

ORGANOTROL ORGANICALLY MODIFIED CLAY

Organotrol Incorporation Tips and Hints

Dispersion.

The key to obtaining optimal efficiency with any organoclay, is to maximize the dispersion. Energy is needed during incorporation to separate the agglomerated bentonite particles into their individual platelets. We recommend incorporation in a grinding phase along with the solvents and other pigments. Best results are obtained by making a pre-gel concentrate, and then adding this concentrate to the let down phase under shear, the pre-gel can also be used as a post-add for final viscosity adjustment.

For those customers who prefer direct addition to the formulation, we offer grades which are pre-ground to a finer particle size for easier incorporation. These grades are Organotrol SA-7, 3660, 1665 and SA-2000, and they can be directly incorporated with moderate to high speed dispersion equipment. Organotrols are not recommended for direct post-addition to adjust the final viscosity.

Viscosity

Maximum viscosity is only obtained after the solvent has fully delaminated the platelets of bentonite. This is obtained if sufficient energy is applied during the mixing and dispersion phase. Immersion time in the solvent is also a factor affecting complete delamination. We recommend taking final viscosity readings 24 hours after mixing to allow complete solvent penetration and the full gel matrix to develop. We do not advise using the pre-gel viscosity as a control test. It has been our experience, that pre-gel viscosities may vary between organoclay manufacturers, but that the final formulation viscosities are very similar.

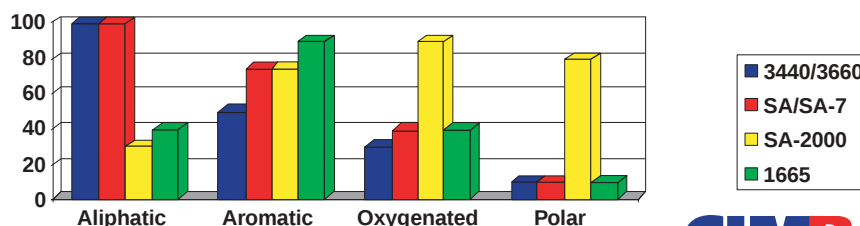
Activation

It is very important to properly activate the organoclay to obtain full gel strength with a polar solvent. The activator affects the quaternary amine attached to the clay surface, which forces the long chain amine to swell and push the platelets apart. It is important that the customer does not over-dose the system, excess activator can have a negative effect and weaken the gel-strength. The amount of water present is also critical for full gel-strength development. The water migrates to the platelet edges and forms hydroxyl bonds between the plates. For our Organotrols, we recommend a ratio of 80% polar activator and 20% water, the dosage level of this blend, should be between 33 – 50% of the weight of the Organotrol added. Self-activating Organotrols do not require the use of a polar activator.

Solvent Impacts

Organoclays change the rheology of a solution, by controlling the solvent's ability to flow. We offer various grades of Organotrol, each formulated for effectiveness in different solvent types. We have not studied the impact of all the possible blends of solvents, so we recommend the customer starts by selecting the grade which best thickens the majority of the solvent type being utilized in the formulation. See table below.

RELATIVE THICKENING EFFICIENCY BY SOLVENT



PRODUCT SELECTION AND PROCESSING RHEOLOGICAL ADDITIVES FOR SOLVENT BASED APPLICATIONS

Organotrol	Non-Activated				Self-Activated				Vistrol
	1665	2200	3440	3660	SA	SA-7	SA-2000	2800	
Clay Type	Bentonite	Bentonite	Bentonite	Bentonite	Bentonite	Bentonite	Bentonite	Bentonite	PL
% Active	97	97	97	99	97	99	97	97	99
<u>Activation</u> Alcohol/water 80/20 - 95/5	■	■	■	■	○	○	○	○	○
Acetone/water 80/20 - 95/5	■	■	■	■	○	○	○	○	○
Propylene carbonate	■	■	■	■	○	○	○	○	○
BYK R-605	○	○	○	○	○	○	○	○	■
BYK 203 & 204	■	■	■	■	□	□	□	□	○
<u>Incorporation</u> Pre-gel	□	□	□	□	□	□	□	□	□
Grind Mills	■	■	■	○	■	○	■	■	○
High Speed Mixing	■	○	○	■	■	■	■	○	■
Stir In	○	○	○	□	○	□	□	○	□
<u>Solvent Selection</u> Aromatic	■	○	○	□	■	■	■	○	■
Aliphatic	○	■	■	■	■	■	○	■	○
Oxygenated	○	○	○	○	○	○	■	○	□
Polar	○	○	○	○	○	○	■	○	□
■ Recommended □ Suitable ○ Not recommended									

PHYSICAL CHARACTERISTICS

Organotrol										Vistrol
Property	1665	2200	3440	3660	SA	SA-7	SA-2000	2800	PL	
Wt % passing through 325 mesh dry	99.9	98.9	99.9	99.9	99.9	99.9	99.9	98.0	NA	
Typical Moisture %	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Specific Gravity	1.7	1.6	1.7	1.8	1.7	1.8	1.7	1.6	1.1	
Grind	Fine	Coarse	Medium	Fine	Medium	Fine	Fine	Coarse	Medium	
Color	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Light Gray	Off White	
Typical use Levels %	Up to 1.0	Up to 1.0	Up to 1.0	Up to 1.0	Up to 1.0	Up to 1.0	Up to 1.0	Up to 1.0	Up to 1.0	

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