

Formulation challenges and product recommendations

BASF offers a broad range of rheology modifiers, each one designed for specific application areas and customer requirements.

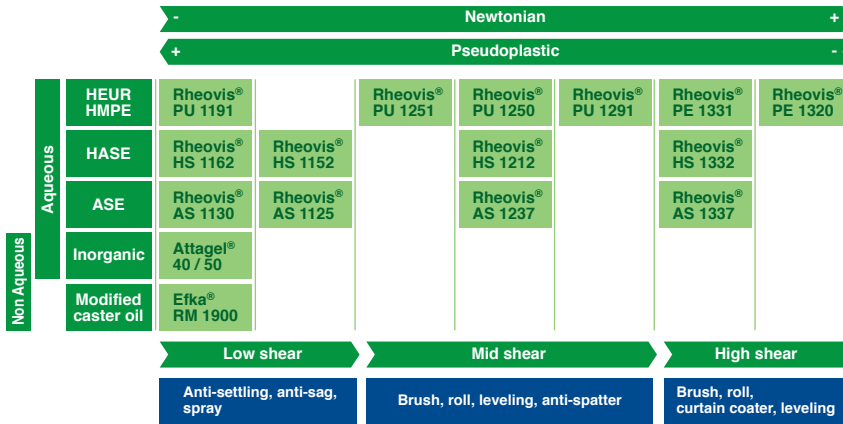


Figure 21: BASF rheology modifier recommendations and their corresponding shear profiles.

HEUR: hydrophobically modified ethoxylated urethane
HMPE: hydrophobically modified polyether
HASE: anionic polyacrylate copolymer hydrophobically modified
ASE: anionic polyacrylate copolymer

Typical challenges customers encounter while formulating paints are:

- **Leveling** – Good leveling is needed to ensure a smooth finish, to avoid brush and roller marks.
 - High shear thickeners help to improve leveling.
- **Brush drag** – A well balanced brush drag is needed to provide perfect hiding power.
 - Mid shear thickeners help to adjust the “resistance” needed to process the paint.
- **Sagging** – Sagging leads to gravity-driven irregularities in thickness and can be prevented by rendering the paint pseudo-plastic in behavior.
 - Low shear thickeners promote pseudo-plastic behavior and improve sag resistance.
- **Spattering characteristics**
 - Associative thickeners allow for low spatter characteristics.
- **Anti-settling** - Homogenous distribution of components of paint allow for a ready-to-use paint without stirring / mixing.
 - Attagel clay provides anti-settling characteristics.

A. Rheology control in aqueous systems, low shear thickening, strong pseudoplasticity

Rheovis PU 1191
 Latest generation strong low-shear associative thickener with excellent performance and easy handling. Strong pseudoplasticity Low VOC, heavy metal and APEO free.

Rheovis HS 1162
 Low VOC, hydrophobically modified alkali-swella-ble emulsion (HASE); strong thixotropic flow-behavior; low water uptake; no impact on wet adhesion even after long water contact; highly recommended for non-dripping stains and paints.

Rheovis HS 1152
 Low VOC, hydrophobically modified alkali-swella-ble emulsion (HASE) for paints and plasters; improves anti-sagging; prolongs open time.

Rheovis AS 1130
 Low VOC alkali-swella-ble emulsion (ASE); highly efficient low-shear thickener; high shear thinning, anti-sagging and anti-settling; highest yield point; used in pigment and filler slurries but also highly successful in industrial and automotive formulations for spray applications.

Rheovis AS 1125
 Low VOC alkali-swella-ble emulsion (ASE); low-shear thickener; highly shear thinning; anti-sagging; high yield point; lower water uptake.
Attagel 50
 The Attagel 50 grade is a premium attapulgite clay product with low residue, small particle size and uniquely rounded particle edges. It is most desired in applications where fineness, surface smoothness and sprayability of the end-use product are critical.

B. Rheology control in aqueous systems, mid shear thickening, medium to low pseudoplasticity

Rheovis PU 1291
 Low VOC, odor-free, associative thickener that shows high efficiency in mid-shear viscosity at lower dosage. This well-balanced mid-shear rheology modifier allows for improved film build and excellent film appearance. It is suitable for all types of aqueous paints and coatings: premium flat & eggshell, semi-gloss and gloss coatings.

Rheovis PU 1250
 Associative mid-shear thickener that is used for modification of the flow properties of water-based coatings. Offers good spatter resistance and the potential to increase film build.

Rheovis PU 1251
 Low VOC associative mid-shear thickener with good contribution to low shear viscosity. Recommended for high volume solids paints and offers improved compatibility and ease of incorporation.

Rheovis AS 1237
 Low VOC alkali-swella-ble emulsion (ASE); mid-shear thickener for high PVC systems. Recommended for paints requiring good flow and leveling.

Rheovis HS 1212
 Low VOC, hydrophobically modified alkali-swella-ble emulsion (HASE) for high quality waterborne systems where good flow and leveling are required. Improves flow; excellent efficiency; all-round product which can be used in most paint systems.

C. Rheology control in aqueous systems, high shear thickening, Newtonian

Rheovis PE 1320
 Associative thickener designed to modify the high shear viscosity in water-based coatings. Offers good flow and leveling properties and is also recommended for use in high-gloss and semi-gloss coatings.

Rheovis PE 1331
 Highly efficient associative thickener for high shear viscosity. Excellent flow and leveling and high film build. Best in class ICI performance. Low VOC, heavy metal and APEO-free.

Rheovis HS 1332
 Low VOC, hydrophobically modified alkali-swella-ble emulsion (HASE) for high shear viscosity build. The most Newtonian ICI builder in the product range, used when excellent flow and leveling is required with a HASE thickener.

Rheovis AS 1337
 Low VOC alkali-swella-ble emulsion (ASE); high-shear thickener for aqueous systems. Recommended for paint which require high flow with low influence on viscosity upon colorant addition.

D. Rheology control in non-aqueous systems

Efka RM 1900
 Castor oil based micronized powder offering a strong thickening effect; high thixotropy, anti-sagging, improved working and flow properties.
Attagel 50

The Attagel 50 grade is a premium attapulgite clay with low residue, small particle size and uniquely rounded particle edges. It is most desired in applications where fineness, surface smoothness and sprayability of the end-use product are critical.