

High Performance, EcoLabel 2015 Compliant

Acrylic Universal Primer Technology

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Product Manager

*Decorative / Architectural Polymers
Engineered Polymer Solutions (EPS)*

**Science
Simplified**

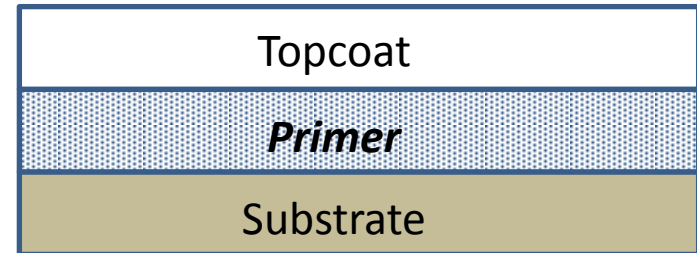
Market Segment

- Decorative / Architectural
- Interior & Exterior



Purpose of a Primer

- Bonds to problematic substrates
- Improves adhesion
- Enhances exterior durability
- Blocks stains
- Protects the paint from the substrate itself



Specialty Primers

Polymers designed for an individual performance attribute or substrate



Universal Primer

Polymer may be used as a specialty primer and / or replace several specialty polymers (raw mat consolidation)



New “Prime-One” Polymer Technology

Modified-Acrylic Polymer

- Hydrophobic barrier, locks in water-based stains.

Proprietary Adhesion Monomers

- Galvanized, cold-rolled steel, aluminum, etc.
- Concrete / masonry
- Wood and other construction materials
- Previously painted surfaces (chalky and glossy substrates)

Ammonia-Free

- Very low odor

Small Particle Size

- Penetrates to seal pores, enhances stain-blocking and adhesion performance.

High Performance + *Regulatory Compliance*



Formulating Primers with “Prime-One” Acrylic Technology

No need for:

- ✓ **Coalescing solvents**
- ✓ **Plasticizers**
- ✓ **Zinc oxide**
- ✓ **Stain-blocking pigments / additives**
(additives can reduce performance)
 - Very low VOC
 - Less hazardous paints
 - Can lower paint formulation cost

Paint Formulations

- ✓ Use readily-available raw materials
- ✓ Polymer-based performance
 - Lower PVC = Best Performance

<u>Suggested Formulation</u>	<u>%</u>
Water	23.8
Orotan 165	0.8
Vantex T	0.3
Drewplus L-475	0.3
Nuosept 498	0.2
Nalzin FA-379	0.3
Minex 4	28.7
R-902 TiO ₂	12.9
Polymer	31.7
Surfynol PSA-336	0.2
Natrosol Plus 330	0.2
Optiflo L-100	0.9

<u>PARAMETERS</u>	
NVW 57.1%	
NVV 40.3%	
PVC 50.0%	
VOC < 1 g/l*	

Primer Evaluation Parameters

Three polymers were evaluated in primer formulations at 30, 50 and 70% PVC

Polymer 1) Prime-One

- Modified-acrylic, no coalescing solvent or plasticizers used (< 1 g/l VOC)

Polymer 2) Competitive Acrylic Emulsion

- 100% acrylic, requires 5% coalescing solvent

Polymer 3) EPS Standard Acrylic Emulsion

- Modified-acrylic, requires 5% coalescing solvent

Tested versus four high-quality commercial primers used as benchmarks

Primer A: Acrylic emulsion based, formulated at 35% PVC

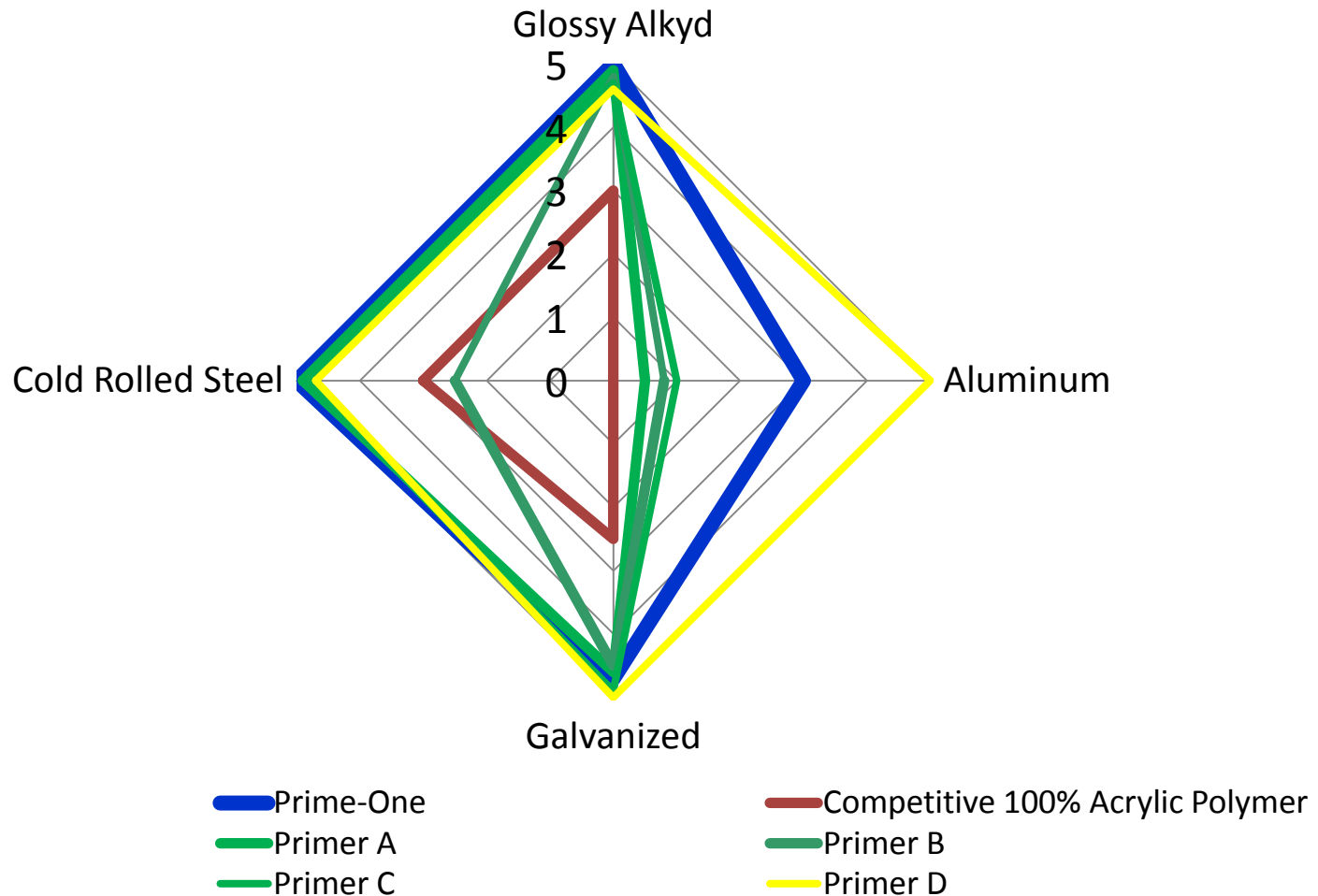
Primer B: Acrylic emulsion based, formulated at 34% PVC

Primer C: Acrylic emulsion based, formulated at 39% PVC

Primer D: Cationic based, formulated at 43% PVC

Adhesion (0-5, 5=best)

v Commercial Primers



Tannin Stain Resistance Mechanism

Prime-One
(Formula 1)

Prime-One
(Formula 2)

**Commercial
Primer**
(High TiO₂)

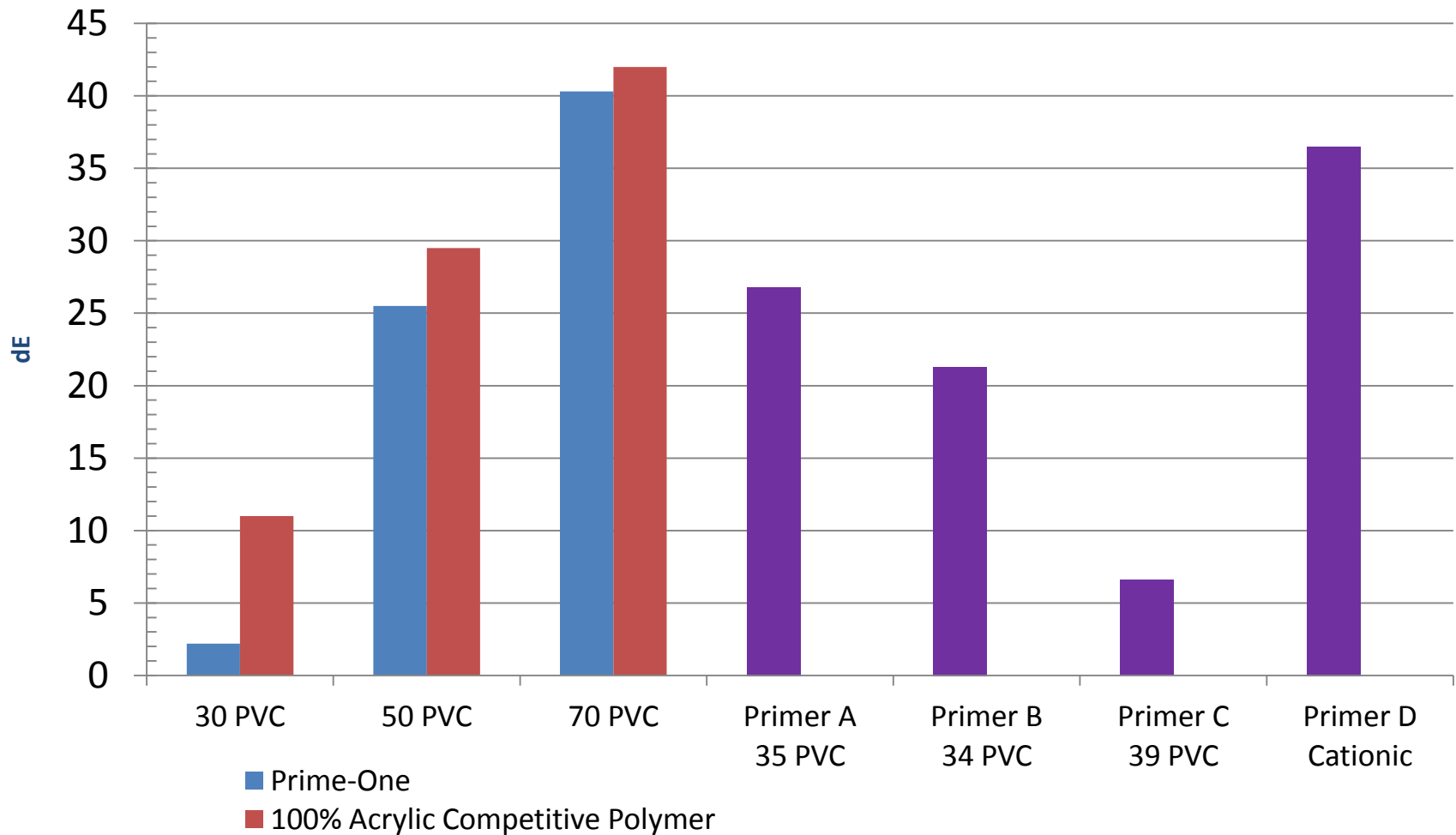
Prime-One
(Formula 3)



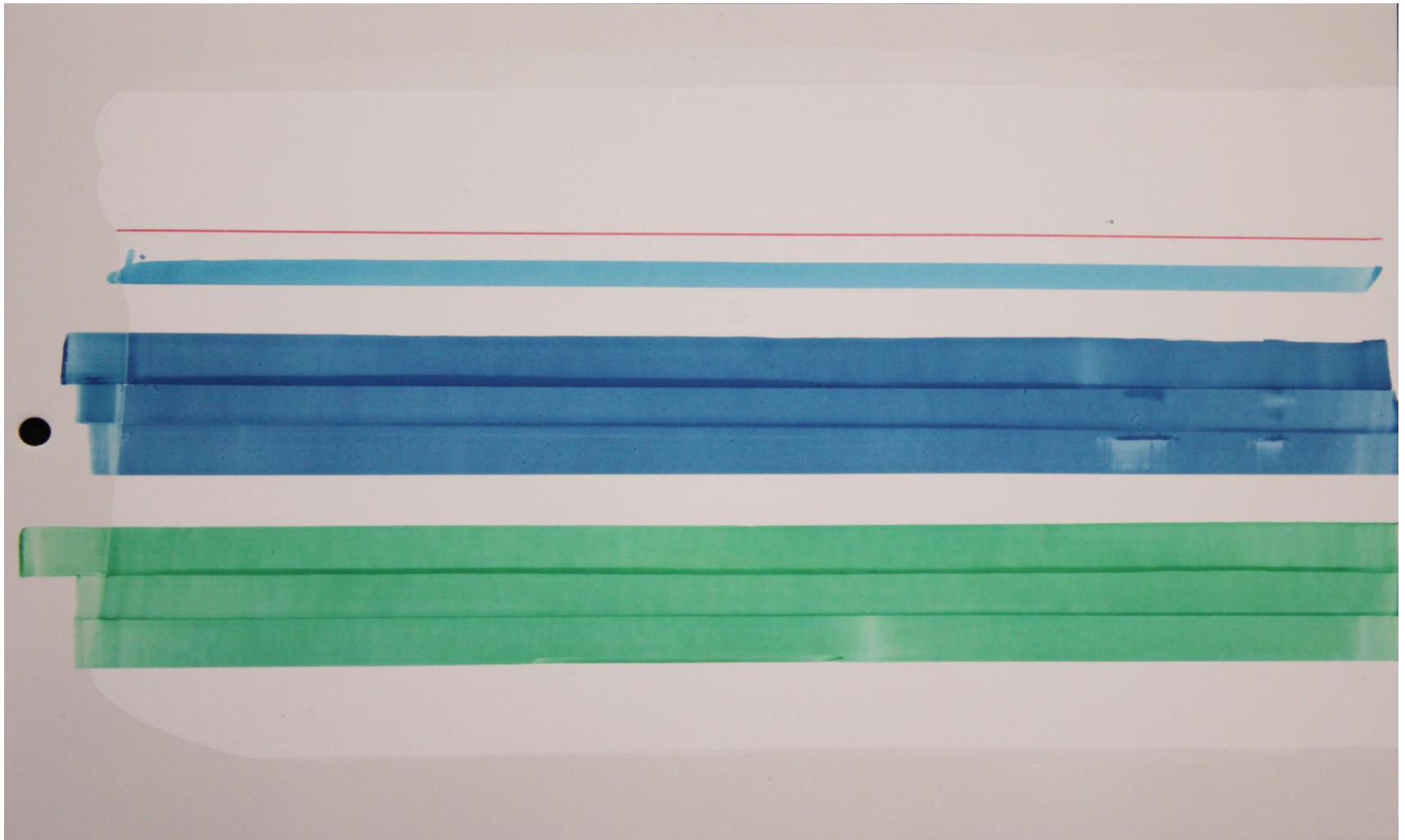
Tannin stain resistance after 24 hours humidity exposure

Tannin Stain Resistance

Merbau @ 72 Hours Humidity



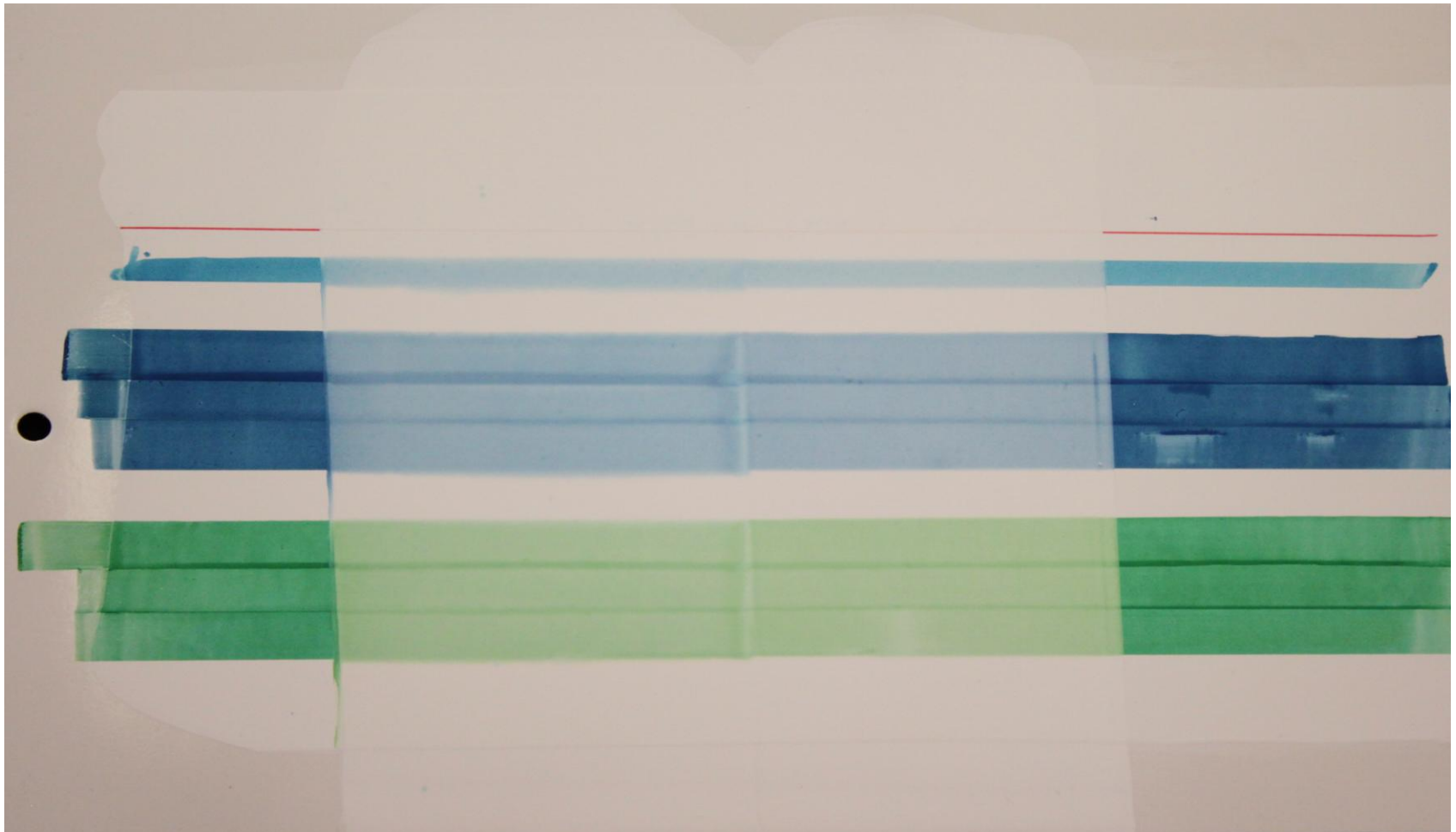
Ink / Marker Stain Resistance



Ink / Marker Stain Resistance

Prime-One

100% Acrylic
Competitive Polymer



Primed Section

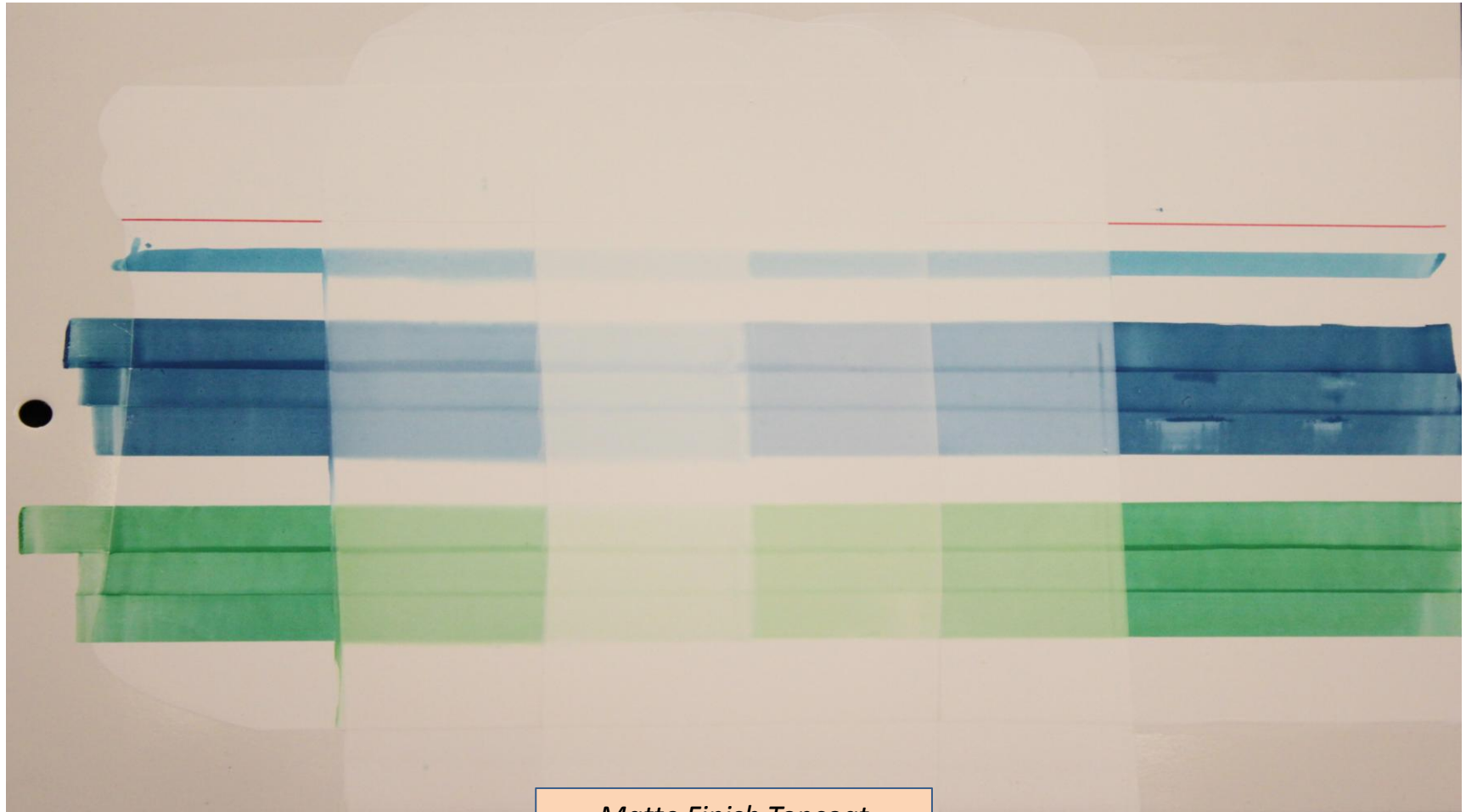
Primed Section

Apply primers side-by-side: 76 micron drawdown

Ink / Marker Stain Resistance

Prime-One

100% Acrylic
Competitive Polymer



Matte Finish Topcoat

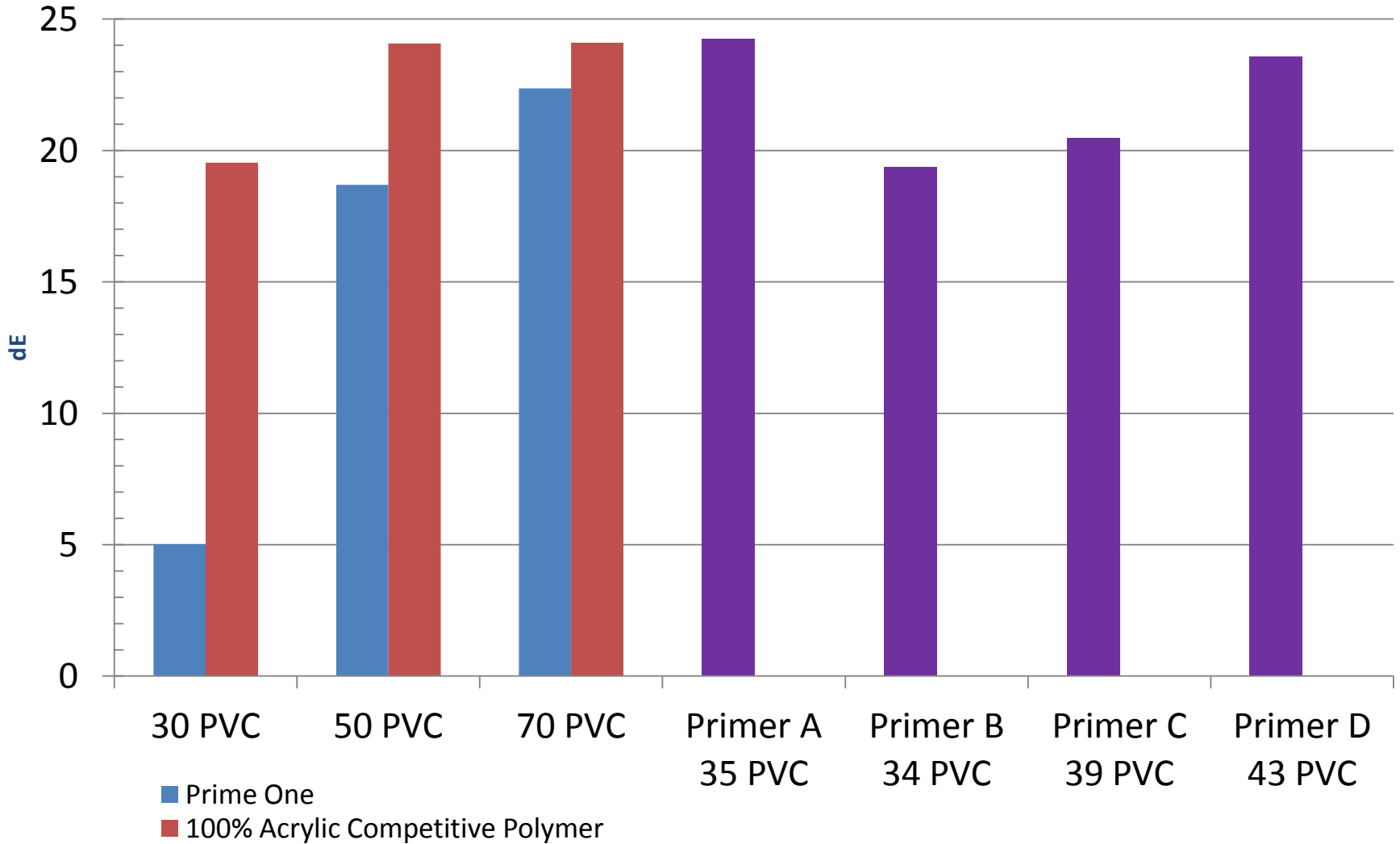
Primed Section

Primed Section

Water-based paint applied over primers

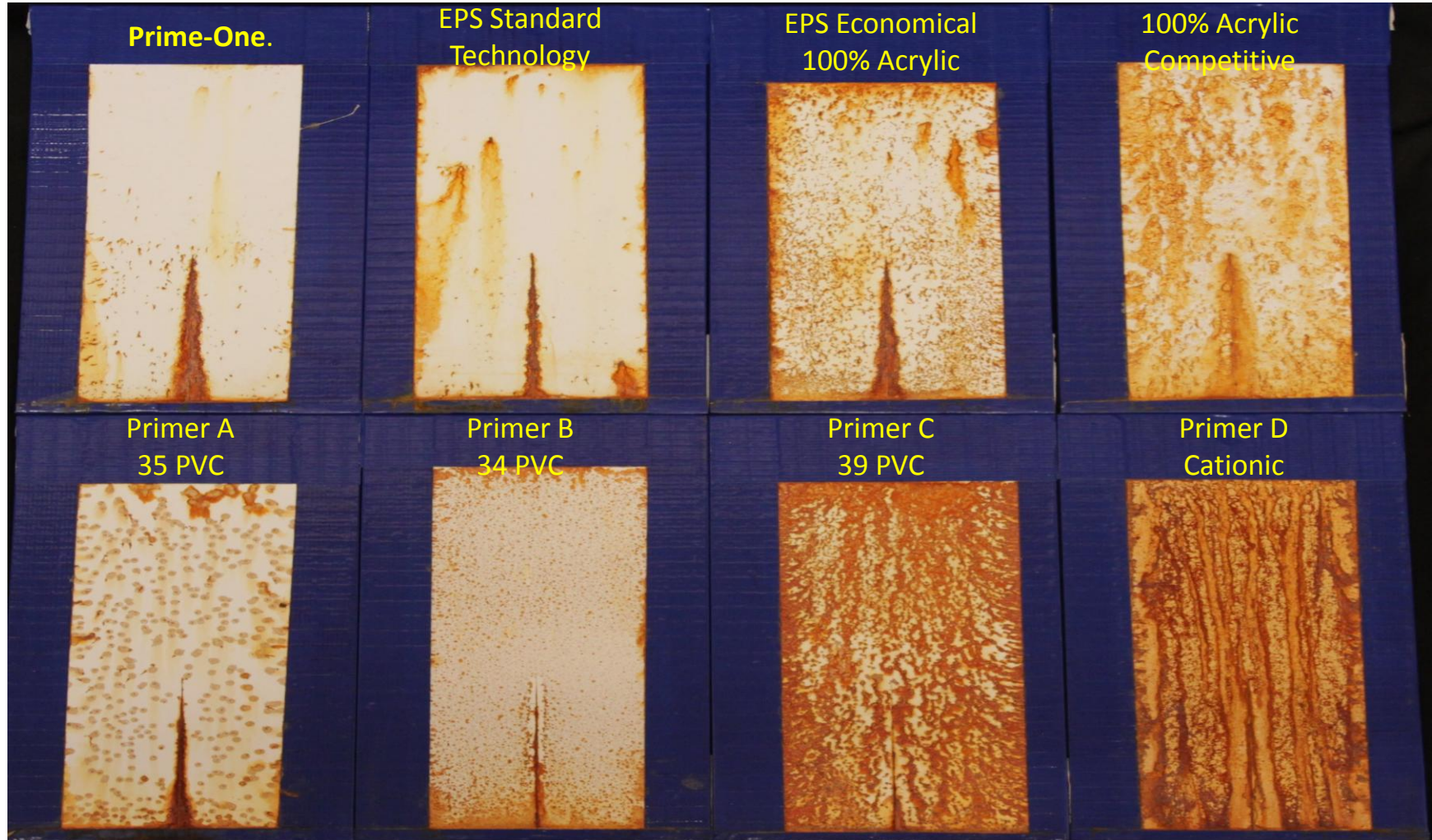
Ink / Marker Stain Resistance

Ability to block water-soluble stains

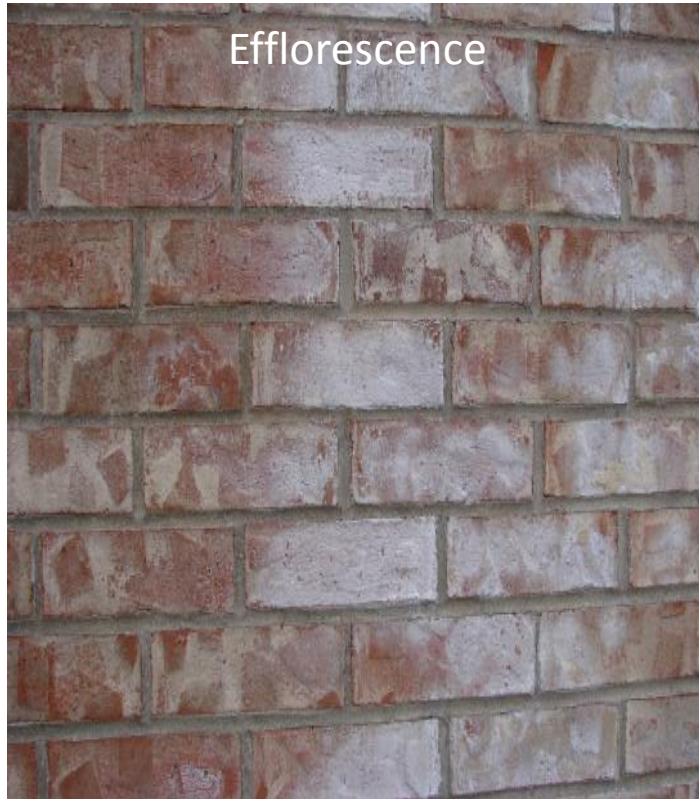


Corrosion Resistance - 120 Hours 5% Salt Fog

Substrate: Cold-Rolled Steel Panels



Typical Problems Painting over Highly Alkaline Substrates



Efflorescence



Tint Retention / Alkali Burnout



Loss of Adhesion

Efflorescence:

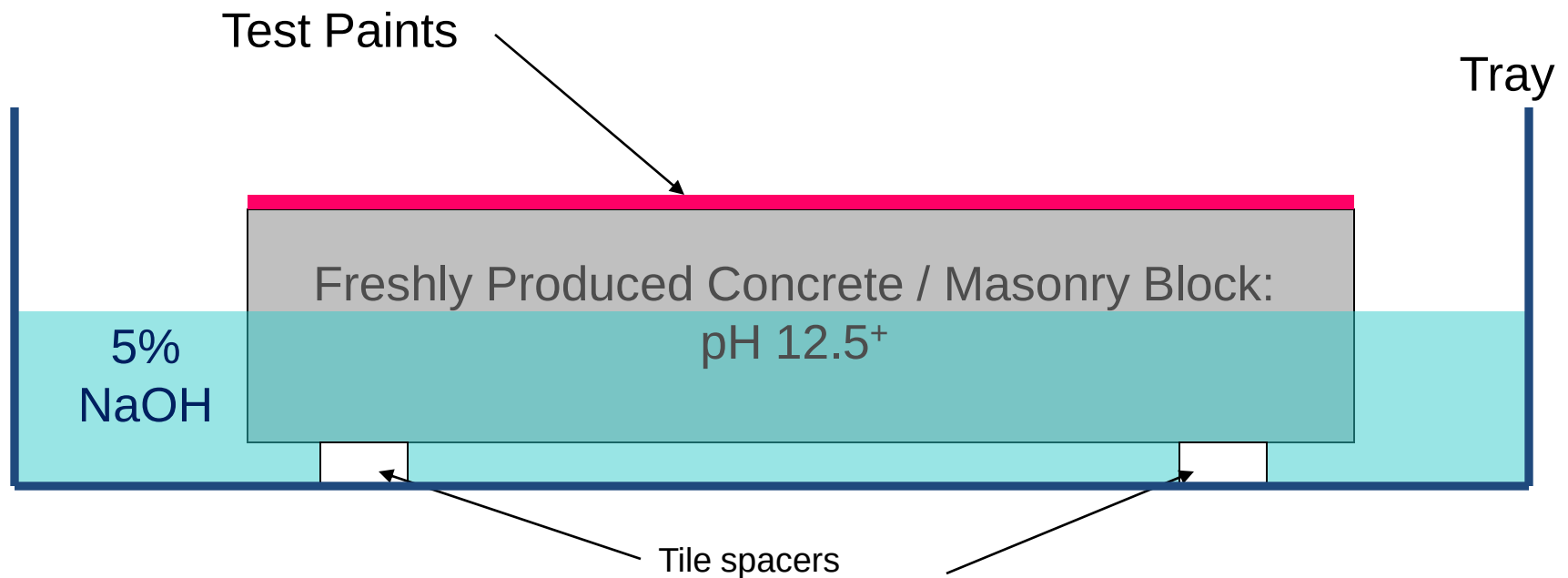
Forms when water-soluble salts of calcium, sodium, potassium, etc. combine w/ carbon dioxide to form carbonates (CaCO_3).

Test Procedure for Alkaline Substrates

Day 1: Concrete / masonry mix made and poured into molds.

Day 2: Block removed from mold, paints applied
(paints tinted w/ quinacridone red + organic yellow)

Days 3-7: Lab testing or exterior exposures



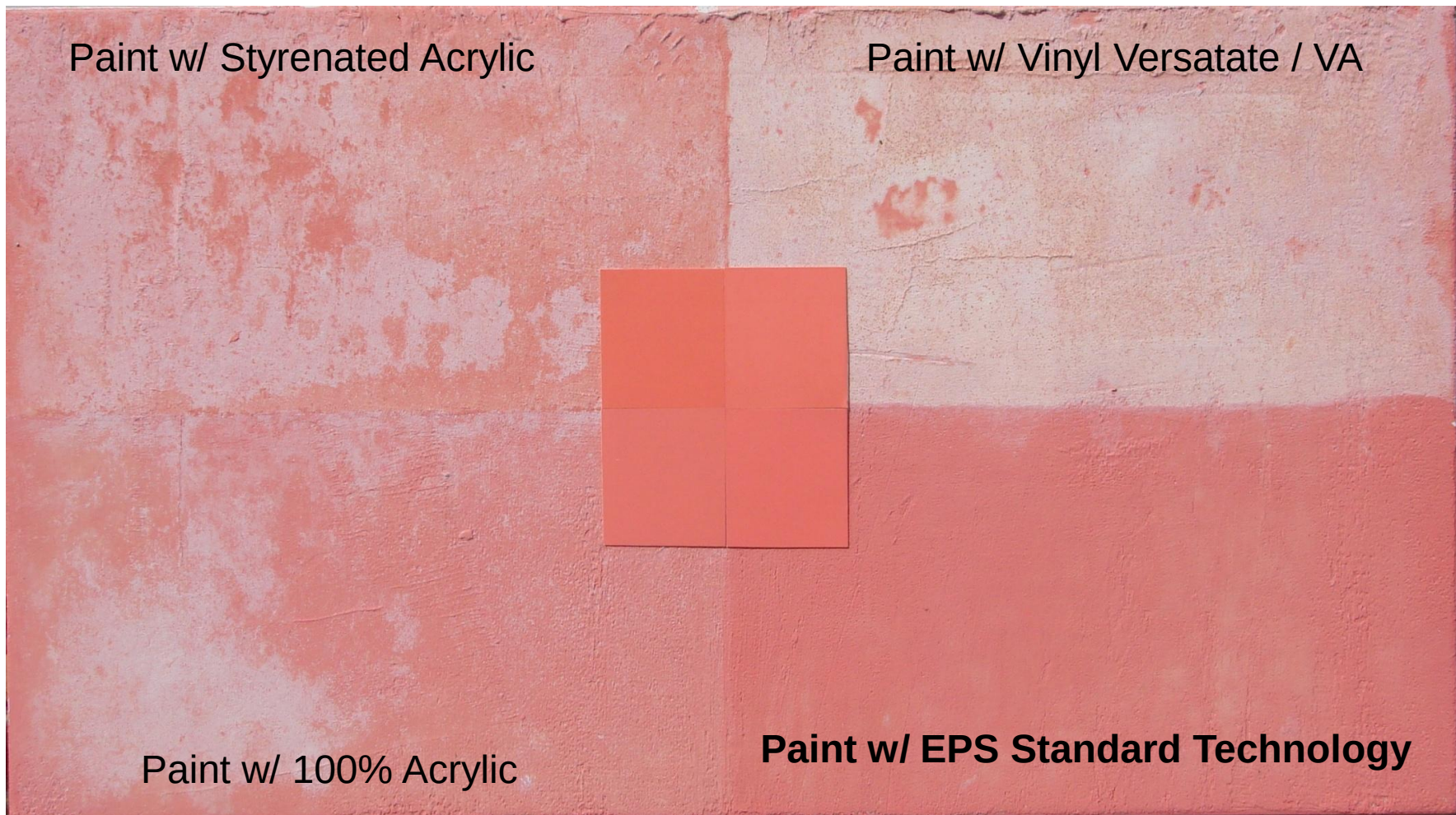
Performance Directly to Highly Alkaline Substrates

versus 3 Premium Commercial Concrete Paints



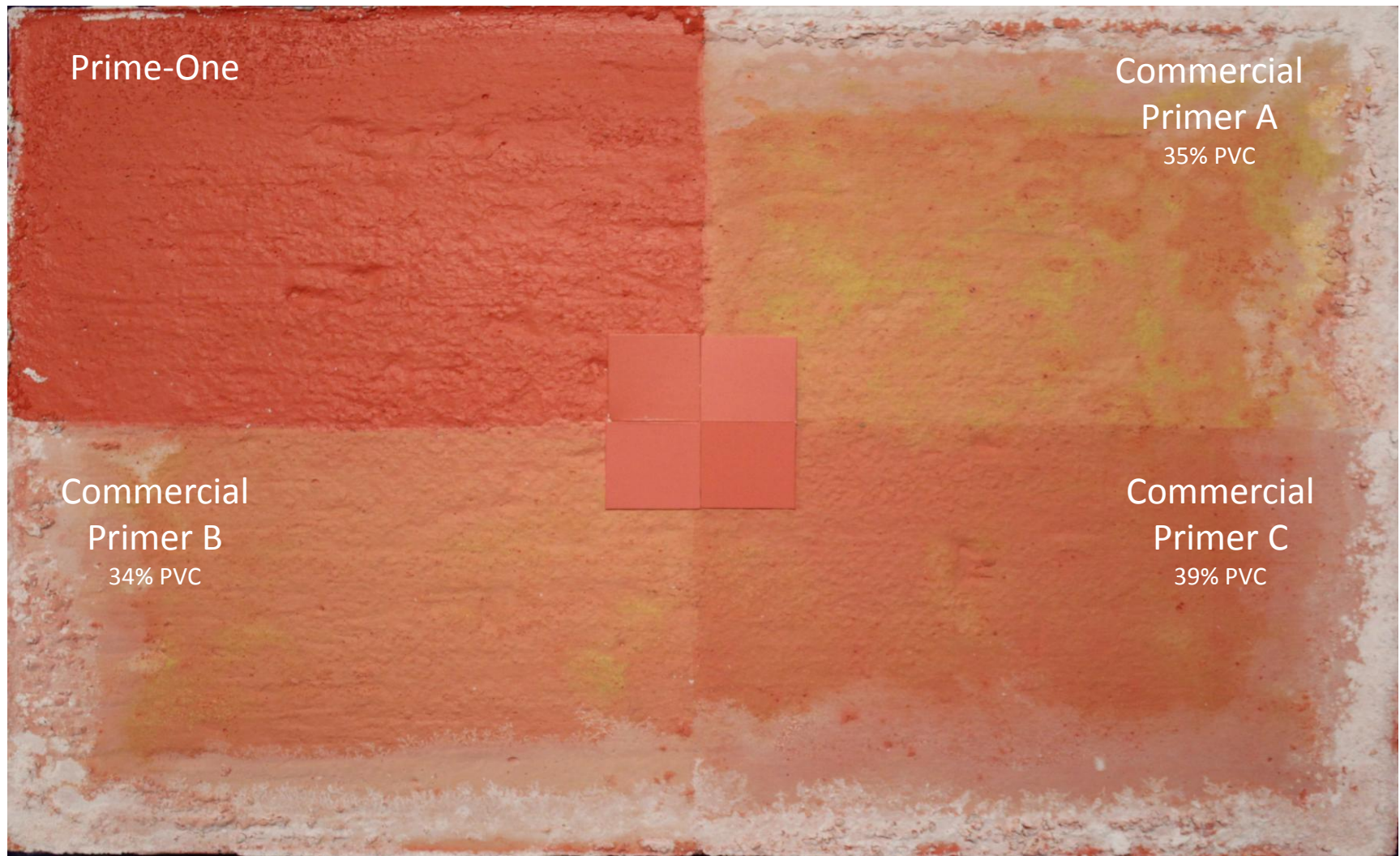
Performance Directly to Highly Alkaline Substrates

versus 3 Premium Commercial Concrete Paints



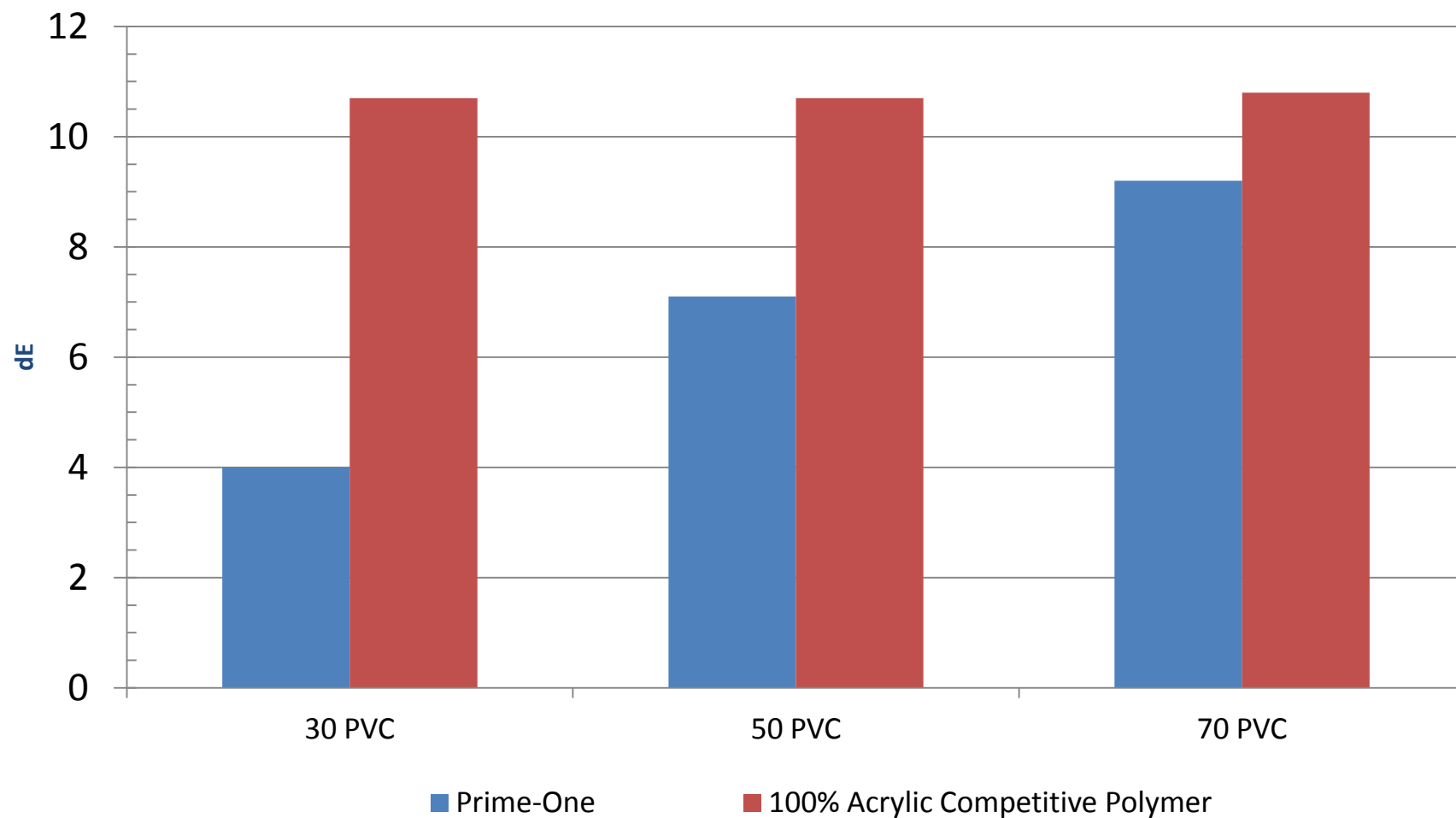
Tint Retention

Highly Alkaline Substrate v Commercial Primers



Tint Retention (Alkali Burn)

Over an Alkaline Substrate



Tint Retention

Exterior Exposure over an Alkaline Substrate (only 4 days exposure)

Prime-One	EPS Standard	EPS Economical 100% Acrylic	100% Acrylic Competitive	Prime-One	Prime-One
					
Prime-One	EPS Standard	Commercial Primer A 35 PVC	Commercial Primer B 34 PVC	Commercial Primer C 39 PVC	Prime-One

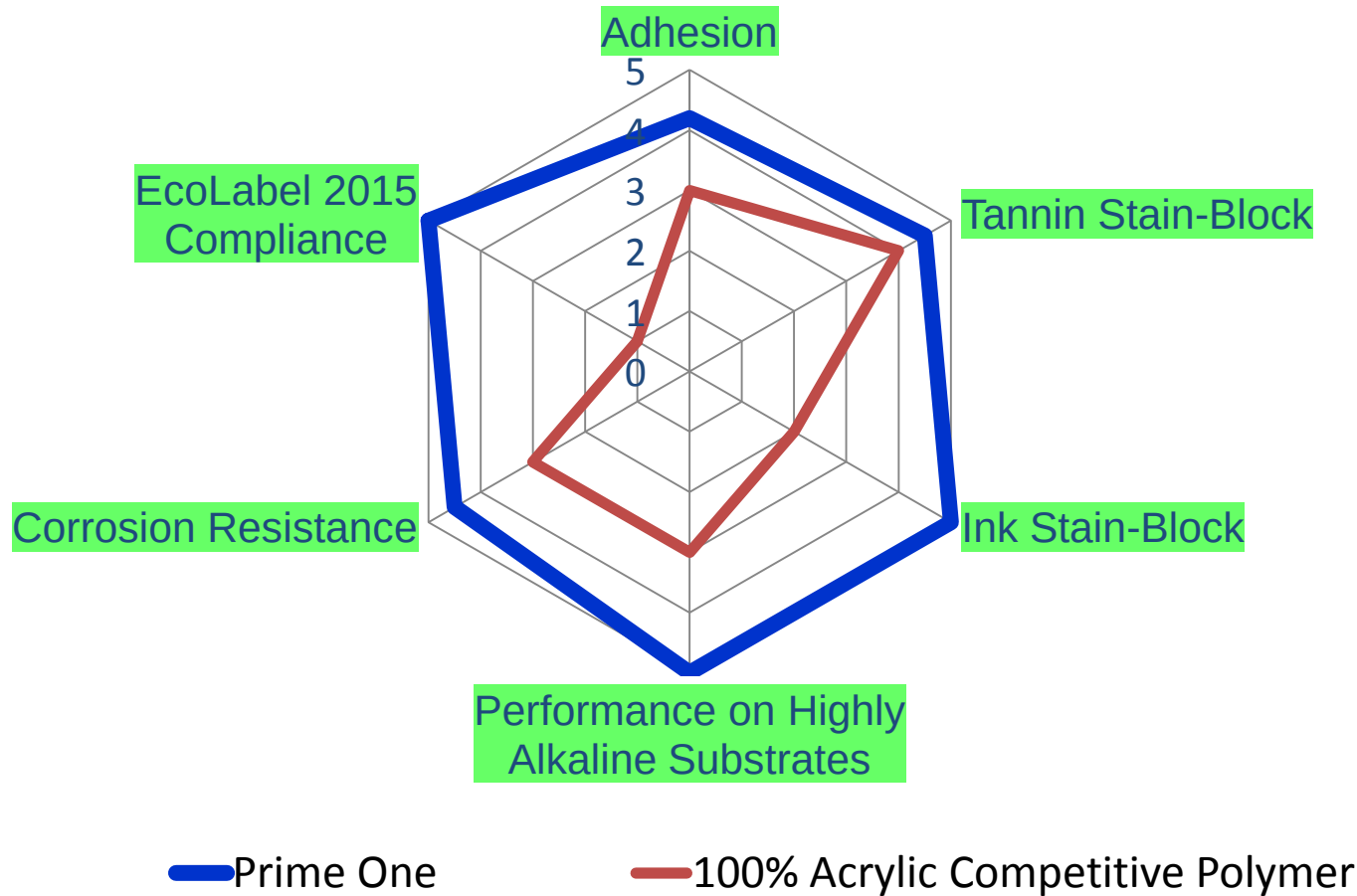
Tint Retention

Exterior Exposure over an Alkaline Substrate: 5 months exposure

Prime-One	EPS Standard	EPS Economical 100% Acrylic	100% Acrylic Competitive	Prime-One	Prime-One
					
Prime-One	EPS Standard	Commercial Primer A 34 PVC	Commercial Primer B 35 PVC	Commercial Primer C 39 PVC	Prime-One

High Performance + EcoLabel Compliance

Performance Scorecard (0-5, 5=best)



Thank You

EC Nuremberg, Germany, 21 – 23.4.2015
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SHOW 2015
Visit us at stand 356 in hall 7

*Science
Simplified*

Nicotine Stain Resistance

Heavily Stained Ceiling Tile

