Technical Data Sheet

ACRYSOL™ RM-8WE Rheology Modifier

For Water Based Coatings

Regional Product Availability

EMEAI

Summary

ACRYSOL™ RM-8WE Rheology Modifier is a non-ionic urethane type polymer, designed to formulate high performance, environmentally friendly, low VOC* or solvent-free* interior/exterior paints.

ACRYSOL™ RM-8WE Rheology Modifier is a mid-shear builder with a rheology profile similar to the one of ACRYSOL™ RM-8W Rheology Modifier but no Sn compound has been intentionally added in its production process.

ACRYSOL™ RM-8WE Rheology Modifier facilitates the formulation of paints with an excellent balance between flow and sag.

ACRYSOL™ RM-8WE Rheology Modifier is delivered as a low viscosity liquid and is therefore very easy to incorporate and should facilitate the paint manufacturing process.

* VOC substances and Solvents are not intentionally added and are not knowingly introduced from another raw material.

Characteristics of the Product

- Solvent*-, APEO*- and tin*-free
- Low odour
- Resistant to enzymatic attack
- Excellent water and alkali resistance
- Excellent spatter resistance
- Use over a wide pH range
- Ease of handling

* Solvents, APEO, Tin and Sn compounds are not intentionally added and are not knowingly introduced from another raw material.

Typical Physical Properties

These properties are typical, not to be construed as specifications.

Property	Value
Appearance	Hazy liquid
Active solids content %	17.5*
Brookfield viscosity, cP	<3500
Specific gravity (wet polymer)	1.04
Solvent	Water
Chemistry	HEUR**

*including solvent-free proprietary viscosity suppressant

**Hydrophobically modified polyethylene oxide urethane

*Total solids content is 22%

Formulation Guidelines

ACRYSOL™ RM-8WE Rheology Modifier is supplied as a pourable and pumpable liquid, free of solvent* and with very low odour. It can be added to the mill-base or to the letdown portion of the formulation.

ACRYSOL™ RM-8WE Rheology Modifier should not be pre-blended with other rheology modifiers prior to paint addition but should be added separately.

* Solvents are not intentionally added and are not knowingly introduced from another raw material.

Rheology Profile

ACRYSOL™ RM-8WE Rheology Modifier is a mid-shear HEUR type thickener with a rheology profile, similar to the one of ACRYSOL™ RM-8W Rheology Modifier but no Sn containing compound has been added in its manufacturing process.

ACRYSOL™ RM-8WE Rheology Modifier shows a very balanced rheology which permits to formulate paints with outstanding balance between flow and sag resistance.

ACRYSOL™ RM-8WE Rheology Modifier can be used as a co-thickener in many types of formulations for attaining a desired balance of low and high shear viscosities. It has excellent compatibility at all blend ratios with the more Newtonian ACRYSOL™ HEUR types like ACRYSOL™ RM- 2020 E and ACRYSOL™ RM-3030 Rheology Modifiers.

Dispersing Agents

Dispersing agents with low ionic content usually work well with ACRYSOL™ RM-8WE Rheology Modifier. OROTAN™ 165, 681 2002, 2011, CA-2500 and 731-A ER Pigment Dispersant are all very compatible and OROTAN™ 1124 Pigment Dispersant can be suggested as well. For low odour paints we suggest the ammonia and solvent free* OROTAN™ 731-A ER, 2002 or 2011 Pigment Dispersant. Depending on formulation type, usage levels of 0.4- 1.0% calculated on total powder have been found adequate. Dispersants which introduce a high level of electrolytes into the paint formulation, such as polyacid homopolymers, should be avoided, as they may cause syneresis.

* Ammonia and solvents are not intentionally added and are not knowingly introduced from another raw material.

Paint pH Control

Being nonionic, ACRYSOL™ RM-8WE Rheology Modifier is usable over a wide pH range and in most formulations pH is not a critical factor. For most latex paints formulated with ACRYSOL™ RM-8WE Rheology Modifier, a pH between 7.0- 9.0 will give best stability and rheology control.

Thickener Combinations

ACRYSOL™ RM-8WE Rheology Modifier can be combined with other rheology modifiers to tailor the viscosity profile of the paint. Combinations with ACRYSOL™ RM-2020 E, ACRYSOL™ RM-3030 or ACRYSOL™ RM-5000 Rheology Modifier for increased high shear viscosity and ACRYSOL™ RM-12W Rheology Modifier for increased low shear viscosity have proven to be very successful in this respect. ACRYSOL™ RM- 8WE Rheology Modifier should not be pre-blended with other rheology modifiers prior to paint addition.

Interactive Effects of the Paint System

The rheology modifying mechanism of ACRYSOL™ RM-8WE Rheology Modifier is primarily associative. Hydrophobic elements of the molecular structure tend to associate with other hydrophobic elements in the paint. These other hydrophobic elements are mostly latex binder and opaque polymers. Association with inorganic pigments is less frequent, but can exist. In the end, we get a network of associations, modifying the rheological profile of the paint and giving it the desired flow. However, associative also means that the rheology of the paint is influenced by a whole range of elements other than the thickener itself.

The following factors have a direct impact on the efficiency of ACRYSOL™ RM-8WE Rheology Modifier in latex paints:

- Latex polymer particle size and distribution
- Latex polymer composition and stabilization
- Surfactants and co-solvents

Latex-Polymer Particle Size and Distribution
The primary site for the associative characteristics of a rheology modifier is the surface of the binder. As a consequence, a greater surface area will lead to stronger association. Greater association leads to an increased efficiency.

For a given volume of unimodal latex binder, a small particle size binder will have a greater total surface area than a larger particle size binder. Thus, the rheology modifier will work more efficiently with the smaller particle size binder. When a binder contains a distribution of particle sizes, the answer is not as clear. Here the distribution of particle sizes from large to small will determine the associative conditions more realistically than average particle size.

Latex Polymer Composition
ACRYSOL™ RM-8WE Rheology Modifier is most efficient with hydrophobic latexes. This hydrophobicity may vary with the latex composition or the stabilizing system.

Surfactants
The hydrophobic nature of surfactants allows them to compete with the associative capacity of the rheology modifier for the latex polymer surfaces. If the surfactant is able to displace the rheology modifier, the viscosity that is inherent to the rheology modifier polymer interaction can be reduced considerably. This means that special attention is needed for the type and amount of surfactant that is used, and to the combination with the binder. In addition, consideration must be given to the surfactants introduced with the colorant system. Pre-dispersed colorants generally contain surfactants for stability and to facilitate color acceptance. Each colorant may have a different type and level of surfactant.

Co-solvents
Water insoluble co-solvents, such as UCAR™ Filmer IBT, have little or no effect on the medium shear viscosity of a paint thickened with an associative thickener. Water soluble co-solvents, however, may reduce the low shear viscosity. Products such as ethylene glycol and propylene glycol will have the least effect, while BUTYL CARBITOL™ Solvent will have the greatest effect among the co-solvents tested to date. As in the case of surfactants, the level of co-solvent that is introduced with a pre-dispersed colorant must be accounted for. One outcome of this co-solvent interaction is the potential to use these products for low shear viscosity adjustments. This can be done very effectively, but with a cost penalty and a potential reduction in water resistance due to the water solubility of these products.

Handling Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal Considerations

Dispose in accordance with all, local or national regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local or national regulations. Contact your Dow Coating Materials Technical Representative for more information.

Chemical Registration

Many countries within EMEAI require the registration of chemicals, either imported or produced locally, prior to their commercial use. Violation of these regulations may lead to substantial penalties imposed upon the user, the importer or manufacturer, and/or cessation of supply. It is in your interests to ensure that all chemicals used by you are registered. Dow does not supply unregistered products unless permitted under limited sampling procedures as a precursor to registration.

Note on EMEAI Product Line

Product availability and grades vary throughout the countries in the EMEAI area. Please contact your local Dow Coating Materials representative for further information and samples.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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www.dow.com

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