



PRIMAL™ CM-219 EF

UNIVERSAL STYRENE ACRYLIC BINDER

SUMMARY

Primal™ CM-219 EF is a multipurpose, APEO free, Styrene/Acrylic copolymer dispersion at 50% solids content for the formulation of interior and exterior emulsion paints, primers, undercoats, putties, etc. to be applied on all sorts of mineral substrates such as masonry, plasters, fibre cement and concrete, amongst others.

Although Styrene/Acrylic polymers as a group do not reach the level of performance typical of pure Acrylic polymers, **PRIMAL™ CM-219 EF** (when formulated for outdoor use) still offers very acceptable exterior durability, especially in those areas where exposure to sunlight is moderate.

Characteristics of the product:

- APEO free
- Excellent binding properties and pigment loading acceptance
- Very good adhesion on mineral substrates
- Good exterior durability
- Excellent water and alkali resistance
- Good efflorescence resistance
- Good Dirt Pick Up resistance
- Versatility for broad formulating latitude
- Easy to handle and formulate

Typical physical properties	
(Not to be used as specifications)	
Appearance	Milky white liquid
Solids content	49.5 – 50.5 %
pH	6.8-7.8
Brookfield LV Viscosity (spindle 3, 60 rpm)	< 500 mPa.s
Minimum Film Formation Temperature	~ 19°C
Specific gravity (wet polymer)	1.06 g/cm ³
Specific gravity (dry polymer)	1.12 g/cm ³

FORMULATIONS GUIDELINES

Primal™ CM-219 EF demonstrates wide formulation latitude from gloss through semi-gloss to matt paints which are suitable for both interior and exterior applications.

The hardness level of this binder makes **Primal™ CM-219 EF** suitable for miscellaneous applications such as interior undercoats and wall paints making it a truly general purpose or "universal" binder for paint companies wishing to stock in bulk a minimum number of raw materials.

Below are some guidelines to help formulators:

Dispersants

In our studies, good pigment dispersion and stability results were obtained with Orotan™ 731A-ER at 0.8% to 1% active ingredient level based on pigment and extenders.

Defoamers

Standard defoamers can be used with **Primal™ CM-219 EF**. For example Foamaster® NXZ or Byk®- 024 gives good results.

Rheology Modifiers and thickeners

Rohm and Haas HEUR family (Acrysol™ RM-825, Acrysol™ RM-8W, Acrysol™ RM-2020, Acrysol™ RM-5000 and Acrysol™ SCT-275) have all been used successfully in formulating paints based on **Primal™ CM-219 EF**.

The level of associative thickener needs to be adjusted carefully. Low levels may give lapping problems over hydrophilic substrates, but high levels may lead to poor block resistance and recoat properties.

Coalescents

Water immiscible coalescent is recommended to ensure good film formation during drying. For example, Texanol gives good results with this polymer.

Extenders and Opaque polymer

Standard extenders can be used in paints formulated with **Primal™ CM-219 EF**. Calcium carbonates like Durcal 10 or Durcal 2 showed to be suitable to formulate high quality paints.

Hard extenders like Minex S 30 or lamellar type like Mica have shown to contribute to very good exterior durability.

Rohm and Haas organic opacifier Ropaque™ Ultra E has shown excellent results when used in satin to matt formulations based on **Primal™ CM-219 EF**. Additionally, the use of Ropaque™ Ultra E in exterior coatings is recommended to further improve dirt pick up and algae and mould resistance.

Biocides

Primal™ CM-219 EF is preserved with a combination of BIT (1,2-Benzisothiazolin-3-one) and DTBMA (dithio-2, 2'-bis(N-methylbenzamide).

Although standard in can preservatives could be used in paint formulations, it is recommended to always test them for compatibility and efficacy.

Rocima™ 564 is recommended as in-can preservative.

It is recommended to use Rocima™ 350 to ensure longer algae and mould resistance.



Interior / Exterior Matt Formulation

based on Primal™ CM-219 EF (PVC 70%)

M-219-70-01

Material Name	Kilograms	Liters	PVC
Grind			
Water	135.0	135.0	
Orotan™ 731A-ER (25%)	16.2	14.7	
Foamaster® NXZ ¹	1.3	1.4	
Natrosol ® 250 HBR ²	3.0	3.0	
Aqueous Ammonia (28% in water)	1.3	1.4	
Tioxide TR92 ³	139.0	34.8	12.0%
Durcal 5 ⁴	117.0	42.5	14.7%
Calibrite SL ⁴	195.0	72.2	25.0%
Finntalc M 15 ⁴	55.0	20.4	7.1%
<i>Grind Sub-total</i>	<i>662.8</i>	<i>325.4</i>	
Let Down			
Primal™ CM-219 EF (50%)	187.0	179.8	
Ropaque™ Ultra E (30%)	63.0	61.5	11.1%
Texanol ⁵	17.5	18.4	
Biocide (*)	0.7	0.7	
Acrysol™ TT-935 ER (30%)	3.9	3.7	
Water	65.1	65.1	
Totals	1000.0	654.6	69.9%

(*) : Kathon™ LXE (1.5%) was used in this formulation

Paint Properties

Volume Solids :	45%
Weight Solids :	63%
Density :	1.530
pH :	~8.6
Dispersant (active based on total powders) :	0.8%
Coalescent (based on polymer solids) :	15.6%
Calculated VOC* content (g/L of wet paint) :	< 0.1

Suppliers¹ Cognis France, Saint-Fargeau Ponthierry, France² Hercules International Ltd, Rijswijk, Netherlands³ Hunstman Tioxide, London, UK⁴ Omya UK Ltd, Dorking, UK⁵ Eastman Chemicals (UK) Ltd, UK

(*) VOC: Amount in g/L of organic compounds having an initial boiling point less than or equal to 250°C measured at a standard pressure of 101.3 kPa.

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Interior / Exterior Matt Formulation

based on Primal™ CM-219 EF (PVC 73%)

M-219-73-01

Material Name	Kilograms	Liters	PVC
Grind			
Water	35.5	35.5	
Natrosol ® 250 HBR ¹	4.9	3.8	
Orotan™ 731A-ER (25%)	7.9	7.2	
Biocide (*)	1.0	1.0	
Propylene Glycol	5.9	5.7	
Foamaster® NXZ ²	2.0	2.2	
Tioxide TR92 ³	49.0	12.3	3.4%
Durcal 5 ⁴	187.0	67.9	19.0%
Durcal 65 ⁴	187.0	69.3	19.4%
Durcal 130 ⁴	200.0	74.1	20.7%
Granicalcium 000 (0.6-1.6 mm) ⁵	97.0	35.9	10.1%
<i>Grind Sub-total</i>	<i>777.2</i>	<i>314.9</i>	
Let Down			
Primal™ CM-219 EF (50%)	211.0	202.9	
Texanol ⁶	11.8	12.4	
Totals	1000.0	530.2	72.6%

(*) : Kathon™ LXE (1.5%) was used in this formulation

Paint Properties

Volume Solids :	69%
Weight Solids :	83%
Density :	1.890
pH :	-
Dispersant (active based on total powders) :	0.3%
Coalescent (based on polymer solids) :	11.2%
Calculated VOC* content (g/L of wet paint) :	11.1

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Interior Matt Formulation

based on Primal™ CM-219 EF (PVC 83%)

M-219-83-01

Material Name	Kilograms	Liters	PVC
Grind			
Water	250.0	250.0	
Orotan™ 731A-ER (25%)	18.5	16.8	
Foamaster® NXZ ¹	1.9	2.1	
Natrosol® 250 HBR ²	5.5	4.2	
Aqueous Ammonia (28% in water)	1.3	1.4	
Tioxide TR92 ³	50.0	12.5	5.1%
Durcal 5 ⁴	528.0	191.8	77.7%
<i>Grind Sub-total</i>	<i>855.2</i>	<i>478.8</i>	
Let Down			
Primal™ CM-219 EF (50%)	92.0	88.5	
Water	15.0	15.0	
Texanol ⁵	10.3	10.8	
Biocide (*)	0.6	0.6	
Water	26.9	26.9	
Totals	1000.0	620.6	82.8%

(*) : Kathon™ LXE (1.5%) was used in this formulation

Paint Properties

Volume Solids :	41%
Weight Solids :	64%
Density :	1.610
pH :	~8.5
Dispersant (active based on total powders) :	0.8%
Coalescent (based on polymer solids) :	22.4%
Calculated VOC* content (g/L of wet paint) :	< 0.1

Suppliers

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³ Hunstman Tioxide, London, UK

⁴ Omya UK Ltd, Dorking, UK

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Storage and handling

Most emulsions from Rohm and Haas have excellent storage stability, so agitation is not needed unless the products are held static for six weeks or more, which may occur in an extended shutdown. Though not absolutely necessary, intermittent agitation may be used when the tank is heated to hold the temperature constant, but take care to avoid excessive foam formation. It is highly desirable that the air space over the emulsion in the tank is humidified to limit skin formation. A regular injection of steam can efficiently maintain a water saturated or humid condition. A coarse filter (400 – 800 μm) positioned in the transfer line is also recommended to remove any skin or grit.

When tanks are located at sites (inside or outside), in which freezing temperatures may exist continuously for 12 hours, insulation and heating must be provided to prevent freezing of the emulsion. As a general rule, emulsions should always be stored at temperatures above 5°C and below 30°C. Most polymer emulsions cannot tolerate repeated freezing and thawing. Primarily, we recommend vertical tanks constructed from thin-walled, reinforced stainless steel.



**SAFE HANDLING
INFORMATION**

Rohm and Haas Company maintains comprehensive and up-to-date material safety data sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Rohm and Haas Company recommends that you obtain copies of our material safety data sheets from your local Rohm and Haas representative on each of our products prior to its use in your facilities. We also suggest that you contact your supplier of other materials recommended for use with our products for appropriate health and safety precautions prior to their use.

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