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ACRONAL® PLUS 4415

Superior sandability for interior and exterior primers

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ACRONAL PLUS 4415 is a styrene-acrylic latex for interior and exterior stain blocking primers at 50 g/L VOC. The latex can be widely applied, offering consistent, high-quality results for both interior and exterior primers. ACRONAL PLUS 4415 demonstrates limited ropes and flakes during sanding and excellent interior stain control. This latex further outperforms commercial products in both adhesion and alkali resistance. ACRONAL PLUS 4415 is the solution for the premium stain blocking primer market.

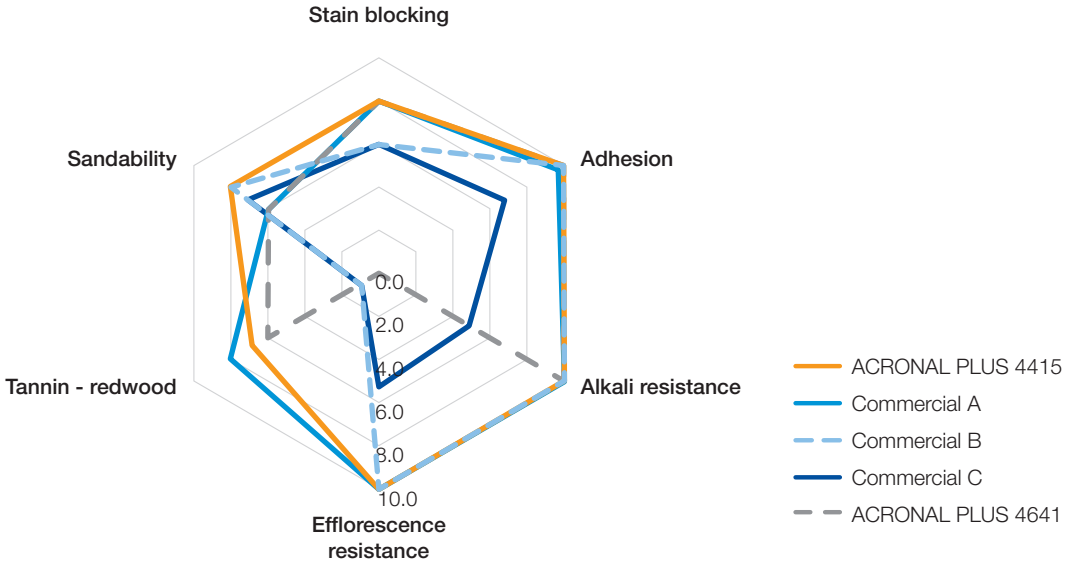
Features

- Excellent sandability
- Low odor
- Excellent interior stain blocking
- Excellent adhesion to a variety of substrates
- Styrene-acrylic latex

Properties

Content %	49.0 – 51.0
Solids content, Volume %	46.0 – 48.0
VOC content, weight %	< 0.2
VOC content, volume %	< 0.2
Brookfield viscosity	< 1000 cps
pH	7.5 – 8.5
Specific gravity g/cm^3	ca. 1.03
Density lbs/gal	ca. 8.6
MFFT	ca. 10
Particle size nm	ca. 110

Performance of ACRONAL PLUS 4415 in an interior/exterior primer formulation



	ACRONAL PLUS 4415	Commercial A	Commercial B	Commercial C	ACRONAL PLUS 4641
Stain blocking	8	8	6	6	8
Adhesion	10	9.7	10	6.7	10
Alkali resistance	10	10	10	5	10
Efflorescence resistance	10	10	10	5	0
Tannin - redwood	7	8	1	1	6
Sandability	8	6	8	7	6

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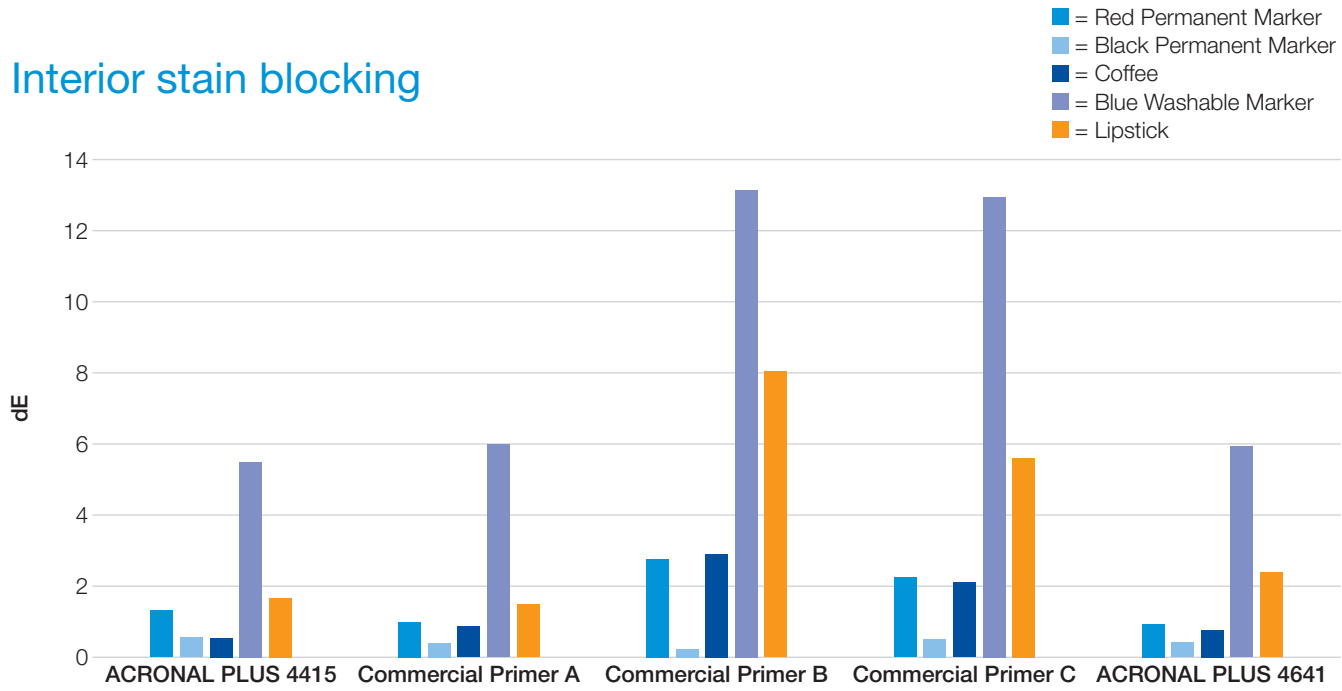
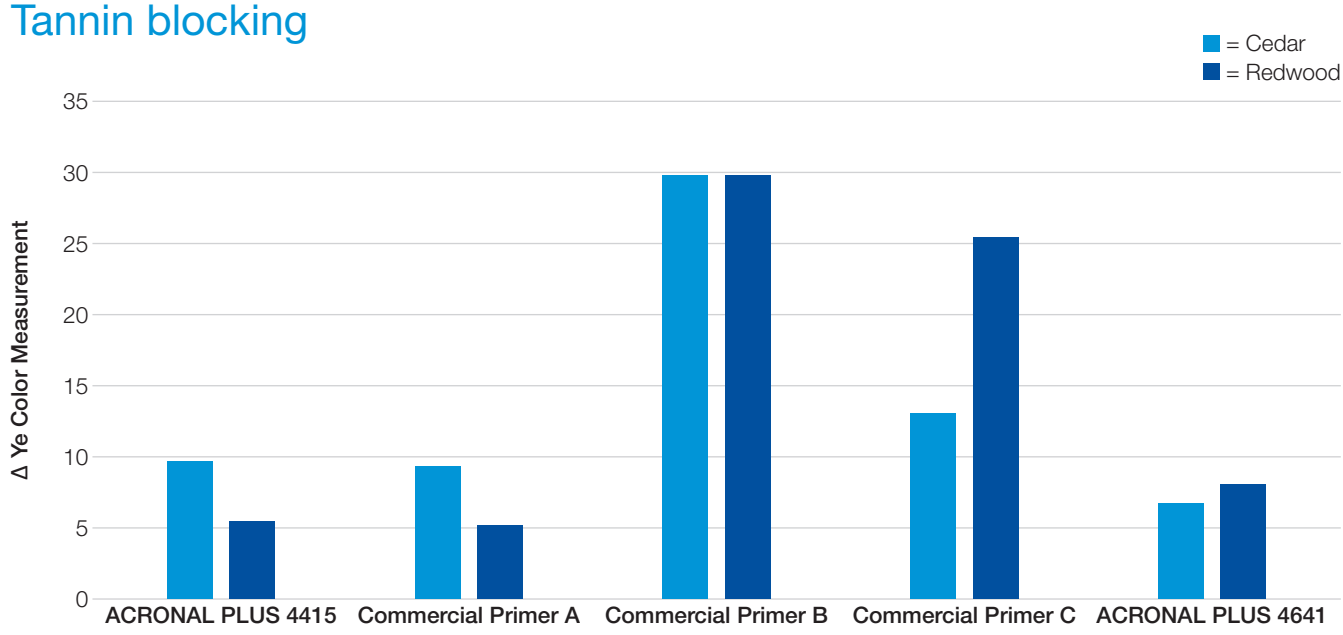
ACRONAL PLUS 4415 effectively blocks both solvent- and waterborne stains, ensuring the topcoat finish looks fresh and blemish free. For exterior application, ACRONAL PLUS 4415 can be used to seal in tannic acid, preventing bleed-through in the final appearance.

Interior stain blocking



Tannin blocking



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Formulation guidelines

Coalescents

ACRONAL PLUS 4415 will require 3-5% coalescent on binder solids for good low temperature film formation and performance. The use of reactive pigments such as zinc oxide may require special formulation considerations. Texanol[1] must be used with adequate surfactant to reduce the partitioning rate into the latex particles. A non-volatile coalescent such as EFKA® PL5651[2] can be used to reduce the surfactant loading while maintaining good film formation. For optimal performance, a screening of coalescents is recommended.

Pigments

Both dry and slurry universal grades of titanium dioxide have been tested and work well with ACRONAL PLUS 4415. Choice of dry or slurry titanium dioxide can depend upon desired appearance, performance, and processing constraints. To increase stain blocking performance, particle shape and packing characteristics should be considered. Using extenders with lamellar structure such as talc or mica can increase the film barrier properties and give better stain blocking. Zinc oxide may also be used for enhanced stain blocking, particularly tannin blocking.

Dispersants/Surfactants

Ammonia carboxylic acid copolymer or ammonia polyacrylate dispersants, such as Tamol 165[3] and DISPEX® CX 4230[2], are excellent options for pigment wetting and dispersing at 1% dispersant on pigment loading. When formulating with zinc oxide, Tamol 681 (ammonia polyacrylate), DISPEX CX 4230 and DISPEX CX 4320[2] (sodium carboxylic acid), are good choices. Higher levels of dispersant, starting at 1.5%, are recommended for good stability with zinc oxide. Use of a co-dispersant, such as KTPP, for zinc oxide containing formulas is also an option. Very high molecular weight dispersants and fatty acid type dispersants should be avoided to maintain good stability and interior stain blocking. Two to three pounds per 100 gallons of nonionic surfactant, such as HYDROPALAT® WE 3320[2] or HYDROPALAT WE 3111[2], provide good wetting of the pigments and fillers during the grinding phase.

Thickeners

HMPE/HEUR/Cellulosic thickeners have all shown great compatibility with ACRONAL PLUS 4415. For a balanced rheology profile, it is advised that a nonionic pseudoplastic HEUR thickeners, such as RHEOVIS® PU 1291[2] and RHEOVIS PU1251[2], be used alongside a high shear nonionic associative thickener, such as RHEOVIS PE 1331[2], Aquaflow NHS-310[4].

Biocides

Iodopropynyl Butyl Carbamate (IPBC) is acceptable for mildew protection in formulas that may require mildew resistance. Formaldehyde or formaldehyde-donor preservative should not be used as they can adversely impact performance.

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

Defoamers

It is suggested that a more aggressive defoamer, such as FOAMSTAR® ST 2438[2] or FOAMSTAR ST2439[2] be used in the grind while a less aggressive defoamer, such as FOAMSTAR ST2420[2] or FOAMSTAR ED2522[2], be used in the letdown. This will provide a balanced of defoaming properties while minimizing film defects.

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Starting point formulation

ACRONAL PLUS 4415 Stain Blocking Primer 4415-001		
raw materials	**lbs**	**gallons**
Ti-Pure R-746[5]	180	9.27
Water	50	6
FOAMSTAR ST 2420[2]	1.3	0.18
Tamol 681[3]	9	0.99
HYDROPALAT WE 3320[2]	3	0.35
Proxel BD20[6]	2	0.22
Minex 47	80	3.68
ASP 400 P[2]	80	3.72
ATTAGEL 50[2]	4	0.2
Sodium Nitrite	0.5	0.07
Mix for 20 minutes at high speed		
Ammonium hydroxide	0.8	0.11
Water	155.4	18.65
Natrosol 330 Plus[4]	0.7	0.06
ACRONAL PLUS 4415[2]	450	51.72
FOAMSTAR ST 2420[2]	2	0.28
Texanol[1]	11.5	1.45
Polyphase 678[8]	5	0.52
Aquaflow NHS310[4]	20	2.3
RHEOVIS PU 1291[2]	2	0.23
Total	**1057.2**	**100**
Viscosity (KU)	95-105	
Viscosity (ICI)	1.0-1.5	
Gloss 85°	0 - 5	
Weight Solids %	51.52	
Volume Solids %	37.98	
PVC %	31.9	
VOC g/l	44	

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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. See the Safety Data Sheet for further information.

Material Safety Data Sheet

All safety information is provided in the Safety Data Sheet for ACRONAL PLUS 4415.

Storage

ACRONAL PLUS 4415 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 Division

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

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