ROPAQUE™ ULTRA-X Opaque Polymer
Ammonia-free Opacifying Polymer for Paints and Coatings

Regional Product Availability
Asia-Pacific

Description
ROPAQUE™ ULTRA-X Opaque Polymer represents excellent performance for a polymeric opacifying agent. Like its predecessors, ROPAQUE ULTRA-X Opaque Polymer, is a hollow sphere polymeric pigment allowing paint manufacturers to reduce the raw material cost of their formulations with no performance penalties. It maintains the same efficiency and light scattering ability of ROPAQUE ULTRA Opaque Polymer, with the added advantage of being ammonia free.

In addition to offering very efficient dry opacity properties, ROPAQUE ULTRA-X Opaque Polymer offers a wide range of benefits in interior and exterior paint formulations and can be used as a ‘drop in’ replacement for ROPAQUE ULTRA Opaque Polymer.

Key Features
- Enhances titanium dioxide (TiO₂) efficiency through spacing.
- Consistent opacity contribution due to inherent light scattering.
- APEO free(1), ammonia free(2) and low VOC.
- Complements exterior durability of high quality exterior paints.

Benefits
- Offers cost savings to the formulator while offering equal hiding.
- Facilitates the formulation of low odor paints.
- Wide formulation latitude, from low to high PVC paints for interior and exterior applications.

Typical Properties
(These properties are typical but do not constitute specifications).

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Opaque, white to off-white liquid</td>
</tr>
<tr>
<td>Solids, by weight, %</td>
<td>30.0</td>
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<tr>
<td>Solids, by volume, %</td>
<td>52.0</td>
</tr>
<tr>
<td>Density (g/ml), wet</td>
<td>1.03</td>
</tr>
<tr>
<td>Density (g/ml), dry</td>
<td>0.605</td>
</tr>
<tr>
<td>pH</td>
<td>7.5</td>
</tr>
<tr>
<td>Particle size, µm</td>
<td>0.4</td>
</tr>
<tr>
<td>Viscosity (Brookfield LV #2, 60 rpm), cps</td>
<td>&lt; 500 cps</td>
</tr>
<tr>
<td>Storage precautions</td>
<td>Protect from freezing</td>
</tr>
</tbody>
</table>

(1) Manufactured without the use of Alkyl Phenyl Ethoxylate surfactants.
(2) Manufactured without the use of aqueous ammonia
ROPAQUE™ Opaque Polymers

ROPAQUE™ Opaque Polymers are non film forming, emulsion polymers, containing a water filled void. During the drying process of the paint, the water in the void diffuses through the polymer shell and leaves an air void. Due to the difference in refractive index between air and the surrounding polymer, light is effectively scattered, contributing to film opacity.

ROPAQUE Opaque Polymers have a narrow particle size distribution and are similar in size to TiO$_2$ particles. This allows them to act like ultra fine inorganic extenders, spacing TiO$_2$ effectively and therefore increasing its efficiency as a primary pigment.

Compared to inorganic small particle size pigment extenders, ROPAQUE Opaque Polymers have a very low specific surface area due to their uniform, spherical shape and non porous surface. The binder demand of ROPAQUE Opaque Polymers is therefore significantly lower, giving the possibility of formulating at higher pigment volume concentrations.

The combined effect of these three product features can be used by paint formulators to either reduce paint cost without negative effect on paint performance, or alternatively, improve paint performance without increasing costs.

Light scattering theory shows that the two parameters most impacting the hiding efficiency are the particle size of the hollow spheres and the void fraction. The optimum light scattering efficiency is obtained at a particle diameter of roughly 0.40µm. The innovative process used to manufacture ROPAQUE ULTRA-X Opaque Polymer enables an optimum particle size (0.38µm) with a maximized void fraction of 44%.

Exterior and Interior Applications

Dow Coating Materials chemists have compiled data confirming that the use of ROPAQUE™ ULTRA-X Opaque Polymer has no adverse effect on the durability of latex paints. In the case of tinted paints, experience has shown that formulations employing ROPAQUE Opaque Polymer exhibit a slight performance advantage in tint retention.

Interior Applications

The lower levels of titanium dioxide and extender pigments in paints containing ROPAQUE™ Opaque Polymer can offer paint films greater resistance to burnishing during cleaning. The hydrophobicity of ROPAQUE Opaque Polymer may also help make the paint film less water sensitive. The overall effect is to improve washability properties.

Below CPVC Formulations

Introducing ROPAQUE™ ULTRA-X Opaque Polymer in conventional paints below the critical pigment volume concentration (CPVC) allows paint manufacturers to reduce the level of TiO$_2$ and allows notable cost savings with equal properties in dry opacity. Because ROPAQUE ULTRA-X Opaque Polymer has a comparatively low binder demand, the total PVC can be slightly increased without sacrificing paint performance.

Interactions with Other Paint Ingredients

The hiding properties of ROPAQUE™ ULTRA-X Opaque Polymer depend on the integrity of the hollow sphere in the paint film. All ROPAQUE Opaque Polymers can be affected by certain solvents, plasticizers, and surfactants especially those with a significant aromatic content. These materials can soften the polymer shell and cause the collapse of the spheres during film formation. Alcohol-based coalescents and glycols are much less of an issue and can be used up to 90 grams per litre.
Formulating Tools

Dow Coating Materials has developed computer programs specifically to make it easy to re-formulate paints with ROPAQUE™ ULTRA-X Opaque Polymer. Contact your Dow Coating Materials Technical Representative for more information.
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

Dispose in accordance with all local, state (provincial) and federal 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, state (provincial) and federal regulations. Contact your Dow Coating Materials Technical Representative for more information.

Chemical Registration

Many countries within the Asia-Pacific 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 Asia-Pacific Product Line

Product availability and grades vary throughout the countries in Asia-Pacific. 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.

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