

## Cool Roadway Solutions - Request for Information Response Form December 8, 2020

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**Solution/Product Name:** TopShell Gray

**Describe how the proposed solution addresses the following** (250 word maximum for each response):

1. What is the expected timeline to develop and commercialize the solution if it is not currently available? [Ready as of 7/1/2020.](#)

2. What surface and air temperature reductions resulting from the roadway solution, daytime and nighttime, have you identified? [Not identified. See TDS for two relevant tests on reflectivity and emittance.](#)

3. How simply can the solution be integrated into existing roadway management and maintenance operations?

[TopShell's ability to be applied to both concrete and asphalt in a variety of colors allows it to seamlessly integrate into mixed use roadway situations. The equipment used for TopShell installation is also easy to adopt for contractors or maintenance divisions specializing in Microsurfacing. TopShell is designed to protect and enhance existing asphalt and concrete pavements and forms a strong bond to both when applied at 1/8 to 1/16 inch. The durable TopShell layer prevents oxidation of the underlying surface and will protect the existing surface for 3-7 years or more depending on the traffic and condition of the existing pavement. It will enhance the value of an existing pavement by adding both aesthetic color consistency and safety factor with a high friction roadway surface. At the end of asphalt pavement's useful life, any such surface with TopShell applied over it will still be valuable as RAP material. However, the asphalt values will be somewhat diminished based on the amount of TopShell utilized \(TopShell has no coal tar or asphalt components.\)](#)

4. What is the global warming potential associated with manufacturing the roadway solution in production and use phase? [TopShell is made of polymerized Portland cement. Any greenhouse gas increase and resulting global warming potential as related to the manufacturing phase is significantly offset by TopShell's use phase because of its ability to preserve the pavement for the long term and prevent the need for repetitive/ alternative future treatment solutions which would require heavy equipment mobilization and more manufacturing.](#)

5. Add any additional information for the proposed solution. Attach photos, videos or links to materials demonstrating application, installed condition, and relevant characteristics of the solution such as product material safety data sheets

**Cost and Installation** (50 word maximum for each response):

1. Can the solution be purchased and installed by in-house department staff (i.e. does not require a licensed installer): Yes/No. TopShell will determine this on a project by project basis. The use of microsurfacing equipment is the only way to install on a large scale. Existing microsurfacing installer contractors are capable of adopting TopShell. Other paving contractors will need training.

- If so, does it require special equipment to install it: Yes/No If yes, what equipment is needed? Yes: Bergkamp/ Akzonobel, V.S.S. Macropaver and Minimac. Other custom options including modified versions of the Rayner Roadsaver.

- If so, what is the cost per square yard for materials: \$/SY \$2.20-3.50

2. What is the cost per square yard for material if installed by contractor: \$/SY TopShell is not a contractor, the contractor will determine this price.

3. What is the average installation rate: SY/Day? 15,000-30,000 SY per day per Bergkamp M310E microsurfacing paver depending on the project type, and equipment utilized for reloading, and availability of water source.

**Use Cases** (250 word maximum for each response)

1. What are the appropriate use cases for the solution (e.g., pavement type, age, condition, climate)? Please provide appropriate case studies, testing, and/or supporting research. 2-10 year old asphalt without base failures and minimal cracking. If cracks greater than 1/8 exist, the cracks need to be treated prior to TopShell installation. Any aged concrete surface that is not polished smooth.

2. What are the safety, slipperiness, and friction characteristics (e.g. typical Surface Coefficient of Friction)? 77 dry. 46 wet.

3. What is the curing time including how quickly the road can open to traffic after installation given average temperatures, partly sunny, and non-humid conditions? How does this compare to existing relevant products? 2-4 hours

4. Is it sensitive to placement in cool weather, i.e. 50° F and falling? Yes, not recommended

5. Is it sensitive to placement in high humidity or damp conditions? Yes.

6. How long does this treatment typically last under average traffic conditions in years? How does this compare to similar products? 3-7+ years. Similar to a type 2 micro surfacing treatment.

7. Can it be re-applied over itself for renewal? Yes

8. Is it recommended for heavy traffic conditions like urban arterials? Pending ongoing field testing, yes.

9. Are standard MUTCD compliant white and yellow markings clearly visible? Yes.