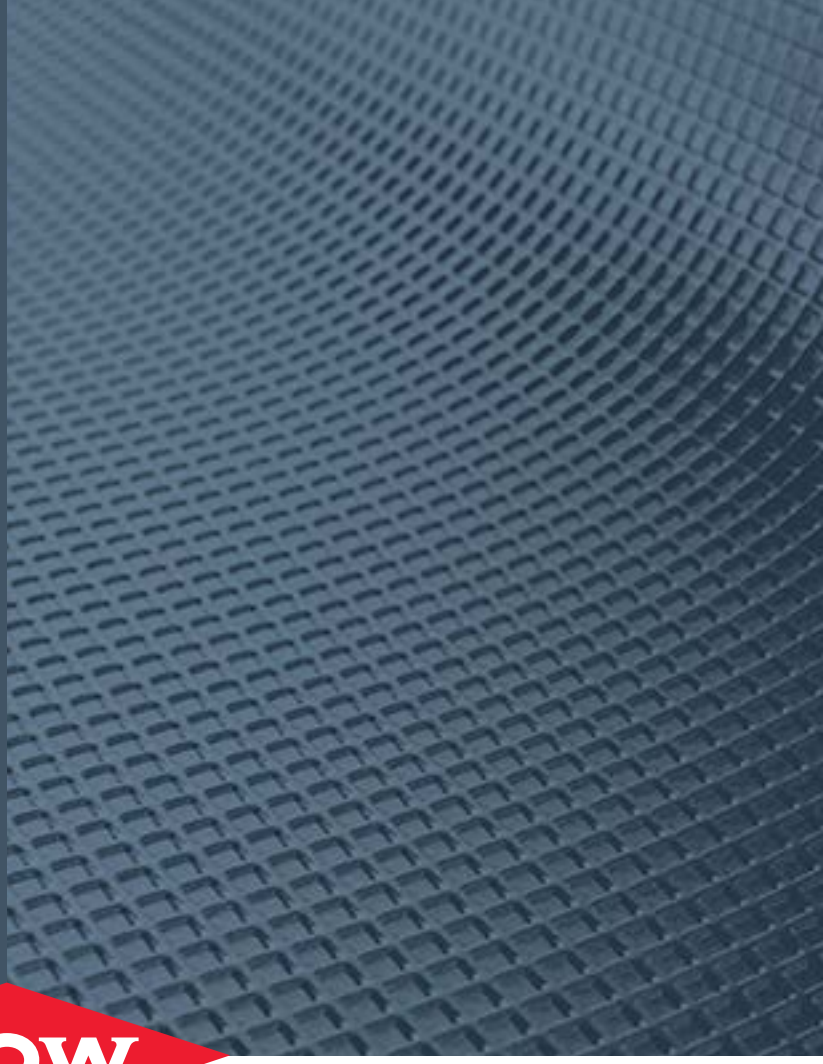
Specialty coatings



DOW®

Solutions for specialty coatings segments

Primers

High gloss

Wood stains

Deck/concrete restoration

Elastomeric wall coatings

Wet look concrete sealers

Natural look concrete sealers

1K garage floor coatings

Basement waterproofing paint

Functional

Specialty architectural coatings

Architectural paints are meant to beautify and/or protect the substrate to which they are applied. While the vast majority of these paints are used as top coats applied to large vertical walls of buildings made of drywall, plaster, brick, and siding (wood/aluminum/vinyl), there are a plethora of other substrates and challenging conditions within and around buildings that can benefit from protective and attractive coatings.

These niche specialty markets include the high touch durability and aesthetics of gloss paints, the adhesion and stain blocking of primers, the long-lasting protection of wood via transparent and tinted stains; and the sealing/protection of concrete and masonry coatings to name a few. Dow Coating Materials addresses these many niches bringing more value to the coatings industry.

Primers

Primers enable painters to overcome various challenges they encounter. Dow Coating Materials' primer binder offerings span a range of chemistries and morphologies to provide performance benefits respective to each segment's needs. RHOPLEX™ 52 polymer enables low VOC water-based primers that offer stain blocking without zinc oxide or other cations and comparable or better than alkyd-based primers. RHOPLEX™ PR-409AF polymer is an all acrylic binder that can be formulated into great general-purpose primers. RHOPLEX™ 732 polymer provides top tier adhesion across wood, metal, and cementitious substrates while also providing excellent efflorescence resistance and superior top coat properties.

Versatile solutions to challenging problems

Product name	Adhesion to alkyds	Adhesion to chalky paint	Adhesion to aluminum	Stain blocking	Return-to-service (sandability)	Top-coat properties	Resists efflorescence and alkali	Highlights
RHOPLEX™ 52	•••	••	•	•••	•••	•	•	Excellent stain-blocking
RHOPLEX™ PR-409 AF	••	•••	••	••	•••	•	•	Universal all acrylic polymer
RHOPLEX™ 732	•	•	•••	••	•••	•••	•••	Excellent adhesion + top-coat

	RHOPLEX™ 52	RHOPLEX™ PR-409AF	RHOPLEX™ 732
Solids, %wt	45.5	45.0	45.0
Density, lb/gal	8.5	8.81	8.54
Chemistry	Sty/acrylic	100% acrylic	Acrylic
MFFT,	~6	~4	~8

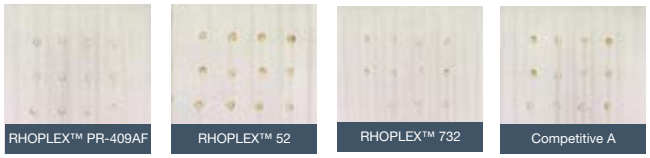
Segment needs

- Adhesion to a variety of substrates
- Excellent stain-blocking
- Resists efflorescence
- Fast return-to-service
- APEO-free

Tannin blocking on cedar

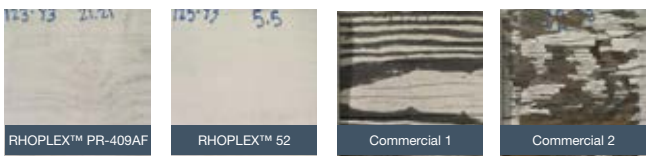
RHOPLEX™ PR-409AF | Competitive A | RHOPLEX™ 52 | Commercial 2 | RHOPLEX™ 732 | Commercial 1

North vertical



1 coat primer
1 topcoat
Series 18DJ
t=1 year

South 45°



2 coats primer
Series 17DJ
t=2 year

Weathered in Spring House, PA

Portfolio highlights

- Choose targeted performance
- Excellent stain blocking
- Excellent metal adhesion
- Good multi-substrate adhesion
- Overall balance
- Alkali resistant on hot concrete
- Made without APEO surfactants
- Great top coat durability

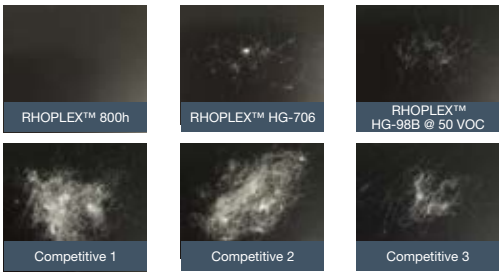
High gloss

High gloss paints are used to provide highlights of luxurious beauty while also withstanding the rigor of high touch environments such as doors, trim, and cabinets. Achieving this level of performance has become more and more challenging as VOC regulations move to lower and lower levels. Dow Coating Materials' polymer emulsions for high gloss paints enable high performance at VOC levels <150g/L, <50g/L, and lower. Research & Development remains highly active, further driving performance improvements in this space. RHOPLEX™ HG-98B polymer sets the gold standard for water-based high gloss paint at a higher VOC level with superior acrylic durability. RHOPLEX™ HG-706 polymer rises to the challenge of delivering excellent gloss, block resistance, and chemical resistance in paints even when VOC levels need to be <50g/L. RHOPLEX™ 800h polymer combines distinct morphology with ambient crosslinking to deliver paints with exceptional block and hardness even for challenging low PVC and low VOC formulations, including deep tone paints.

Building in performance across a range of VOC limits

	RHOPLEX™ 800h	RHOPLEX™ HG-706	RHOPLEX™ HG-98B
Interior/exterior	Int	Int/ext	Int/ext
Solids, %wt	45	45	45
APEO-free	Yes	Yes	Yes
Coalescent demand, %	0	3	12
~MFFT,	3	5	20
VOC capability	< 5	< 50	< 150
Performance rating			
Alkyd adhesion	Better	Best	Best
Block resistance	Best	Better	Better
Dirt pick-up resistance	Best	Best	Best
Gloss potential	Better	Best	Best
Gloss retention	Good	Better	Best
Stain resistance	Good	Better	Better
Scrub resistance	Better	Good	Better
Oil softening	Good	Best	Better

Cotton ball tack test

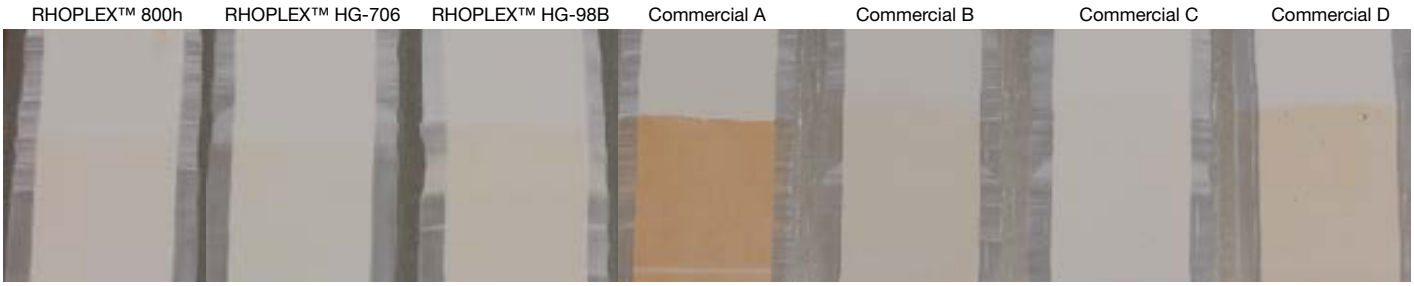


0 g/L VOC unless otherwise noted
Deep tone + 12oz of lamp black; 24hr dry time

Segment needs

- Gloss retention
- Block resistance
- Exterior durability
- Dirt pick-up resistance
- Hardness
- Print resistance
- Oil softening

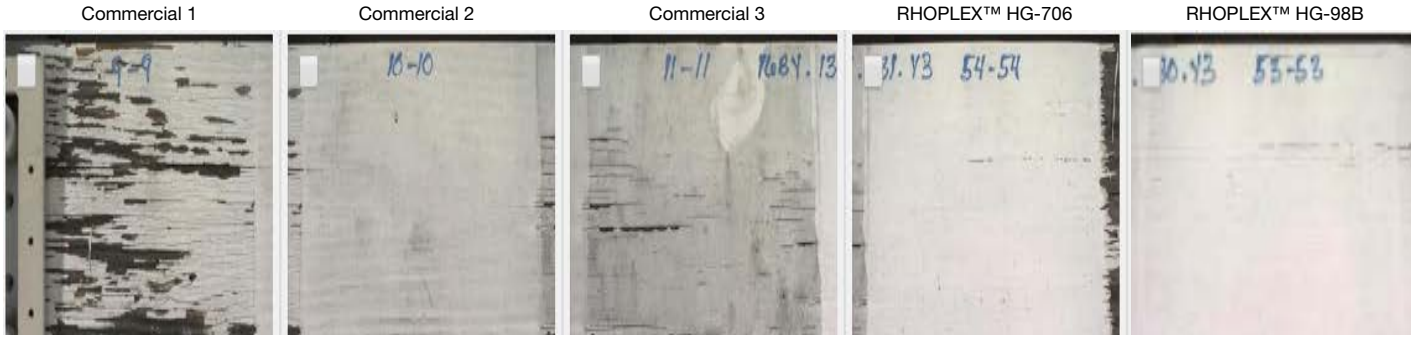
Dirt pick-up resistance



Dow product offerings have excellent dirt pickup resistance.

RHOPLEX™ HG-706 shows best balance of performance at current CARB VOC regulations.

Exterior exposure



2016 Commercial exposure series 16BY
23 months, South 45°, Weathered yellow pine @ Spring House Exposure Station

Wood stains

Wood has been used in building construction for centuries because of its strength, sustainability, and raw beauty. The challenge of maintaining this beauty is increasing as today's consumer puts more emphasis on convenience. Dow Coating Materials' products enable manufacturers to make industry leading wood stains that allow owners to enjoy the beauty of their wood with less maintenance. When wood is new and owners want to show off the beautiful grain, transparent and semi-transparent stains made with AVANSE™ ST-410 polymer bring out the wood's full depth and richness for years even on tough decks. When wood has defects that need hiding, RHOPLEX™ AC-464 polymer can be formulated into premium solid color stains that allow the texture of the grain to show through while delivering many years of low maintenance. Deck stains come in a variety of vibrant colors, and stains made with RHOPLEX™ 585 polymer keep the color from fading.

Solid color wood stains

Beautiful wood with less maintenance

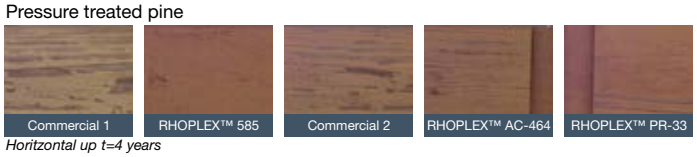
Product name	Adhesion to pine	Adhesion to cedar	Crack resistance	Dirt pick-up resistance	Tannin blocking*	Gloss/color retention	Highlights
RHOPLEX™ AC-464	•••	•••	•••	••	••	••	Premium all around performance
RHOPLEX™ 585	••	•	••	•••	••	•••	Value with great tint retention

	RHOPLEX™ AC-464	RHOPLEX™ 585	RHOPLEX™ PR-409AF	RHOPLEX™ PR-33
Solids, %wt	60.5	58.5	45.0	43.0
Density, lb/gal	8.5	8.81	8.81	8.85
Chemistry	100% acrylic	100% acrylic	100% acrylic	100% acrylic
MFFT,	~6	~4	~4	~4
APEO-free	Yes	Yes	Yes	No

Segment needs

- Grain cracking resistance
- Adhesion to wood
- Tannin blocking (*requires ZnO)
- Dirt pick-up resistance

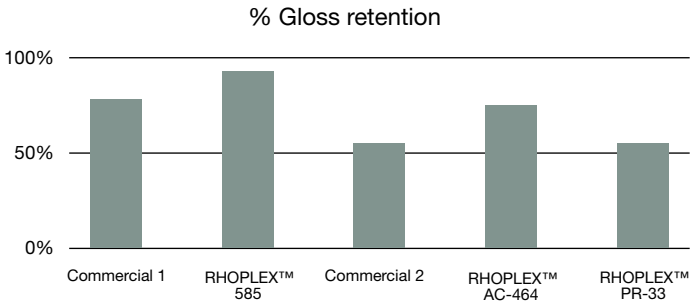
Pressure treated pine



Horitzontal up t=4 years

Cedar with foot traffic

Horitzontal up t=2 years



Semi-transparent wood stains

The full beauty of wood with less maintenance

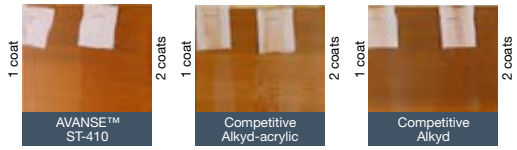
Product name	Adhesion to pine	Crack resistance	Lapping	Dirt pick-up resistance	Erosion failure	Early water resistance	Highlights
AVANSE™ ST-410	•••	•••	•••	••	•••	••	Industry leading durability
RHOPLEX™ AC-337N	••	•	••	•••	•	•••	Versatile value

	AVANSE™ ST-410	RHOPLEX™ AC-337N
Solids, %wt	37.0	50.0
Density, lb/gal	8.5	8.81
Chemistry	100% acrylic	100% acrylic
MFFT,	< 5	~16

Segment needs

- Grain cracking resistance
- Adhesion to wood
- Minimal flaking failures
- Lapping
- Early water resistance

Early water resistance



(16hr dry; 16hr fog box; 10 rubs with cheesecloth)

Exterior exposure

Spring House, PA; 2 years; horizontal up with foot traffic

Portfolio highlights

- Excellent exterior durability
- Erosion failure mechanism
- No metal drier required
- Excellent lapping resistance
- Excellent early water resistance
- Made without APEO surfactants

Deck and concrete restoration

When it comes to well-weathered decks and concrete patios, deck restoration coatings are breathing new life into substrates weathered by the elements. Developed and tested on well-weathered wood and concrete substrates, RHOPLEX™ DCR Binders build on the signature durability of RHOPLEX™ 100% acrylic chemistry to meet the challenging needs of high-traffic exterior surfaces. RHOPLEX™ DCR-317 and DCR-113 Binders demonstrate excellent overall durability and adhesion across multiple substrates most notably showing continued adhesion and no cracking after two winter seasons. RHOPLEX™ DCR-521 offers improved adhesion over previously stained pine, comparable flexibility, improved abrasion resistance, and comparable tensile strength.

Product highlights

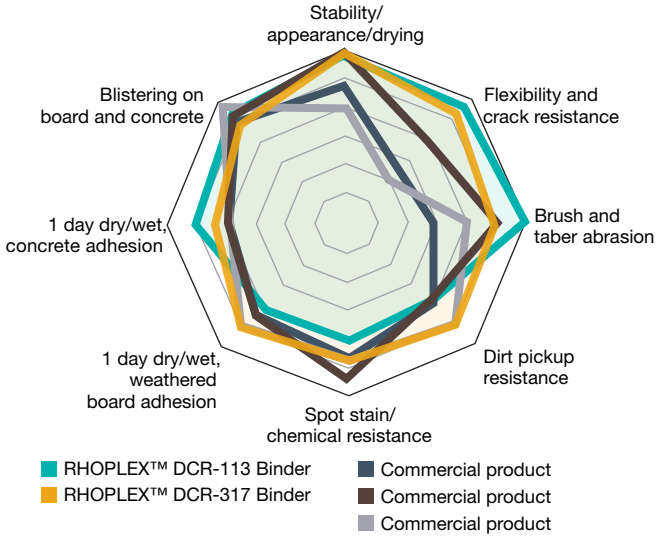
Product name	Flexibility and crack resistance	Abrasion resistance	Adhesion to weathered wood	Dirt pickup resistance	Mechanical properties	Permeability
RHOPLEX™ DCR-113 Acrylic Emulsion	••	•	•	•	••	••
RHOPLEX™ DCR-317 Acrylic Emulsion	•	••	••	••	••	••
RHOPLEX™ DCR-521 Acrylic Emulsion	••	•••	••	••	••	•

	RHOPLEX™ DCR-113	RHOPLEX™ DCR-317	RHOPLEX™ DCR-521
Solids, %wt	53.5	60.5	57.0
Chemistry	100% acrylic	100% acrylic	100% acrylic
MFFT, °C	3	3	25
APEO-free	Yes	Yes	Yes

Segment needs

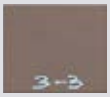
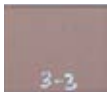
- Adhesion to well-weathered wood and concrete
- Flexibility and resistance to cracking
- Abrasion resistance
- Dirt pickup resistance
- Blistering resistance

Well-rounded performance compared to market benchmarks



Excellent adhesion over block cedar on footbridge exposure

Excellent adhesion over diverse and challenging substrates

Substrate	Series 14AY 25 months		Series 16BH 25 months
	RHOPLEX™ DCR-113 Binder	RHOPLEX™ DCR-317 Binder	RHOPLEX™ DCR-521 Binder
Previously stained pressure treated pine			
3-month weathered cedar			
3-month weathered pressure treated pine			

Spring House, PA; horizontal up footbridge; 25 months

Excellent adhesion over diverse and challenging substrates

		RHOPLEX™ DCR-521 Binder	RHOPLEX™ DCR-113 Binder	RHOPLEX™ DCR-317 Binder
		Performance rating		
Adhesion to wet wood	Cedar	9	7	6
Room temperature flexibility (Mandrel Bend) 1/8"		pass	pass	pass
Hoffman abrasion, cut-through kg		6	5	4
Mechanical properties	max psi	277	268	227
	% elongation at break	56	69	119
Perms		15	22	19

Elastomeric wall coatings

Elastomeric wall coatings deliver high performance on masonry substrates, including stucco, brick, and concrete. Key performance needs are high tensile strength and elongation, good flexibility at low temperatures, alkali and dirt pickup resistance, and water vapor permeability. Dow Coating Materials' product portfolio offers a balance of properties while providing APEO-free and zinc oxide-free options. RHOPLEX™ 78 polymer is a higher solids, APEO-free polymer that delivers superior dirt pickup resistance even when formulated into zinc oxide-free formulations. RHOPLEX™ 2438C polymer can be formulated into elastomeric paints with excellent elongation and low temperature tensile strength. Paints formulated with RHOPLEX™ EC-3814 polymer have excellent alkali resistance and elongation at low temperatures.

Product offerings delivering performance needs

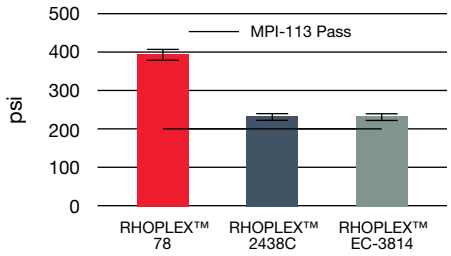
Product name	% solids	APEO-free	Elongation, room temp.	Tensile strength, room temp	Elongation, cold temp.	Tensile strength, cold temp	Alkili resistance	Dirt pick-up resistance	Tack
RHOPLEX™ 78	60.0	Yes	••	•••	••	•••	•	•••	••
RHOPLEX™ 2438C	50.5	No	•••	••	•	•••	•	••	••
RHOPLEX™ EC-3814	60.5	Yes	••	••	•••	••	•••	••	

Product highlights	
RHOPLEX™ 78	• Excellent dirt pick-up resistance • ZnO-free capable
RHOPLEX™ 2438C	• Good room temperature elongation
RHOPLEX™ EC-3814	• Superior alkali resistance • Good room temperature elongation

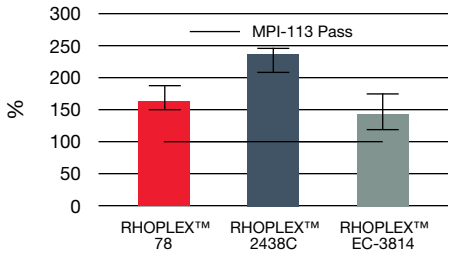
Segment needs

- Good balance of tensile strength and elongation
- Recovery after elongation
- Alkali resistance
- Permeability
- Dirt pick-up resistance

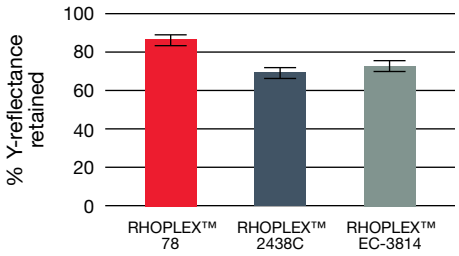
Tensile strength



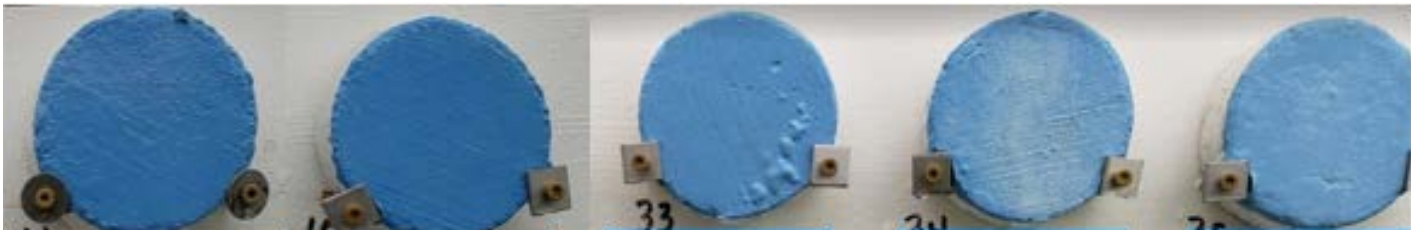
Elongation



Dirt pick-up resistance



Exterior performance on hot concrete



RHOPLEX™ EC-3814 | RHOPLEX™ 78 | Commercial 1 | Commercial 2 | Commercial 3

50 g/L VOC 1K garage floor coatings

Garage floor coatings can provide an attractive and durable surface, and they must deliver high performance, including resistance to hot tire pickup, chemical resistance, and adhesion to concrete. There is an increasing demand from DIY users for one-component (1K) products that are more user friendly compared to two-component (2K) products. RHOPLEX™ 2510 polymer is an all-acrylic polymer with built-in improved adhesion to concrete. Compared to key commercial 1K benchmark products, paints with RHOPLEX™ 2510 polymer match the performance of top commercial products and outperform middle and lower-tier products. RHOPLEX™ 2510 polymer delivers excellent adhesion to concrete, improved hot tire pickup resistance, and excellent chemical resistance in a 50 g/L VOC starting point formulation.

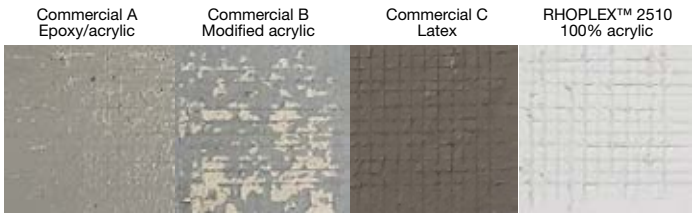
RHOPLEX™ 2510 polymer delivers excellent hot tire pickup resistance, adhesion, and chemical resistance

RHOPLEX™ 2510			
100% acrylic	Yes	pH	9
Solids, %wt	42.5	MFFT,	18
Density, lb/gal	8.81	Coalescent level	12-15

Segment needs

- Adhesion to concrete
- Hot tire pick-up resistance
- Chemical resistance
- Gloss retention

Wet adhesion

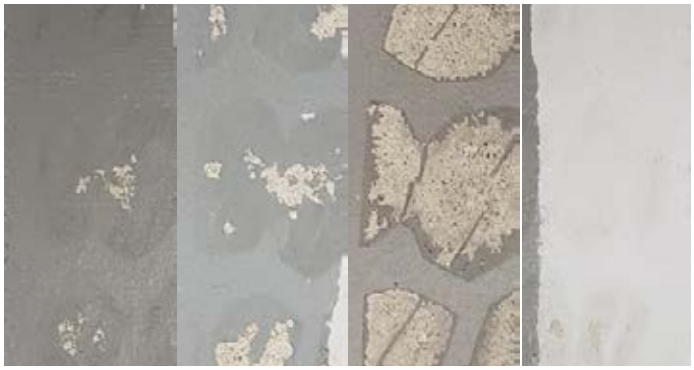


Product highlights

- Excellent wet adhesion on challenging concrete
- Superior hot tire pickup adhesion and black marking resistance
- Excellent chemical resistance, with improved film softening and resistance to discoloration over commercial paints

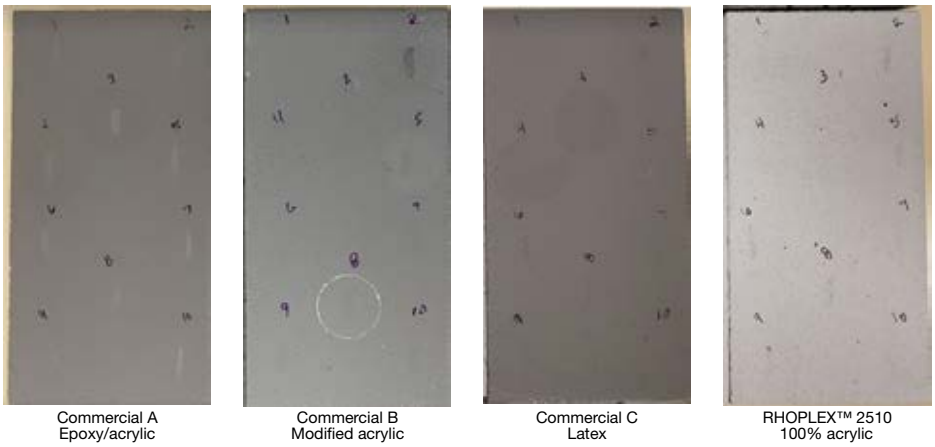
Hot tire pick-up resistance

Unprepped concrete



Wire brushed concrete

Chemical resistance



- Gasoline
- Brake fluid
- Motor oil
- Transmission fluid
- Battery acid
- Caustic
- Water
- Pinesol
- Anti-freeze
- Wiper fluid

Wet look concrete sealers

Clear concrete sealers serve to protect concrete surfaces, including poured patios and pavers. There is a growing trend for clear sealers to also beautify concrete by providing a glossy, wet look appearance or maintaining a more natural appearance of concrete. RHOPLEX™ HG-98B and RHOPLEX™ 2510 polymers provide excellent durability in a 100 g/L VOC sealer formulation while offering versatile appearance profiles. RHOPLEX™ HG-98B polymer provides a more glossy appearance with darker color, while RHOPLEX™ 2510 polymer, uniquely developed for improved adhesion performance, offers more moderate gloss and color. Sealers formulated with RHOPLEX™ HG-98B and RHOPLEX™ 2510 polymers offer improved water whitening resistance over commercial benchmark products while maintaining the premium adhesion, household stain, and chemical resistance on the market today.

Wet look concrete sealers < 100 g/L VOC

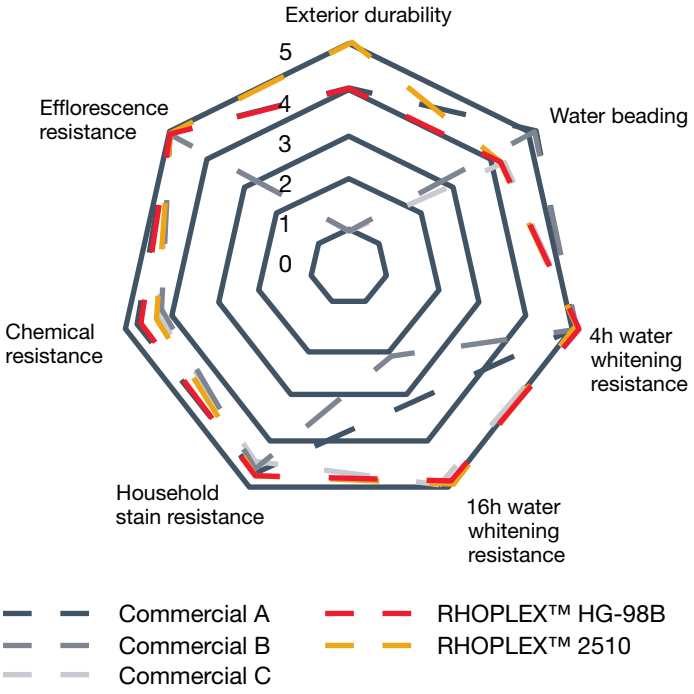
Product name	Super high gloss	Wet look	Water whitening resistance	Household stain resistance	Chemical resistance	Efflorescence resistance	Gloss retention	Exterior durability
RHOPLEX™ HG-98B	•••	••	•••	•••	•••	•••	•••	•••
RHOPLEX™ 2510	•	•	•••	•••	•••	•••	•••	•••
RHOPLEX™ CS-4000	••	•		•	•	•		

	RHOPLEX™ HG-98B	RHOPLEX™ 2510
Solids, %wt	45.0	42.5
Density, lb/gal	8.8	8.8
pH	9	9
MFFT,	24	18

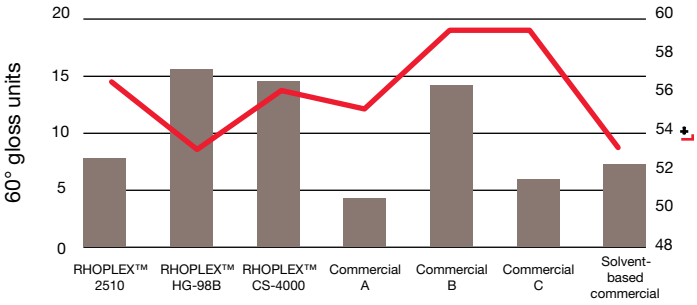
Segment needs

- Water resistance
- Stain and chemical resistance
- Efflorescence resistance
- Alkali resistance
- Exterior durability
- Wet look appearance

Overall performance

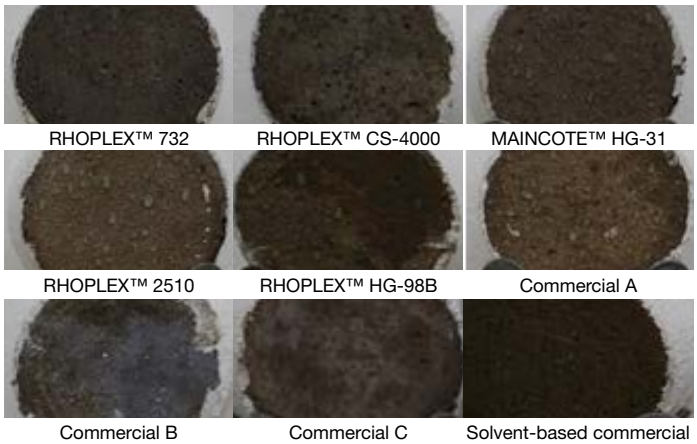


Gloss and color on concrete



Exterior exposure on hot concrete

Please note that MAINCOTE™ HG-31 polymer is not recommended for long term exterior use



Natural look concrete sealers

Natural look concrete sealers typically deliver a lower gloss and appearance profile that is similar to bare concrete. Many commercial products in the natural look sealer space are based on acrylic chemistry or silane/siloxane chemistry. RHOPLEX™ DCR-521, RHOPLEX™ HG-706, and RHOPLEX™ 2510 Acrylic Emulsions offer excellent durability while providing a lower gloss, more natural appearance profile. DOWSIL™ 6696 and DOWSIL™ IE 6683 Emulsions are silane-based offerings that deliver performance profiles that compete with commercial silane-based sealers on the market.

Natural look concrete sealers < 100 g/L VOC

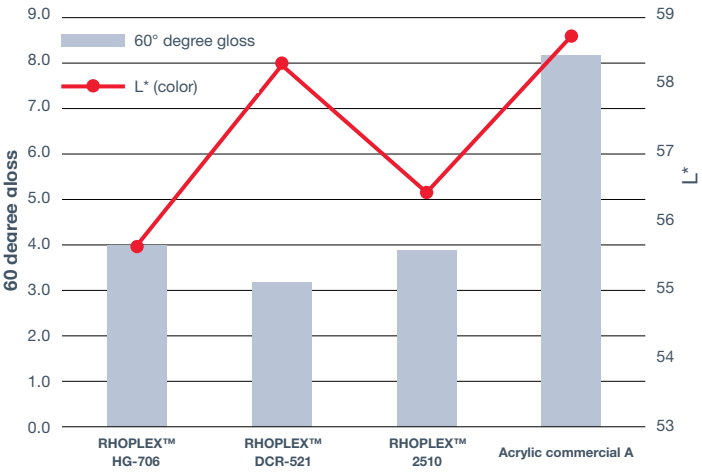
Product name	Lower gloss	Water whitening resistance	Water beading	Stain resistance	Chemical resistance	Efflorescence resistance	Gloss retention	Exterior durability
RHOPLEX™ DCR-521	•	•	•	•	•	•	•	•
RHOPLEX™ HG-706	•	•		•	•	•	•	•
RHOPLEX™ 2510	•	•		•		•	•	•
DOWSIL™ 6696	•	•	•			•	•	•
DOWSIL™ IE 6683	•	•	•			•	•	•

	RHOPLEX™ DCR-521	RHOPLEX™ HG-706	RHOPLEX™ 2510	DOWSIL™ 6696	DOWSIL™ IE-6683
Solids, %wt	57	45	42	30	40
Chemistry	100% acrylic	100% acrylic	100% acrylic	Cationic PDMS	Silane/siloxane
MFFT, °C	25	< 5	26	—	—
APEO-free	Yes	Yes	Yes	Yes	Yes

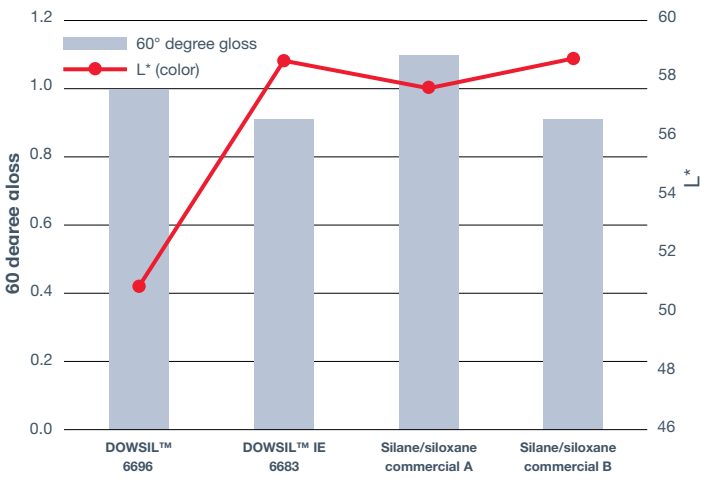
Segment needs

- Water resistance
- Household stain resistance
- Efflorescence resistance
- Exterior durability
- Natural look appearance

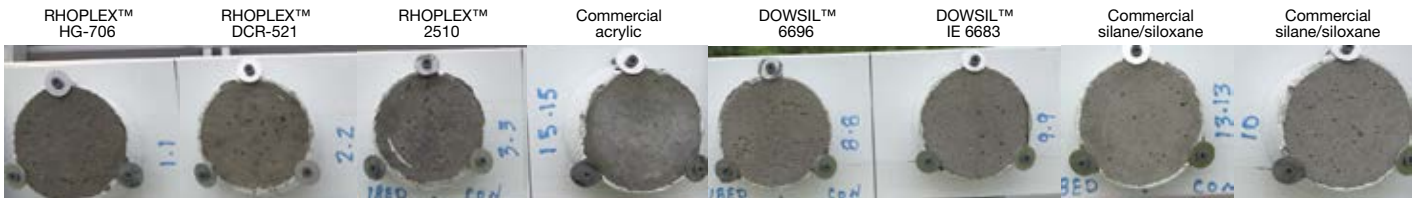
Low gloss with acrylic offerings



Low gloss with silane/siloxane offerings



Excellent water whitening and alkali resistance from acrylic and silane/siloxane offerings on exterior exposure



Natural look concrete sealers exposed 12 months North vertical on 7 day cured tilt-up concrete substrates in Spring House, PA (Series 18ED)

Basement waterproofing paint

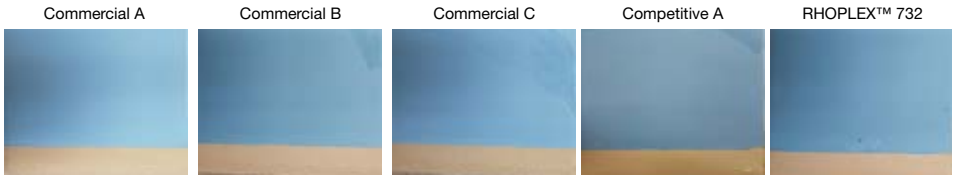
Interior, below-grade cinderblock walls are often subjected to pressure from outside water saturating the soil surrounding basements. High build latex paints are often applied to interior walls to provide waterproofing benefits, and different paints can withstand varying levels of hydrostatic pressure from water. A typical basement wall is 8 feet in height, and this equates to 4 psi of hydrostatic pressure from water built up against a wall of that height. Basement paints formulated with RHOPLEX™ 732 polymer withstand 20-25 psi of hydrostatic pressure, outperforming several top commercial products in lab testing. Paints made with RHOPLEX™ 732 polymer also offer excellent alkali and efflorescence resistance critical for cementitious substrates. Additionally, RHOPLEX™ 732 polymer has versatile use in primers and general exterior architectural coatings.

RHOPLEX™ 732 polymer withstands high levels of hydrostatic pressure and delivers excellent alkali resistance

Product name	Chemistry	% solids	VOC capable (g/L)	Highlights
RHOPLEX™ 732	Acrylic	49.0	< 50	• Excellent alkali resistance • Superior resistance to high levels of hydrostatic pressure
RHOPLEX™ 2510	100% acrylic	42.5	< 100	• 100% acrylic • Withstands >4psi of hydrostatic pressure
AVANSE™ 200	Styrene/acrylic	45.0	< 100	• Excellent alkali resistance • Passes ASTM D-7088

Paint/property	Commercial A	Commercial B	Commercial C	Competitive A	RHOPLEX™ 732 Dow Paint
Claimed PSI	12	20	15	—	—
ASTM D-7088 (4psi)	FAIL	FAIL	FAIL	FAIL	PASS
Failed/blistered, psi	4	4	4	4	25
Alkali Resistance (0.5N NaOH, 2 wks)	+	Control	=	=	+

Alkali resistance



Segment needs

- Resistance to hydrostatic pressure
- Alkali resistance
- Adhesion to concrete
- Roller, brush, spray application

Resistance to hydrostatic pressure (ASTM D-7088)

All three commercial paints fail ASTM D-7088 by blistering and leaking water at 4 psi. RHOPLEX™ 732 polymer withstands high levels of hydrostatic pressure, outperforming commercial and competitive benchmarks.

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Form No. 884-02287-01-0521 S2D