BENTONITES

CHARACTERISTICS OF BENTONITES

- Bentonite is a natural colloidal clay that was discovered at Fort Benton, Wyoming, in 1888. In contrast to other clays, bentonite has the property of swelling in water to give a gel of varying thickness. A large number of deposits have been found throughout the world, each of which contains a bentonite with different properties. In some cases, in fact, their properties are so different, that a mineralology analysis is the only way of assigning a bentonite to a particular group.
- From the standpoint of mineralology, bentonite is a hydrated aluminium silicate belonging to the Montmorillonites. It contains exchangeable ions (principally calcium, sodium and magnesium). In wine, silicon and aluminium ions are not exchangeable.
- The surface charges of bentonite gels are negative, explaining their reactivity towards proteins in wine (that have a positive pH charge in the wine).
- Bentonites are used in a number of industries as varied as foundries, drilling, wine making or cosmetics. The bentonites used in wine making and cosmetics evidently comply with a very high purity criteria.
- Bentonite has been used in wine making since around 1930, when the work of Ribereau Gayon showed that this special clay had the property of absorbing proteins in wine. Today, treating musts and wines with bentonite is a universally recognized practice. For total success, however, the bentonite must be carefully chosen depending on the desired goal.

- We can distinguish three large groups of bentonites used in wine making.
  - *natural sodium bentonites* (naturally swelling and active)
  - *natural calcium bentonites* (swell slightly, little activity but gives very little lees when used in wines)
  - *activated bentonites* (swelling and activity defined by the level of activation). The volume of lee formed in the wine is directly proportional to the level of activation.

- In order to maintain a line of bentonites that best respond to each specific case, the **MARTIN VIALATTE** research laboratory has defined five principal criteria of usefulness in musts and wines.

  They are :

  - *Deproteinization,*
  - *Improved filtration,*
  - *Clarification,*
  - *Discolouring,*
  - *The quantity of deposits produced when used in wine.*

- A diagram with five axes has been defined for each bentonites in the line. Each axis is verified regularly before delivery. The supply chain is started when these criteria are complied with. They are verified again at delivery.

- The following tests are carried out :
  - visual appearance, odour, tasting of a gel at 50 g/L, adsorption of proteins, measurement of the specific surface, measurement of surface charges, degree of swelling in water and in a synthetic solution similar to wine.

AFAQ ISO 9001 VERSION 2000 Produits oenologiques

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INSTRUCTIONS FOR USING BENTONITES

- **All bentonites must first be swelled in water before use**. Cold tap water is sufficient. Heating the water to 50-60°C only results in an acceleration of the swelling.
- The simplest, quickest and easiest way to use bentonite is to sprinkle it slowly on the surface of the water that is being vigorously mixed with a rapid propeller. Moisten all the powder and reabsorb clumps. After 2 hours, mix again. Leave inflating for 12 hours is preferable.
  The bentonite is now ready to use.
- **CALCIUM BENTONITE** : practically no swelling. Simply moisten it for one hour.
  The concentration can reach 200 g per litre of water. (**CALCICA**)
- **NATURAL SODIUM BENTONITE AND MOST ACTIVATED BENTONITES**.
  Swelling for 2 to 3 hours, 12 hours is preferable. (**OPTIBENT, ELECTRA, GRANULA, BENTEFF**).
  Do not exceed 50 g of bentonite per litre of water.
- **MIRACOL** : highly activated bentonite. Do not exceed 30 g per litre of water; swell for 12hours.
- The bentonite gel must be in liquid form in order to disperse in the wine. When it is ready, inject into the total quantity of the wine during pumping over with a pump. Use a DOSACOL (fining connector) or a metering pump connected to the pump suction. Do not add the bentonite to the top of the vat with a pail. Avoid introducing air that forms bubbles, which will cause the flakes to float.
- The flocculation of bentonite starts as soon as it comes in contact with the wine, a process caused by the ions in the wine. Even though action is completed within several hours, it is necessary to wait until the flakes sediment and pack at the bottom of the vat. This requires 3 to 10 days depending on the bentonite, the height of the vat, temperature, etc.

DOSAGE

- The doses are extremely variable, depending on the bentonite used and the sought after purpose. Every treatment must be preceded by a test of efficacy. Average doses are in the range of 20 to 150 g/hL (refer to the specificity sheet for precise information).

PACKAGING

Bentonite	1kg	5kg	25 kg
CALCICA			X
ELECTRA	X	X	X
GRANULA	X	X	X
MIRACOL	X		X
OPTIBENT		X	X
BENTEFF		X	X

STORAGE

- Full original sealed packaging, store in a dry, odourless environment, out of the light.
- Once opened, use quickly.

REFERENCES

- POINSAUT P. HARDY G. (MV/SOEC). Les bentonites : Caractérisation-Analyse et Comportement – Utilisation des bentonites en œnologie. Revue des œnologues n°75 (Avril1995) n°76 (Juin 1995) N°77 (Septembre 1995).