

VANATURAL®

Bentonite Clay

VEEGUM®

Magnesium Aluminum Silicate

VAN GEL®

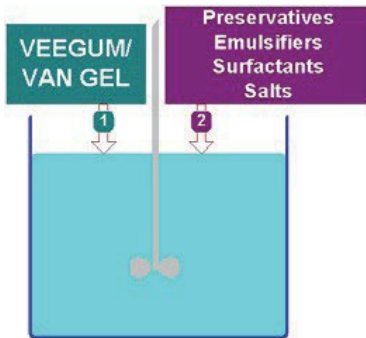
Magnesium Aluminum Silicate

VANATURAL, VEEGUM and **VAN GEL** clay products must be properly dispersed in water and hydrated to provide the desired performance properties.

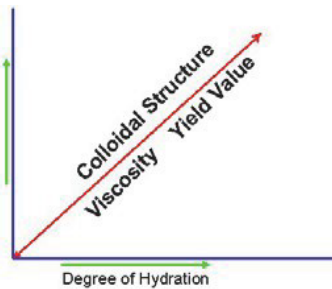
The two guides to successful hydration are:

- ✓ **THE BEST DISPERSIONS ARE PREPARED IN WATER FREE OF ADDITIVES.**
- ✓ **MORE ENERGY INPUT GIVES QUICKER HYDRATION.**

Any materials present in the water when the clay is added, including preservatives, chelating agents or other minor additives, will interfere with hydration and inhibit the formation of the desired colloidal structure.



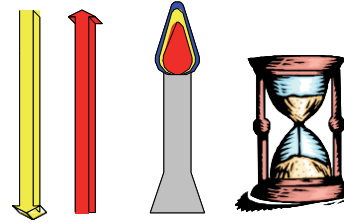
Dry clay particles are actually multiple layers of individual platelets separated by a layer of water. The extent to which these particles are delaminated into individual clay platelets is referred to as the degree of hydration. The greater the degree of hydration, the stronger the colloidal structure, and the greater the viscosity and yield value of the dispersion.



The degree of hydration is directly proportional to the amount of energy used to disperse the

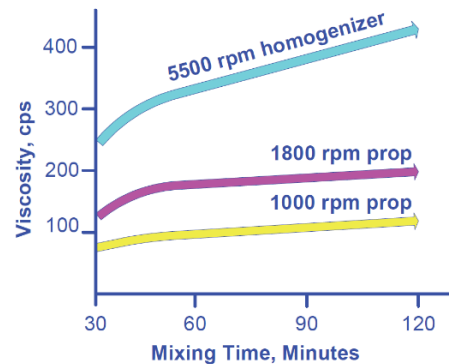
product, and therefore increases in proportion to the following factors:

- **Shear, or mixing intensity**
- **Heat input, or water temperature**
- **Mixing time**

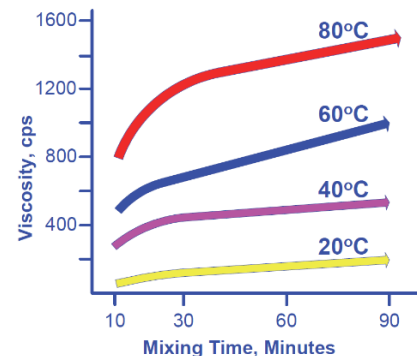


SHEAR HEAT TIME

Using greater shear, or mixing for a longer time, will provide better hydration, which is measured as higher viscosity, as seen here with a 5% dispersion of **VEEGUM R**, and greater yield value.



Heat input in the form of heated water has an even more pronounced beneficial effect on hydration than does the mechanical energy contribution of shear.



Any modification of mixer intensity (e.g., speed, propeller to vessel ratio) or water temperature will affect the degree of hydration and the hydration time. Whichever mixing conditions are used, it is very important that they be consistently controlled to achieve reproducible results in the laboratory, during scale-up and in production.

Because of their unique nature, **VEEGUM Ultra**, **VEEGUM EZ**, **VANATURAL CA**, **VANATURAL XGB**, and **VAN GEL SX** are exceptions. They are relatively unaffected by changes in hydration parameters. Adequate hydration will be achieved in most cases in no more than 15 minutes. Increasing mixing intensity, mixing time or water temperature will not significantly affect the degree of hydration.

The following table provides guidelines for the minimum amounts of time suggested for the hydration of the various clay grades. They are based on laboratory scale preparations under practical formulating conditions. Actual hydration times in the laboratory or in production will depend on the particular combination of batch size, mixer shear, and water temperature used. In the laboratory or during production, the key to consistent performance of these clays is consistent hydration conditions. Changes in hydration time, mixer shear, vessel size or water temperature will change results.

| Minimum Suggested Hydration Times | | | |
|---|----------------|--------------|---------------|
| | Hydration Rate | | |
| | Normal | Fast | Ultra |
| | VEEGUM R | VEEGUM HS | VEEGUM Ultra |
| | VEEGUM K | VEEGUM D | VEEGUM EZ |
| | VEEGUM HV | VANATURAL | VANATURAL XGB |
| | VEEGUM Pure | VANATURAL MC | VANATURAL CA |
| | VAN GEL B | VAN GEL ES | VAN GEL SX |
| | VAN GEL R | | |
| | VAN GEL K | | |
| Propeller Mixer: 800 rpm, 25°C water 800 rpm, 75°C water | 120 Minutes | 30 Minutes | 15 Minutes |
| | 45 Minutes | 20 Minutes | 10 Minutes |
| Homogenizer: 3000 rpm, 25°C water 3000 rpm, 75°C water | 30 Minutes | 20 Minutes | 10 Minutes |
| | 15 Minutes | 10 Minutes | 10 Minutes |

For detailed information on the properties and uses of these clay products, please request a copy of the **VEEGUM/VANATURAL** or **VAN GEL/VEEGUM** technical brochures.

VANATURAL, **VAN GEL** and **VEEGUM** are registered trademarks of Vanderbilt Minerals, LLC.

Rev01/31/23