

PARALOID™ K-400

All-Acrylic Modifier for Cellular Vinyl Products

Description

PARALOID K-400 modifier is a free-flowing, white powder that efficiently improves the quality and processability of cellular Vinyl products. This relatively high molecular weight acrylic copolymer increases interparticle friction during processing and aids in the breakdown of the Vinyl grains. Not only does this accelerate the fusion process, but the necessary melt elasticity exists to trap the evolving gas and prevent the bubbles from coalescing. Modifying Vinyl foam formulations with acrylic copolymers provides:

- Reduced foam density
- Improved surface quality
- Good cell uniformity
- Functional impact strength

PARALOID K-400 all-acrylic foam modifier provides the following benefits over earlier products from Rohm and Haas and over competitive modifiers:

- Improved efficiency because less modifier is required to attain the targeted density
- Makes possible lower densities
- Excellent surface quality
- Increased processing flexibility
- Effective in free foam, inward-foaming or coextrusion processes

Physical Description

Chemical Description: Acrylic Polymer-based compound

Appearance: Free-flowing white powder

Bulk Density: 0.40 - 0.52

Improved Efficiency/Lower Density

PARALOID K-400 modifier provides the ability to achieve low, targeted densities efficiently in cellular Vinyl formulations. Lower density foam is achieved in tin-stabilized formulations when using PARALOID K-400 rather than competitive modifiers. A converter now has the option of using less modifier to attain the desired density or to supply an even lighter product to the market.

Typical Formulation

This formulation was used to obtain the data reported in this data sheet.

| Material | Formulation |
|----------------------------------|-------------|
| Vinyl (K=69) | 100.0 |
| ADVASTAB™ TM-950F Tin Stabilizer | 0.6 |
| Calcium Stearate | 0.8 |
| Wax | 1.2 |
| PARALOID K-400 Modifier | 4.0 |
| Calcium Carbonate | 5.0 |
| Titanium Dioxide | 0.75 |
| Azodicarbonamide | 0.35 |

Smooth Surface

The surface of Vinyl foam sheets or profiles modified with PARALOID K-400 modifier is exceptionally smooth compared to either unmodified Vinyl or Vinyl with competitive modifiers. The surface can be easily finished or laminated without further treatment prior to the decoration step.

Uniform Cell Structure

PARALOID K-400 modifier has a significant effect on the viscosity and melt elasticity of the Vinyl foam formulation and this, in turn, influences the cell morphology or cell size and distribution and the subsequent physical properties. Increasing the level of PARALOID K-400 modifier results in a small uniform closed-cell structure.

Excellent Processability

PARALOID K-400 modifier has the ability to reduce fusion time. This allows improved processing flexibility through lower operating temperatures or increased output rates.

Fusion and Heat Stability Characteristics

| | PARALOID K-400 | PARALOID K-125 | Competitors | |
|--|----------------|----------------|-------------|------|
| | | | A | B |
| Brabender Fusion Conditions: 160°C/60 RPM/60 gram charge | | | | |
| Fusion Time (seconds) | 108 | 142 | 126 | 356 |
| Melt Temperature at Fusion (°C) | 180 | 176 | 180 | 173 |
| Fusion Torque (meter grams) | 4750 | 4400 | 5050 | 4600 |
| Brabender Fusion Conditions: 185°C/60 RPM/60 gram charge | | | | |
| Fusion Time (seconds) | 44 | 52 | 54 | 60 |
| Melt Temperature at Fusion (°C) | 178 | 180 | 185 | 184 |
| Fusion Torque (meter grams) | 3750 | 3600 | 3550 | 3450 |

Technical Support

Since there are many different end use applications and production processes for Vinyl foam, it is critical for manufacturers to optimize formulations. Rohm and Haas has the technical resources and market knowledge to provide specific formulation solutions for a wide range of processes and applications. We have foam development groups at our technology centers in Spring House, Pennsylvania, USA and Valbonne, France. These development and testing laboratories are equipped with the latest foam extrusion lines that serve as proving grounds to establish processing conditions for various end uses. In addition, we offer customers all of our analytical services for product characterization and problem solving.

Standard Packaging

The standard package is either a unitized pallet of 50 x 50 lb. bags (2500 lb. net) or a unitized pallet of 2 x 1000 lb. bags (2000 lb. net). Please check with your account representative for specific package availability as some packages are dependent upon density and demand of material.

Storage and Handling (see MSDS for details)

Standard recommended storage conditions are as follows:

- Store indoors, protected from weather (moisture)
- Temperature should not exceed 60°C
- Protect from ultraviolet light
- With stretch hood or stretch wrap intact (if applicable)

Unopened (if material is opened, it should not be left exposed and should be used within one month); ambient temperature preferred.

When stored correctly in the original packaging, the shelf life is:

2.5 years from date of manufacture

Safe Handling Information

Avoid high concentrations of dust in air and accumulation of dust on equipment. An airborne dust of this material can create a dust explosion. When handling and processing this material, local exhaust ventilation may be required to control dust and reduce exposure to vapors. To prevent dust explosions, employ bonding and grounding for operations capable of generating static electricity. Dispose of by placing powder or pellets in air tight bags. Incinerate or landfill at a permitted facility in accordance with local, state, and federal regulations.

Material Safety Data Sheets (MSDS)

Material Safety Data Sheets are available outlining hazards and safe handling methods. Contact Rohm and Haas for copies of the MSDS for this product and for other handling information.

Rohm and Haas Plastics Additives Solutions Provider Product Range

| | |
|----------------------|--|
| ACRYLIGARD™ | Weatherable Acrylic Capstock Resins CS-100 Series: Weatherable Capstock Resins with Gloss Reducer CS-200 Series: Weatherable Capstock Resins |
| ADVALUBE™ | Specialty Lubricants F-1000: Internal Lubricants E-2000: External Lubricants B-3000: Balanced Lubricants |
| ADVAWAX™ | Specialty Waxes 200 Series: Balanced Lubricants for Broad Process Window in Extrusion and Injection Molding |
| ADVASTAB | Thermal Stabilizers TM-Series: TGA-based and Reverse Ester Stabilizers |
| ADVAPAK™ | Stabilizer/Lubricant One-Packs S-1000: Methyl Tin One-Packs |
| PARALOID | Impact Modifiers KM-300 Series: Acrylic Impact Modifiers for Weatherable Vinyl Applications BTA Series: MBS Impact Modifiers for Non-weatherable Vinyl Applications |
| PARALOID | Processing Aids K-100 Series: General Purpose Acrylic Processing Aids K-400 Series: High Molecular Weight Acrylic Processing Aids |
| PARALOID | Acrylic Multi-functionals and Specialties KM-388/KM-390: Low-Gloss, Wood-Look/Smooth, Satin Finish KM-940: High-Gloss, Fast Fusion, Improved Processability HT-100: Heat Distortion Resistance for Vinyl KF-710: For Matte Appearance in Vinyl |
| PARALOID EXL™ | Additives for Engineering Resins EXL-2300/3300 Series: Acrylic Impact Modifiers for Engineering Resins EXL-2600/3600 Series: MBS Impact Modifiers for Engineering Resins EXL-5136: Gloss Reducer for Engineering Resins |
| VINYZENE™ | Antimicrobials for Plasticized Vinyl, TPU, PU, TPE, Rubbers, Polymeric Alloys Active Ingredient: DCOIT in Liquid and Solid Carriers Active Ingredient: OBPA in Liquid and Solid Carriers Active Ingredient: OIT in Liquid and Solid Carriers Active Ingredient: TCPP in Liquid and Solid Carriers |

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July 2002
PA K-400.PB0702E