Welcome to the 2014 ACR Webinar Series!!

Invest one hour with us and we’ll help you grow your business with products and technology from Arkema Coating Resins
Today's Topic: Architectural Coatings
Speaker: Neal Rogers
Title: Senior Product Development Engineer
Our training goal

Give you the knowledge necessary to confidently recommend the right products for your customer’s architectural coatings needs

- High level overview of architectural coatings applications, formulation, and testing
- Characteristics and benefits of different Arkema resin technologies
- Highlight several Arkema products and describe their performance benefits
Today’s Agenda

- U.S. Architectural Coatings Market Overview
- Architectural coatings formulation and test methodology basics
- Arkema Coating Resins product overview by technology type for architectural coatings segment
- Product Spotlight
  - CELOCOR®
  - SNAP® 728
  - SYNAQUA® 4804
- Recap
U.S. Architectural Coatings
Market Overview
Architectural is the largest coatings segment
Mix by Category (Based on Gallons)

Source: American Coatings Association
U.S. Architectural coatings market is rebounding
Climbing Up from the Bottom

Source: U.S. Dept of Commerce, American Coatings Association
Consolidation Continues
The Big Get Bigger

Consolidation in the North American architectural coatings market has been occurring for decades

Four large, strategic deals executed by Sherwin-Williams, PPG, and Valspar since the fourth quarter of 2012 have been true game changers.

- Sherwin-Williams’ acquisition of Comex-USA/Canada provides additional geographical coverage in under-represented regions and enhances its market-leading position in USA.
- PPG’s acquisition of Akzo Nobel’s N.A. Architectural Coatings (Glidden) business and the pending Comex-Mexico deal makes PPG the largest coatings company in the world and a strong #2 player in N.A. architectural coatings.
- Valspar’s supply agreement with Ace Hardware and acquisition of Ace’s paint manufacturing assets demonstrates a commitment to the architectural coatings market and provides an opportunity to significantly expand distribution and brand awareness.

As a result, four companies (S-W, PPG, Masco/Behr and Valspar) account for an estimated 84% of architectural coatings sold in North America.

Source: Grace Matthews, Inc. 2013
What Are Our Small- and Medium-Size Architectural Customers Focused On?
Small- to medium-sized US architectural paint companies face several challenges

Market Dynamics

- Market is rebounding from trough but sales & profits have been squeezed
- Consolidation has reduced the number of regional players

VOC regulations and raw material product line consolidations have driven their R&D activities

- But focus is shifting to product performance innovations

It is critical for them to differentiate themselves from the "nationals" (S-W, PPG, Behr, Valspar) so that don't have to follow on price

Most important buying factors for raw materials:

- 1.) Familiarity (reputation) 2.) Product Consistency 3.) Sales & Tech resources 4.) Price
What are architectural coatings?
Architectural Coatings are paints used to coat new and existing buildings

- Used for both interior and exterior surfaces
- Paints are often recommended for different architectural substrates
  - Wood
  - Masonry and Stucco
  - Metal
- Primarily decorative in nature but they must protect and adhere to the substrate
- The category includes both primers and topcoats
Architectural Paints are composed of various ingredients

- Latex binder
- Pigments
- Coalescents
- Thickeners
- Additives
Polymer and latex characteristics impact performance

### POLYMER

- **Composition**
  - durability
  - water resistance
  - adhesion

- **Glass Transition Temp (T_g)**
  - “hardness”
  - dirt pick up resistance
  - tensile/elongation
  - coalescent/plasticizer demand

- **Molecular weight**
  - exterior durability
  - “toughness”

### LATEX

- **Particle size/ Distribution/ Morphology**
  - thickener efficiency
  - rheology
  - freeze/thaw stability
  - binding efficiency
  - adhesion

- **Surfactant package**
  - stability
  - water sensitivity
Pigments are used to impart hiding, control appearance and performance

- Titanium dioxide provides whiteness

- Extender choice can impact film performance
  - Some mineral extenders are harder – Silica, aluminum silicates
  - Other mineral extenders are softer – Calcium carbonate, talc
  - Selection may impact scrub and burnish resistance or washability

- Pigment Volume Concentration (PVC) in an architectural paint determines the reflective nature of the paint
  - Higher PVC systems are flat and low sheen
  - Lower PVC systems are semi-gloss to gloss
Thickeners alter flow characteristics

- Thickeners prevent phase separation in the can
- How a product flows when applied by brush, roller, or spray to the painting surface
- They should impart a balance of sag resistance and leveling
- Leveling is important to give the film a consistent uniform appearance
Additives enhance key properties

- Glycols impart freeze/thaw resistance and increase open time
  - Example: propylene glycol and ethylene glycol

- Dispersants and surfactants provide stabilization to the pigment particles
  - Example: COADIS®, Tamol®

- Defoamers reduce the surface tension of the formulation to minimize process foam or roller application foam
  - Example: BYK® defoamers, Foamaster® series, Dee Fo®, etc.

- Preservatives and mildewcides provide protection to bacteria and mildew growth
  - In-can preservatives: BIT, CMIT, and MIT isothiazolones
  - Film preservatives to resist mildew: IPBC; DCOIT, etc.
VOC content is a key driver for ingredient selection in architectural coatings

- Low VOC content driven by regulatory requirements, most stringent in California’s South Coast AQMD

- Common components that add VOC to paint formulas:
  - Glycols
  - Coalescents

- Most modern dispersants, thickeners and other additives have no VOC or very low VOC contribution

- Keep in mind that Low VOC does not necessarily = Low Odor!
Key Testing Methodologies for Architectural Coatings
Architectural coatings are evaluated for a range of attributes

**Appearance**
- Gloss
- Color
- Hiding

**Liquid Paint**
- Viscosity
- Storage Stability: Heat aged or Freeze-thaw cycles
- Mechanical stability

**Application**
- Flow and Leveling
- Touch Up
- Cold Temperature Coalescence
- Mudcracking
- Foam and Spatter Resistance

**Film Toughness**
- Scrub Resistance
- Washability / Stain Removal
- Block Resistance
- Burnish Resistance
- Adhesion
- Stain Blocking (generally for primers)

**Exterior Durability**
- Cracking, Loss of Adhesion
- Dirt Pickup Resistance
- Chalking
- UV resistance (gloss and color retention)
- Mildew Resistance
A paint's target application dictates the testing emphasis

- **Contractor Paints**
  - Flow and Leveling
  - Open Time
  - Touch Up Characteristics

- **Interior DIY Paints**
  - Appearance
  - Scrub Resistance
  - Washability

- **Exterior Paints**
  - Fade Resistance
  - Dirt Pickup Resistance
Scrub resistance has been the key metric for assessing interior durability

**Scrub Resistance**
- Tested with a wet brush using an abrasive soap solution
- Thin film of paint is scrubbed until the coating fails
- Linear Abrasion Test machine counts the number of cycles

Better Scrubs  Worse Scrubs
Washability is becoming increasingly important

- **Washability**
  - Also called Stain Removal testing
  - Stains are applied to a paint film and allowed to set for a specified time
  - Uses same test apparatus as Scrub Resistance
  - A soft wet sponge and non-abrasive cleaning solution is scrubbed over the stained paint for a specified number of cycles
  - Color change of the unstained section versus the stained and washed section is measured
Accelerated testing is no substitute for real world exposures when assessing Exterior Durability

Arkema Coating Resins maintains an extensive exterior coatings testing program in Cary, NC

Statistics
- Over 3,000 panels on test at the site
- About 60 new test series added every year
- Mix is roughly 1/3 developmental and new products testing, 1/3 customer support or technical service, and 1/3 commercial product benchmarking
Exterior Durability must be assessed on various substrates

- **Paints applied in-lab to a variety of substrates**
  - New or weathered wood
  - Fiber cement siding
  - Fresh cementitious surface
  - Glossy or chalky substrate panels for adhesion

- **Monitored over time**
  - Gloss or color change
  - Dirt pickup and mildew
  - Cracking
  - Loss of adhesion
Product Line Overview
ACR offers a broad range of products to this segment with our Tool Box of Polymers

**Broadest technology platform**

- NEOCAR® Acrylic polymers
- Acrylic polymers
- Styrene acrylic polymers
- NEOCAR® polymers
- Vinyl acrylic polymers
- Vinyl acetate ethylene polymers
Diverse product range to provide options to our customers

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Arkema Coating Resins self certification program

Demonstrates commitment to sustainable formulated products

- Helping support “Green” initiatives
- Reduction of air pollution
- Meeting VOC (Volatile Organic Compounds)
- Reducing environmental impact
- Enabling **sustainable** formulating
No added alkyl phenol ethoxylate (APEO) surfactants

No added formaldehyde or formaldehyde donors

Total latex VOC <5 g/ L

Below regulatory reporting limits for carcinogens, reproductive toxins and ozone depleting compounds

Low residual monomer levels
- Total monomer <500 ppm

Minimal use of Hazardous Substances
- Green Seal™ hazardous components
  - <0.01% per component
- California Prop 65 substances
  - Minimized and documented with data available upon request
- Hazardous Air Pollutants (HAPS) < 0.1%
- No known added phthalates, triphenyl or tributyl tins, 1,2-dichlorobenzene
ACR has an extensive Acrylic product line

**General Performance Characteristics**

- Durability for exterior exposure
- Alkali resistance
- Dirt pick-up resistance
- Good washability
- Grain crack resistance
- Flexibility and elongation

| ENCOR 626 | ENCOR 657 (EnVia) |
| ENCOR 627 | SNAP 720 (EnVia) |
| ENCOR 631 (EnVia) | SNAP 728 (EnVia) |
### ACR offers a full range of Acrylic options

<table>
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<tr>
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<td>Encor 627</td>
<td>43.5</td>
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<td>SNAP 720</td>
<td>50</td>
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<tr>
<td>SNAP 728</td>
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</table>

### Selection Guidelines

- **ENCOR 657 and 626** are versatile general use acrylics
  - Both products have good exterior durability performance
  - Select 626 where exterior wet adhesion is a requirement
- **ENCOR 627** for stainblocking primer formulations. Also capable for masonry applications.
- **ENCOR 631** for improved film toughness over 626 and 657
  - Self Crosslinking for enhanced performance
  - Zero VOC formulation capable for Flat through Semi-Gloss levels
- **SNAP 720 or 728** for high gloss enamels. The two products offer similar features; SNAP 728 offers the broadest formulation capability
ENCOR 627 / ENCOR 631 demonstrates superior performance to many commercial offerings

Weathered White Pine exposed on South 45 for 1.5 years

Sections 30, 31 and 32 A – represents a system based on ENCOR 627 primer & internal control topcoat

Section 31C is ENCOR 627 primer with ENCOR 631 topcoat. All other systems in sections B, C and D are various combinations of commercially available primers and topcoats

**Conclusion:** The exposure demonstrates ENCOR 631 with ENCOR 627 as the primer can be formulated to give outstanding adhesion, excellent dirt pickup resistance and grain crack resistance equal to or better than several commercial primer and topcoat paints
ACR is a long standing market leader in vinyl acrylics

**Positive**
- Excellent scrub resistance
- Cost effective
- Good binding efficiency
- Color retention
- Color development
- Good surface wetting
- Good low temperature touch-up

**Challenges**
- Block resistance
- Alkali resistance
- Water sensitivity
- Dirt pick-up resistance
- Wet adhesion

| ENCOR 379G | ENCOR 300 |
| ENCOR 309 (EnVia) | ENCOR 310 (EnVia) |
| ENCOR 357 (EnVia) | ENCOR 367 |
ACR offers a full range of vinyl acrylic options

<table>
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<th>% Solids</th>
<th>Tg</th>
<th>MFT [°C]</th>
<th>Minimum VOC Potential [g/ L]</th>
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<td>Encor 309</td>
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<td>Encor 357</td>
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<td>12</td>
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<td>Encor 367</td>
<td>55</td>
<td>19</td>
<td>10</td>
<td>100</td>
</tr>
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</table>

**SELECTION GUIDELINES**

- All the Vinyl Acrylics can be used in similar formulations
  - Stand-alone resins
  - Blend with acrylics
- ENCOR 379G/309 are high molecular weight polymers that give superior exterior durability
- ENCOR 300/310 offer the lowest VOC potential; maintain film toughness even at low VOC
- ENCOR 357 is the strongest choice for use in higher gloss formulations where block resistance is a requirement
- ENCOR 367 offers good freeze-thaw resistance of the liquid paint
ACR also offers VAE chemistry

**Positive**

- Excellent scrub resistance
- Excellent low-temperature touch-up potential
- Low VOC formulating capability
- Better performance than standard Vinyl Acrylates for:
  - Block resistance
  - Alkali resistance
  - Water sensitivity

**Challenges**

- Dirt pick-up resistance
- Wet adhesion

**ENCOR 282 (EnVia)**

- High performance general purpose VAE binder
- 55% Solids
- Tg = 11°C
- MFFT = 0°C
ACR is the market leader in NEOCAR® technology

General Performance Characteristics

- Durability for exterior exposure
- Alkali resistance
- Good washability
- Good scrub resistance
- Grain crack resistance
- Color retention
- Tannin stain resistance
- Chemical resistance

<table>
<thead>
<tr>
<th>ACRYLIC based</th>
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<tr>
<td>NEOCAR Acrylic 820</td>
<td>NEOCAR Latex 2300</td>
</tr>
<tr>
<td>NEOCAR Acrylic 850</td>
<td>NEOCAR Latex 2535</td>
</tr>
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</table>
NEOCAR® technology enhances performance

Vinyl versatate modification enables:
Exceptional water resistance
Exceptional alkali resistance
Improves chemical resistance
Exceptional flexibility and elongation

Hydrophobicity

Vinyl Acrylic     NEOCAR Latex     Acrylic     Styrene Acrylic     NEOCAR Acrylic
NEOCAR® is your choice for superior performance in both vinyl acetate containing and acrylic based latexes

<table>
<thead>
<tr>
<th></th>
<th>% Solids</th>
<th>Tg</th>
<th>MFT [°C]</th>
<th>Target Application</th>
<th>Key Feature</th>
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<tr>
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<td>Chemical Resistance and Hot Tire Pickup Resistance</td>
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Arkema’s NEOCAR product offerings provide coatings solutions where excellent hydrophobicity and water resistance properties are needed.
ACR styrene acrylic product line

**Positives**
- Hydrophobic
- Good adhesion
- Excellent alkali resistance
- Stain resistance
- Scrub resistance

**Challenges**
- Potential to chalk and yellow
- Little grain crack resistance

<table>
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<tr>
<th>ENCOR® 461</th>
<th>ENCOR CL36</th>
<th>ENCOR 9176</th>
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<tbody>
<tr>
<td>ENCOR 471</td>
<td>ENCOR 123</td>
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<td>ENCOR 481</td>
<td>ENCOR 3176A</td>
<td>ENCOR Flex 192</td>
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ACR offers a full range of styrene acrylics

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<td>Elastomeric coatings</td>
<td>Superior water and alkali resistance</td>
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<td>Ambient crosslinking imparts superior toughness</td>
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<td>Cost-effective with good DPR</td>
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<td>&lt; 50</td>
<td>Elastomeric coatings</td>
<td>Excellent adhesion with good DPR</td>
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</table>
SYNAQUA 4804

- APEO and ammonia free
- Short Oil alkyd emulsion
- Capable to formulate <50 g/L
- Excellent High Gloss potential
- Quick Dry Time

Typical Applications

- High gloss trim paints
- Transparent and semi-transparent stains
More details are available in our technical data sheets.

SNAP® 728
For Architectural Coatings Applications

SNAP® 728 is a structured non-acrylic polymer for use in high gloss sheet coatings applications. Its 100% acrylic latex features excellent gloss and adhesion and is ENVIA® certified.2 SNAPSHOT technology provides outstanding block resistance and exceptional film formulations at zero or low VOC. Due to its common-base composition, SNAP® 728 is an excellent choice for systems where odor of the finished product is a concern.

- 100% acrylic latex composition
- No added Allylphenol Ethoxylate (APE) surfactants
- No added formaldehyde or formaldehyde donors
- Ammonia free
- Superior block resistance and "shrink less" film hardness compared to standard acrylic binders
- Lower VOCs, acceptable from 0.50 g/L
- Outstanding dirt pickup resistance
- Excellent scrub resistance
- Offers superior adhesion to a wide variety of substrates
- Low odor

Typical Physical Properties Latex

- Total Solids, % by weight: 40.8
- Weight per Gallon, lbf: 8.9
- pH Value: 7.0
- Particle Size, Nanometers: 0.10
- Viscosity, cP: <500
- Minimum Filing Temperature °C: 0

1 These products meet the requirements of Arkema’s Coating Policy SNAP program. These products are designed to acid catalyze in varying free solid contents and obligate parts in heat-thinned products.
2 The data provided for these properties are typical values. Individual lots may vary, and should not be construed to values, specifications.

Figure 1: Block Resistance

Using the supplied starting point formulation, coatings based on SNAP® 728 latex display comparable or improved block resistance compared to commercially available binders.

1 Day Deep Tint Room Temperature and High Temperature Block Resistance (14 oz-

Figure 2: Block Resistance with High Colorant Loadings

Testing allows coatings based on SNAP® 728 binder maintain excellent block resistance when tinted with 1% of E NoverColor® Zero VOC Colortint.
ACR offers alternatives to many competitive products

### ACRYLIC

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<thead>
<tr>
<th>Product</th>
<th>Supplier</th>
<th>Arkema Suggestion</th>
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<tr>
<td>Optive® 130</td>
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<td>ENCOR® 626</td>
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<td>Rhoplex® AC-264</td>
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<tr>
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### OPACIFIER

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*NEOCAR Latex 2535 is not a 100% acrylic technology but offers similar performance for exterior coating applications*
ACR offers alternatives to many competitive products

**VINYL ACRYLIC**

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<th>Product</th>
<th>Supplier</th>
<th>Arkema Suggestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avicor® 385</td>
<td>Celanese</td>
<td>ENCOR @ 309</td>
</tr>
<tr>
<td>Avicor 325</td>
<td>Celanese</td>
<td>ENCOR 379G</td>
</tr>
<tr>
<td>Rovace ® 9900</td>
<td>Dow</td>
<td>ENCOR 310</td>
</tr>
<tr>
<td>Rovace 9100</td>
<td>Dow</td>
<td>ENCOR 379G</td>
</tr>
<tr>
<td>Rovace 661</td>
<td>Dow</td>
<td>ENCOR 367</td>
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</table>

**VINYL ACETATE ETHYLENE (VAE)**

<table>
<thead>
<tr>
<th>Product</th>
<th>Supplier</th>
<th>Arkema Suggestion</th>
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</thead>
<tbody>
<tr>
<td>EcoVAE ® 401</td>
<td>Celanese</td>
<td>ENCOR 282</td>
</tr>
<tr>
<td>Vinnapas ® EF8001</td>
<td>Wacker</td>
<td>ENCOR 282</td>
</tr>
</tbody>
</table>
ACR continually works to refresh and improve our latex offerings

Current projects include the following areas

- Direct to Metal Low VOC Coatings
- Washability Improvement for Interior Paints
- Dirt Pickup Resistance Enhancement
Key Message

- **Breadth of waterborne chemistry**
  - More tools in the toolbox
  - Allows us to offer optimal solution for the customer’s needs
  - Gives best balance of performance and value

- **We have deep technical expertise in Architectural coatings**
  - Real world industry experience
  - Ongoing training
  - Support to enhance your capabilities

- **ACR continually works to refresh and improve our latex offerings**
CELOCOR®
Opacifying Polymer for Hiding Optimization
CELOCOR® opacifying polymer technology

- Use of Opacifier is widely accepted in architectural coatings and has been used since the 1990’s

- Practically all architectural coatings producers use opacifying polymer to:
  - Optimize hiding and tint strength performance
  - Reduce TiO₂ usage in their formulations
  - Hedge against fluctuating TiO₂ prices

- CELOCOR is can be substituted easily for the standard grades of opacifier in the marketplace
CELOCOR® offers a balance of properties

<table>
<thead>
<tr>
<th>Performance Property</th>
<th>Competitor B</th>
<th>Celocor</th>
<th>Competitor A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiding/Tint Strength</td>
<td>-</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>Gloss Development</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Burnish Resistance</td>
<td>++</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Scrub Resistance</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>
CELOCOR® offers competitive hiding performance

Wet & Dry Hide all comparable. Opacifier paints contain 7% PVC of opacifier and a 1.6% PVC (21#/100gal.) reduction in TiO₂.
Opacifier paints contain 7% PVC of opacifier and a 1.6% PVC (21#/100gal.) reduction in TiO₂. Tinted with 2oz. Colortrend phthalo blue E.
CELOCOR® offers competitive scrub resistance

Scrub resistance of Celocor is comparable to Competitor A & B. The opacifiers perform closely to TiO₂.
CELOCOR® offers competitive exterior durability

Celocor Section A&B
- VA-based Flat, PVC 48%, VS 36%

Competitor A on Section C&D
- Acrylic-based Flat, PVC 46%, VS 39%

Celocor shows exterior performance equal to competition.
Summary

- CELOCOR® has comparable hiding and tint strength performance to the competition

- Scrub, burnish, block resistance, touch up and exterior durability have minimal to no change in performance

- CELOCOR gives coatings manufacturers a viable second source to the industry standard opacifying polymers

- CELOCOR offers a hedge against TiO$_2$ pricing volatility
SNAP® 728
Structured Nano-Acrylic Polymer for Satin to High Gloss Coatings
SNAP® technology offers breakthrough performance

- Excellent “enamel-like” film hardness compared to standard acrylic binders
- Superior block resistance at both room temperature and high temperature in no or low VOC formulations
- Increased gloss potential
- Improved adhesion to difficult substrates
- Improved stain removal
- Improved scrub resistance performance
- Maintains excellent low temperature film formation without solvents
- Low odor
- Enables a VOC reduction and a performance enhancement
SNAP® 728 extends the application window

- Novel binder technology designed to be used in satin to high gloss finishes in both interior and exterior applications. SNAP® 728 builds on the strengths of the SNAP® family and provides formulators with the following benefits

- **Polymer Design**
  - Structured Nano-Acrylic Polymer
  - **Envia®** by Arkema
  - Low VOC capable - from 0-50 g/L
  - No Alkylphenol Ethoxylate (APE) surfactants
  - No added formaldehyde-donors or formaldehyde*
  - Ammonia free

- **Performance Benefits**
  - Excellent “Enamel-like” Film Hardness compared to standard acrylic binders
  - Superior block resistance at both room temperature and high temperature in no or low VOC formulations
  - Increased Gloss
  - Improved Adhesion to difficult substrates
  - Improved Stain Removal
  - Improved semi-gloss scrub resistance performance
  - Maintains excellent low temperature film formation without solvents
  - Low odor

*please request EnVia® technical details for further information*
SNAP® technology offers excellent block resistance

![Bar chart showing performance of SNAP 728, SNAP 720, and competitor's product. The chart compares RT and HT properties. SNAP 728 and SNAP 720 have similar performance, with SNAP 720 slightly higher in RT and SNAP 728 slightly higher in HT. The competitor's product has lower performance in both RT and HT compared to SNAP 728 and SNAP 720.]
Superiority in block resistance even more evident in neutral tint bases*

*1 Day Deep Tint Room Temperature and High Temperature Block Resistance (14 oz - B)
Print resistance is outstanding

Print Rating

<table>
<thead>
<tr>
<th></th>
<th>Best</th>
<th>Worst</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAP 728</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>SNAP 720</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Competitor's Product</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Print Resistance (120°F for 1 Hr)
SNAP® technology can be formulated to deliver high gloss

- SNAP 728: ~0 g/L
- SNAP 720: ~0 g/L
- Competitor's Product: -50 g/L formula, supplied at 45% NVM
SNAP® technology delivers outstanding wet adhesion in neutral tint base formulation
SNAP® can be formulated for superior stain resistance

SNAP® 728

Competitor’s Product
SNAP® delivers superior scrub performance*

Cycles to Failure

SNAP 728 > SNAP 720 > Competitor’s Product

*In High Gloss Starting Point Formulas
Summary

SNAP® 728: novel binder technology

- Excellent block resistance at both room temperature and high temperatures in no and low VOC formulations
- Excellent “Enamel-like” Film Hardness compared to standard acrylic binders
- Increased gloss
- Improved adhesion to difficult substrates
- Low VOC (0-50 g/ L)
- Improved stain removal
- Improved semi-gloss scrub resistance performance
- Maintains excellent low temperature film formation without solvents
- Low odor
SYNAQUA® 4804
Waterborne Alkyd for High Gloss Coatings
SYNAQUA® 4804

An APEO and ammonia free short oil alkyd emulsion designed for use in a wide variety of coatings in which performance similar to solvent based alkyds are desired. It offers the coatings formulator a low VOC option to develop the highest gloss products while giving the application feel of a solvent based alkyd.

- High gloss trim paints
- Interior/ exterior primers for wood and metal
- Direct-to-metal coatings with anticorrosive properties
- Transparent and semi-transparent stains

Performance benefits

- High gloss potential and excellent gloss retention
- Very good hardness
- Quick dry time
- Low yellowing
- Good stability with anticorrosive pigments
- Good application characteristics
- Outstanding resin for blending with other technologies, including styrene acrylics, acrylates and polyurethane dispersions
SYNAQUA® 4804 offers very high 20° gloss potential.

Bar chart showing gloss potential:
- **SA 4804**
  - Gloss @ 60°: 100
  - Gloss @ 20°: 90
- **Comp A**
  - Gloss @ 60°: 90
  - Gloss @ 20°: 70
- **Comp B**
  - Gloss @ 60°: 80
  - Gloss @ 20°: 50

Legend:
- **Gloss @ 60°**
- **Gloss @ 20°**

Competitive A: PU-modified alkyd emulsion
Competitive B: Alkyd-acrylic hybrid
SYNAQUA® 4804 delivers good resistance to yellowing
SYNAQUA® 4804 offers good hardness for decorative trim enamel applications

Typical Konig hardness range for commercial water-based low VOC gloss enamel paints is 8-12.
SYNAQUA® 4804 develops good block resistance

![Graph showing block resistance comparison between Comp A, SA 4804, and Comp B at 7 Day Room Temp and 7 Day 52°C conditions.]
SYNAQUA® 4804 has good adhesion to a variety of substrates

Crosshatch Adhesion, 7-Day Dry

Wet Film Crosshatch Adhesion, 7-Day Dry
Summary

Synaqua® 4804 offers the coatings formulator a waterborne alkyd technology that has broad formulation capability and outstanding performance.

- Excellent gloss potential and gloss retention
- Very good hardness
- Quick dry time
- Low yellowing
- Good stability with anticorrosive pigments
- Excellent application characteristics
- Very good adhesion to a variety of substrates
- Outstanding resin for blending with other technologies - Styrene acrylics, Acrylics and PUD dispersions
Summary

Highlights of Today’s Webinar
Recap

- Market is rebounding from trough which resulted from the collapse in housing and construction
  - sales & profits have been squeezed

- Consolidation has reduced regional competition, resulting in four national paint producers controlling > 80% of the market

- It is critical for small and mid-size paint manufacturers to differentiate themselves from the "nationals" so that don’t have to follow on price

- Most important buying factors, in order of importance, for paint producers
  - Familiarity (reputation)
  - Product Consistency
  - Sales & Tech resources
  - Price

- Arkema Coating Resins offers the broadest range of technologies for the Architectural coatings segment

- Today’s Spotlight Products
  - CELOCOR® – a viable alternative to opacifiers in the market
  - SNAP® 728 – low VOC technology for premium high gloss enamels
  - SYNAQUA® 4804 – the ease of waterborne with the gloss development of solventborne technology
Questions? Please contact the Account Team

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2014 ACR Webinar Series

Next Month’s Topic: Waterborne Coatings for Metal

Speaker: Jeff Arendt

Title: Technical Account Coordinator

Friday October 17, 2014 @ 2:00pm ET
Thank You for Joining Us!!

See you in October!!