

MnDOT Special Surface Finish II for Concrete

Qualification Procedure

1. Material Qualification Process

NOTE*: The environmental review required below in 1.b may be done prior to any other testing and reviewed to ensure a product is not precluded on that basis or conducted concurrently with the product testing at the submitters risk / choice. Products can be precluded for use based on the environmental review despite the material or field performance if found to be too high a liability.

- a. Send the submittal package to:

Allen Gallistel
MnDOT Office of Materials and Road Research
Chemical Lab Director
1400 Gervais Ave
Maplewood, MN 55109

Telephone: (651) 366-5545
allen.gallistel@state.mn.us

- b. Submittal package should include:

- Completed New Products Application Form (attached)
- Product Data Sheets including mixing and curing directions
- Safety Data Sheet
- Performance History References in a cold, heavy salt spray environment (if available)
- Quart sample of material for Verification Testing
- Certification that the product meets Minnesota Statute 115A.9651 requirements for heavy metals and VOC requirements
- National Transportation Product Evaluation Program - NTPEP testing data verifying performance requirements for the material according to limits in the table below; for information on the Concrete Coating Systems program and how to submit samples to NTPEP for evaluation visit the following site:
<http://www.ntpep.org/Pages/ProtectiveCoatings.aspx>
- Independent lab testing verifying requirement for moisture loss according to ASTM C309 if the product can be used as a cure on fresh concrete
- *Completed MnDOT Office of Environmental Services Hazardous Evaluation Process Documentation (attached)

c. Material Qualification Requirements

General Requirements

The product shall be a single component concrete coating available in varying texture levels including a smooth version. Based on test results defined below a product will be categorized for use near chloride exposure and/or as a cure on fresh concrete.

Specific Requirements

Single Component Special Surface Finish for Concrete				
Physical Tests - NTPEP				
			Requirement	Units
VOC Compliant		Max.	500	g/L
Viscosity		Min.	100	ku
Sag Thickness		Min.	30	mils
Color Match		Max.	3	delta E
Performance Tests - NTPEP				
			Requirement	Units
Chloride Ion Penetration	non-chloride exposure	Min.	n/a	% reduction in 0.25" - 0.5"
	chloride exposure	Min.	50	% reduction in 0.25" - 0.5"
MVT		Max.	70	% reduction of control
Weatherability	Color Change	Max.	5	delta E from as submitted color
	Blistering		none	
	Efflorescence		none	
	Fungal Resistance		none	
Adhesion	UV-Con - 2500 hours	Concrete	no loss	psi (defined as less than 10% decrease from un-weathered)
		Repair	no loss	psi (defined as less than 10% decrease)
	Freeze Thaw	Concrete	report	psi
Graffiti Overcoat	Color	Paint Max.	5	delta E
		Marker Max.	5	delta E
	Adhesion	Paint Min.	50	% of original adhesion
		Marker Min.	50	% of original adhesion
Performance Tests - optional				
			Requirement	Units
Water Loss **	ASTM C309	Max.	0.5	kg/m2

** additional test requirement for product to be used as a cure

2. MnDOT Bridge Office Field Performance Evaluation

MnDOT feels it is critical to develop procedures to evaluate the field performance of special surface finish and provide guidance and data to Contractors and MnDOT bridge maintenance personnel so that high quality products will be used and long-term performance ensured. Therefore, the MnDOT Single Component Special Surface Finish Qualification Process will include a field performance evaluation on a minimum of five entire bridges over a two year period.

Following successful completion of the MnDOT environmental (HEP) review and verification that NTPEP testing meets the appropriate material specifications shown in the above tables, MnDOT will send a provisional letter to the product manufacturer describing the field application and performance evaluation process for specified aesthetic level projects. The product manufacturer will then be allowed to apply the product to an aesthetic level C test bridge as directed by the MnDOT Bridge Office. The manufacturer's technical representative must be present at the application of the coating and provide written certification that the material was applied in accordance with their recommended procedures and at the application rate that was targeted in the NTPEP testing procedure.

As part of the evaluation process, MnDOT will review and approve the Contractor's Quality Control Plan (QCP). MnDOT will then verify that the Contractor adhered to the approved QCP and provided adequate documentation of adherence to the QCP for each test bridge.

Field performance will be evaluated by MnDOT based on visual observation of any coating deficiencies. Visual observations will be performed after each respective winter season for two years and documented on a Special Surface Finish II Evaluation Worksheet.

Upon completion of the initial two year performance evaluation period, this product will either be issued an extension for limited provisional approval on an aesthetic level B test bridge or removed from consideration for use in Minnesota.

Field performance evaluation will continue for three additional years if the product is issued an extension for limited provisional use on aesthetic level B test sites before it will be considered for use on aesthetic level A projects.

If the product fails to perform, MnDOT reserves the right to remove the product from the Approved Products List (APL).

SPECIAL SURFACE FINISH II EVALUATION WORKSHEET

BRIDGE NUMBER/ELEMENT: _____
 PRODUCT: _____

APPLICATION DATE: _____
 EVALUATION DATE: _____

EVALUATOR: _____
 WINTER: _____

ID	Section Description	L (ft.)	H (ft.)	W (ft.)	Visual Observations																												
					Adhesion Cracking/Efflorescence				Adhesion Flaking			Map Cracking				Cohesion Flaking			Color Retention			Erosion				Abrasion Resistance				Concrete Surf Deficiency			
					# of Vert. Cracks	# Failed Vert. Cracks	Comments	Photos	% of Area	Comments	Photos	% Area	Pass/Fail	Comments	Photos	% of Area	Comments	Photos	Δ E	Comments	Photos	% Area	Pass/Fail	Comments	Photos	Abrasion (% of Area)	Removal (% of Area)	Comments	Photos	% of Area	Comments	Photos	
A																																	
B																																	
C																																	
D																																	
E																																	
F																																	
G																																	
H																																	
I																																	
J																																	

CRACK SEALANT VISUAL OBSERVATIONS SUMMARY

ID	Failure Mode					Erosion	AR	Effectiveness**	Comments
	ACE	AF	CF	MC	CR				
A	0%	0%	0%	0%	0	0%	0%	Effective	
B	0%	0%	0%	0%	0	0%	0%	Effective	
C	0%	0%	0%	0%	0	0%	0%	Effective	
D	0%	0%	0%	0%	0	0%	0%	Effective	
E	0%	0%	0%	0%	0	0%	0%	Effective	
F	0%	0%	0%	0%	0	0%	0%	Effective	
G	0%	0%	0%	0%	0	0%	0%	Effective	
H	0%	0%	0%	0%	0	0%	0%	Effective	
I	0%	0%	0%	0%	0	0%	0%	Effective	
J	0%	0%	0%	0%	0	0%	0%	Effective	
	0%	0%	0%	0%	0	0%	0%	Effective	

uniformity 0

Special Surface Finish II Product Effectiveness

Adhesion Cracking/Efflorescence	Section will be deemed ineffective if >20% of cracks fail
Adhesion and Cohesion Flaking	Section will be deemed ineffective if total percentage of these two failure modes is greater than 2%
Map Cracking	Section will be deemed ineffective if total percentage of this failure mode is greater than 10%
Color Retention	Retention: Section will be deemed ineffective if delta E is greater than 5 (post weathering). Uniformity: Section will be deemed ineffective if the difference between the maximum and minimum reading is greater than 3 delta E
Abrasion Resistance and Erosion	Section will be deemed ineffective if greater than 20% area fails due to abrasion and erosion.
Concrete Surface Deficiency	Does not affect coating effectiveness.

****If greater than 30% of the sections are deemed ineffective, the entire coating system will be deemed ineffective at this bridge/structure. If the coating is deemed ineffective at any time during the evaluation process, the coating on the bridge/structure will be considered unsuccessful.**

State of Minnesota
Department of Transportation
New Product Preliminary Information Form

INSTRUCTIONS: Answer ALL questions. Where a question is not applicable enter "N/A".
Attach additional sheet(s) as required with reference to item number.

Date: _____

1. Trade Name _____

Manufacturer _____

Phone No. (_____) _____

Address _____ City _____ State _____ Zip _____

Patent pending Yes ___ No ___ Patent No. _____

2. Local Distributor _____ Phone No. (_____) _____

Address _____ City _____ State _____ Zip _____

3. Recommended Primary
Use: _____

4. Describe product, material equipment or process:

5. Describe any limitations or use restrictions:

6. Material composition (attach laboratory test results, storage requirement, shelf life,
Material Safety Data Sheet and disposal procedure):

7. Outstanding feature or advantage claimed:

8. Date introduced on market _____. Alternate for what existing product?

9. a. Total Estimated Cost Per Unit Material (including delivery) _____
b. Total Estimated Cost Per Unit Furnished and Installed _____

10. Does product meet requirements of any of the following specifications?
(Give specific number.)
AASHTO _____ ASTM _____ Fed. Spec. _____ Mn/DOT _____
Others (state and attach specifications) _____

11. Indicate whether this product has been evaluated by a national or regional product evaluation program? (Attach any results.)

_____ HITEC _____ NTPEP _____ Others (specify)

12. Cite use by other agencies and persons to be contacted concerning experience with use, including how many years used, and whether use has been experimental or routine (list names, titles, mailing address and phones):

13. Note here and attach any test results, reports, etc., from the organizations above:

14. Is a documented quality control process available for this product?

15. Who has been contacted within Mn/DOT about this product? _____

Has this person been sent a copy of this form? _____

16. Additional comments: _____

Name and Title of person completing this form:

Address, State, Zip:

Date: _____ Phone: (_____) _____

Email Address: _____

_____ Manufacturer _____ Representative

10/20/2020

Technical Overview: Hazard Evaluation Process (HEP) Policy OP010

The MnDOT Office of Environmental Stewardship developed the Hazard Evaluation Process (HEP) as a tool to determine potential environmental impacts that could result from use of a product and consequently, if the product is acceptable for use on MnDOT infrastructure. The following information must be submitted by the vendor in order for MnDOT to complete the HEP:

1. Vendor information
 - a. Name of company
 - b. Address
 - c. Technical contact name and telephone number
 - d. Product trade name
 - e. Product chemical name
 - f. Product data sheet
2. Provide Safety Data Sheets (SDS) for all chemicals in the product/waste material.
3. Regulatory approvals and status:
 - a. Licenses
 - b. Approvals
 - c. Permits
 - d. TSCA Listing
4. Chemical Status:
 - a. Provide individual chemical & physical properties (EPA Methods 830.7200, 830.7220, 830.7840, 830.6317, 830.7370, 830.7570, 830.7950, 835.1230, and 835.2130 or equivalent methods);
 - b. Identify chemicals with molecular weights greater than 1000 Daltons (OECD Methods 118, 120 or equivalent);
 - c. Proof that final product would not be considered a hazardous waste under Minnesota Rules Chapter 7045 if disposed of unused;
 - d. Names and Chemical Abstract Numbers (CAS numbers) of the reportable substances in the product (40 CFR 302);

The following product-specific information must be submitted if known. If information for a representative test is unknown it must be stated as such. Testing for this information must follow standardized testing procedures, such as U.S. EPA [SW-846 test methods](#), [OECD product test methods](#), or U.S. EPA Office of Chemical Safety and Pollution Prevention [Harmonized Test Guidelines](#).

- Leach test results (EPA Method 1312 with subsequent analysis for test substance or equivalent method);
- Biodegradation (EPA Method 835.3110, 835.3190, 835.3215, 835.3300, 835.4100 or equivalent method);
- Ecotoxicity to include three trophic levels (EPA Method 850.1300, 850.1400, 850.4100, 850.4150, 850.5400, and 850.6200 or equivalent method);
- Other available test data that provide individual chemical fate, exposure and pathway information.