

ACTIFERM P1-P2

Complete fermentation activator - Dual action

ACTIFERM P1 FAVOURS THE MULTIPLICATION OF YEASTS AND A RAPID ONSET OF FERMENTATION.

ACTIFERM P2 INCREASES RESISTANCE OF YEASTS TO ETHANOL AND ACCELERATES THE END OF FERMENTATION.

ACTIFERM P1 - CHARACTERISTICS

◆ **ACTIFERM P1** contains :

- **THIAMIN (vitamin B1)**

Studies carried out at the INRA Montpellier (IPV) have shown that at the moment of inoculation yeasting musts are often depleted of thiamin, because of consumption by indigenous yeasts that develop during prefermentation treatments.

In order to ensure correct yeast growth, the need of thiamine is about 0.2 to 0.3 mg/L in practice (SABLAYROLLES, (1)).

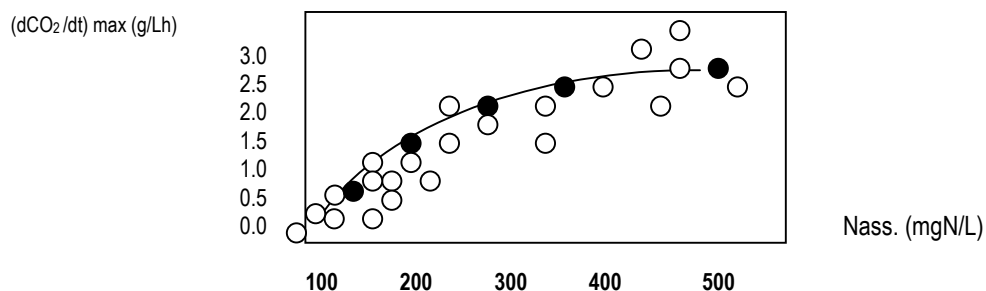
- **Assimilable nitrogen (diammonium phosphate and amino acids)**

The assimilation of nitrogen, at the onset of fermentation, activates protein synthesis and leads to a higher yeast viability.

The maximal rate of fermentation is directly related to the content of assimilable nitrogen in the musts (Figure 1).

➤ A high rate of assimilable nitrogen induces a rapid onset of fermentation.

Figure 1 : Influence of level of assimilable nitrogen in musts on the maximal rate of fermentation.



➤ The nitrogen content of musts is highly variable and often deficient :
Thus, the addition of nitrogen often leads to a more rapid onset of fermentation (2).

- **Cellulose and autolysed yeasts**

They increase the turbidity of musts, playing the support role for yeasts and favouring gas release. Recent studies have shown the effect of the level of turbidity on the fermentability of musts (3). This effect is due to the lipid fraction of sediments that limit the production of inhibitory fatty acids.

Over clarification of juices is never recommended in order to avoid problems of stuck and sluggish fermentations.

- Inactivated yeasts

These inactive yeasts (by heat, then dried by atomizing) contain vitamins, trace elements, amino acids, proteins and sterols. They favour the multiplication of yeasts and the supply of sterol completes the supply of oxygen, that is necessary for enabling the yeasts to resist ethanol. Measurements of oxygen in musts at the moment of inoculation have shown variable and often limiting levels (1).

Table 1 shows the effectiveness of the combined addition of nitrogen and oxygen on the duration of fermentation and exhaustion of sugars.

ACTIFERM P1-P2 use is optimum in combination with **OXYFERM** or **OXYFRITTÉ** (to realize controlled supply of oxygen 5 to 10 mg/L) (4).

Oxygen (mg/L)	0	0	0.9	1.8	4.5	9	4.5
Nitrogen (mg/L)	0	60	0	0	0	0	60
Residual sugars (g/L)	50	22.7	19.2	15.6	11.9	7.8	3.5

Table 1 : The effect of the addition of nitrogen and oxygen on the level of residual sugars measured at the end of fermentation

ACTIFERM P1 MUST BE ADDED AT THE TIME OF YEASTING

ACTIFERM P2 : CHARACTERISTICS

♦ **Actiferm P2** contains diammonium phosphate and inactivated yeast :

- Ammoniacal nitrogen (diammonium phosphate)

This nitrogen confers a higher ethanol resistance of the yeasts.

When nitrogen is added at mid-fermentation, it does not cause an increase in the number of yeast cells, but leads to an increased nitrogen content of the yeasts. Protein synthesis resumes and there is a reactivation of the sugar transport system (5).

A nitrogen addition at mid-fermentation is very often more effective than an addition at the onset of fermentation (Table 2).

Table 2 : Effect of the moment of nitrogen addition (63 mg N/L) on the duration of fermentation.

NITROGEN CONTENT OF INITIAL MUST(mg N/L)	DURATION OF FERMENTATION (h)		
	CONTROLS WITHOUT NITROGEN ADDITION	NITROGEN ADDED DURING FIRST 2 DAYS	NITROGEN ADDED AT MID-FERMENTATION
76	271	205	187
86	278	234	193
146	128	107	103
207	94	79	79
374	93	88	88

- Inactivated yeasts

They supply nitrogen, vitamins and sterols that will lead to a better resistance to ethanol. Sterols participate in the cohesion of the yeast cell membrane.

Similarly, these inactive yeasts supply yeast walls that will absorb C6, C8 and C10 fatty acids and thereby limit their inhibitory action on yeasts (demonstration at the Bordeaux Oenology Institute (6)).

ACTIFERM P2 SHOULD BE ADDED AT 1/3 – 1/2 THROUGH THE FERMENTATION

ACTIFERM P1-P2 : INSTRUCTIONS FOR USE

- ◆ **ACTIFERM P1** must be dissolved in 10 times its weight in water or must be added to the must after the inoculation with rehydrated yeast.
 - Dosage : **20 g/hL** (refer to oenologist's recommendations).
 - Aeration : A controlled oxygenation (10 mg/L) with our calibrated system (Oxyferm or Oxyfritté) is recommended between third and mid fermentation. This addition of oxygen leads to an additional multiplication of the yeast and increases their resistance to ethanol.

- ◆ **ACTIFERM P2** must be dissolved in 10 times its weight in must in fermentation and incorporated in the tank at mid-fermentation, fairly slowly to prevent overflowing. Whenever possible, it is a good idea to homogenize the vat. The natural mixing created by gas release is normally sufficient.
 - Dosage : **20 g/hL** (refer to oenologist's recommendations).

ACTIFERM P1-P2 : PACKAGING

- ◆ **1 kg in two sacks** : carton of 20 x 1 kg -500 g of **ACTIFERM P1**, 500 g of **ACTIFERM P2**
- ◆ **5 kg in two sacks** : carton of 4 x 5 kg - 2.5 kg of **ACTIFERM P1**, 2.5 kg of **ACTIFERM P**

STORAGE

- ◆ Original sealed packaging, store in a dry, odourless environment, out of direct light.
- ◆ Once opened, use quickly.

REFERENCES

- (1) SABLAYROLLES JM , SALMON JM, BARRE P, 1996 - Carences nutritionnelles des moûts, efficacité des ajouts combinés d'azote et d'oxygène. Rev.Fr. Oenol,159, 25-32.
- (2) BELY M., SABLAYROLLES J.M., BARRE P. - Automatic détection of assimilable nitrogen during alcoholic fermentation in oenological conditions – Journal of fermentation and bioengineering Vol. 70, n° 4, p. 246-252, 1990
- (3) ALEXANDRE H., NGUYEN T. , FEUILLAT A. et CHARPENTIER C. Contribution à l'étude des bourbes : influence sur la fermentescibilité des moûts – Revue française d'oenologie n° 146, mai/juin 1994, cahier scientifique.
- (4) GERLAND C, 1996. Accélération des fins de fermentation par aération maîtrisée des moûts : mise en place pratique dans les caves . Rev. Fr. Oenol, 160, 9-11.
- (5) SALMON J.M., VINCENT O., MAURICIO J.C., BELY M., BARRE P. - Sugar transport inhibition and apparent loss of activity in *S.cerevisiae* on a sugar limiting factor of oenological conditions - American Journal of Enology and Viticulture, 44 (1), 56-64, 1993.
- (6) LAFON - LAFOURCADES., LARUE F., GENEIX C., BERTRAND A., RIBEREAU-GAYON P. - Premières observations sur le mode d'action des écorces de levure. – Connaissance Vigne et Vin, 1984, 18, n° 2, p. 111-12.