

ELEMENTIS

Application Leaflet

RHEOLATE[®] 1 and RHEOLATE[®] 2001

Stabilization of aqueous
abrasive slurries

Unique chemistry, sustainable solutions



Key Benefits

- Excellent Stabilization of dense abrasive particles in liquid stage
- No sedimentation

TABLE 1: Results sedimentation tests

| Sample | Visual assessment of suspension (after 2 weeks storage at ambient conditions) |
|---|---|
| Blank (no rheology modifier) | Almost complete settling of particle, slight milky grey liquid layer on top of settlement |
| 3.2% RHEOLATE® | Strong sedimentation; grey milky layer on top |
| 3.2% RHEOLATE® 1 0,8% RHEOLATE® 2001 | No sedimentation; no phase separation |

FIGURE 1: Samples sedimentation tests



Overview

In liquid and pasty abrasive compounds rheological additives are required to suspend abrasive powders such as diamond powder or selected covalent carbides homogeneously and to prevent settling and syneresis.

The described abrasive slurries are being used in various industries, e.g. the electronic industry.

Products

RHEOLATE® 1 is an alkali swellable vinyl acrylic copolymer with a solids content of 30%.

RHEOLATE® 2001 is an aqueous anti settling agent with 24% active substance which is based on a proprietary copolymer.

Test results

In a commercially available formulation of an abrasive paste RHEOLATE® 1 and RHEOLATE® 2001 have been tested as anti-settling agents, in this case for boron carbide.

The left described **TABLE 1** becomes even more obvious in case watching the sample as displayed in **FIGURE 1**.

TABLE 2: Formulation abrasive slurry

| Component | Concentration [%] |
|--|-------------------|
| Water | 89 - X |
| Solvents (e.g. glycols) | 8 |
| Abrasive powder (e.g. boron carbide or diamond powder) | 3 |
| Rheology modifier | X |
| Total | 100 |

Conclusion

A combination of 3.2% RHEOLATE® 1 and 0.8% RHEOLATE® 2001 reach optimal suspension and stabilization of abrasive powders. RHEOLATE® 1 alone could not achieve sufficient stabilization of the particles. There was nearly no viscosity increase observed.

Test formulation

Preparation of samples:

1. Add abrasive powder under stirring into water
2. Disperse for 10 minutes
3. Add rheological additives under stirring and homogenize.
4. Adjust pH to approximately 8-9.

The pH of approximately 8 - 9 is necessary to activate RHEOLATE® 1 polyacrylic thickener

NOTE:

The information herein is currently believed to be accurate. We do not guarantee its accuracy. Purchasers shall not rely on statements herein when purchasing any products. Purchasers should make their own investigations to determine if such products are suitable for a particular use. The products discussed are sold without warranty, express or implied, including a warranty of merchantability and fitness for use. Purchasers will be subject to a separate agreement which will not incorporate this document.

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