



We create chemistry

Acronal[®] EDGE 4247

Premium Performance for
Exterior Paint and Primer in One

Acronal® EDGE 4247

Engineered to offer high exterior performance by combining the best primer and top coat features

Acronal EDGE 4247 is a high performance, all acrylic latex designed for exterior flat to semi-gloss paints. Acronal EDGE 4247 provides the foundation for premium performance by uniting the requirements of a primer and top coat. This latex offers the durability of a premium top coat by providing superior dirt pick-up resistance and strong grain cracking resistance. Acronal EDGE 4247 brings excellent primer properties to a paint like blocking wood tannins and resisting efflorescence through its complete film formation.

Due to its balanced mechanical properties, excellent film formation, surfactant leaching resistance, and gloss retention, Acronal EDGE 4247 will keep your exterior coatings looking new.

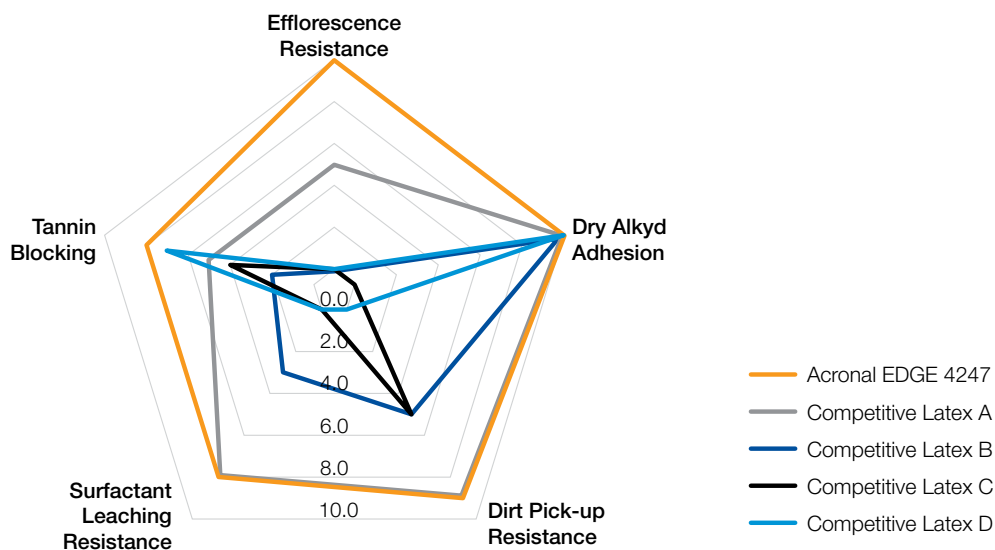
Features

- Outstanding dirt pick-up resistance
- Excellent efflorescence resistance
- Superior tannin blocking
- Exceptional surfactant leaching resistance
- Ultra low VOC capable
- Adhesion to multiple substrates

Properties

Solids content, weight %	52.0 – 54.0
Solids content, volume %	49.0 – 51.0
VOC content, weight %	< 0.2
VOC content, volume %	< 0.2
Brookfield Viscosity	< 1000 cps
pH	8.0 – 9.5
Density, lbs/gal	ca. 8.89
MFFT	ca. 6 – 7 °C
Particle size nm	125 approx.

Performance of Acronal EDGE 4247 in exterior flat paint formulation



	Acronal EDGE 4247	Competitive Latex A	Competitive Latex B	Competitive Latex C	Competitive Latex D
Efflorescence Resistance	10	5	0	0	0
Dry Alkyd Adhesion	10	10	10	0	10
Dirt Pick-up Resistance	9	9	5	5	0
Surfactant Leaching Resistance	8	8	5	0	0
Tanning Blocking	8	5	3	4	7



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Efflorescence Resistance

Acronal EDGE 4247 surpasses competition in efflorescence resistance. As displayed on the plaster tiles below, after exposure to a salt water environment, paints with Acronal EDGE 4247 resist salt migration to the film surface.



Competitive Latex A



Competitive Latex B



Acronal EDGE 4247



Competitive Latex C



Competitive Latex D

Tannin Blocking

Acronal EDGE 4247 enables coatings to block tannins migrating from the wood. As you can see on the redwood panels below, Acronal EDGE 4247 outperforms competitive latexes in both one coat (left side) and two coats (right side).



Competitive Latex A

Competitive Latex B

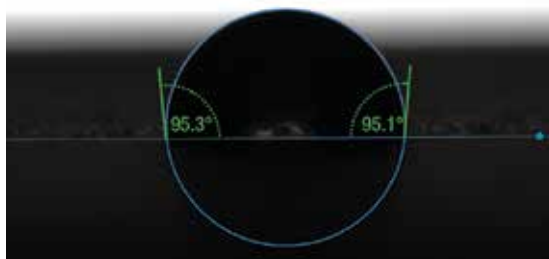
Acronal EDGE 4247

Competitive Latex C

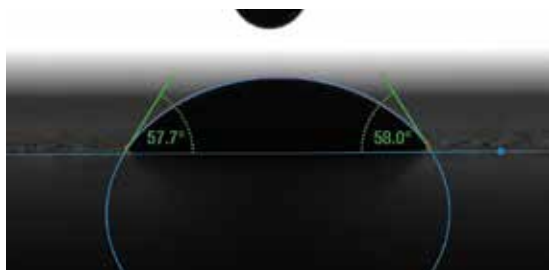
Competitive Latex D

Contact Angle

Acronal EDGE 4247 can minimize water permeability problems like mildew growth and blistering by maintaining a sharper contact angle with water droplets, allowing water to quickly run off the film. This also contributes to higher dirt pick-up resistance and better surfactant leaching resistance.



Acronal EDGE 4247 with contact angle of 95°



Competitive Latex D with a contact angle of 58°

Dirt Pick-up Resistance

Acronal EDGE 4247 outperforms competitive latexes in dirt pick-up resistance. Displayed below are draw downs on black PVC panels. Dry dirt particulate was applied to the left half of the panels, then tapped off. Data confirms the visual color difference between the stained and unstained portion of the paint film.



Competitive Latex A

Competitive Latex B

Acronal EDGE 4247

Competitive Latex C

Competitive Latex D



Acronal[®] EDGE 4247

Formulation Guidelines

Coalescents

Studies have found that 3% Velate 368, based on binder solids can give good low temperature film formation and performance. The use of reactive pigments such as zinc oxide may require special formulation consideration.

Loxanol 5310 or Optifilm 400 can be substituted for Velate 368 for reduced formula VOC.

Pigments

Both dry and slurry universal grades of titanium dioxide have been tested and work well with Acronal EDGE 4247. Choice of dry or slurry titanium dioxide can depend upon desired appearance, performance and processing constraints. Acronal EDGE 4247 provides good tannin blocking without zinc oxide, but tannin blocking can be enhanced with minimal amounts of zinc oxide in the formulation.

Dispersants/Surfactants

A sodium salt of carboxylic acid copolymer, such as Dispex CX 4320, works very well for pigment dispersing. Sodium polyacrylate copolymer dispersants also showed an increase in low shear viscosity. An ammonium copolymer can also be used, such as Dispex CX 4240.

Non-ionic surfactants, such as Hydropalat WE 3320 or Hydropalat WE 3111, provide good wetting of pigment and fillers during dispersion preparation along with good color development and color acceptance.

Use appropriate surfactant and dispersant levels for high PVC coatings.

Thickeners

For a balanced rheology profile, it is advised that a nonionic pseudoplastic HEUR thickeners, such as Rheovis PU 1251 and Rheovis PU 1191, be used alongside a high shear nonionic associative thickener, such as Rheovis PE 1331. This will provide the best flow and sag balance.

Cellulosic thickeners, such as Natrosol 330+, with attapulgite clay, such as Attagel 40 or Attagel 50, will provide good in-can stability.

Biocides

Polyphase 663 can protect the paint from mildew, algae and fungi attack. Iodopropynyl butylcarbamate (IPBC), formaldehyde or formaldehyde donor preservatives should not be used as they can adversely impact color or performance.

In-can preservatives such as MIT, BIT, or CIT, and combinations of these are adequate for long-term preservation.

Defoamers

Star polymer-based defoamers work well with Acronal EDGE 4247. It is suggested that a more aggressive defoamer, such as Foamstar ST 2438 or Foamstar ST 2439, be used in the grind while a less aggressive defoamer, such as Foamstar ST 2420 or Foamstar ED 2522, be used in the letdown. This will provide a balance of defoaming properties while minimizing film defects.

It is advised to avoid mineral oil defamers for higher gloss paints.

Acronal[®] EDGE 4247

Suggested Formulations

Exterior Flat 4247-001

raw materials	lbs	gallons
Grind		
Kronos ¹ 4311	294.0	15.02
Water	50.0	6.00
Dispex ² CX 4320	8.0	0.78
Foamstar ² ST 2420	2.0	0.28
Hydropalat ² WE 3320	3.0	0.35
Proxel ³ BD20	3.0	0.33
Minex ⁴ 4	230.0	10.57
Attigel ² 50	4.0	0.20
Grind for 15-20 minutes, then add Letdown		
Letdown		
Water	155.0	18.61
Polyphase ⁵ 663	10.0	1.03
Ammonium Hydroxide (28%)	1.4	0.19
Foamstar ² ST 2420	2.0	0.28
Acronal ² EDGE 4247	365.0	41.25
Velate ⁶ 368	6.0	0.75
Rheovis ² PE 1331	35.0	4.07
Rheovis ² PU 1191	2.5	0.29
Total	1170.9	100.00
Vol solids, %	41.0	
Wt solids, %	57.5	
PVC, %	46.1	
VOC, g/L	< 25	
KU	95 - 105	
ICI	1.0 - 1.5	
Gloss:		
60 degree	5 max	
85 degree	5 max	

Exterior Flat 4247-002

Formulation for enhanced mildew and tannin protection (with zinc oxide)

raw materials	lbs	gallons
Grind		
Kronos ¹ 4311	294.0	15.02
Water	50.0	6.00
Dispex ² CX 4320	8.0	0.78
Foamstar ² ST 2420	2.0	0.28
Hydropalat ² WE 3320	3.0	0.35
Proxel ³ BD20	3.0	0.33
KTPP	1.0	0.05
Minex ⁴ 4	230.0	10.57
ZOCO ⁷ 101	15.0	0.32
Attigel ² 50	4.0	0.20
Grind for 15-20 minutes, then add Letdown		
Letdown		
Water	151.9	18.23
Polyphase ⁵ 663	10.0	1.03
Ammonium Hydroxide (28%)	1.4	0.19
Foamstar ² ST 2420	2.0	0.28
Acronal ² EDGE 4247	365.0	41.26
Velate ⁶ 368	7.0	0.87
Rheovis ² PE 1331	35.0	4.07
Rheovis ² PU 1191	1.5	0.17
Total	1183.8	100.00
Vol solids, %	41.4	
Wt solids, %	58.7	
PVC, %	46.6	
VOC, g/L	< 25	
KU	95 - 105	
ICI	1.0 - 1.5	
Gloss:		
60 degree	5 max	
85 degree	5 max	

Acronal® EDGE 4247

Suggested Formulations

Exterior Semi-Gloss 4247-003

raw materials	lbs	gallons
Grind		
Water	45.8	5.50
Natosol® 330+	0.3	0.02
Ammonium Hydroxide (28%)	0.5	0.07
Hydropalate ² WE 3320	1.3	0.15
Dispex ² CX 4240 (40%)	2.0	0.22
Foamstar ² ST 2438	2.2	0.31
Attigel ² 50	5.0	0.26
Minex ⁴ 12	22.5	1.04
Aquaflow ³ NHS 310	6.0	0.70
Grind for 15-20 minutes, then add Letdown		
Letdown		
Acronal ² EDGE 4247	497.0	56.16
Foamstar ² ST 2438	1.5	0.19
Water	143.0	17.15
Mix for 5 minutes		
Kronos ¹ 4311	288.3	14.73
Velate ⁶ 368	8.0	0.98
Proxel ³ AQ	4.5	0.49
Polyphase ⁵ 663	3.5	0.35
Hydropalat ² WE 3320	1.3	0.15
Aquaflow ³ NHS 310	12.0	1.41
Rheovis ² PU 1251	1.0	0.12
Total	1045.7	100.00
Vol solids, %	37.0	
Wt solids, %	50.2	
PVC, %	21.7	
VOC, g/L	<25	
KU	90-100	
ICI	0.9-1.5	
Gloss:		
20 degree	10-15	
60 degree	45-55	
85 degree	80-90	



Acronal[®] EDGE 4247

Safety

General

The usual safety precautions when handling chemicals must be observed. These include the measures described in Federal, State and Local health and safety regulations, thorough ventilation of the workplace, good skin care and wearing of protective goggles.

Material Safety Data Sheet

All safety information is provided in the Material Safety Data Sheet for Acronal EDGE 4247.

Storage

Acronal EDGE 4247 should be stored in accordance with the “Handling and Storage of polymer dispersions” brochure. Technical information regarding the storage of BASF polymer dispersion products is available upon request. Product should not be allowed to freeze.

About the Dispersions & Resins Business

The Dispersions & Resins business of BASF develops, produces and markets a range of high-quality resins, additives, colorants and polymer dispersions worldwide. These raw materials are used in formulations for coatings and paints, printing and packaging products, construction chemicals, adhesives, fiberbondings, nonwovens, and paper manufacturing. With a comprehensive product portfolio and extensive knowledge of the industries we serve, our customers benefit from innovative and sustainable solutions to help them advance their formulations through chemistry. For further information about the Dispersions & Resins business in North America, please visit <http://www.basf.us/dpsolutions>

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