

PWGSC	Painted Traffic	Section 32 17 23
Gros Morne National Park	Lines & Markings	Page 1
Highway 430 Realignment, Deep Cove		
Project NO. R.062334.001		2014-02-10

## PART 1 - GENERAL

### 1.1 Standards

- .1 Provide all pavement markings in accordance with the Manual of Uniform Traffic Devices for Canada, latest edition.
- .2 ASTM C169-2011, Standard Test Methods for Chemical Analysis of Soda-Lime and Borosilicate Glass.
- .3 ASTM D185-2012, Standard Test Methods for Coarse particles in Fragments.
- .4 ASTM D711-2010, Standard Test Method for No Pick-up Time of Traffic Paint.
- .5 ASTM D869-2011, Standard Test Method for Evaluating Degree of Settling of Paints.
- .6 ASTM D1210-2010, Standard Test Method for Fineness of Dispersion of Pigment - Vehicle Systems by Hegman-Type Gauge.
- .7 ASTM D1309-2010, Standard Test Method for Settling Properties of Traffic Paints During Storage.
- .8 ASTM D1347-2011, Standard Test Method for Color and Color-Difference Measurement by Tristimulus Colorimetry.
- .9 ASTM D2205-2010, Standard Guide for Selection for Traffic Paints.
- .10 ASTM D2243-95(R2008), Standard Test Method for Freeze-Thaw Resistance of Water-Borne Coatings.
- .11 ASTM D3760-2005, Practice for Determining Volatile Organic Compounds, Content of Paints and Related Coatings.

### 1.2 References

- .1 The following publications are applicable to this standard.
  - .1 Canadian General Standards Board (CGSB), 1-GP-71 or American Society of Testing and Materials (ASTM) or as noted herein.

- 1.3 Samples
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, CGSB specification number and formulation number and batch number.
  - .3 The Departmental Representative reserves the right to test samples of paint at the point of delivery, from any or all batches of paint to be used. The samples will be tested and all paint from any batch tested that does not meet specifications, will not be permitted to be used on this project.

## PART 2 - PRODUCTS

- 2.1 Material
- .1 The low temperature, water-borne (acrylic), lead free, fast drying traffic paints shall be designed to be applied in environmental conditions such that operational temperatures shall be in the range of 2 degrees Celsius and rising.
  - .2 Paint to be well ground to a uniform smooth consistency and be free from skin, dirt and other foreign particles. The paint must be capable of being sprayed at the temperature intended for the paint. It must flow evenly and smoothly and cover solidly when applied to pavement. Supply paint ready-mixed for use without any addition of water.
  - .3 Paint mixture to include the glass bead intermix system.
  - .4 The paint mixture must be able to be applied under pneumatic pressure by a standard truck mounted dispensing machine moving at speeds of 8 to 24km/hr.
- 2.2 Paint
- .1 Paint to this standard shall comply with the following detail requirements when tested in accordance with the specified test methods:
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Property	Specification		Test Method (1)
General:	Min.	Max.	
Density	-	-	Method 2.1
Consistency, KU (2)	85	95	Method 4.5
Skinning Properties (3)	0	0	Method 10.1
Contrast Ratio (5)	0.992		
VOC (6)		150g/L	ASTM D3960
Volatile Matter % (mass) (including water)		24	Method 17.1
Freeze-thaw resistance	Pass		ASTM D2243
Pigment Content, % (mass)	56	62	Method 21.2
Binder solid, % of mass (7)	16.75		Method 19.1
100% Acrylic Polymer, % (mass)	15	-	Method 57.1
No-pick-up time, min. (4)	1	5	ASTM D711
Non-tracking time, sec. (9)		60	
Fineness of grind, HU	3	-	ASTM D1210
Coarse Particles:			
#60 Sieve - 250um	nil	Nil	ASTM D185 &
#100 Sieve - 150 mm	-	0.01	ASTM D2205
Bleeding	4	-	ASTM D868 & ASTM D2205
Settling Rate	6 8	- -	ASTM D1309 ASTM D869
White Paint:			
Titanium Dioxide, g/L	150	-	Method 2.1, 21.1, 50.14
Titanium Dioxide Pigment (8)			
Reflectance	80	-	ASTM E97
Colour	-	-	1-GP-12C 513-301
Yellow Paint:			
Reflectance	60	-	ASTM E97
Colour	-	-	505-308 (approx)

- .1 Perform tests by methods as per Canadian General Standards Board (CGSB), 1-GP-71 or American Society of Testing and Materials (ASTM) or as noted herein.
- .2 Kreb units at 25°C
- .3 Paint must be non-skinning. (See General Requirements, 2.1.1.2).
- .4 Also, field tests on a 15 mil wet film thickness of hot spray (maximum 50°C). Wait one (1) minute, drive a passenger vehicle over the film and no visible (from 15m) deposition of paint is deposited onto the adjacent pavement.

.5 Contrast Ratio: apply a wet film thickness of 381 microns on Laneta Penopac form (1B)  
Drying Time: Minimum 24 hours at 23°C. (plus or minus 2°C)

.6 Volatile organic compounds (VOC) (excluding water): max. 150g/L; method ASTM D3960.

.7 Titanium dioxide pigment shall be Rutile type and have a minimum TiO<sub>2</sub> content of 93%.

.8 Non-tracking time based upon 375um (15 mils) wet film thickness applied when pavement temperature is greater than 10° C and humidity conditions of 80% or less on dry pavement.

### 2.3 Glass Bead Intermix System

- .1 Compound to be a mixture of glass beads and drying agent materials.
- .2 Compound must meet the following gradation when tested according to ASTM D1214:

<u>Sieve Size</u>	<u>% Passing</u>
1.180mm (#16)	100%
0.850mm (#20)	90 - 100%
0.600mm (#30)	65 - 95%
0.300mm (#50)	10 - 35%
0.150mm (#100)	0 - 5%

- .3 Glass bead component of the compound to be colourless, clean, transparent, and free from milkiness and excessive air bubbles. They must be spherical in shape, containing no more than 30% irregularly shaped particles and be the equivalent of an AASHTO Type I glass bead. The silica content of the glass spheres must not be less than 60% as per ASTM C169 testing. Component to be manufactured of glass of a composition designed to be highly resistant to traffic wear, decomposition, etching under atmospheric conditions, dilute acids, alkalis, paint film constitutes, and to the effect of weathering, and should be composed of recycled glass (to the maximum extent possible).
- .4 Drying agent component to be smooth and spherically shaped, amber to white in colour, and of a type that promotes accelerated coalescence of the latex polymer and as such

reduces water-borne paint dry to touch time by approximately 40% (minimum).

- .5 Compound must show no tendency to absorb moisture in storage and shall remain free of clusters and hard lumps. It must flow freely from dispensing equipment at any time when applying with pavement marking.

### PART 3 - EXECUTION

#### 3.1 Equipment Requirements

- .1 Paint applicator must be an approved pressure type mobile distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut-off.

#### 3.2 Condition of Surfaces

- .1 Surface to be dry, free from ponded water, frost, ice, dust, oil, grease and other foreign materials.

#### 3.3 Traffic Control

- .1 Conduct traffic control in accordance with Section 01 55 26 - Traffic Regulation.

#### 3.4 Application

- .1 Unless otherwise approved by Departmental Representative, apply paint only when air temperature is above 10°C, wind speed is less than 60km/h and no rain is forecast within next 4h.
- .2 Apply traffic paint evenly at rate of 3m/L.
- .3 Do not thin paint unless approved by Departmental Representative.
- .4 Symbols and letters to conform to dimensions indicated.
- .5 Paint lines so they are of uniform colour and density with sharp edges.

.6 Apply temporary traffic markings as 300mm strips at 10m spacing.

.7 Thoroughly clean distributor tanks before refilling with paint of different colour.

3.5 Tolerance

.1 Paint markings to be within plus or minus 12mm of dimensions indicated.

.2 Remove incorrect markings to approval of Departmental Representative.

3.6 Protection of Completed Work

.1 Protect pavement markings until dry.