



We create chemistry

ACRONAL[®] Xpress 4347

Superior performance for
pavement markings



ACRONAL Xpress 4347

Superior performance for pavement markings

With a growing number of vehicles on the road, quality pavement markings are becoming increasingly more important for maintaining safe roadways. ACRONAL Xpress 4347 is an acrylic copolymer designed for fast drying waterborne pavement markings. Traffic paint formulations utilizing ACRONAL Xpress 4347 can meet federal and state Department of Transportation (DOT) regulations for exceptionally fast drying high-performance paints.

Tested to meet industry standards

Pavement markings currently produced with standard industry formulations can easily utilize ACRONAL Xpress 4347 without introducing any new raw materials or dramatic variances in dosage levels. Typical performance results with paints utilizing ACRONAL Xpress 4347 can meet or exceed current industry standards.

Features

- All-acrylic copolymer dispersion with excellent durability
- Fast drying
- Superior scrub resistance
- Excellent latex and paint stability
- Non-APEO containing

Properties

Solid content, weight %	49 - 51
Viscosity, cps	<300
pH	10.5
Density, lbs/gal	8.87
Tg, °C	25

Performance of ACRONAL Xpress 4347 in a white traffic paint formulation

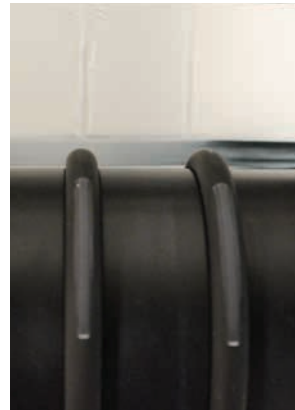
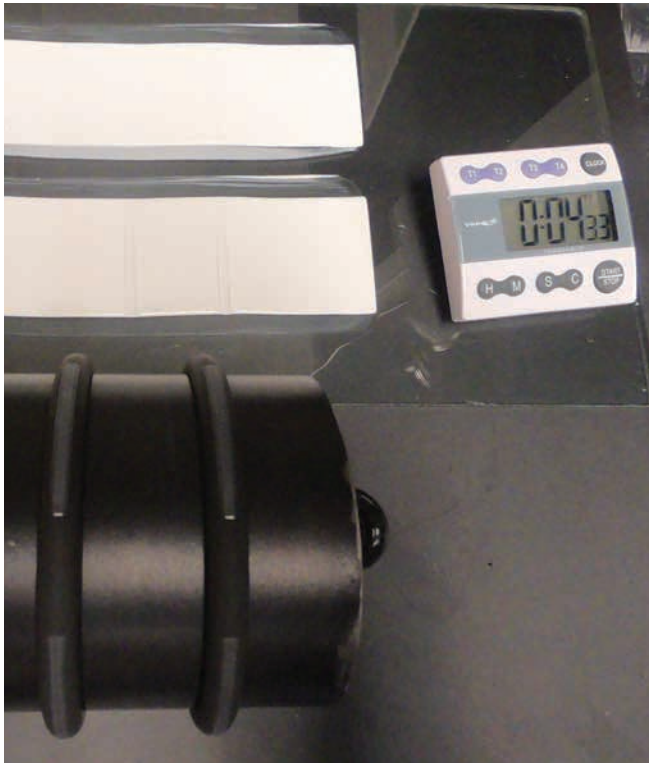
	ACRONAL Xpress 4347	Competitive latex A	Competitive latex B	Commercial traffic paint
Dry no-pick-up time, mins	4:30	4:30	4:30	4:30
Heat stability (50°C/ 2 weeks), KU change	1.8	gelled	7.8	3.8
Freeze-thaw (-18°C/ 3 cycles), KU change	2.1	1.8	0.9	gelled
Scrub resistance, cycles until failure	>2000 scrubs	>2000 scrubs	>2000 scrubs	>2000 scrubs

ACRONAL Xpress 4347

Exceptionally fast drying time

Traffic paints formulated with ACRONAL Xpress 4347 exhibit exceptionally fast drying. No-pick-up time is observed at four minutes and 30 seconds, which exceeds industry standard of 10 minutes. Compared to traffic paint formulated with the industry leading fast-dry competitive latex, formulations with ACRONAL Xpress 4347 have equivalent fast-drying properties.

In the ASTM D711 dry no-pick-up time test ACRONAL Xpress 4347 formulation is drawn down on glass panel at 25 mils wet (15 mils dry film thickness). The glass panel dries in a horizontal position under a controlled temperature and humidity of 73°F and 50% relative humidity. After allowing to dry for four minutes and 30 seconds, a weighted 12-pound traffic wheel is then free rolled over the film to evaluate no-pick-up time.



Left: ASTM D711 test set up to evaluate dry no-pick-up time of traffic paint coatings. Formulations with ACRONAL Xpress 4347 (bottom) and formulations with competitive latex A (top) both exhibit no-pick-up at four minutes and 30 seconds.

Center: Formulation with ACRONAL Xpress 4347 showing no paint pick-up on wheel.

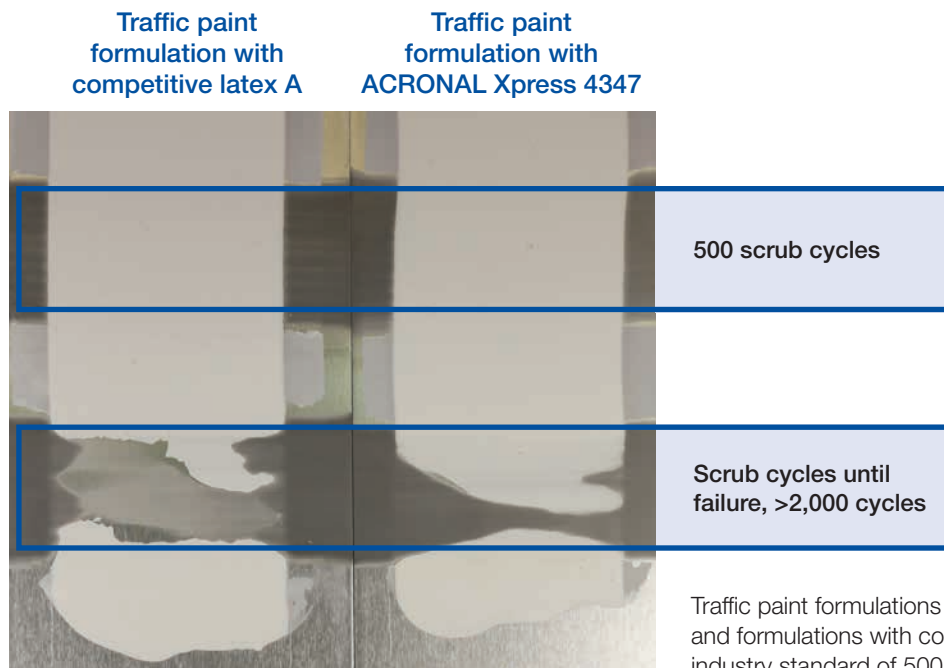
Right: Example of traffic paint failing ASTM D711 no-pick-up test.

ACRONAL Xpress 4347

Excellent scrub resistance

ACRONAL Xpress 4347 formulations exhibit excellent scrub resistance properties for high durability. The formulation performs over 2000 cycles in scrub resistance exceeding the industry standard of 500 cycles. Compared to traffic paint formulated with the industry leading competitive latex, formulations with ACRONAL Xpress 4347 have equivalent scrub resistance properties.

Traffic paints are drawn down on aluminum panels at 20 mils wet (13 mils dry film thickness) accordingly to Federal Specification TT-P-1952F, Section 4.3.12. Panels are air dried for 48 hours at controlled temperature and humidity at 73°F, 50% relative humidity. Testing follows procedure ASTM D2486 for scrub resistance. The panels are then evaluated for industry standard 500 scrub cycles and also tested until film failure.



Traffic paint formulations with ACRONAL Xpress 4347 (right) and formulations with competitive latex A (left) both exceed industry standard of 500 scrub cycles.

ACRONAL Xpress 4347

Formulation guidelines

Formulating with ACRONAL Xpress 4347 is similar to formulating other types of waterborne paint. In order to achieve maximum properties in fast drying, stability, and strength, formulators are highly recommended to follow the guidelines below.

pH

Only use ammonia to adjust pH. It is important to maintain pH at higher than 10.0 during paint manufacturing process and storage.

Grind

Grind speed should range from 1000 to 1200 rpm. Do not exceed speed higher than 1200 rpm. Avoiding excessive heat during grind stage helps minimizing chances of skinning and / or agglomeration.

Dispersants

The DISPEX® line of dispersants are recommended for this product. Ammonium-based dispersants, such as DISPEX AA 4040 NS, has proven effective, providing good balance of tint strength and performance properties, including excellent stability of pigment dispersion at higher pH and temperature. Typical dosage for DISPEX AA 4040 NS is 0.2% - 0.4% to total pigment weight on active level.

Wetting agent

An non-ionic surfactant, such as HYDROPALAT® WE 3323, is recommended. HYDROPALAT WE 3323 is a hydrophobic, anti-foaming wetting agent providing excellent pigment, and substrate wetting. In addition, it minimizes foam during grind stage. In combination with DISPEX AA 4040 NS, they create a stable and high performing formulations. HYDROPALAT WE 3323 dosage is typically from 0.25% to 1.00%.

Defoamers

Both FOAMSTAR® and FOAMASTER® lines of defoamers can be used for ACRONAL Xpress 4347. FOAMSTAR ST 2410 and FOAMASTER MO 2133 are well-rounded option for formulating with this dispersion. It is highly effective and can be utilized in grind and let-down stage. Common dosage is 0.3% to 0.5% in total formulation.

Coalescence

A non-volatile coalescing agent, LOXANOL® CA 5086, is highly recommended. LOXANOL CA 5086 provides excellent film formation while maintaining fast drying properties in an environmental friendly solution. In addition, paints utilizing LOXANOL CA 5086 have superior freeze thaw stability. LOXANOL CA 5086 can be used to substitute Texanol™⁵ at one-to-one level or less. Common dosage of LOXANOL CA 5086 can be used at 10% based on polymer solids in waterborne traffic paint. LOXANOL CA 5088 should be added slowly into the vortex of paints.

ACRONAL Xpress 4347

Suggested formulations

White waterborne traffic paint formulation

Raw Materials	lbs	gallons
Grind		
ACRONAL ¹ Xpress 4347	443.35	50.10
DISPEX ¹ AA 4040 NS	4.82	0.44
HYDROPALAT ¹ WE 3323	11.02	1.32
FOAMSTAR ¹ ST 2410	3.44	0.48
Ti-Pure ² R-900	96.35	2.89
Omyacarb ³ 5	732.9	32.53
15 minutes at 1100rpm		
Letdown		
Methanol	34.45	5.20
LOXANOL ¹ CA 5086	22.97	2.75
FOAMSTAR ¹ ST 2410	2.81	0.39
2% active Natrosol ⁴ 250 HR in D.I. water	6.74	0.80
D.I. water	25.84	3.10
Adjust pH > 10.0 with ammonia as needed		
15 minutes at 700rpm		
Total	1384.70	100
Vol solids %	69.5	
Wt solids %	79.2	
PVC %	59	
VOC g/L	65	
KU	82	
pH	10.3	

Yellow waterborne traffic paint formulation

Raw Materials	lbs	gallons
Grind		
ACRONAL ¹ Xpress 4347	493.77	55.79
DISPEX ¹ AA 4040 NS	5.37	0.50
HYDROPALAT ¹ WE 3323	12.28	1.47
FOAMSTAR ¹ ST 2410	3.84	0.53
Ti-Pure ² R-900	14.71	0.44
Yellow 65	35.17	3.01
Yellow Oxide	3.84	0.13
Omyacarb ³ 5	816.26	24.49
15 minutes at 1100rpm		
Letdown		
Methanol	38.37	5.79
LOXANOL ¹ CA 5086	25.58	3.06
FOAMSTAR ¹ ST 2410	3.13	0.44
2% active Natrosol ⁴ 250 HR in D.I. water	7.35	0.89
D.I. Water	28.78	3.45
Adjust pH > 10.0 with ammonia as needed		
15 minutes at 700rpm		
Total	1488.59	100
Vol solids %	70.4	
Wt solids %	78.7	
PVC %	59	
VOC g/L	77	
KU	83	
pH	10.1	

ACRONAL Xpress 4347

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

Please refer to the most current version of the Material Safety Data Sheet that can be found on-line at www.basf.us/sds

Storage and handling recommendations

ACRONAL Xpress 4347 has a shelf life of six months from delivery date, provided it is 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.

About the Dispersions & Resins Business

The Dispersions & Resins division 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 a number of industries, including coatings, construction, adhesives, printing and packaging, nonwovens and composites, electronics, and paper. With its comprehensive product portfolio and its extensive knowledge of the industry, the Dispersions & Resins division offers its customers innovative and sustainable solutions and helps them advance their formulations. For further information about the Dispersions & Resins division, please visit www.basf.us/dpsolutions.

About BASF

BASF Corporation, headquartered in Florham Park, New Jersey, is the North American affiliate of BASF SE, Ludwigshafen, Germany. BASF has more than 20,000 employees in North America and had sales of around \$20 billion in 2018. For more information about BASF's North American operations, visit www.basf.com.

At BASF, we create chemistry for a sustainable future. We combine economic success with environmental protection and social responsibility. The approximately 122,000 employees in the BASF Group work on contributing to the success of our customers in nearly all sectors and almost every country in the world. Our portfolio is organized into six segments: Chemicals, Materials, Industrial Solutions, Surface Technologies, Nutrition & Care and Agricultural Solutions. BASF generated sales of around €63 billion in 2018. BASF shares are traded on the stock exchanges in Frankfurt (BAS), London (BFA) and Zurich (BAS). Further information at www.basf.com.

United States and Canada

BASF Corporation
11501 Steele Creek Road Charlotte, NC 28273
Phone: 800-251-0612
Fax: 704-587-8224
E-mail: dpsolutions@basf.com
www.basf.us/ConstructionSolutions

Mexico

BASF Mexicana, S.A. de C.V. Av. Insurgentes Sur 975
Col. Ciudad de los Deportes 03710 Mexico, D.F.
Phone: 52-55-5325-2600
Fax: 52-55-5723-3011
E-mail: contactoed@basf.com
www.basf.com.mx

Trademark Usage

- ¹ Registered trademark of BASF Chemical Co.
- ² Registered trademark of The Chemours Company
- ³ Registered trademark of Omya Inc.
- ⁴ Registered trademark of Ashland Specialty Ingredients
- ⁵ Texanol is registered trademark of Eastman Chemical Co.

THE DESCRIPTIONS, DESIGNS, DATA AND INFORMATION CONTAINED HEREIN ARE PRESENTED IN GOOD FAITH, AND ARE BASED ON BASF'S CURRENT KNOWLEDGE AND EXPERIENCE. THEY ARE PROVIDED FOR GUIDANCE ONLY, AND DO NOT CONSTITUTE THE AGREED CONTRACTUAL QUALITY OF THE PRODUCT OR A PART OF BASF'S TERMS AND CONDITIONS OF SALE. BECAUSE MANY FACTORS MAY AFFECT PROCESSING OR APPLICATION/USE OF THE PRODUCT, BASF RECOMMENDS THAT THE READER CARRY OUT ITS OWN INVESTIGATIONS AND TESTS TO DETERMINE THE SUITABILITY OF A PRODUCT FOR ITS PARTICULAR PURPOSE PRIOR TO USE. IT IS THE RESPONSIBILITY OF THE RECIPIENT OF PRODUCT TO ENSURE THAT ANY PROPRIETARY RIGHTS AND EXISTING LAWS AND LEGISLATION ARE OBSERVED. **NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE MADE REGARDING PRODUCTS DESCRIBED OR DESIGNS, DATA OR INFORMATION SET FORTH HEREIN, OR THAT THE PRODUCTS, DESCRIPTIONS, DESIGNS, DATA OR INFORMATION MAY BE USED WITHOUT INFRINGING THE INTELLECTUAL PROPERTY RIGHTS OF OTHERS.** ANY DESCRIPTIONS, DESIGNS, DATA AND INFORMATION GIVEN IN THIS PUBLICATION MAY CHANGE WITHOUT PRIOR INFORMATION. THE DESCRIPTIONS, DESIGNS, DATA, AND INFORMATION FURNISHED BY BASF HEREUNDER ARE GIVEN GRATIS AND BASF ASSUMES NO OBLIGATION OR LIABILITY FOR THE DESCRIPTIONS, DESIGNS, DATA OR INFORMATION GIVEN OR RESULTS OBTAINED, ALL SUCH BEING GIVEN AND ACCEPTED AT THE READER'S RISK.