

971 PAVEMENT MARKING MATERIALS. (REV 2-8-19) (FA 2-11-19) (7-19)

SUBARTICLE 971-2.2 is deleted and the following substituted:

**971-2.2 Specific Properties**: The large (Type 3 or larger) glass spheres used for drop on beads shall have an adhesion coating. Type 1 glass spheres used for drop on beads shall have a dual coating. Beads used in the intermix of materials are not required to be coated.

The following physical requirements apply:

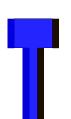
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Property	Test Method	Specification
Roundness*	AASHTO PP 74	Min: 70 % by weight
Roundness**	AASHTO PP 74	Min: 80% by weight
Refractive Index*	Becke Line Method (25+/-5C)	1.5 minimum
Refractive Index**	Becke Line Method (25+/-5C)	1.9 minimum

\*Type 1, 3, 4 and 5 beads \*\*High Index beads



	Percent by Mass Passing Designated Sieve ( AASHTO PP 74				PP 74)
Sieve Size	Grading Designation				
Sieve Size	Type 1 (AASHTO)	Type 3 (FP 96)	Type 4 (FP 96)	Type 5 (FP 96)	High Index
No. 8				100	
No. 10			100	95 - 100	
No. 12		100	95 - 100	80 - 95	
No. 14		95 - 100	80 - 95	10 - 40	
No. 16	100	80 - 95	10 - 40	0 - 5	100
No. 18		10 - 40	0 - 5	0 - 2	
No. 20	95 - 100	0 - 5	0 - 2		95 - 100
No. 25		0 - 2			
No. 30	75 - 95				55 - 85
No. 40					15 - 45
No. 50	15 - 35				0 - 5
No. 80					
No. 100	0 - 5				



SUBARTICLE 971-2.4 is deleted and the following substituted:

**971-2.4 Containers:** The spheres shall be furnished in new 50 pound moisture-proof bags or 2000 pound triwall boxes. All containers shall meet Interstate Commerce Commission requirements for strength and type.



### 971-3.2 Composition:

SUBARTICLE 971-3.2 is deleted and the following substituted:

Component	Test Method	Criteria
Total Solids, by weight	ASTM D2369	minimum 75%
Pigments, by weight	ASTM D3723	minimum 57%
Vehicle Solids % of Vehicle*		minimum 40%
TiO <sub>2</sub> , Type II Rutile (white paint only)	ASTM D476	minimum 1.0 lb/gal
Volatile Organic Content, (VOC)	ASTM D3960	maximum 150 g/L
*Vehicle Solids % of Vehicle = ( <u>% total solids - % pigment)</u> (100 - % pigment)		

SUBARTICLE 971-4.2 is deleted and the following substituted:

#### 971-4.2 Composition:

Component	Test Method	Criteria		
Total Solids, by weight	ASTM D2369	75% minimum		
Pigments, by weight	ASTM D3723	57% minimum		
Vehicle Solids, % on Vehicle*		40% minimum		
TiO <sub>2</sub> , Type II Rutile (white paint only)	ASTM D476	1.0 lb/gal minimum		
Volatile Organic Content, (VOC)	ASTM D3960	150 g/L maximum		

\*Vehicle Solids % of Vehicle = (% total solids - % pigment)
(100 - % pigment)
Vehicle solids shall be 100% acrylic emulsion polymer.

SUBARTICLE 971-4.3 is deleted and the following substituted:

**971-4.3 Physical Requirements:** Test laboratory samples in accordance with ASTM E811 and E1349. Samples shall meet the following criteria:

Property	Test Method	Minimum	Maximum
Density	ASTM D1475	$13.5 \pm 1.4 \text{ lb/gal}$	N/A
Viscosity at 77°F	ASTM D562	80 KU	100 KU
Fineness of Grind	ASTM D1210	3(HS)	
Dry Opacity at 5 mils WFT	ASTM D2805	0.92	-
Bleed Ratio	ASTM D969	0.95	-
Flexibility	ASTM D522 Method B	Pass	-
Abrasion Resistance	ASTM D4060	Pass	-

SUBARTICLE 971-5.2 is deleted and the following substituted:

### 971-5.2 Composition:

Component	Test Method	White	Yellow
Binder	ASTM D 4797	20% minimum	20% minimum
TiO <sub>2</sub> , Type II Rutile	ASTM D476	10% minimum	-
Glass Spheres	ASTM D 4797	40% minimum	40% minimum
Yellow Pigment		-	% minimum per manufacturer
Calcium Carbonate and Inert Filler (- 200 mesh sieve)		30% maximum	37% maximum
Percentages are by weight.			

SUBARTICLE 971-9.2 is deleted and the following substituted:

#### 971-9.2 Composition:

Component	Test Method	White	Yellow
Binder	ASTM D 4797	20% minimum	20% minimum
TiO <sub>2</sub> , Type II Rutile	ASTM D476	10% minimum	-
Reflective Elements	ASTM D 4797	% minimum per manufacturer	% minimum per manufacturer
Yellow Pigment		-	% minimum per manufacturer
Calcium Carbonate and Inert Filler (-200 mesh sieve)		% minimum per manufacturer	% minimum per manufacturer

Component	Test Method	White	Yellow
Note: Percentages are by weight.			

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SUBARTICLE 971-10.2 is deleted and the following substituted:

### 971-10.2 Composition:

Component	Test Method	White	
Binder	ASTM D 4797	18% minimum	
TiO <sub>2</sub> , Type II Rutile	ASTM D476	10% minimum	
Reflective Elements	ASTM D 4797	30% minimum per manufacturer	
Skid Resistant Elements 10% minimum per manufacturer			
Note: Percentages are by weight.			



