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LUMIMARK - SAFETY TRAFFIC MARKING SYSTEM

THE NEED

Masters Builders, Inc. developed Lumimark HW 100 White and Yellow, polymer-modified, cementitious safety traffic marking products. It's designed for use in edge and center line striping on concrete pavement for both mainline and secondary roads, and all striping needs on runways, taxiways and aprons at airports. This product can be recommended for:

- New concrete pavement
- Retrofit concrete pavement
- Airport runways, taxiways and aprons
- Where reflective curbs and light standards are required
- Normal to hot weather conditions (60 to 110 F)

THE TECHNOLOGY

This technology helped the Department avoid a costly bridge replacement project by rehabilitating a steel truss bridge using lightweight composites. Reducing dead load on the bridge by 265 tons, the application of this technology doubled the load ratings to a level higher than the original design and allowed weight restrictions to be removed, while saving \$1.4 million in the process. This was the first time this type of rehabilitation was accomplished in the United States.

The Lumimark pavement marking system is integrated into the concrete pavement rather than applied to the surface. Installed into a groove ¼ inch deep in the concrete pavement, Lumimark becomes part of the pavement, having the strength and durability of concrete. Glass beads and pigments are incorporated throughout the polymer-modified cementitious matrix of the Lumimark material, giving it long-lasting visibility. It can be used on both highways and airport runways. Performance Data - a is following as:

TABLE 1 PERFORMANCE DATA

Working Time	Approx. 30 minutes at 70 F
Compressive Strength (ASTM C 109, modified)	
1 day	2000 psi (13.8 MPa)
7 day	4000 psi (27.6 MRs)
28 day	5000 psi (34.5 MRa)
Splitting Tensile Strength (AS TM C 496, modified)	
1 day	250 psi (1.7 MRs)
7 day	350 psi (2.4 MPa)
28 day	450 psi (3.1 MPa)
Length Change,%- (AS TM C 157, modified)	
28 day	0.08%
Pull-Of Bond (ASTM C 4541)	
1 day	100 psi (0.7 MPa)
7 day	150 psi (1.0 MPa)
28 day	200 psi (1.4 MPa)
Retro-reflectivity (ASTM 04061)	
86.0 Entrance Angle	Yellow - 250 mcd/m ² /Lx
0.2 Observation Angle	White - 350 mcd/m ² /Lx
Freeze-Thaw Resistance (AS TM C 666, A) 300 cycles	Relative Durability Factor (RDF)
No.1 Sealed, ¼ in. (6 mm) composite - b	90%
No.2 Plain, Solid Beam	95%

The data shown is representative of laboratory tests of 2 day moist cured samples. Reasonable variations from results shown may be experienced as a result of atmospheric and jobsite conditions. Mix entire bag of LUMIMARK HW 100 when preparing compressive strength specimens.

Composite beam prepared by overlaying ¼ in (6 mm) of product on hardened concrete.

THE BENEFITS

- Retro-reflectivity equal to or greater than that of other marking systems

- Highly durable and cost-effective compared to other high-performance marking systems
- Surface and integral glass beads for long lasting retro-reflectivity
- Compressive strength equal or greater to that of typical concrete pavement
- Thermally compatible with concrete pavement
- Approximately 30 minutes working time at 70F (21C)
- Excellent bond to base concrete

STATUS

Founded in 1909, Master Builders, Inc. has focused on the development, manufacturing and marketing of construction chemicals committed to improving concrete. The Civil Engineering Research Foundation (CERF) announced Lumimark - Safety Traffic Marking System as one of four finalists for the 2000 CERF Charles Pankow Award for Innovation.

BARRIERS

Longer installation duration and more labor power for installation are required compared to traditional line painting method.

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REFERENCES

1. Master Builders Technologies <http://www.masterbuilders.com/>
2. CERF Charles Pankow Award for Innovation http://www.cerf.org/about/press/7_21_00A.htm

REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

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