LEVULINE®

SYMBIOSE

***Torulaspora delbrueckii* yeast, for sequential inoculation with a suitable strain of *Saccharomyces cerevisiae* yeast to make top-of-the-range aromatic white wines with rich complexity.**

LEVEL 2 SOLUTIONS

The wide variety of natural yeasts selected reflects the biodiversity of microflora present during alcoholic fermentation of wines. Nevertheless, considering the large number of species and sub-species (other than *Saccharomyces*) present in most grape musts, this world is still underexploited. During spontaneous fermentation, microbial activity generates a succession of enzyme actions that make either a positive or negative contribution to the aromatic complexity and diversity of wines. With Level² Solutions, Lallemand is innovating by introducing new species and new controlled, safe methods for managing alcoholic fermentation (sequential inoculation), which are opening up new horizons for winemakers.

APPLICATIONS

LEVULINE® SYMBIOSE yeast has been specially developed for making top-of-the-range white wines with rich complexity. It contains *Torulaspora delbrueckii* yeast, for sequential inoculation with a suitable strain of *Saccharomyces cerevisiae* yeast. LEVULINE® SYMBIOSE has been selected for its contribution to the aromatic complexity and fullness in the mouth of white wine from vine varieties such as Chardonnay, Chenin Blanc, Semillon, Ugni Blanc, Melon de Bourgogne and Maccabeu.

MICROBIOLOGICAL AND ENOLOGICAL PROPERTIES

- Species: *Torulaspora delbrueckii*
- Lag phase: moderate
- SO_2 sensitivity: considerable
- Volatile acidity production: nil
- Optimum fermentation temperature: 16-20°C (much slower metabolism at temperatures < 16°C)
- Tolerance to high osmotic pressures: high
- Nitrogen requirement: for musts with assimilable nitrogen deficiency (< 80 mg/L), the addition of a complex nutrient is recommended (20 g/hL) at the start of alcoholic fermentation
- Alcohol tolerance: average, hence the importance of sequential inoculation after a 10-15 point drop in density

ORGANOLEPTIC IMPACT

Tasting notes, in comparison with the reference yeast (*Saccharomyces cerevisiae*)

	LEVULINE® SYMBIOSE	Reference Yeast
Chardonnay, 2011 harvest	Round, smooth, complex, rich. Hints of white-fleshed fruits, pears in syrup, brioche, peach turnover. Long aromatic persistence.	Livelier, fresher, more pronounced acid sensation. Fresh fruits, exotic fruits (litchis). Slightly shorter on the palate.
Melon de Bourgogne, 2011 harvest	Floral, elegant nose. Slightly spicy, iodine flavor. Hints of citrus fruits. More mature. Long and well-balanced in the mouth.	More acidic sensation. Lively attack. Several hints of green apples and lime. Slightly thin. Overall, very fresh and intense.

INSTRUCTIONS FOR USE

LEVULINE® SYMBIOSE is intended for sequential inoculation with a compatible strain of *Saccharomyces cerevisiae* yeast. Seek advice to choose a suitable strain of *Saccharomyces cerevisiae.*

1°) Preparation of LEVULINE® SYMBOSE yeasts

Rehydrate the yeasts in 10 times their weight in water. The rehydration temperature for LEVULINE® SYMBIOSE is not the same as for *Saccharomyces* yeasts: the optimum temperature is 20-30°C.

Leave to settle for 15 minutes before mixing gently. Then acclimatize the yeast to the temperature by gradually adding an equivalent volume of must. The difference in temperature between the rehydration solution and the must should not be more than 10°C. Rehydration should not last longer than 45 minutes.

2°) Inoculation Process

When inoculating with LEVULINE® SYMBIOSE, ensure that the free SO_2 content in the must is no higher than 15 mg/L.

Avoid using SO_2 as much as possible, replacing it with an inert gas or dry ice.

1. **Inoculate the must with LEVULINE® SYMBIOSE at a rate of 25 g/hL, before alcoholic fermentation.**
2. **24 hours after the inoculation of LEVULINE® SYMBIOSE, inoculate with the recommended *Saccharomyces cerevisiae* yeast at a rate of 25 g/hL.**

Use good fermentation practices, such as providing nutrition and protection.

3°) Important Considerations for Must

A - Temperature:

- **The optimum fermentation temperature for LEVULINE® SYMBIOSE is > 16 °C.**
- **At temperatures < 16 °C, there may be slow growth and a long lag phase.**

B – Turbidity:

- **LEVULINE® SYMBIOSE is sensitive to low turbidity (< 80 NTU).**

C – Nutrition:

If assimilable nitrogen in the must is > 80 mg/L, LEVULINE® SYMBIOSE will use up all the nitrogen in the environment, making the final stages of fermentation difficult for *Saccharomyces cerevisiae*. The addition of a complex nutrient is therefore recommended:

- **After inoculation with *Saccharomyces cerevisiae***
- **After a 45-point drop in must density compared to its starting density.**

Like all yeasts, LEVULINE® SYMBIOSE requires assimilable nitrogen in order to grow. If there is a high assimilable nitrogen deficiency (< 80 mg/L), both yeasts will require special nutrition:

- **Addition of a complex nutrient immediately after inoculation with LEVULINE® SYMBIOSE: 20 g/hL.**
- **Addition of a complex nutrient immediately after inoculation with Saccharomyces cerevisiae yeast: 20 g/hL.**

PACKAGING

One 500 g pack (to inoculate 25 hL).

STORAGE

Store for 24 months at 4°C, in the original packaging.
Use vacuum-sealed sachets only. Once opened, use quickly.

A Danstar product, distributed by: