ITOTONE 883

ORGANOCLAY RHEOLOGICAL ADDITIVE FOR SOLVENT BASED SYSTEM

PROPERTIES

- **Appearance :** Light Yellow, Free-flowing Powder
- **Moisture Content (@105°C, 2 hrs) :** < 3.5%
- **Granularity (<76µm or 200mesh) :** > 98%
- **Viscosity (7% xylene gel, 25°C) :** > 3.0 Pa•S
- **Viscosity (5% 200# gel, 25°C) :** 500–1500 mPa•S
- **Loss on Ignition (@800-900°C) :** < 40%
- **Heavy Metal (Pb) :** <15 ppm
- **Heavy Metal (Cd) :** <15 ppm
- **Heavy Metal (Cr) :** <15 ppm
- **Heavy Metal (Hg) :** <15 ppb
- **Arsenic (As) :** < 5mg/kg

APPLICATION

- **Solvent Polarity range :** Low to middle polarity Gasoline, diesel oil, white camphor oil, benzene, styrene, ester, ketone, ether, alcohol mixed solvent, vegetable oil.
- **Dispersion Conditions :** High speed dispersion and polar activator. Use 95% ethanol at rate of 30- 50% of weight of ITOTONE 883. grind to improve fineness.
- **Addition method :** Pre-gel
- **Organoclay addition :** 5-8% ITOTONE 883
- **Solvent addition :** 88-92% Xylene
- **Activator addition :** 3-6% of either 95% ethanol or 95% methanol

CHARACTERISTICS

1. Strong thickening ability, good compatibility, needs polar activator.
2. Applicable to low and middle polar solvent systems.
3. Used in paints, printing inks, sealants, lubricating greases, paint fillers, atomic ash mixed paints, etc.
4. Similar to Bentone – 34.

DISCLAIMER

The information herein offered is based on the best of our knowledge at present. However, we are not able to guarantee these matters, as the result of application may vary according to conditions adopted. Preliminary tests are, therefore, recommended in all cases. Please refer to MSDS regarding handling of the products.

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APPENDIX

Pre gel addition

ITOTONE 883 is made up of lamellar structure polymer. Under shear, solvent penetrates the capillary gap and causes wetting. This leads to lamellar structure polymer de-agglomeration. Addition of high shear or a polar activator under low shear causes the lamellar polymer structure become separated completely and form a gel structure as edge to edge hydrogen bonding occurs making a structure like a house of cards. This is known as pre-gel addition.

Preparation of pre-gel

1. Add 85-87% of solvents or mixed solvents
2. Add ITOTONE series organoclay and disperse at high speed (2500rpm for 5-10 minutes)
3. Add polar activator and disperse at high speed (2500rpm for 15-20 minutes).

Addition of ITOTONE pre-gel

A. For poor wetting resin systems use in combination with surfactant and use the following addition process.

1. Charge resin and solvents and mix.
2. Add ITOTONE pre-gel mixture and mix.
3. Add surfactant.
4. Add pigment and disperse
5. Dilute

B. For poor wetting capacity resin and non thixotropic grind material s use the following addition process

1. Charge resin and solvents and mix.
2. Add surfactant (if required)
3. Add pigment
4. Disperse to the desired fineness with grinding
5. add ITOTONE pre-gel
6. Disperse completely to desired fineness
7. Dilute.

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EXPERIMENTAL

ITOTONE 883 samples versus Bentone 34 in Air-Drying Alkyd Paint.

1: Objective:

Compare ITOTONE 883 to Bentone 34 (Elementis)

2: Experimental:

2.1: comparing the ITOTONE 883 organoclay sample

As reference organoclay Bentone®34 (Elementis) has been used.

The ITOTONE 883 sample has a light brownish-yellow color and is lighter in colour (less brownish) compared to the reference sample Bentone 34.

All samples have similar hydrophobicity, comparing the wetting characteristics in mineral spirits as well as water.

2.2: test in air-drying alkyd paint.

Used sample ITOTONE 883, for the complete test in the alkyd paints.

Prepared the pre-gels, containing 10% organoclay. All pre-gels are made under exactly same dispersion and gelling conditions, using following recipe:

Start with:

85% mineral spirits and add:

10 % Bentone. Disperse on dissolver for 6 minutes at 6000 rpm. Fineness of grind: < 10 µm.

As next stage add gelling agent:

5% Ciba® EFKA® 5044, at 2000 rpm

100% pre-gel.

Ciba® EFKA® 5044 is an organic surfactant, widely used as a gelling agent for bentonites. It

has organic solvents, contributing to the swelling and gelation of the bentonite platelets. By experience it is known that using Ciba® EFKA® 5044 as an activator for Bentone® organoclays, gels are formed that are more easy workable compared to gels just made with alcohol activation (resulting in stiff pastes). The organoclay pre-gels are added to a pre-formulated standard white air-drying alkyd paint.

Formulation:

86,4% White Alkyd Test Paint

8,6% White spirit

5% Bentonite gel, 10%

Mix for 6 minutes, dissolver low speed

(Remark: these conditions are used, because of limited access to preparing the original alkyd paint, starting from the raw materials. However, turned out to work well for the purpose of the test scheme: comparison performance of 2 different organoclays)

3: Results:

Comparing the 10% bentonite gels, immediately after completing the gelation process:

Gel based on Bentone® (reference) : soft gel, glossy appearance

Gel based on ITOTONE 883 : lighter than the reference gel, less smooth but as gelly as the reference gel. Test results, after incorporation of the organoclay gels in the paint system

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EXPERIMENTAL (CONT)

Liquid paint performance:

Bentonite Quality	Initial ŋ*	After 1 day, ŋ*	After 1 month, ŋ*	Appearance, liquid paint	Sedimentation test after 4 months storage, RT
Standard, Bentone 34	310	380	420	OK	No sediment
ITOTONE 883	140	350	410	As standard	No sediment, performance as standard

***ŋ= Brookfield Viscosity, at 23°C in mPa.s, at 50rpm, spindle 4**

The activator used under test, Ciba® EFKA® 5044, works slower for the ITOTONE 883 than for the Bentone 34. However, after 1 day similar degrees of viscosity are obtained. The selection of the most optimal activating conditions for ITOTONE 883 would yield similar results initially.

The paints are applied onto glass panels in order to test paint film performances.

Bentonite Quality	Initial 75 µm, wire bar: dry film appearance	Leveling, 25-150 µ gauge	Sag Test *	Color	Drying Speed
Standard, Bentone 34	OK	25 µm OK	OK	OK	OK
ITOTONE	As standard	As standard	As standard	OK	As standard

***: sag test made, 90 minutes after application of the paints (due to low initial viscosity of all paints).**

Additionally a brush test is made, applying the paint on a primer substrate. No differences in ease of application, brush ability, spattering, sagging, leveling could be noticed between the two paints.

4: Conclusion.

The performance of ITOTONE 883 as a thickener for the air-drying alkyd test paint is rated as being OK and very close to the effect of benchmark product Bentone 34. No main differences in paint performance characteristics such as brush ability, leveling; sagging, color, gloss or drying has been noticed.

Slight differences between the two organoclays ITOTONE and Bentone 34 were found in the speed of activation, using Ciba® EFKA® 5044 as activator. The speed of gelation is slower for ITOTONE 883 finally reaches nearly same level of thickening. Choice of optimal activation conditions would allow the ITOTONE 883 to produce similar results.

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