

Rheological additives

RD01

Features and Advantages:

A synthetic flake silicate for use in water-based systems, which improves low-shear rheology.

Product Specifications:

Appearance	Free-flowing white powder
Bulk Density	1,000 kg/m ³
pH (2% aqueous solution)	10
Moisture Content	Maximum 10%
Chemical Composition	Synthetic (modified) flake silicate

Application fields:

Coatings Industry

Properties and Advantages

RD01 is used in water-based coatings to increase low-shear viscosity, whilst having minimal effect in the high-shear range; it also prevents sagging or blending of the coating during wet-on-wet application. This additive improves application properties and storage stability, whilst effectively preventing the settling of pigments, fillers, matting agents or other solid substances in water-based coating systems. RD01 has a very wide range of applications and is effective in formulations with pH values ranging from strongly acidic to strongly alkaline. Furthermore, this additive performs exceptionally well in systems containing water-soluble organic solvents or high levels of dissolved salts. RD01 is particularly suitable for water-based automotive coatings, as it accelerates post-application film formation, thereby achieving ideal orientation of effect pigments. Its rheological properties also effectively prevent sedimentation and dehydration shrinkage in base coats, whilst

enhancing stability. No pH adjustment is required during addition. It exhibits a high degree of synergy with organic rheological additives, enabling precise adjustment of rheological properties.

Recommended Applications

Architectural coatings, automotive OEM coatings, automotive refinish coatings, general industrial coatings, wood and furniture coatings

Recommended Dosage

For automotive coatings, the dosage is 0.1–0.7% of the total formulation (as supplied). For other coatings, the dosage is 0.1–2% of the total formulation (as supplied); the specific dosage should be determined based on formulation performance. The above recommended dosages are provided for reference. The optimum dosage should be confirmed through relevant application series testing.

Addition and Processing Instructions

To ensure optimal dispersion, efficacy and reproducibility during use, RD01 must be fully hydrated in water at low ionic concentration ($20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$). When using RD01, a 2% deionised water dispersion is recommended. Add RD01 slowly to the deionised water whilst stirring. Once the dispersion is clear and no undissolved particles are visible, the dispersion is ready for use. If the addition level reaches 3 per cent, it is recommended to use a low-molecular-weight diol as the liquid medium. In this case, add it in a 1:1 ratio with RD01. The use of a diol also improves the storage stability of the dispersion. Add the diol only when the dispersion is clear and no undissolved particles are visible. To achieve the desired orientation effect, it is recommended to stir thoroughly before adding the effect pigment paste to ensure uniform dispersion of the rheological additive.

Special Note

The RD01 dispersion should be used before it develops visible viscosity to ensure that no coarsening occurs during incorporation. Concentrations above 2% result in the formation of a high-viscosity gel, which is difficult to incorporate into the formulation. This effect can be counteracted by using water-soluble organic solvents, such as low-molecular-weight polyethylene glycol.

Domestic, industrial and institutional applications

Features and benefits

RD01 is a rheological additive that produces a thixotropic effect. It is widely used as an anti-settling agent in water-based systems to prevent the settling of abrasives and other particles without causing excessive thickening. Cleaning agents containing RD01 are easy to use and suitable for spray application. The use of this additive improves adhesion to vertical surfaces and extends contact time, thereby enhancing the cleaning performance. RD01 is particularly suitable for water-based cleaning and care products with a pH range of 6 to 12.

Recommended Applications

Floor care products, automotive cleaning and care products, household cleaners, kitchen cleaners, damp-surface cleaners, and laundry detergent formulations

0.1–3% (as supplied); the specific dosage should be determined based on formulation performance. The above recommended dosages are provided for reference only. The optimum dosage should be confirmed through relevant application series testing.

Addition and Processing Instructions

RD01 is hydrophilic and easy to use in water. To ensure optimal distribution, efficacy and reproducibility in the application, RD01 must be added slowly to water at $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ whilst stirring, and pre-dispersed for at least 20 minutes. For best results, the concentration of RD01 in the premix should not exceed 3% by weight. Once complete hydration is assured, add the remaining water and all other ingredients in the formulation to the dispersion. No wetting agents or dispersants are required to produce this dispersion.

Special Notes

The selection of the most suitable rheological additive should be based not only on the required rheological properties but also on other physical characteristics (such as colour, transparency and compatibility with the chemical environment of cleaning agents and detergents).

Agriculture

Properties and Benefits

As a rheological modifier, RD01 increases viscosity within a low shear range. In agriculture, RD01 is commonly used as a gelling agent and can be used in combination with polymeric rheological modifiers.

Recommended Uses

RD01 is particularly suitable for water-based crop protection formulations in the form of emulsions, emulsion concentrates, suspensions, suspension concentrates and water-dispersible granules.

Recommended Dosage

0.05–1% of the total formulation (as supplied). The above recommended dosage is provided for reference only. The optimum dosage should be confirmed through relevant application series testing.

Addition and Processing Instructions

RD01 is hydrophilic and easy to use in water. To ensure optimal distribution, efficacy and reproducibility in applications, RD01 must be added slowly to water at $20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ whilst stirring, and pre-dispersed for at least 20 minutes. To achieve optimal results, the concentration of RD01 in the premix should not exceed 3% by weight. Once complete hydration is ensured, the remaining water and all other ingredients in the formulation should be added to the dispersion. No wetting agents or dispersants are required to produce this dispersion.

Adhesives and Sealants

Properties and Benefits

RD01 increases viscosity in the low-shear range, whilst having minimal effect in the high-shear range. This additive improves processability and storage stability, whilst also effectively preventing the settling of pigments, fillers, matting agents or other solid substances in water-based adhesive and sealant systems. RD01 is particularly effective in formulations with strongly acidic or strongly alkaline pH values, whilst also performing excellently in systems containing water-soluble organic solvents or high levels of dissolved salts.

Recommended dosage

0.1–2% of the total formulation (as supplied). The above recommended dosage is provided for reference. The optimum dosage should be confirmed through relevant application series testing.

Addition and processing instructions

To ensure optimal distribution, efficacy and reproducibility in the application, RD01 must be fully hydrated in water at low ionic concentration ($20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$). Add RD01 slowly to water whilst stirring continuously, and pre-disperse for at least 20 minutes. The dispersion is ready for use once it is clear and no undissolved particles are visible. To achieve optimum processability, it is recommended to prepare a dispersion with a maximum RD01 solid content of 3% in water.

Energy Storage**Properties and Advantages**

As a rheological additive, RD01 exhibits a high degree of synergy when used in combination with organic thickeners. It can therefore be used to produce highly stable water-based electrode slurries and to improve the adhesion and mechanical strength of electrode coatings. When incorporated into graphite anode slurries, RD01 can significantly enhance cycling stability.

Recommended Applications

RD01 can be combined with conventional organic resins, such as carboxymethyl cellulose (CMC), polyacrylic acid (PAA) and styrene-butadiene rubber (SBR), for use in water-based electrode coatings.

Recommended dosage

Less than 1 per cent of the total formulation (as supplied). The above recommended dosage is provided for reference. The optimum dosage should be confirmed through a series of application tests.

Addition and processing instructions

To ensure optimal distribution, efficacy and reproducibility in the application, RD01 must be fully hydrated in water at low ionic concentration ($20\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$). Add RD01 slowly to the water whilst stirring continuously, and pre-disperse for at least 20 minutes. The dispersion is ready for use once

it is clear and no undissolved particles are visible. All other components of the formulation should then be added to the RD01 dispersion.

Packing:

Net weight: 25 kg.

Storage:

As the product is hygroscopic, it should be transported and stored in its original, unopened container in a dry environment, at a temperature between 0°C and 30°C.