



## **RHOPLEX™ HG-44P Acrylic Co-polymer Emulsion**

For Exterior and Interior High Gloss and Semigloss Enamel Applications

### **Regional Product Availability**

- North America

### **Description**

RHOPLEX™ HG-44P Acrylic Co-polymer Emulsion was developed specifically as a paint vehicle for both interior and light duty exterior high gloss and semigloss enamels. This aqueous latex allows the formulator to make enamel-like paints with the outstanding block resistance, stain removal, and washability needed for indoor use. RHOPLEX™ HG-44P Emulsion also has good metal adhesion, resistance to household chemicals and can be formulated for light maintenance applications. With RHOPLEX™ HG-44P Emulsion, enamels can be easily formulated that represent a true alternative to oil-based paints. All of these benefits can be achieved without sacrificing the advantages inherent in high-quality waterborne acrylic paints.

### **Performance Advantages**

RHOPLEX™ HG-44P Emulsion offers enhanced hardness and block resistance. Its resistance to blocking, even at elevated temperatures, makes it an excellent choice for use on window frames and sills, bookcases, and other areas where sticking is a problem with softer latex products.

Exposure testing at The Dow Chemical Company Exposure Testing Station indicates that gloss enamels based on RHOPLEX™ HG-44P Emulsion will maintain good appearance and protection over primed and sound repainted surfaces (both acrylic and alkyd).

Performance advantages over gloss alkyd paints include early re-coatability, alkali and mildew resistance, grain crack resistance and gloss retention. As the table shows, the enamel based on RHOPLEX™ HG-44P Emulsion has an excellent balance of application properties, durability, and adhesion over a variety of substrates.

### **Typical Physical Properties**

(These properties are typical and should not be considered specifications).

<b>Properties</b>	<b>Value</b>
Appearance	Milky-white liquid
Solids Content	41.5%
pH	7.5–8.5
Brookfield Viscosity (#3 spindle, 60 rpm)	1,500 cP max.

## Typical Physical Properties (Cont.)

Properties	Value
Density	8.5 lb / US gal.
Bulking Value of Dry Solids	0.113 US gal./lb
Specific Gravity	1.020 g/l
Minimum Film Formation Temperature (MFFT)	27°C

### Benefits of Enamels based on RHOPLEX™ HG-44P Emulsion

#### Application and Appearance

- Excellent gloss
- Alkyd-like application process
- Excellent flow and leveling
- Early tack-free time
- Good hardness development
- Low odor

#### Performance

- Very good block and print resistance
- Excellent adhesion to repainted surfaces, including aged alkyds, under wet and dry conditions
- Ease of stain removal
- Resistance to yellowing
- Excellent mildew resistance

## Performance Properties of Gloss Paints

Comparison of gloss paints formulated with RHOPLEX™ HG-44P Emulsion and alkyd vehicles

	RHOPLEX™ HG-44P Emulsion	High Solids Alkyd	Conventional Alkyd
<b>Application/Appearance Properties</b>			
Flow (10 = Best)	8+	9	9
Tack Free Time (Hours)	4	18	11
<b>Gloss</b>			
60 Initial	85	90	90
60 (Aged for 2 Weeks)	82	82	82
Yellowing	Excellent	Very Poor	Very Poor
<b>Exterior Properties</b>			
Gloss Retention	Good	Very Poor	Poor
Grain Crack Resistance	Good	Fair	Good
Mildew Resistance	Excellent	Poor	Poor
<b>Early Blister Resistance</b>			
Over Alkyd	Excellent	Excellent	Excellent
Over Chalk	Excellent	Excellent	Excellent

## Performance Properties of Gloss Paints (Cont.)

	RHOPLEX™ HG-44P Emulsion	High Solids Alkyd	Conventional Alkyd
<b>Exterior Properties</b>			
Adhesion to Galvanized Steel	Very Good	Very Poor	Very Poor
Alkali Resistance (Over Cementitious Substrates)	Very Good	Poor	Poor
<b>Interior Properties</b>			
Block Resistance			
Early	Very Good	Very Poor	Poor
Ultimate	Very Good	Excellent	Excellent
Alkyd Adhesion	Excellent	Excellent	Excellent
Alkali Resistance	Excellent	Fair	Fair
Stain Removal	Very Good	Good	Very Good

### Formulation

Starting point formulations for using RHOPLEX™ HG-44P Emulsion in gloss, semigloss, or gloss tint base paints are separate from this bulletin. These formulations are intended to serve as guidelines for developing paints that use the outstanding properties of RHOPLEX™ HG-44P Emulsion to its fullest advantages. The most current starting point formulations for this product are available from your Dow representative.

#### Rheology Modifiers

ACRY SOL™ RM-2020NPR Rheology Modifier is a nonionic polyurethane thickener which when used with RHOPLEX™ HG-44P Emulsion imparts alkyd-like application properties, such as good brush-drag which results in high film build. ACRY SOL™ RM-2020NPR Rheology Modifier is very efficient in achieving high shear viscosity. The optimum pH range for paints based on a combination of RHOPLEX™ HG-44P Emulsion and ACRY SOL™ RM-2020NPR Rheology Modifier is 8.0 to 8.5.

ACRY SOL™ DR-5500 Rheology Modifier is also recommended for use with RHOPLEX™ HG-44P Emulsion at a maximum level of 3 percent active ingredient based on RHOPLEX™ HG-44P Emulsion solids. The optimum pH range for paints based on this combination is 8.3 to 8.8.

Cellulosic thickeners can detract from the excellent flow, leveling, and gloss of paints based on RHOPLEX™ HG-44P Emulsion.

#### Dispersants and Pigments

The type and level of pigment dispersant play an important role in attaining a desirable balance of rheology, gloss, and stability in a paint formulation. In ACRY SOL™ DR-5500 Rheology Modifier thickened formulations, TAMOL™ 1124 Dispersant is recommended for good gloss, flow, and lower cost at a level of 1 percent (active ingredient) on pigment. In formulations using ACRY SOL™ RM-2020NPR Rheology Modifier as the primary thickener, TAMOL™ 681 Dispersant at levels between 2 and 5 percent (active ingredient) on pigment provides excellent rheology while maintaining a good balance of overall properties. This dispersant/thickener combination gives formulations with higher film-build characteristics. Typically, high-shear viscosities can be well above 2.0 poise without difficulty in brushing.

## **Formulation (Cont.) Dispersants and Pigments (Cont.)**

The choice of the proper titanium dioxide grade is another important factor in achieving high gloss in enamels. Universal or Gloss Grades such as Ti-Pure R-706, Tiona 535 or 628, and Tioxide TR-92 work well with RHOPLEX™ HG-44P Emulsion.

The consistency of the pigment grind can affect gloss level as well. A relatively "tight" grind is preferred. This maximizes energy input and thereby increasing the degree of dispersion of the titanium dioxide. The greater the degree of dispersion, the higher the gloss.

ROPAQUE™ Ultra Opaque Polymer is a non-film forming pigment engineered to optimize hiding in architectural coatings. In addition to inherent hiding properties, it enables the formulator to improve properties and realize cost savings. ROPAQUE™ Ultra Opaque Polymer is performance proven for interior and exterior applications and can be effectively used in semigloss enamel formulations based on RHOPLEX™ HG-44P Emulsion.

### **Coalescents**

Proper choice and level of coalescent is essential for good film formation under adverse conditions when using a hard, gloss enamel binder such as RHOPLEX™ HG-44P Emulsion. A low volatility coalescent facilitates formation of a tough paint film that is required for good grain crack resistance and exterior and interior durability. Texanol Ester Alcohol at a level of 18–20 percent on latex binder solids is recommended as a coalescent for RHOPLEX™ HG-44P Emulsion. Even at this high level, block resistance is excellent. Formulations which were developed for applications with less severe drying conditions can use a lower level (between 14–18 percent) of coalescent which will result in further improvements in block resistance and hardness development.

Alternative coalescents which will offer a different balance of properties are DOWANOL™ DPnB, Exxate 1000, and Hexyl Carbitol.

### **Defoamers**

With high-gloss systems, it is especially important to defoam the paint. Tiny craters, which may not show in flat paint systems, can become very noticeable in high-gloss systems. Some defoamers can even reduce the gloss of the paint. Any defoamer should be properly evaluated before it is used in a formulation.

The defoamer recommended for RHOPLEX™ HG-44P Emulsion formulations is Foamaster AP9. Alternative considerations are Byk-022, Foamex 1488, Dee Fo HG-12, Drewplus L-435, and SAG CA-101.

### **Preservatives**

An effective preservative for RHOPLEX™ HG-44P Emulsion formulations that protects the paint from manufacture through storage, transport, and end use is KATHON™ LX 1.5% Microbicide. Recommended level of addition of this microbicide is 1.5 pounds of product as supplied per 1,000 pounds of paint

## **Formulation (Cont.) Tinting Systems**

The level and type of colorants added to paints based on RHOPLEX™ HG-44P Emulsion can affect the gloss, rheology, and application properties of the finished paints.

Tinting systems such as the Nuodex Colortrend 8800 series (glycol-dispersed) work well with RHOPLEX™ HG-44P Emulsion. Paint formulators may also prepare colors by grinding pigments, or with water-dispersed colors such as Harshaw Aurasperse. This method may be preferred for medium and deeptone paints because it does not affect gloss and rheology as much as some glycol-based colorants do when used at a high level.

### **Primer Recommendations**

High gloss enamels based on RHOPLEX™ HG-44P Emulsion show best exterior durability when applied over previously painted or primed surfaces. A stainblocking primer based on RHOPLEX™ MV-23LO Emulsion Copolymer (Formulation P-23LO-22) is recommended for use under gloss enamels when a primer is required.

### **Early Rust Resistance**

Over metal surfaces, a water-based or oil-based primer is recommended under gloss enamels based on RHOPLEX™ HG-44P Emulsion. However, if there is a chance of an enamel based on RHOPLEX™ HG-44P Emulsion coming into direct contact with metal, then the addition of 1 pound of sodium nitrite to 100 gallons of a RHOPLEX™ HG-44P Emulsion formulation which uses TAMOL™ 681 Dispersant and ACRY SOL™ RM-2020NPR Rheology Modifier is recommended. Sodium nitrate should be added to the letdown as a 15% solution in water. This addition will minimize both flash and early rust.

**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.

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Stewardship**

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