



**TOP**SHELL

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## THE CEMENT MICROSURFACE

March 2021



# Who is TopShell?

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- Formed in 2018, TopShell is a materials manufacturer headquartered in Austin, TX
- Company Vision: *Bring technologically advanced solutions to the pavement preservation market*
- Mission Statement: *Deliver safety-enhancing and environmentally friendly pavement preservation products that extend the lifecycle of existing infrastructure*



# What is TopShell?

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- TopShell is a cementitious **pavement preservation** product designed to protect and enhance the overall physical properties of asphalt and concrete surfaces.
- TopShell creates a durable, high-friction wearing course that bonds permanently to aggregate, pavement surfaces, and metal.
- Basic Composition: Sand, Portland Cement, & Polymers
- Single-Component System: TopShell requires only the addition of water



# Why use TopShell?

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- Enhances the aesthetic appeal of older pavements in a variety of colors
- Provides corrosion and oxidation protection to the underlying surface
- Improves safety and restores surface texture by increasing skid resistance
- Contains no coal-tar or asphalt emulsions
- **A single application protects pavements for 10+ years**



# Where to use TopShell:

- Parking Lots
- Logistics Centers
- Highway Shoulders
- Bridge Decks
- Subdivisions & Private Roads

- Airports
- Local Roads
- Bike Lanes
- Walking/Bike Paths
- School & University Campuses



WHITE



GRAY



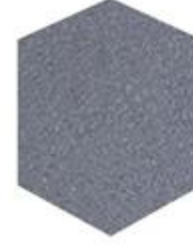
LIGHT GRAY



NATURAL TAN



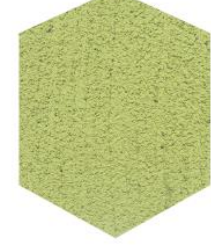
SAND STONE



DARK GRAY



BLACK

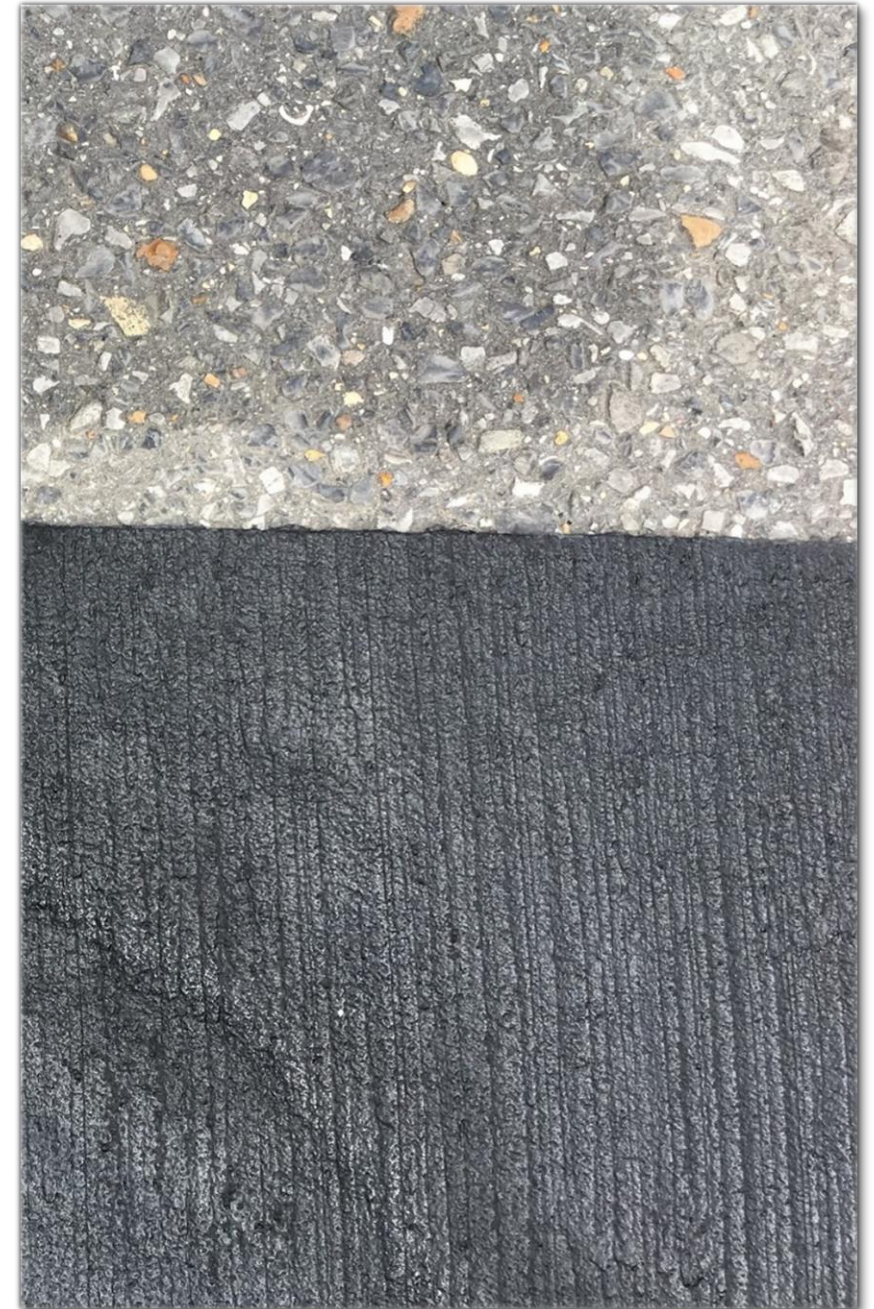


BRIGHT GREEN



# When to use TopShell

- Asphalt or concrete without base failures
- Approximately 2-10 years old
- Slightly oxidized with exposed aggregates
- Minimal cracking
- Clear of debris and organics
- Cleaned of any oils or fuels
- Best applied at 40 – 100 degrees F





# Performance & Testing Data

## Strengths:

- Adhesion to Asphalt
- Compressive Strength
- Skid Resistance
- Wet Track Abrasion

**Table 1: Physical Properties of TopShell Gray**

Property	Test Method	Results
Density, lbs/gal (25°C)	ASTM D2939-07	16.7
Residue by Evaporation, %	ASTM D6934	74.5
Dry Time, 0.1 hrs	ASTM D711	0.31
Viscosity,	Brookfield	5200
Adhesion to Asphalt – New & Old	PRI	Pass
Adhesion to Metal & Concrete	PRI	Pass
Compressive Strength	ASTM C-109	24 hrs – 2,500 / 7 days – 5,800 / 28 days – 7,210 psi
Freeze Thaw	FAA, P-627	Pass
Skid Resistance	ASTM E303	0.667
Bond Adhesion	AASHTO TP-108	Pass
Water Resistance	ASTM D2939-15	Pass
Fuel Resistance	ASTM D2939-12	Pass
Wet Track Abrasion, g/m	ISSA TB-100	2.12 mg loss
Accelerated Weathering (1000 hrs)	ASTM D4798	Pass – No Loss

**Table 2: Environmental Properties of TopShell Gray**

Property	Test Method	Results
LEEDS Reflectance, SRI	ASTM E1980	0.49
LEEDS Emittance, SRI	ASTM E1980	0.91
VOC's, %	EPA 24	0.01

All properties and results shown are typical of those obtained when professionally tested using industry standard testing methods. Different application thicknesses and uses were tested due to variations in mix design or specific application techniques. Variables include; water ratio, application thickness, application tool/technique, drying temperature, environment, wind, curing temperature & humidity.

# Application Process

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- Components: Clean Water & TopShell material (a dense granular powder)
- TopShell will initially set within 2 hours or less; return to vehicular traffic in 6 hours or less. (depending on ambient temperature and humidity)
- TopShell may be applied in a single pass or in multiple lifts. When applying multiple lifts, allow the first coat to set thoroughly before starting the application of the next coat.

COVERAGE RATES (per 3000 lb bag)	
<u>1/16 inch (1.6 mm)</u>	935-1,075 yds <sup>2</sup> (780-890 m <sup>2</sup> )
<u>1/8 inch (3.2 mm)</u>	535-670 yds <sup>2</sup> (445-555 m <sup>2</sup> )



## The Bergkamp Inc. M310E

- 24,000 lbs (9.44 cubic yards) of TopShell material and 1100 gallons of water onboard
- Digital calibration system
- Precision application rate with realtime printouts specifying mix properties, volumes, and distances
- Assures proper suspension of the fine aggregates in the mixture
- Fully loaded truck can apply up to 1.2 lane miles in under 10 minutes at 1/16"

## Microsurfacing Equipment for TopShell





The Bergkamp Inc. M310E



## Bergkamp M310E



Bergkamp M310E





## VSS Minimac





Samples on asphalt





TopShell Gray with broom finish



TopShell Black with broom finish







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