



ACRYSOL™ RM-8W Rheology Modifier

For Water Based Coatings

Regional Product Availability

EMEA

Summary

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

ACRYSOL™ RM-8W Rheology Modifier is a mid shear builder with a rheology profile similar to the ones of ACRYSOL™ RM-8 and ACRYSOL™ RM-825 Rheology Modifier but is delivered free of solvents*.

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

ACRYSOL™ RM-8W 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. ACRYSOL™ RM- 8W Rheology Modifier has excellent compatibility at all blend ratios with the more newtonian, solvent-free* ACRYSOL™ RM-2020 E and ACRYSOL™ RM-5000 Rheology Modifiers.

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

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

Characteristics of the Product

- No added Solvent*
- Low odour
- Resistant to enzymatic attack
- Excellent water and alkali resistance
- Excellent spatter resistance
- Use over a wide pH range
- Ease of handling

* Solvents 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**

*Total solids content is 21.5% including solvent-free proprietary viscosity suppressant

**Hydrophobically modified polyethylene oxide urethane

Formulation Guidelines

ACRYSOL™ RM-8W 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. Occasionally, this rheology modifier can show some separation (which does not affect the quality of the product) and we recommend agitating the material before using.

ACRYSOL™ RM-8W Rheology Modifier should not be preblended 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-8W Rheology Modifier is a mid shear HEUR type thickener with a rheology profile, similar to the ones of ACRYSOL™ RM-8 and ACRYSOL™ RM-825 Rheology Modifiers, but is delivered without added solvents.

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

ACRYSOL™ RM-8W 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, solvent free ACRYSOL™ RM- 2020 E Rheology Modifier. The combination of the two gives a wider formulation latitude to the paint formulator than previously attainable for solvent free systems.

Dispersing Agents

Dispersing agents with low ionic content usually work well with ACRYSOL™ RM-8W Rheology Modifier. OROTAN™ 165, 681 and 731-A ER Pigment Dispersant are all very compatible and OROTAN™ 1124 Pigment Dispersant can be recommended as well. For environmentally friendly, low odour paints we suggest the ammonia and solvent free* OROTAN™ 731-A ER 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.

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

Paint pH Control

Being nonionic, ACRYSOL™ RM-8W 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-8W Rheology Modifier, a pH between 7.0- 9.0 will give best stability and rheology control.

Thickener Combinations

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

Interactive Effects of the Paint System

The rheology modifying mechanism of ACRY SOL™ RM-8W 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 ACRY SOL™ RM-8W Rheology Modifier in latex paints:

- Latex polymer particle size and distribution
- Latex polymer composition and stabilisation
- 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

ACRY SOL™ RM-8W Rheology Modifier is most efficient with hydrophobic latexes. This hydrophobicity may vary with the latex composition or the stabilising 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 colourantsystem. Predispersed. colourants generally contain surfactants for stability and to facilitate colour acceptance. Each colourant 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 predispersed colourant 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.

Distinct Technology

Although the thickener is purely nonionic by nature, this technology accounts for the fact that in many ways ACRY SOL™ RM-8W Rheology Modifier does not behave in the exact same manner as its predecessor (ACRY SOL™ RM-8 Rheology Modifier). This is particularly true about its interactions with surfactants and co-solvents (in case they are used).

With most urethane thickeners, addition of surfactants leads to lesser efficiency. In the case of ACRY SOL™ RM-8W Rheology Modifier, quite the opposite can occur. Up to a certain point, addition of surfactants may increase the thickening efficiency, until a certain maximum is reached, after which the product behaves like a traditional urethane rheology modifier and efficiency starts to drop. Therefore, if increased efficiency is required, testing addition of surfactants is suggested, in particular when the binder system is stabilised by colloids. In these situations TERGITOL™ 15S40 Surfactant has proved to be effective.

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.
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