



Pavement Marking/Delineators/Flexible Tubular Markers 2019

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Pavement Marking

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Delineators and Marker Posts

Culvert End Markers
Delineator Flexible Post
Guardrail Reflectors
E.A.T. Marker Posts

Flexible Tubular Marker Posts

Flexible Tubular Marker Posts-Surface Mounted

Linette Rizos

DOTSignMarkWZMaterials@dot.wi.gov

Pavement Marking

Waterborne Paint				
Manufacturer	Product	Color	NTPEP Number	Approval Date
Sherwin-Williams	Yellow Premium Waterborne (11Y3)	Yellow	PMM-2011-01-098	1/1/2017
	Yellow Premium Waterborne (13Y1)	Yellow	PMM 2013-01-034	1/1/2017
	White Premium Waterborne (11W2)	White	PMM 2011-01-095	1/1/2017
Ennis-Flint, Inc.	High Build Waterborne Paint 985222 Yellow	Yellow	2011-01-062	1/1/2017
	High Build Waterborne Paint 985221 White	White	2011-01-056	1/1/2017
	Low Temp Waterbone Paint 985352 Yellow	Yellow	PMM-PA-55 (991156)	1/1/2017
	Low Temp Waterbone Paint 985351 White	White	PMM-PA-51 (991152)	1/1/2017
	Standard Fast Dry Waterborne 984902	Yellow	PMM-2010-01-33	1/1/2017
	Standard Fast Dry Waterborne 984901	White	PMM-2010-01-37	1/1/2017
	Fast Dry Traffic Paint 984932	Yellow	PMM-2011-01-061	2/6/2018
	Fast Dry Traffic Paint 984931	White	PMM-2011-01-051	2/6/2018
Diamond-Vogel	VP13-Y7 Yellow Waterborne Traffic ((UC35-11926)	Yellow	PMM-2013-01-068	1/1/2017
	VP13-W2 White Waterborne Traffic (UC15-11928)	White	PMM-2013-01-063	1/1/2017
	VP13-Y6 Yellow Waterborne Traffic (UC35-15663)	Yellow	PMM-2013-01-067	1/1/2017
	VP13-W3 White Waterbrone Traffic (UC15-15562)	White	PMM-2013-01-064	1/1/2017
Swarco	Yellow High Build Waterborne Traffic Paint	Yellow	PMM-2011-01-082	1/1/2017
	White High Built Waterborne Traffic Paint	White	PMM-2011-01-081	1/1/2017
Ozark Materials	White Fast Dry Waterborne 14245	White	PMM-2017-01-139	10/29/2019
	Yellow Fast Dry Waterborne	Yellow	PMM-2017-01-140	10/29/2019

Slow Dry Epoxy				
Manufacture	Product	Color	NTPEP Number	Approval Date
Poly Carb, Inc	Mark 55.4	Yellow	PA - 2002	1/1/2017
	Mark 55.4	White	PA - 2001	1/1/2017
	Mark 55.9	Yellow	PMM-2013-01-84	1/1/2017
	Mark 55.9	White	PMM-2011-01-83	1/1/2017
Ennis-Flint, Inc.	HPS-2 Slow Cure Epoxy	Yellow	PMM-2013-01-056	1/1/2017
	HPS-2 Slow Cure Epoxy	White	PMM-2013-01-055	1/1/2017
Epoplex	LS-60	Yellow	PMM-PA-055	1/1/2017
	LS-60	White	PMM-PA-054	1/1/2017
	LS-65	Yellow	PMM-2008-01-193	1/1/2017
	LS-65	White	PMM-2008-01-192	1/1/2017
P3 Infrastructure, Inc.	Clarus LL Slow Set Epoxy Pavement Marking	Yellow	PMM-2014-01-122	1/30/2017
	Clarus LL Slow Set Epoxy Pavement Marking	White	PMM-2014-01-121	1/30/2017
Sherwin Williams	Yellow Slow Cure Epoxy TM 8221	Yellow	PMM-2008-01-203	4/4/2017
	White Slow Cure Epoxy TM 8220	White	PMM-2008-01-202	4/4/2017

*If black epoxy is required, you shall use any of the above products that come in black.

Pavement Marking Continued

Fast Dry Epoxy				
Manufacture	Product	Color	NTPEP Number	Approval Date
Poly Carb, Inc	MARK-55.3 (Fast Set Epoxy)	Yellow	PMM 2011-01-089	1/1/2017
	MARK-55.3 (Fast Set Epoxy)	White	PMM 2011-01-088	1/1/2017
Ennis-Flint, Inc.	HPS-3 Fast Cure Epoxy	Yellow	PMM-2008-01-121	1/1/2017
	HPS-3 Fast Cure Epoxy	White	PMM-2008-01-120	1/1/2017
	HPS-4 Urethane Modified Epoxy	Yellow	PMM-2011-01-084	1/1/2017
	HPS-4 Urethane Modified Epoxy	White	PMM-2011-01-083	1/1/2017
Swarco	1186 Yellow Epoxy Traffic Paint	Yellow	PMM-2013-01-057	1/1/2017
	1180 White Epoxy Traffic Paint	White	PMM-2013-01-058	1/1/2017
	MUFA 10	Yellow	PMM-2008-01-123	1/1/2017
	MUFA 10	White	PMM-2008-01-122	1/1/2017
Sherwin Williams	Yellow Fast Cure Epoxy TM 8301	Yellow	PMM-2008-01-201	4/4/2017
	White Fast Cure Epoxy TM 8300	White	PMM-2008-01-200	4/4/2017

*If black epoxy is required, you shall use any of the above products that come in black.

Permanent Tape			
Manufacturer	Product	Color	Approval Date
3M	3m Stamark All Weather Tape A381AW	Yellow	12/18/2013
	3m Stamark All Weather Tape A380AW	White	12/18/2013
	3m Stamark All Weather Tape A380AW-5 (Contrast)	White with Black	12/18/2013
	Adhesive: 3M Brand P-50	-	-
	SPA 60	-	-
3M	Stamark High Performance Tape 380 I-ES	Yellow/ White	Removed June 2019
	Stamark High Performance Tape 380 I-ES (Contrast)	White with Black	Removed June 2019
	Adhesive: 3M Brand P-50	-	-
	SPA 60	-	-
Brite-Line Technologies	Deltaline XRP	Yellow/White	Removed June 2019
	Deltaline XRP-HCL (Contrast-Long Lines Only)	White with Black	Removed June 2019
	Deltaline XPR-R (Long Lines Only)	Yellow/White	Removed June 2019
	Deltaline XPR-R-HCL (Contrast-Long Lines Only)	White with Black	Removed June 2019
	Adhesive: Brite-Line D20 Adhesive	-	Removed June 2019
Swarco Industries	Swarco Director 60-HPT	Yellow/ White	Removed June 2019
	Swarco Director 60	Yellow/ White	Removed June 2019
	Adhesive: Swarco Contact Cement Adhesive	-	-
	DPE-4 Primer Sealer	-	-

Pavement Marking Continued

Removable Tape				
Manufacturer	Product	Color	NTPEP	Approval Date
Advanced Traffic Markings	ATM 200 Series	Yellow	PMM-2014-01-016	1/1/2017
	ATM 200 Series	White	PMM-2014-01-015	1/1/2017
	ATM 280	Black	PMM-2014-01-021.	1/1/2017
Brite-Line Technologies	Brite-Line Series 100	Yellow	PMM-2013-01-016	1/1/2017
	Brite-Line Series 100	White	PMM-2013-01-012	1/1/2017
	Delta-Line TWR	Yellow	PMM-2011-01-016	1/1/2017
	Delta-Line TWR	White	PMM-2011-01-015	1/1/2017
	Deltaline BTR	Black	PA 2002	1/1/2017
	TWR-HCL (Contrast) Removable	White with black	PMM-2011-01-016	1/1/2017
	TWR-HCL (Contrast) Removable	Yellow with black	PMM-2011-01-015	1/1/2017
3M	3M Stamark Wet Reflective Removable Tape 711	Yellow	PMM-2010-01-024	1/1/2017
	3M Stamark Wet Reflective Removable Tape 710	White	PMM-2010-01-023	1/1/2017
	3M Stamark Mask Tape Removable 715	Black	PMM-2010-01-025	1/1/2017
	3M Stamark W.R. Removable Tape 711-5 (Contrast)	Yellow with black	PMM-2010-01-024	1/1/2017
	3M Stamark W.R. Removable Tape 710-5 (Contrast)	White with black	PMM-2010-01-023	1/1/2017
Swarco	Director 2 Temporary Removable Tape	Yellow	2008 PA	3/27/2018
	Director 2 Temporary Removable Tape	White	2008 PA	3/27/2018
	Director 2 Temporary Removable Tape	Black	2008 PA	3/27/2018

Temporary Raised Pavement Markers Type 1				
Manufacturer	Product	Color	Approval Date	
Ennis-Flint, Inc.	Stimonite	White	-	-
	Stimonite	Yellow	-	-
www.3m.com	3M 290	White	-	-
	3M 290	Yellow	-	-
	3M 291	White	-	-
	3M 291	Yellow	-	-
Ray-O-Lite	Round Shoulder 8800 Series	-	-	-
	AA 9700 Series	-	-	-
Apex Universal, Inc	Apex 921 Series	White	-	-
	Apex 921 Series	Yellow	-	-

Wet Reflective/Recoverable Elements				
Manufacturer	Product	Application Rate	Approval Date	
3M	3M Wet Reflective Elements Series 70E	4.1 pounds per gallon of 3M Wet Reflective Elements per 18-22 pounds per gallon of M247 Type 1 Beads.	November 2018	
Potters	VisiMax Plus	10 pounds per gallon of VisiMax Plus Wet Recoverable Elements per 10 pounds per gallon of M247 Type 1 Beads.	November 2018	
	VisiUltra NC	8 lbs per gallon of VisiUltra per 6-8 lbs per gallon of M247 Type 1 Beads.	October 2019	

Delineators & Marker Posts

Culvert End Markers			
Manufacturer	Product	Color	Approval Date
Safe-Hit	SH248GP3-WV	White	-
Pexco-Davidson	FG 500 Series	White	-
	FG 500 Series	White	-
Carsonite Composites	Survivor 01	White	-
	Curve-Flex Marker 01	White	-
Shur-Tite	Shur-Flex Drivable Delineator (#SD0031)	White	-

Delineator Flexible Posts			
Manufacturer	Product	Color	Approval Date
Safe-Hit	SH248GP3-WS	White	-
Pexco-Davidson	FG 500 Series	White	-
	FG 500 Series	White	-
Carsonite Composites	Survivor 01	White	-
	Survivor 02	White	-
	Curve-Flex Marker 01	White	-
Shur-Tite	Shur-Flex Drivable Delineator (#SD0031)	White	-
	Shur-Flex Drivable Delineator (#SD0031)	White	-

Guardrail Reflectors			
Manufacturer	Product	Color	Approval Date
Pexco	FatCat Guardrail Marker	--	-
Western Safety	TD 9150	--	-

E.A.T. Marker Posts			
Manufacturer	Product	Color	Approval Date
Pexco-Davidson	FG 500 Series	Yellow	-
Carsonite Composites	Survivor 02	Yellow	-

E.A.T. Marker Posts			
Manufacturer	Product	Color	Approval Date
Pexco-Davidson	FG 500 Series	Yellow	-
Carsonite Composites	Survivor 02	Yellow	-

Flexible Tubular Marker - Surface Mounted

Flexible Tubular Marker - Surface Mounted			
Manufacturer	Product	Color	Approval Date
Pexco, LLC	Davidson FG 300 UR Series	White/Yellow/Orange	12/8/1999
	Flexi-Guide FG 300 Model PE Series	White/Yellow/Orange	12/21/2015
	Flexi-Guide FG 300 Model EFX Series	White/Yellow/Orange	12/21/2015
	Davidson DP 200 Channelizer Post	White/Yellow/Orange	12/21/2015
FlexStake, Inc	FlexStake 750 Series	White/Yellow/Orange	12/8/2015
Safe-Hit	Dura-Post	White/Yellow/Orange	12/8/1999
	Safe-Hit	White/Yellow/Orange	12/8/1999
Bent Manufacturing Co.	Masterflex Series	White/Yellow/Orange	5/19/2010
New Direction Manufacturing	360 Surface Mount	White/Yellow/Orange	5/19/2010
Lakeside Plastics	Divider - Surface Mount Post	White/Yellow/Orange	6/20/2017
Impact Traffic	Tuff Post (SPEC-TP3)	White/Yellow/Orange	9/22/2017

Pavement Marking Approval Process

1. INTRODUCTION

The pavement marking materials are covered by this approval process.

QUALIFICATION

The Wisconsin Department of Transportation provides manufacturers or vendors two options to apply for addition to the approved products list in Wisconsin. In order to be considered, the vendor or manufacturer must initiate the evaluation of their pavement marking material.

Qualification for Immediate Approval

1. The subject material has been tested and has NTPEP data for two (2) years or more from the Northern test decks from 2008 or later. Refer to Appendix B & C for required test values.
2. Submit the required Application Form, Test Data, Installation Specifications, Product Specifications, Report, and Product Sample as follows:
 - **Application Form**
 - **Test Data:** Submit NTPEP test data from participation in Northern Test Deck for comparison to Wisconsin Department of Transportation's (WisDOT) qualification and performance requirements. The NTPEP data will include:
 - Durability Data
 - Retro-reflectivity Data
 - Color Data
 - Bead Data
 - Application Data
 - Traffic Data
 - Weather Data
 - Limitations
 - **Installation Specifications:** Submit proper product installation instructions along with a website address where the installation specifications can be located.
 - **Product Specifications:** Submit product specifications that include the material safety data sheet and any other literature along with a website address where the specifications can be located
 - **Report:** Submit a written report containing all of the following information and a statement agreeing to the provisions of the application and review process.
 - Technical Assistance: The name(s), telephone number(s) and email addresses for the vendor or manufacturer representatives.

- Manufacturer Quality Control Program: A written submission of a quality control program that monitors the manufacturer's production for WisDOT approval. Outline the details of the types of tests and frequency of tests on each of the lots produced and outline the manufacturer's laboratory product quality and accuracy control testing procedures.
 - Manufacturing Capability: The manufacturer must have, in operation, a plant adequate for and dedicated to the manufacturing of the specific pavement marking. Provide written assurance that the manufacturer is able to produce batch or lot sizes consistent with the quantities that are required for pavement marking projects. In addition, include verification that the manufacturer has produced similar material over the past two (2) years with success.
- **Product Sample**: Pavement marking material acceptance is based on the manufacturer's certification and quality control testing. The manufacturer or vendor is required to supply one pint of the product to WisDOT BTO Pavement Marking Program for verification. In addition, submit quality control test results to WisDOT as well as a manufacturer's written certification listing the batch or lot number, quantity and verification that the product being submitted for review meets WisDOT BTO specifications. Send sample and supporting documents to:

Linette Rizos
Department of Transportation
3609 Pierstoff St.
Madison, WI 53704
(414) 333.6234
Email: DOTSignMarkWZMaterials@dot.wi.gov

3. After the process is completed, WisDOT will notify the manufacturer or vendor of the results of the evaluation. If the product is accepted, it will be included on the Pavement Marking Approved Products List. If the product is rejected, the manufacturer or vendor can reapply after 6 months.
4. It is the responsibility of the manufacturer or vendor to submit all changes to WisDOT BTO in order to remain in good standing on the approved products list once the product has been added to the approved products list. If the product begins to show signs of failure before the end of its lifecycle, the manufacturer or vendor will be notified and will have 1 month to correct the problem or provide a resolution plan. If the problem is corrected, the product will remain on the approved products list. If the problem is not corrected, the product will be removed from the approved products list. The manufacturer or vendor may reapply after 6 months to be placed back on the approved products list.

ON-GOING APPROVAL

In order to recertify products to be included on the approved products list, the manufacturer or vendor is required to resubmit all of the documents listed above every 3 years. The NTPEP data submitted must be current to within one (1) year of the recertification application date. Failure to recertify products will result in removal from the Approved Products List.

**Wisconsin Department of Transportation
Pavement Marking: Approved Products Application**

Application Information

Company Name: _____ Phone Number: _____
Address: _____
Email Address: _____
Website: _____

Distributor Information

Company Name: _____ Phone Number: _____
Address: _____
Email Address: _____

Product Information

Product Name and Model: _____
Type of Marking:
 Solventborne Paint Tape
 Waterborne Paint Other: _____
 Epoxy

Has this product, or similar products been used previously by WisDOT? Yes No
If yes, please explain: _____

Documents to Submit:

- Quality Control Plan
- Data Sheets
- Installation Specifications
- Material Safety Data Sheet
- Technical Assistance
- Other Literature
- Submit a 1 pint or 10 ft sample of your product
- NTPEP Testing year & product name (From PA or MN): _____

Signature

Signed: _____ Title: _____
Printed Name: _____ Date: _____

Submit this application and supporting documents to:

Linette Rizos
Department of Transportation
3609 Pierstoff St.
Madison, WI 53704
(414) 333.6234
DOTSignMarkWZMaterials@dot.wi.gov

APPENDIX A

- Retro-reflectivity Data
 - Marking thickness
 - Pavement Type
 - Old or new
 - Concrete or asphalt
 - Application equipment and method
 - Reflectivity versus age
 - Traffic
 - Weather
- Color Data
 - Daytime color beads
 - Color drift over time
- Bead
 - Distribution & embedment
 - Type
 - Gradation
 - Coating
 - Application Weight
 - Roundness
- Durability
 - Marking thickness
 - Pavement Type
 - Old or New
 - Concrete or Asphalt
 - Adhesion to existing markings
 - Application equipment and method
 - Surface preparation
 - Durability versus age
 - Traffic
 - Weather
- Application Data
 - Required application equipment
 - Required application method
 - Speed
 - Weather limitation
 - Equipment modification costs (if any)
 - Dry time versus weather
 - Safety and health limitations

APPENDIX B

White Color Requirements							
Daytime Chromaticity Coordinates (Corner Points)							
1		2		3		4	
x	y	x	y	x	y	x	y
0.355	0.355	0.305	0.305	0.285	0.325	0.335	0.375

Yellow Color Requirement							
Daytime Chromaticity Coordinates (Corner Points)							
1		2		3		4	
x	y	x	y	x	y	x	Y
0.560	0.440	0.490	0.510	0.420	0.440	0.460	0.400

White					
Material	Expected Life (years)	Initial Retro	Retro After 1 year	Retro After 2 years	End of Life Durability
Paint	2	275	200	100	7
Epoxy	4	275	225	150	8
Permanent Tape	8	650	400	350	8

Yellow					
Material	Expected Life (years)	Initial Retro	Retro After 1 year	Retro After 2 years	End of Life Durability
Paint	2	185	100	--	7
Epoxy	4	185	140	100	8
Permanent Tape	8	425	335	250	8

Material	Expected Life (months)	Initial Retro	Retro After 6 Months
Temporary Tape - White	6	300	150
Temporary Tape - Yellow	6	200	100

APPENDIX C

AASHTO M247 Gradation of Glass Beads Type I		
Sieve Designation		Mass Percent Passing
Standard mm	Alternate No.	Type I
0.850	20	100
0.600	30	75-95
0.425	40	--
0.300	50	15-35
0.180	80	--
0.150	100	0-5

Application Thickness				
Surface	Epoxy		Paint	
	Gallons per mile (4 inch line)	Wet Thickness mils	Gallons per mile (4 inch line)	Wet Thickness mils
SMA Pavement and Epoxy Overlay Surfaces	27.5	25	17.6	16
Rumble Strip Surfaces	22.0	20		
Tined or Diamond Ground Pavement Surfaces	22.0	20		
All Other Pavements Surfaces	17.6	16		

Temporary Marking Application Thickness				
Surface	Epoxy		Paint	
	Gallons per mile (4 inch line)	Wet Thickness mils	Gallons per mile (4 inch line)	Wet Thickness mils
SMA Pavement and Epoxy Overlay Surfaces	13	12	13	12
Rumble Strip Surfaces				
Tined or Diamond Ground Pavement Surfaces				
All Other Pavements Surfaces				

APPENDIX D

MATERIAL DEFINITIONS:

Waterborne Paint – Conventional traffic paint consists of three interwoven elements: pigment, binder, and glass beads. Binder materials (or resins) are usually latex or acrylic materials that provide the adhesive and cohesive properties of the material.

- High-Build Waterborne Paint: A high-solids, water-borne paint that is thicker, more durable, and takes longer to cure than regular water-borne paint.

Epoxy: A durable two-component pavement marking material consisting of two components: a pigmented resin base and a hardener. Each component is heated separately and then thoroughly mixed and applied

- Modified Epoxy: Modified urethane is a two-component durable marking material with similar performance characteristics to those of polyurea. The product is marketed as being slightly more durable than epoxy but with quicker cure times and better UV color stability. Modified epoxy and urethane can be sprayed from any standard epoxy truck.
- Slow Cure Epoxy: Products that take longer than ten minutes to dry are categorized as slow cure epoxy.
- Fast Cure Epoxy: Products that take ten minutes or less to dry are categorized as fast cure epoxy.

Permanent Tape: This is a durable marking product that is inlaid on freshly laid bituminous surfaces or is grooved into concrete and older bituminous surfaces. These tapes bond with the pavement surface so that it cannot be removed by hand. This includes any inlaid installations that have achieved good bond with the surface.

Temporary Tape: This is a temporary marking material used for short-term applications such as work zones. These tapes are much thinner than permanent tapes and are pre-coated with a self-bonding adhesive. Temporary tape can be utilized to minimize pavement scarring.