

Carbopol[®]* EZ-3 Polymer

A Versatile, High Efficiency, Self-Wetting Rheology Modifier for Household and I&I Applications

Introduction

Carbopol[®] EZ-3 polymer is a patented hydrophobically modified crosslinked polyacrylate powder. It is a high efficiency, self-wetting rheology modifier designed to impart thickening, emulsion stabilization and suspension properties to a wide range of household products. Carbopol[®] EZ-3 polymer is an easy to use, all purpose product for use in applications where high efficiency, moderate electrolyte tolerance, good emulsion stabilization and ease of handling are key requirements.

Benefits

Carbopol[®] EZ-3 polymer provides numerous benefits in a wide variety of HI&I formulations:

- Very fast self-wetting
- Moderate speed of break with good shear-thinning rheology
- Provides low misting and controlled spray pattern
- Provides highest yield stress and most rigid gels
- Good clarity
- Excellent vertical cling and suspension properties

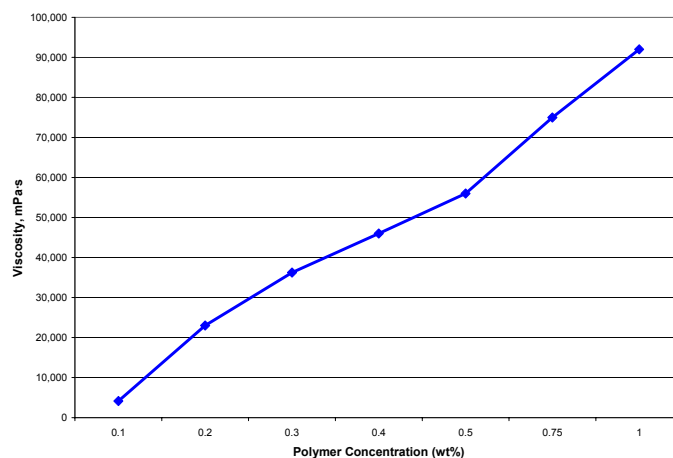
Applications Suggestions

- Hard surface gel cleaners
- Abrasive cleaners
- Gelled Fuels
- Hard surface sanitizing gels
- Auto care waxes, polishes and protectants

Product Performance

Carbopol[®] EZ-3 polymer is a very efficient thickener and stabilizing agent. The use level is dependent upon desired characteristics and is influenced by the formulation nature and quantity of other ingredients.

Carbopol[®] EZ-3 Polymer Viscosity vs. Concentration – The graph below shows the effect of Carbopol[®] EZ-3 polymer concentration on viscosity.



Data obtained at pH 6.3 polymer neutralized with NaOH, using Brookfield RVT at 20 rpm @ 25°C

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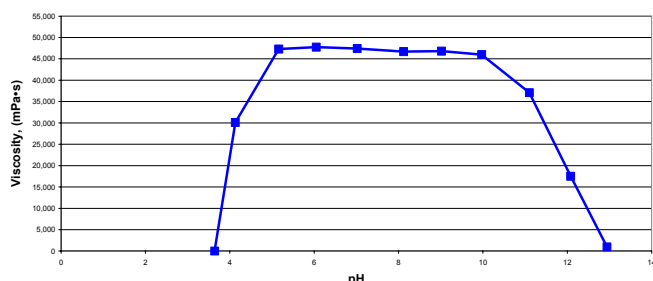
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For further information, please visit www.homecare.noveon.com

Broad Suitable pH range

Carbopol® EZ-3 Polymer is effective across a broad pH range giving the formulator maximum flexibility for a wide range of applications.

Carbopol® EZ-3 Polymer Viscosity vs. pH – The graph below shows the effect of pH on the viscosity of Carbopol® EZ-3 polymer at 0.5 wt%.



Viscosity data obtained using Brookfield RVT at 20 rpm @ 25°C

Ingredient Compatibilities

Carbopol® EZ-3 Polymer is compatible with many materials including nonionic surfactants, alcohols, waxes and abrasives. In addition, Carbopol® EZ-3 Polymer is also compatible with oxidizers such as hydrogen peroxide.

The viscosity and yield value provided by Carbopol® EZ-3 Polymer can be influenced by the ionic strength of the system. Deionized or soft water is therefore recommended in product applications. Carbopol® EZ-3 Polymer does not support bacterial or fungal growth, but it does not inhibit such growth either. Typical use of preservatives is recommended as appropriate in the formulated system.

Physical Properties

Carbopol® EZ-3 polymer has the following typical physical properties:

Product Description	
Appearance	White powder
Odor	Mildly acrylic
Total Solids (wt%)	100
pH (aqueous dispersion)	2.5 - 3.5
Mucilage Viscosity (0.5 wt%, mPa·s)	45,000 - 65,000

Formal product specifications are available upon request.

Order of Addition

To ensure maximum benefit and efficiency from the polymer, we recommend the following order of addition:

1. Water (deionized).
2. Carbopol® EZ-3 polymer.
3. Surfactants.
4. Builders (phosphate, zeolite, etc.).
5. Oils, waxes, etc.
6. Neutralizers and other high pH materials.
7. Abrasives, aesthetics, etc.

Note: For formulations with high levels of electrolytes or surfactants, partial neutralization (adding 10.0 wt% of neutralizer to Carbopol® EZ-3 polymer) before adding surfactants may be beneficial.

Processing Guidelines

- Sprinkle the polymer onto the surface of the water (no special hydration or mixing equipment needed). The powder will self-wet and drop below the surface in minutes.
- When there is no visible white powder on the water surface, begin agitation.
- Conventional impellers such as propellers or turbines are recommended.
- Extremely high shear (>5,000 rpm) mixers or homogenizers should be cautiously used because high shear can impact and destroy the polymer gel structure resulting in permanent viscosity loss.
- Reduced processing time is possible if the polymer is added to the vortex of water under agitation. Dispersion will be faster if added to warm water. The optimal water temperature is 40-50°C.
- Upon neutralization, a grainy “applesauce” appearance may be noted initially. Over the next 30-60 minutes the neutralized gel clusters will continue to relax and expand. Using gentle mixing will yield a smooth gel.
- Polymer clumping can occur if the polymer is added to water and agitation is started before the polymer is allowed to self-wet. This can be avoided by adding the polymer to water under moderate agitation.

Special Processing Note: Some producers choose to make a stock dispersion of Carbopol® EZ-3 polymer in water and then add this dispersion to their formulation mix tank. Unlike traditional Carbopol® polymers, Carbopol® EZ-3 polymer can be dispersed at concentrations up to 6.0 wt% and still remain pumpable.

Handling and Storage

Packaging: 20 kg cardboard boxes.

Shelf-Life: 2 years.

Storage: Store in cool, dry, well-ventilated area.

Consult the Carbopol® EZ-3 polymer MSDS for additional pertinent information.

Additional Literature

Please visit www.homecare.noveon.com for other product Quick Start Guides as well as Specifications, Technical Data Sheets, Toxicology Studies, Patents, Certificates of Origin and Formulations.