPAL USE	TEMPERATURE RANGE	ATTENUATION	ALCOHOL TOLERANCE
Whisky	Malt	25~32°C	> 98%	15%ABV
OSMO-TOLERANCE		HIGH GRAVITY SUITABILITY	PITCHING RATE	
Good		Good	80 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity	

## AM-MAX

APPLICATION	PRINCIPAL USE	TEMPERATURE RANGE	ATTENUATION	ALCOHOL TOLERANCE
Whisky	Malt	22~35°C	> 100%	15%ABV
OSMO-TOLERANCE		HIGH GRAVITY SUITABILITY	PITCHING RATE	
High		High	80 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity	

## AG-2

APPLICATION	PRINCIPAL USE	TEMPERATURE RANGE	ATTENUATION	ALCOHOL TOLERANCE
Whisky	Grain	25~35°C	> 95%	18%ABV
OSMO-TOLERANCE		HIGH GRAVITY SUITABILITY	PITCHING RATE	
High		High	50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity	

## W201

APPLICATION	PRINCIPAL USE	TEMPERATURE RANGE	ATTENUATION	ALCOHOL TOLERANCE
Whisky	Grain	25~38°C	> 98%	16%ABV
OSMO-TOLERANCE		HIGH GRAVITY SUITABILITY	PITCHING RATE	
Good		High	50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity	



Whisky  
Yeast



### BREWING PROPERTIES

#### Temperature range

25–35°C

#### Apparent attenuation

> 100%

#### Alcohol tolerance

15%ABV

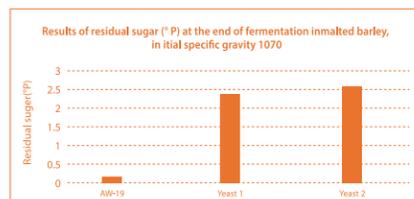
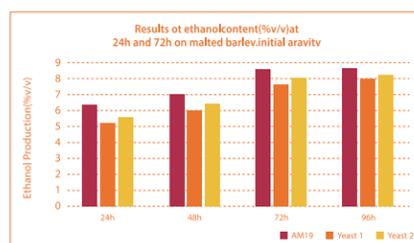
#### High gravity suitability

High

#### Fermentation performance

High

### FERMENTATION PROFILE



### MICROBIOLOGICAL ANALYSIS

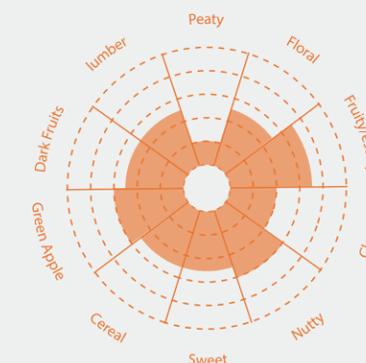
Species	<i>Saccharomyces pastorianus</i>
Dry weight	> 94%
Viable yeast	> 20.0*10 <sup>9</sup> cfu/g
Wild yeast	< 3.0*10 <sup>3</sup> cfu/g
Total bacteria	< 1.0*10 <sup>3</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>4</sup> cfu/g

Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.

### STORAGE

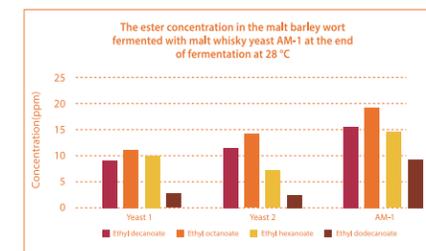
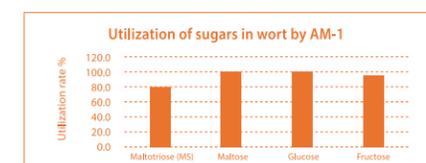
Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.



AM-1 is a special yeast for Scotch style whisky, featuring fast fermentation, strong maltotriose assimilation, high wort utilization, soft taste and good vinous aroma, especially for single malt whisky making.

### FERMENTATION PROFILE



### MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces pastorianus</i>
Dry weight	> 94%
Viable yeast:	> 20.0*10 <sup>9</sup> cfu/g
Wild yeast	< 3.0*10 <sup>3</sup> cfu/g
Total bacteria	< 1.0*10 <sup>4</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>4</sup> cfu/g

Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.

### STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

The information is true and accurate to the best of our knowledge. However, the data sheet is not to be considered as a guarantee, expressed or implied, or as a condition of sale of this product.

### BREWING PROPERTIES

#### Temperature range

25–32°C

#### Apparent attenuation

> 98%

#### Alcohol tolerance

15%ABV

#### High gravity suitability

Medium

#### Fermentation performance

High

# AM-MAX Single Malt Whisky Yeast

# Grain Whisky Yeast

# AG-2



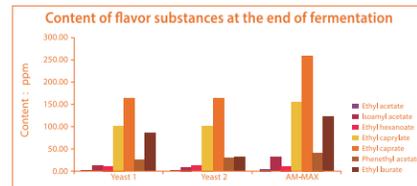
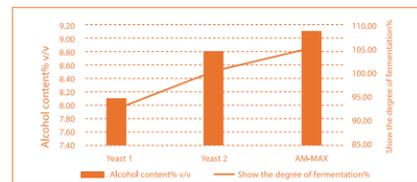
This yeast has a fast onset of fermentation, strong fermentation performance and the ability to produce complex ester aromas, giving the whisky a multilayered floral and fruity character that is perfectly suited to the fermentation of a single malt whisky. NEW MAKE displays an elegant and rich flavour profile, with a particularly prominent fruity aroma.

This yeast has a wide range of fermentation temperatures (22-32°C), high sugar tolerance and ethanol tolerance, and is able to cope effectively with high sugar substrates, maintaining the stability of fermentation performance and good fermentation efficiency even at high ethanol concentrations.

## BREWING PROPERTIES

- Temperature range**  
22–35°C
- Apparent attenuation**  
> 100%
- Alcohol tolerance**  
15%ABV
- High gravity suitability**  
High
- Fermentation performance**  
High

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

<b>Species</b>	<i>Saccharomyces cerevisiae</i>
<b>Dry weight</b>	> 94%
<b>Viable yeas</b>	> 20.0*10 <sup>9</sup> cfu/g
<b>Wild yeast</b>	< 3.0*10 <sup>3</sup> cfu/g
<b>Total bacteria</b>	< 3.0*10 <sup>4</sup> cfu/g
<b>Lactic acid bacteria</b>	< 1.0*10 <sup>4</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature (≤10°C) and dry place, with the shelf life of 24 months.

## USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

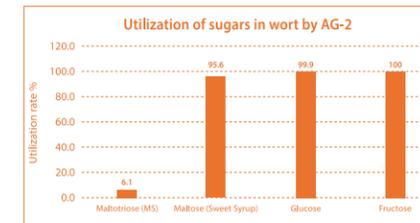
**Rehydration:** Rehydrate the yeast in 10 times its weight of water at 36–38°C (97°F–100°F) for 20 minutes. Stir the mixture and then inoculate into the fermentor.

If there is a temperature difference of more than 8°C between the substrate to be inoculated and the rehydration solution, add some substrate into the rehydration solution to reduce this temperature difference.

Once the sealed-vacuum bag is open or broken, use the yeast promptly.

AG-2 delay period is short and fast yeast, strong fermentation ability, clean wine body, balanced taste, suitable for the brewing of wheat, corn and other grain whisky. It has high glucose and ethanol tolerance, and the glycosyl enzymes preparation can improve the utilization rate of maltotriose (MS), monosaccharide with three carbon atoms and dextrin.

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

<b>Species</b>	<i>Saccharomyces cerevisiae</i>
<b>Dry weight</b>	> 94%
<b>Viable yeas</b>	> 20.0*10 <sup>9</sup> cfu/g
<b>Wild yeast</b>	< 3.0*10 <sup>3</sup> cfu/g
<b>Total bacteria</b>	< 1.0*10 <sup>4</sup> cfu/g
<b>Lactic acid bacteria</b>	< 1.0*10 <sup>4</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature (≤ 10°C) and dry place, with the shelf life of 24 months.



## BREWING PROPERTIES

- Temperature range**  
22–35°C
- Apparent attenuation**  
> 95%
- Alcohol tolerance**  
18%ABV
- High gravity suitability**  
High
- Fermentation performance**  
High

## USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Rehydration:** Rehydrate the yeast in 10 times its weight of water at 36–38°C (97°F–100°F) for 20 minutes. Stir the mixture and then inoculate into the fermentor.

If there is a temperature difference of more than 8°C between the substrate to be inoculated and the rehydration solution, add some substrate into the rehydration solution to reduce this temperature difference.

Once the sealed-vacuum bag is open or broken, use the yeast promptly.



## BREWING PROPERTIES

### Temperature range

22–35°C

### Apparent attenuation

> 100%

### Alcohol tolerance

15%ABV

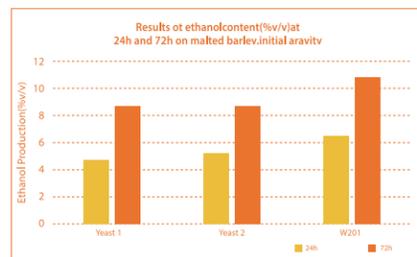
### High gravity suitability

High

### Fermentation performance

High

## FERMENTATION PROFILE



## MICROBIOLOGICAL ANALYSIS

Species	<i>Saccharomyces cerevisiae</i>
Dry weight	> 94%
Viable yeas	> 20.0*10 <sup>9</sup> cfu/g
Wild yeast	< 3.0*10 <sup>3</sup> cfu/g
Total bacteria	< 3.0*10 <sup>4</sup> cfu/g
Lactic acid bacteria	< 1.0*10 <sup>4</sup> cfu/g

*Pathogenic micro-organisms: in accordance with regulation; before releasing to markets, all products must pass a series of detection in our factory.*

## STORAGE

Store in low temperature ( $\leq 10^{\circ}\text{C}$ ) and dry place, with the shelf life of 24 months.

This is a complex yeast for the fermentation of starchy alcohols such as whisky or vodka, where all or part of the grain material is used as the fermentation substrate, and it has a combination of high fermentation degree, high tolerance, and high fermentation speed, which makes it economically advantageous, especially in fermentation environments with high osmotic pressure.

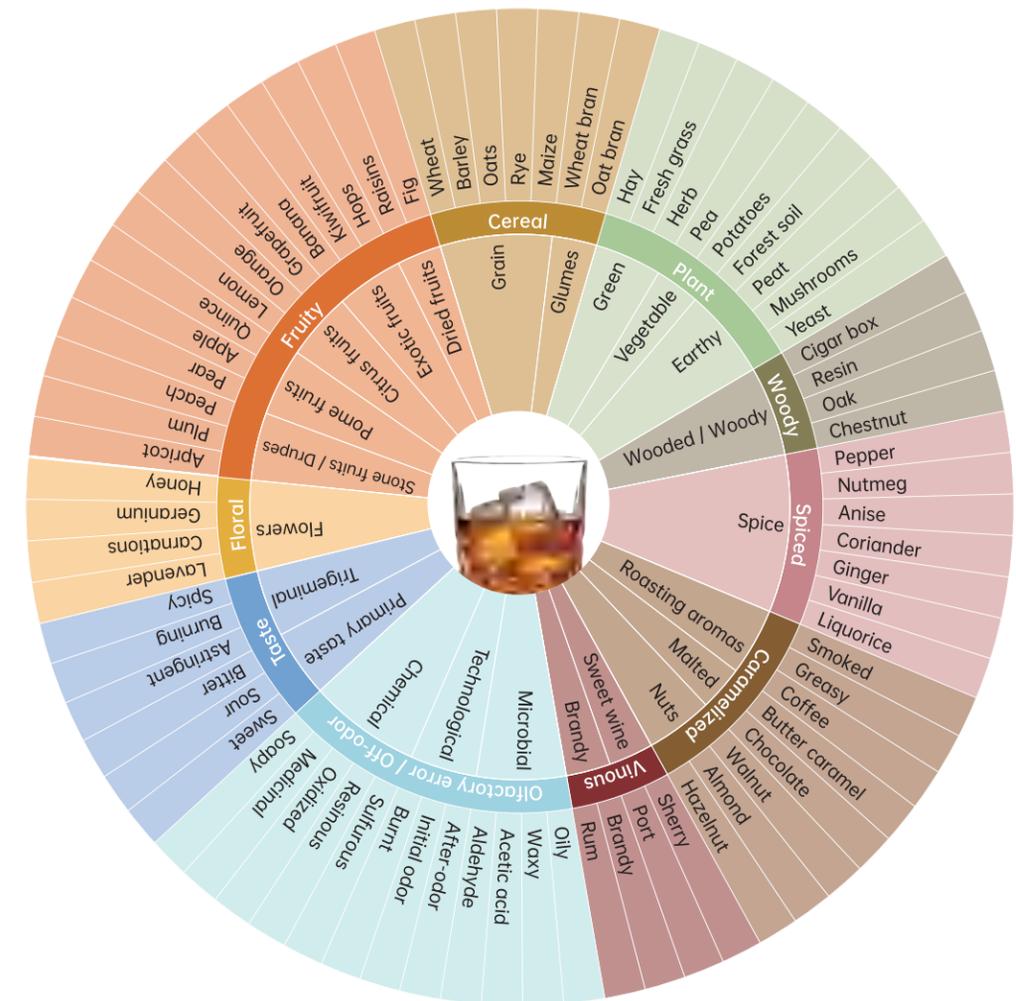
## USAGE

**Dosage:** 50 to 100 g/hl, increasing yeast dosage under difficult fermentation conditions and high gravity.

**Rehydration:** Rehydrate the yeast in 10 times its weight of water at 36–38°C (97°F–100°F) for 20 minutes. Stir the mixture and then inoculate into the fermentor.

If there is a temperature difference of more than 8°C between the substrate to be inoculated and the rehydration solution, add some substrate into the rehydration solution to reduce this temperature difference.

Once the sealed-vacuum bag is open or broken, use the yeast promptly.



The flavor wheel developed by the Scotch Whisky Research Institute (SWRI) serves as a pivotal tool in the realm of whisky sensory evaluation. In 1978, scientists affiliated with the institute's precursor, the Pentlands Scotch Whisky Research based in Edinburgh, introduced the inaugural Pentlands flavor wheel, which established a systematic methodology for whisky tasting. Initially conceptualized for industrial applications, it employed rather academic nomenclature. In 1992, Charles MacLean, a distinguished whisky writer, streamlined and enhanced it, thereby increasing its accessibility to the general consumer base and transforming it into a widely utilized instrument. Typically structured into three tiers and eight segments, this flavor wheel encompasses aroma profiles from the fermentation and distillation phases as well as the maturation phase, including notes of grains, fruits, and the like. It enables individuals to accurately characterize and discriminate among flavors, thereby augmenting sensory appraisal capabilities. The evolution of this tool mirrors the advancement and popularization of research into whisky flavor chemistry.



# Hard Seltzer Solution

## Best practices and strategies for hard seltzer fermentation

Application fields: Hard seltzer, flavored malt beverages (FMB) or RTD drinks. Hard seltzer and other RTD drinks are commonly carbonated alcohol drinks with different flavors. The alcohol base is made from sucrose, dextrose, maltose, syrup or malted barley. There are several challenges to produce complete fermented bases from sugar wort or substrate, including yeast selection, nutrient supplement, temperature control, oxygen supplement and pH range management. The impressive hard seltzer fermentations need yeast and nutrients, because there are no nutrients in the sugar wort.

### HG20

The yeast HG 20 is a neutral flavor yeast with high tolerance to stressful conditions and robust fermentation kinetics. Using HG 20, brewers can easily get a neutral alcohol base which can be flavored.

#### Characteristics of hard seltzer yeast HG 20

- Yeast species: *Saccharomyces cerevisiae*
- High-quality viability and vitality
- Alcohol yield: 21%v/v
- Fermentation speed: Fast
- Temperature tolerance: 10–32°C
- Tolerance to stressful conditions: High
- Fermentation flavor: Neutral and clean

### SuperNutri 26

SuperNutri 26 is formulated well-balanced nutrients with nitrogen, vitamins, minerals, survival factors of yeast and pH buffer capacity to maintain protein synthesis of yeast and yeast health and achieve optimal fermentation performance, which is especially important for super high gravity fermentations to ferment up to 21% v/v alcohol in 5–7 days. Survival factors in SuperNutri 26 can maintain the structural integrity of yeast membranes and ensure a healthy and vigorous fermentation. HG 20 and SuperNutri 26 are a premium combination for hard seltzer and FMB drinks.

#### Characteristics of yeast nutrient SuperNutri 26

- Advanced and complete nutrient formula
- Balanced combination for necessary nutrients
- Provides essential minerals and vitamins for yeast metabolism
- Provides survival factors for yeast reproduction
- Has pH buffer capacity

#### Controlling pH in fermentation

pH monitoring is crucial in sugar fermentations. Sugar metabolism can lead to an acidic environment, which inhibit yeast growth and negatively affects fermentation progress and performance. SuperNutri 26 can maintain the fermentation in a suitable pH range for yeast activity.

#### Temperature control and management

Fermenting at high temperatures can produce off-flavors, and at lower temperatures can lead to sluggish or stuck fermentations. The ideal range of temperature can reach desired flavors and avoiding fermentation problems. Off-flavors will be detected at high temperatures, above 30°C.

## Guides of hard seltzer fermentations with SuperNutri 26 and HG 20

### Application 1#

SuperNutri 26: 0.8–0.9g/L

HG 20: 0.2g/L

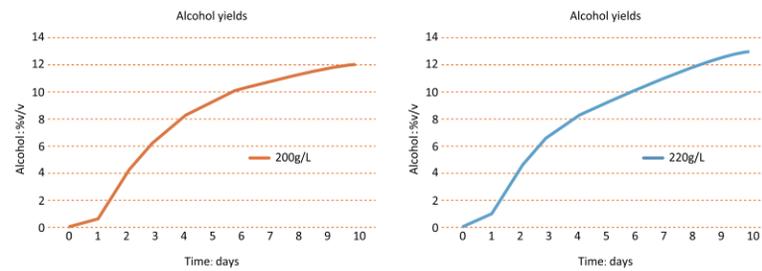
Sugar concentration: 200–220g/L

Temperature: 25°C

Alcohol yields: 12–13%v/v

Fermentation time: 10 days

Using 1.8g/L SuperNutri 26, alcohol yield can get to 12.3-13.5% in 5 days



### Application 2#

SuperNutri 26: 1.3–1.4g/L

HG 20: 0.2–0.3g/L

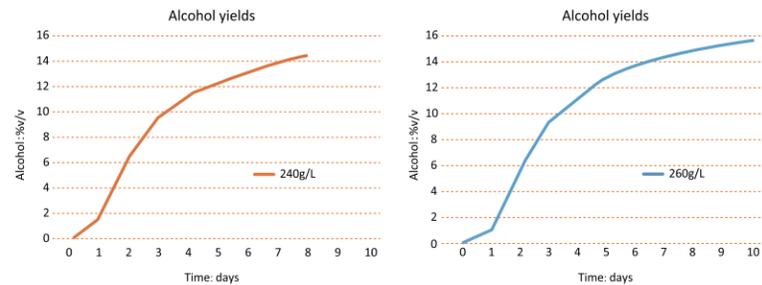
Sugar concentration: 240–260g/L

Temperature: 25°C

Alcohol yields: 14.5–15.5%v/v

Fermentation time: 8–10 days

Using 2.25g/L SuperNutri 26, alcohol yield can get to 14.8-16.1% in 5–6 days



### Application 3#

SuperNutri 26: 2.7–2.8g/L

HG 20: 0.3–0.4g/L

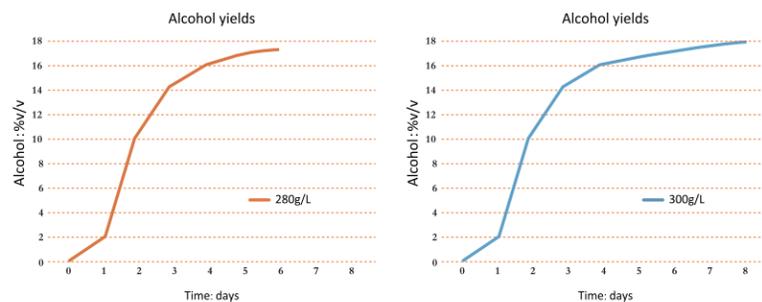
Sugar concentration: 280–300g/L

Temperature: 25°C

Alcohol yields: 17.2–17.85%v/v

Fermentation time: 6–8 days

Using 3.6g/L SuperNutri 26, alcohol yield can get to 17.4–18.3% in 5 days



## Techniques for successful super high gravity fermentation

High gravity fermentation is a challenge and requires more techniques to overcome. HG 20 is a high alcohol tolerance and robust yeast with effective fermentation capability to absorb sugar. SuperNutri 26 provides proper and necessary nutrients for yeast growth and fermentation.

SuperNutri 26: 6.4g/L

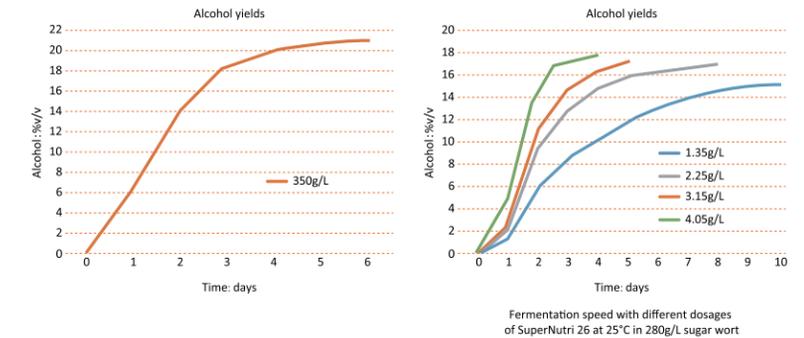
HG 20: 1.6g/L

Sugar concentration: 350g/L

Temperature: 25°C

Alcohol yields: 21%v/v

Fermentation time: 6 days



Quality is our top priority. Angel's products are here to support you, whether you are a home brewer or factory.

With our products, you'll find you are the master of hard seltzer and FMB fermentations.

Our commitment to quality and innovation can help you create truly impressive alcohol beverages.

Our technical team would be happy to support you with optimization fermentation, contact us at

niangzao@angelyeast.com.

