

RESTARTING STUCK MALOLACTIC FERMENTATIONS

RECOMMENDATIONS FROM LALLEMAND NORTH AMERICA

Winemakers are aware that *Oenococcus oeni* bacteria, responsible for malolactic fermentation (MLF), are successful only if they can adapt to the harsh environment of a fermenting must or finished wine. The usual factors influencing the success of MLF include pH, temperature, alcohol and SO₂ (both free and total). Problems can arise when pHs are low (under 3.4), alcohols are high (greater than 14.5%), the temperature of the wine is low (less than 18°C/65°F) or higher than 24°C (75°F) (especially in combination with higher alcohols) or the total SO₂ is high (greater than 30ppm). In addition, these four conditions have a combined cumulative effect, making life truly difficult for the malolactic bacteria (MLB) if several stressful conditions coincide sometimes resulting in a stuck MLF.

To restart and complete a stuck MLF, sometimes it is simply enough to add and gently mix in a nutrient such as **Opti'Malo Plus, Opti'Malo Blanc** or **ML Red Boost**. If that fails to restart the MLF, a more extensive protocol using a 1-Step starter kit is necessary to complete the MLF. Lallemand's R&D team, headed by Dr. Sibylle Krieger-Weber, has developed an MLB acclimatization strategy for using the 1-Step starter kit to finish wines with stuck malolactic fermentations. The 1-Step starter kits each contain a sachet of malolactic bacteria and a second sachet containing an activator. This bacteria activation and adaptation can be critical in reducing the effect of an unfavorable wine matrix on the bacteria, favoring successful completion of the MLF.

Adaptation Protocol for Handling Stuck Malolactic Fermentations

Stage 1

Pre-treat the wine and adjust the temperature

Prepare the stuck MLF wine by removing any lees, potential inhibitory toxins and inhibitory organisms. In a wine with a stuck MLF suspected of containing substances toxic to malolactic bacteria, Lallemand recommends a pre-treatment with **Nutrient Vit End** or **Reskue** at 30 g/hL (2.5 lb/1,000 gallons). Prepare the Nutrient Vit End or Reskue suspension in water (Reskue should be prepared in hot water at 100°F/38°C) or wine then add it to the stuck wine while mixing. Rack off after 48 hours. Finally adjust the temperature of the stuck MLF wine to 18-22°C (65-72°F).

Stage 2

Prepare the 1-Step VP41 or 1-Step Alpha starter kit

Please refer to the table on the next page for liquid volumes according to the size of the kit used. **Note:** The use of the 1-Step starter kit for restarting a stuck MLF requires twice the normal dosage to compensate for the more difficult MLF environment of a stuck MLF.*



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1. Rehydration Phase

- Mix and dissolve contents of the activator sachet in drinking water (temperature between 18-25°C (65-77°F)).
- Add contents of the bacteria sachet and dissolve carefully by gentle stirring.
- Wait 20 minutes.

2. Acclimatization Phase

- Mix the 1-Step preparation (activator and bacteria dissolved in drinking water) with wine, pH > 3.5. The water temperature should be between 18-25°C (65-77°F). Important: if the stuck wine has <1.0 g/L malic acid, then wait only 6-8 hours before inoculation. If the stuck-MLF wine has >1.0 g/L malic acid, then wait 12-18 hours before inoculation.

3. Inoculation

- Inoculate the wine with the acclimated culture.
- Maintain temperature between 18-22°C (65-72°F).
- Check MLF activity (malic acid degradation) every 2 to 4 days.

Liquid Volume Table

Liquid Volume Table 1-Step Kit	Volume of Water (Step 1)	Volume of Wine (Step 3)	*Inoculation
For 25hL (660 gal) size kit	2.5L (0.65 gal)	2.5L (0.65 gal)	Add to 12.5hL (330 gal) of stuck wine
For 100hL (2,600 gal) size kit	10L (2.6 gal)	10L (2.6 gal)	Add to 50hL (1,300 gal) of stuck wine
For 500hL (13,000 gal) size kit	50L (13 gal)	50L (13 gal)	Add to 250hL (6,500 gal) of stuck wine
For 1000hL (26,000 gal) size kit	100L (26 gal)	100L (26 gal)	Add to 500hL (13,000 gal) of stuck wine