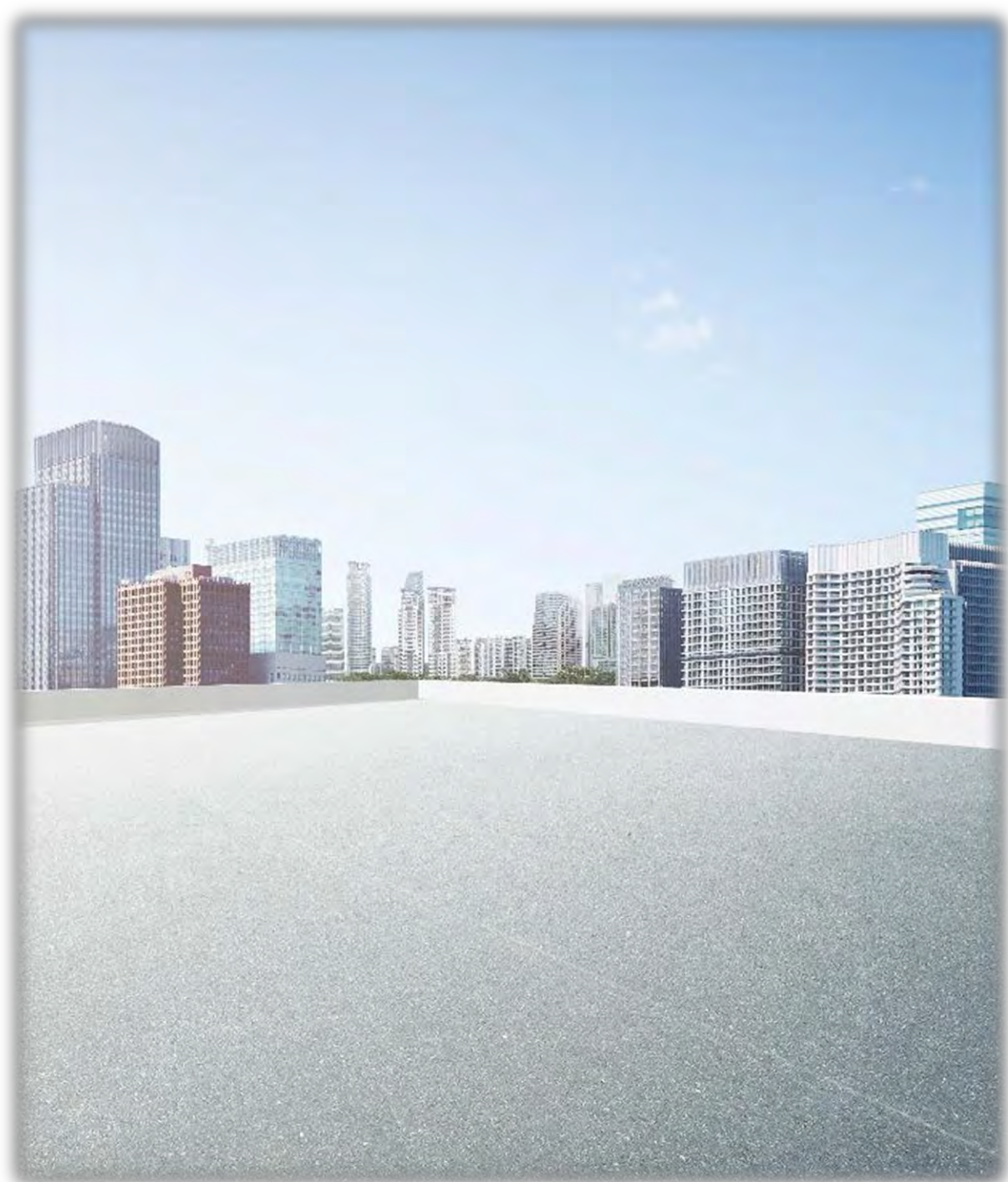


IMPROVED ENERGY EFFICIENCY

BINDERS FOR COOL ROOF COATINGS

20-01-2022

Nico Sgrolli



Agenda

Roof coatings and cool roof coatings

- Tobacco-juicing in asphalt roofs
- EPS[®] 719

Common coating failures

- EPS[®] 533
- EPS[®] 730

Conclusion

Types of Roof Coatings

RCMA (Roof Coatings Manufacturers Association)

- Roof Coating: A fluid-applied adhered coating used for roof maintenance, roof repair, or as a component of a roof covering system or roof assembly

Cool Roof Coatings

- A roof coating that has been designed to reflect more sunlight and absorb less heat than a standard roof – www.energy.gov
 - Metal and Concrete
 - Sprayed Polyurethane Foam (SPF)
 - Single Ply Membranes
 - Asphalt Roofs
 - I. Modified Bitumen (is toughed, flexibilized, and reinforced with fabric)
 - II. Built-Up Roof (BUR) Consists of multiple alternating layers of bitumen and fabric. Softens Self-heals during warm temps. Gravel is used as a topcoat.

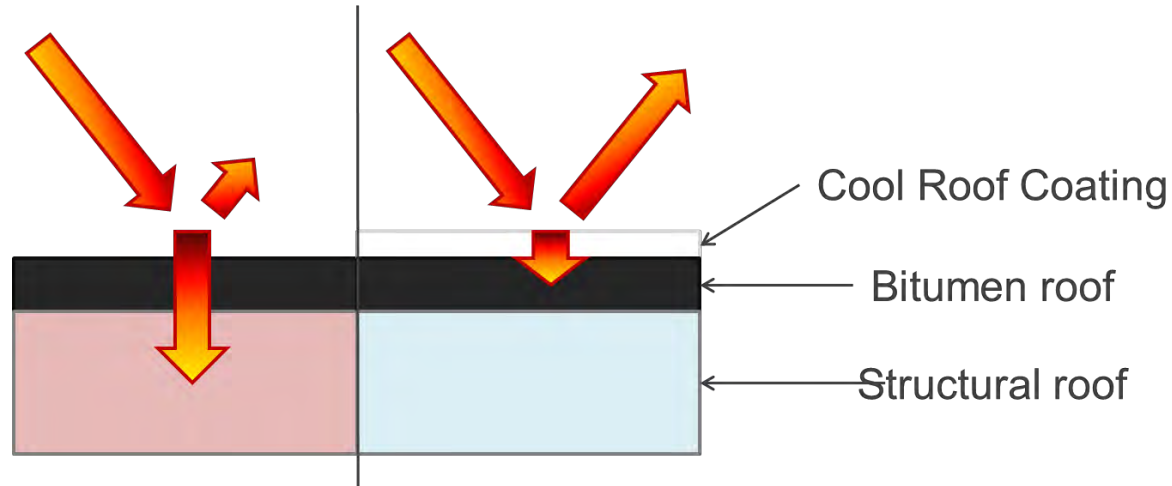
Cool Roof Benefits

- Protect the roof surface (low-cost sacrificial layer)
- Extends service life of the roof indefinitely
- Reduce surface temperatures
- Improve quality of life
- Avoids disruption and roof replacement. Lower maintenance costs.
- Energy cost: The reduction of peak energy use. Savings between 10-30%
- Expected growth: 5.4 mil USD in 2025, 7,0% CAGR

Sources:

Cutting Peak Electrical Demand with Reflective Roof Coatings. <https://www.roofcoatings.org/wp-content/uploads/2017/10/RCMA-White-Paper-Peak-Energy-Demand.pdf>
businesswire "Cool Roof Coatings Market Size, Share & Trends Analysis Report By End Use, By Product (Elastomeric, IR Reflective), By Application (Slow-sloped, Steep-sloped), And Segment Forecasts, 2018 - 2025". <https://www.businesswire.com/news/home/20181113005701/en/Global-Cool-Roof-Coatings-Market-Size-Share>

Total Solar Reflectance (TSR)



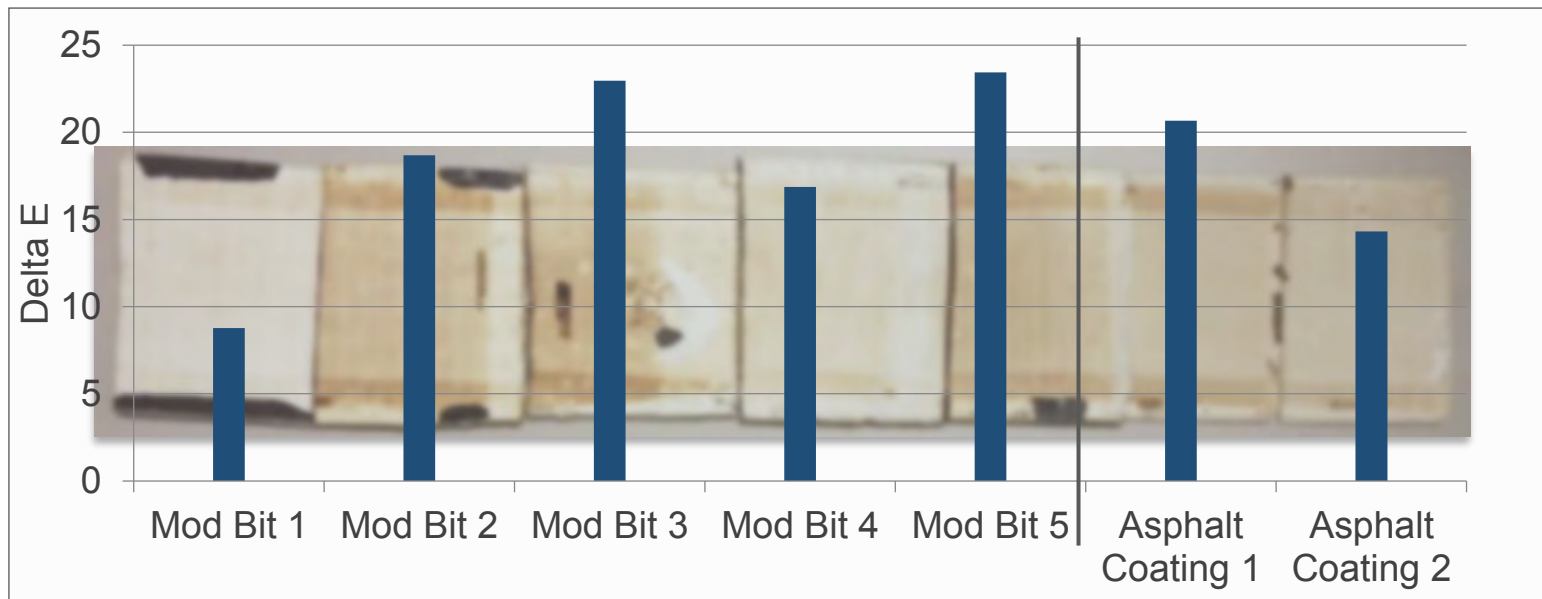
	TSR
Bitumen Roof	0.10 - 0.20
White Cool Roof Coating on bitumen	0.60 - 0.75

- TSR – percentage of irradiate energy reflected by an object
- Most important characteristic for Cool Roofs

Asphalt Bleed Through on White Roof Coatings

Tobacco-Juicing

- Light oils present in asphalt used in bitumen roof, exude from material
- This oil quick diffuse to the top of an applied coating
- Causing a strong colouring effect of the coating (cappuccino colour)



- Coating discolouration (500h QUV)
- Common problem over different asphalt-based roofing materials

EPS[®] 719 Product Information

All-acrylic copolymer

Recommended for Construction.

This resin is designed to minimize asphalt bleed through in cool roof coatings while maintaining flexibility and toughness.

PROPERTIES

- Excellent exterior durability
- Exceptional resistance to dirt pickup
- Exceptional water resistance
- Exceptional adhesion to asphalt, PVC, metal
- Hydrophobic
- Low water uptake

Specifications

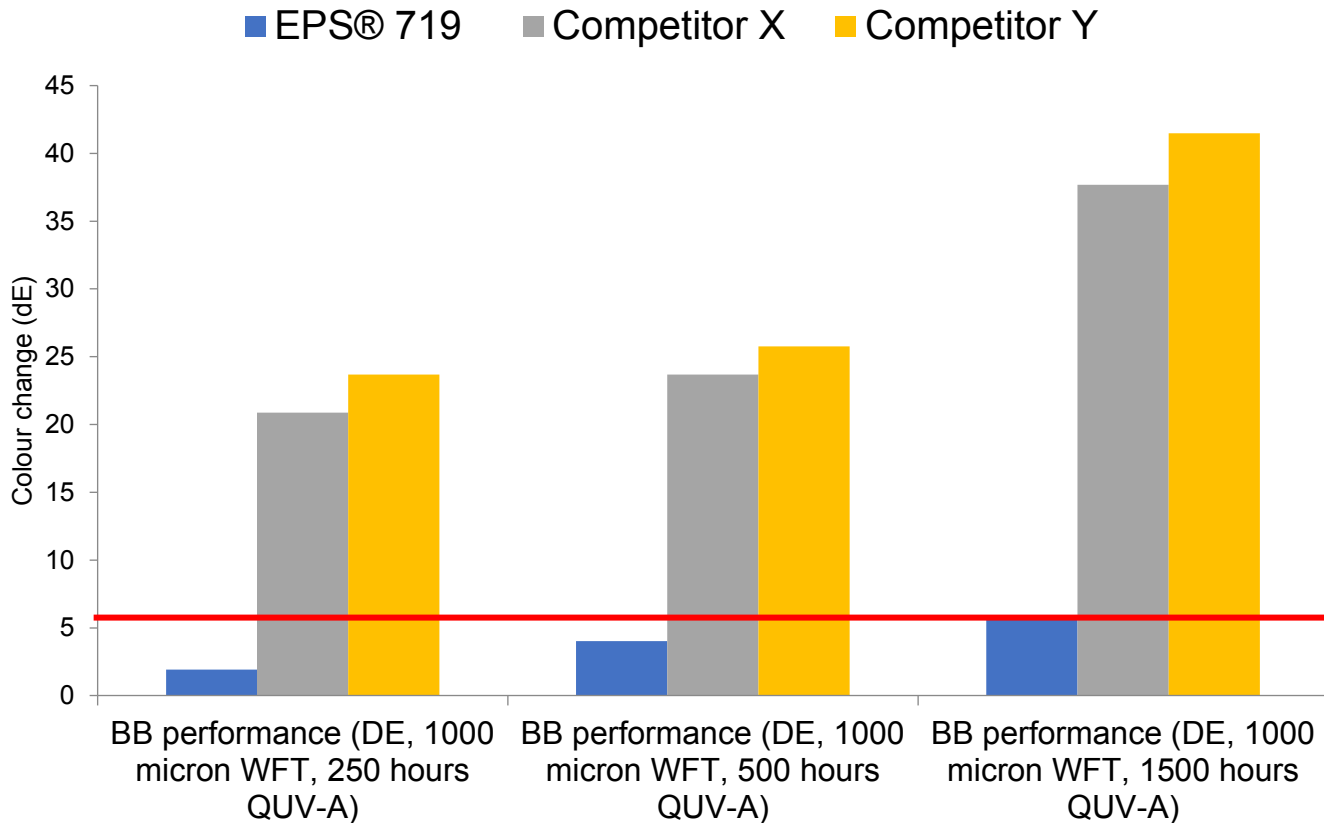
Weight Solids [%]	55.0 ± 1
Viscosity, 23 °C [mPa·s]	< 500
pH	8.0 – 9.0

Typical Properties

MFFT [°C]	± 10
Density @ 20 °C [kg/m ³]	NA



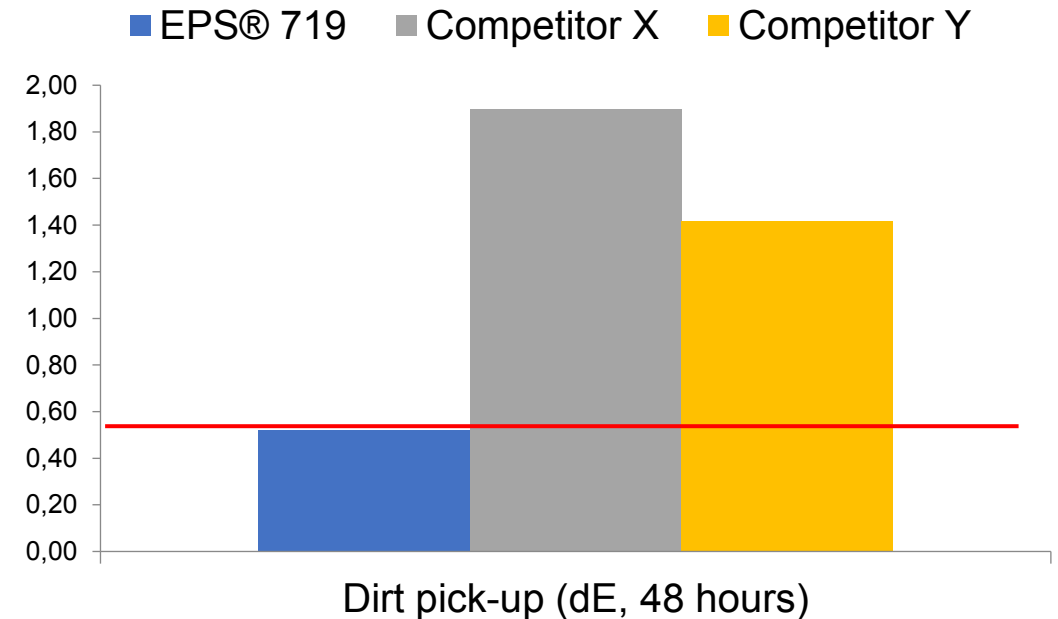
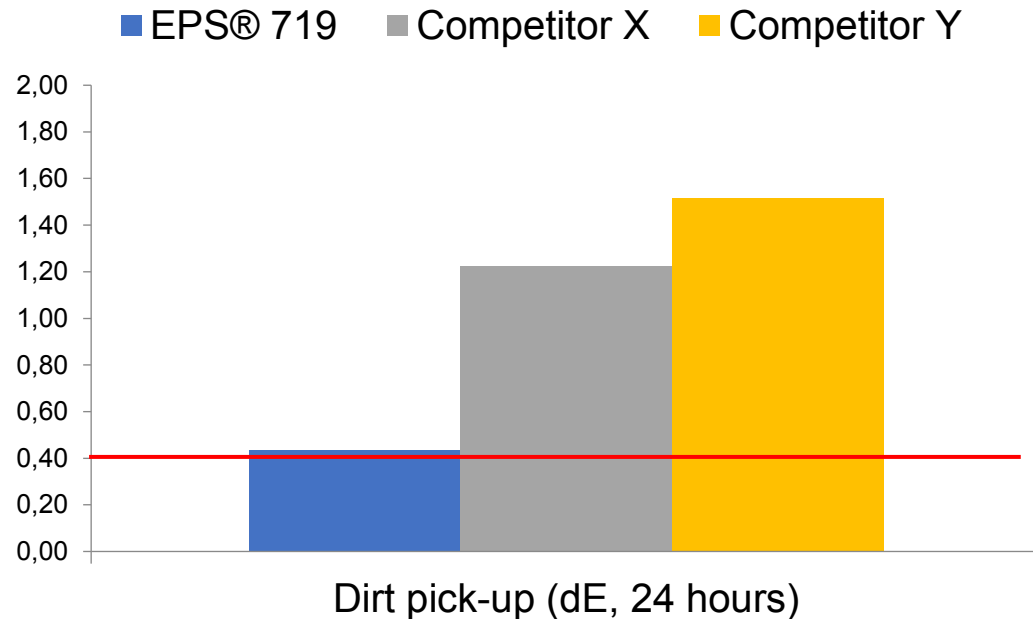
EPS® 719 - Bleed Block Comparison



- EPS® 719 outperforms samples Competitor X and Y



EPS® 719 - Dirt Pickup (500 µm wft)



- Dirt pickup of EPS® 719 is substantially lower than Competitor X and Y (30% ca).
- Interesting: Dirt pickup is following the same trend as Bleed Block

Coating Appearance After Accelerated Aging

1500h accelerated aging QUV

- Competitor X and Y present severe chalking after 1500 h accelerated aging
- EPS[®] 719 doesn't show any chalking issue



EPS[®] 719

33 Months South 5° Exterior Exposure in Marengo, IL



Common Coating Failures

Efflorescence

Dirt pickup



Adhesion failure



Discoloration



EPS[®] 533 Product Information

Acrylic copolymer

Versatile polymer offering exceptional stain and tannin blocking characteristics, with excellent adhesion to multiple substrates.

PROPERTIES

- Exceptional low water uptake
- Exceptional efflorescence resistance
- Exterior durability
- Hydrophobic

Specifications

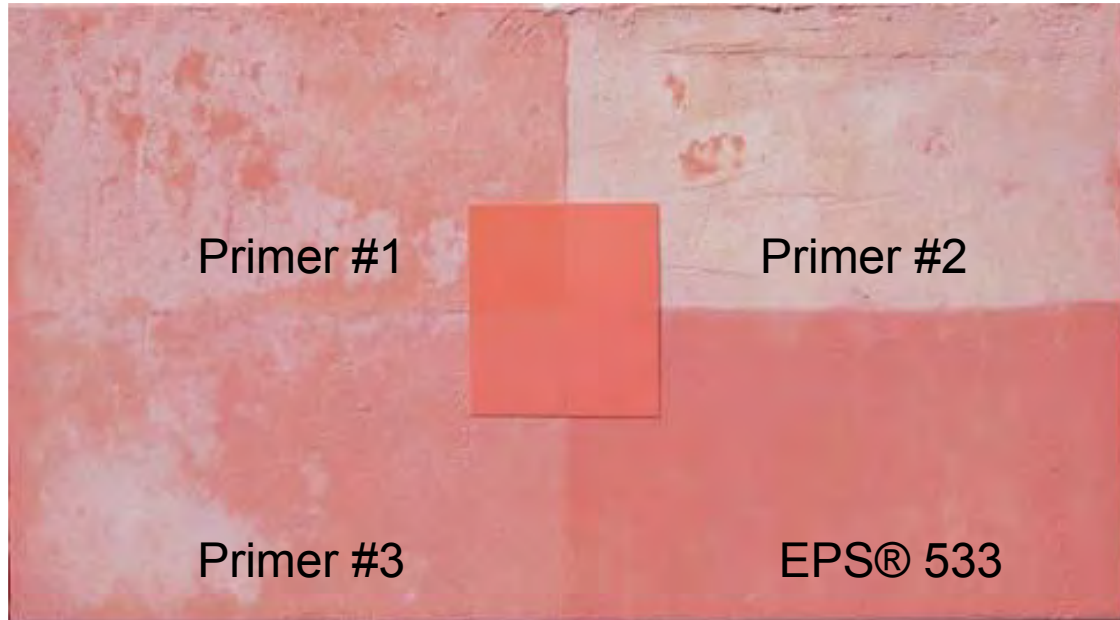
Weight Solids [%]	45.5 ± 1
Viscosity, 23 °C [mPa·s]	< 500
pH	7.0 – 8.0

Typical Properties

MFFT [°C]	± 9
Density @ 20 °C [kg/m ³]	1033

EPS® 533 Efflorescence Block

- Longer durability and constant long-term appearance
- Avoid dirt pick up caused by efflorescence
- Improved color retention
- No chalking
- No delamination



EPS[®] 730 Product Information

Acrylic copolymer

Ultrafine particle size, surfactant stabilized, polymer for stabilizing powdery cementitious substrates.

PROPERTIES

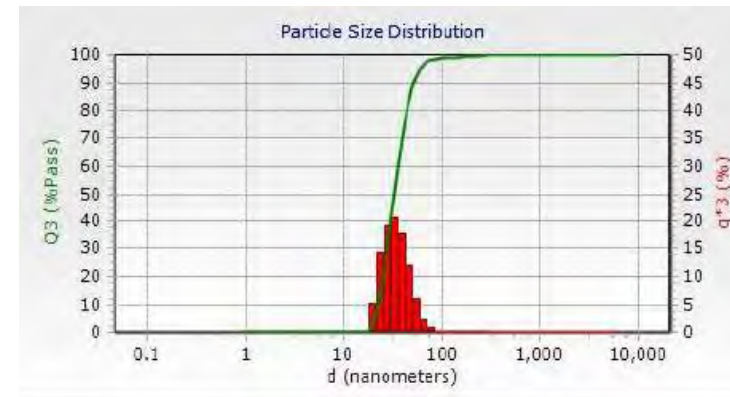
- Excellent efflorescence resistance
- In-can clarity
- Exterior durability
- Outstanding adhesion on plasters and cementitious substrates
- Excellent penetration on wood
- Narrow particle size distribution (33nm)
- Excellent penetration and good sealing properties

Specifications

Weight Solids [%]	30.0 ± 1
Viscosity, 23 °C [mPa·s]	< 500
pH	8.0 – 9.0

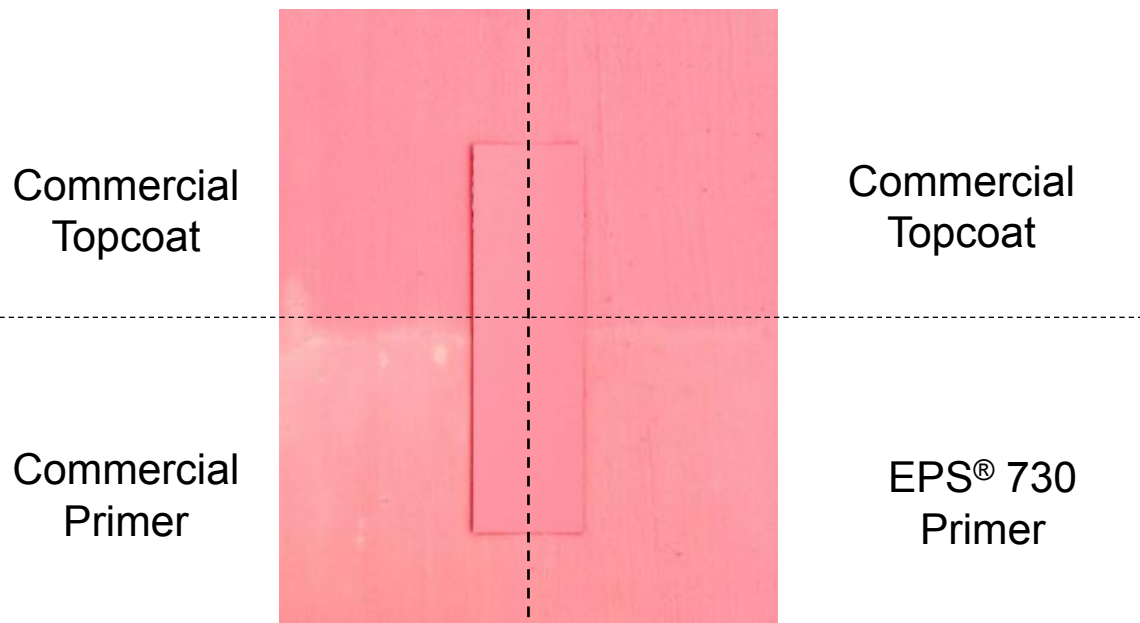
Typical Properties

MFFT [°C]	± 0
Density @ 20 °C [kg/m ³]	1055



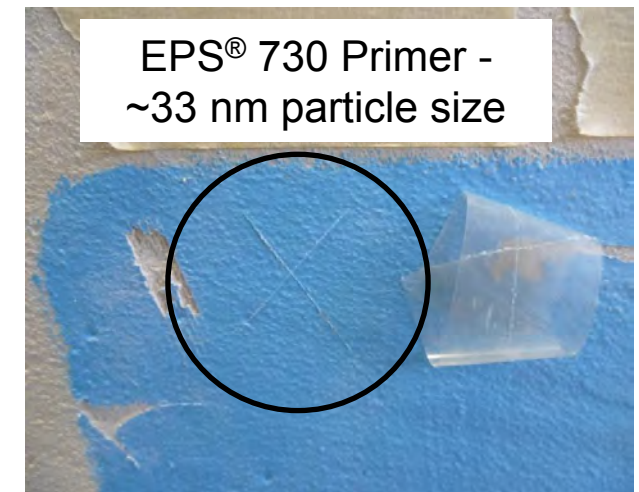
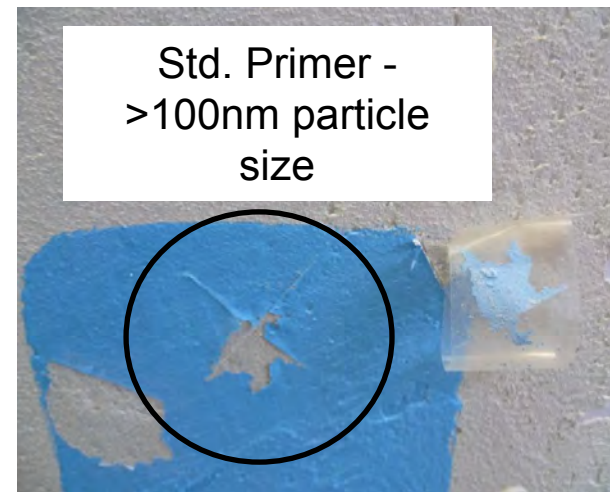
Adhesion and Efflorescence resistance

- Good alkali resistance
- Good substrate sealing behavior
- Optimal wetting and penetration on high absorbing substrates, e.g. gypsum boards, chalk plasters
- Great sealing resulting in improved adhesion of the topcoat



Commercial Topcoat

EPS® 730 Primer



Conclusion


Avoid common coating failures; improve energy efficiency in construction.

EPS® 719 minimises asphalt bleed-through and dirt pickup in roof coatings while maintaining flexibility and toughness. This improves the cool roof coatings efficiency and extends service life.

EPS® 533 block efflorescence and stains, reducing discolouration and delamination.

EPS® 730 stabilises powdery cementitious substrates avoiding efflorescence and improving adhesion.

THANK YOU



The data in this presentation represent typical values. Because application variables are a major factor in product performance, this information should serve only as a general guide. EPS assumes no obligation or liability for use of this information.