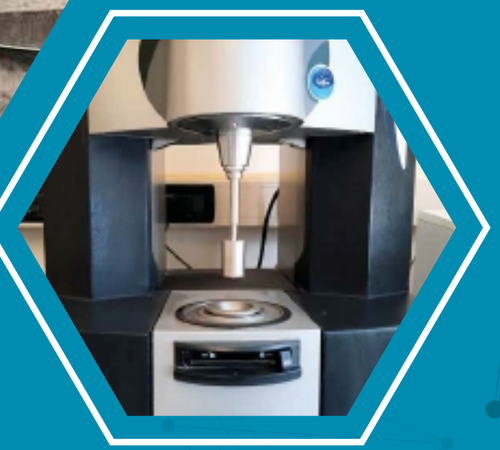
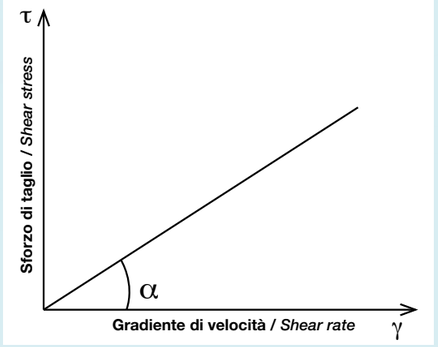
01



RHEOLOGICAL CURVE

It is the analysis of the behaviour of a liquid phase subjected to an effort.



Example of a rheological curve of a Newtonian liquid

THIXOTROPY

It is the inclination typical of the suspension to modify its rheological behaviour depending on sliding regime to which they were subjected before.

SLIDING LIMIT

The necessary effort, measured in Pascal, that is necessary to make the slip move.

SOLID/LIQUID FLUIDIFYING AGENTS FOR MIXTURE

Mistral ITALIA

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Mistral ITALIA

01 SOLID/LIQUID FLUIDIFYING AGENTS FOR MIXTURE

The purpose of the FLUIDIFICATION: to reach a thick suspension with the less quantity of water but sufficiently fluid to be spray-dried.

The suggestion of a fluidifying agent, both liquid and solid, is always the result of a careful study of fluidi fication, where the conditions of the raw materials are evaluated and the grinding water is characterized.

The following material is necessary:

- 5 Kgs of mixture (for each type of mixture)
- 3 Lts. of grinding water (the water that directly goes to the mill)
- 0,5 Kgs of reference fluidifying agent.

To have a real feedback is necessary to reproduce the industrial conditions in laboratory.

So, it is necessary to know the fluidification data:

- Type of mill (continuous or batch)
- Density of the slip at the mill exit
- Viscosity at the mill exit
- Residue (specifying how it is calculated and at which µm value).

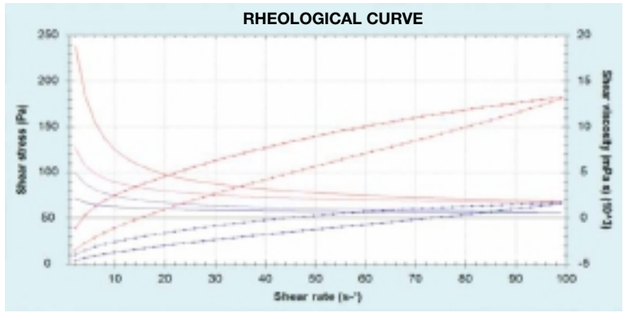
The grinding water directly affects the fluidification and so it is fundamental to use, during the studying phase, the industrial factory water for which the study is car ried. The main characterization of the water consists on measuring:

- CONDUCTIVITY. A very high conductivity always leads to a worsening of the rheological conditions of the slip. The salts dissolved on it, in fact, are caught from the ions present on the fluidifying agent that will be no more available to act on the clays.
- pH. We know that the acid pH negatively affects the fluidification because one part of the fluidifying agent is necessary to move the pH towards basic values, in order to create a stopgap solution suitable to the fluidification.
- DENSITY. To calculate the % of dry product.

The main purpose of the study is to improve the rheological conditions of the industrial slip.

- Rheological curve
- Sliding limit
- Thixotropical area.

EXAMPLE OF IMPROVEMENT OF THE RHEOLOGICAL CONDITIONS

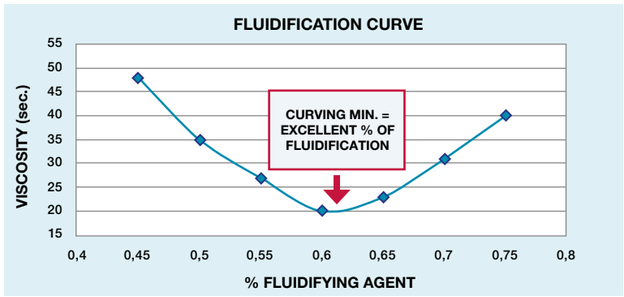


RED CURVE.
It shows the sliding limit and thixotropy.

BLUE CURVE.
It does not have sliding limit and low thixotropy.

FLUIDIFICATION CURVE:

To identify the excellent percentage.

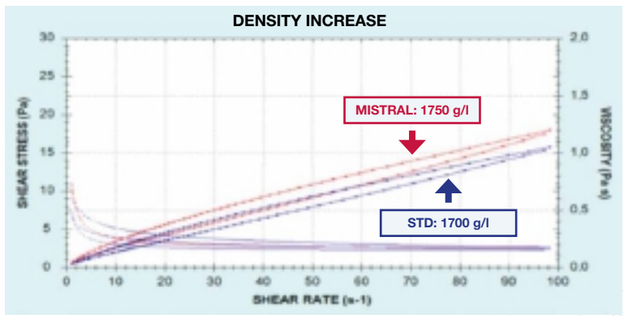


0,6% excellent quality of fluidification.

INCREASE OF THE DENSITY:

Important for an energetic saving.

$$\frac{\text{610000 NECESSARY KCAL TO EVAPORATE 1 ton H2O}}{\text{8250 KCAL/M3 COLORIFIC POWER OF THE METHANE GAS}} = \text{74 M3 METHANE GAS}$$



The increase of the density of a slip is possible only if good rheological conditions are maintained.

The experience gained over more than 20 years enables Mistral Italia to offer products designed to maximise the efficien- cy of the milling and atomisation process. Through laboratory tests it is possible to identify the best rheological conditions to maximise slip density. By reducing the amount of water in the milling process, it will therefore be possible to cut energy costs and carbon dioxide emissions into the atmosphere. A further step towards building sustainability in every respect.