BEST PRACTICE GUIDELINES FOR SAMPLING OF TRAFFIC PAINT

GENERAL

These guidelines have been created to ensure that consistent paint sampling information is collected during the line paint stripping operation.

BACKGROUND

Alberta Transportation currently pre-qualifies suppliers of traffic paint through a Road Service Test Procedure. Traffic paint formulations are applied to a test deck and observed over a period of six months. At the conclusion of the test period, paint formulations are selected for the subsequent year's application based upon how well they performed during the pre-qualification trial.

A number of laboratory tests are also undertaken on each paint formulation. These laboratory tests are not used to accept or reject the product during the pre-qualification period but they are used as benchmarks to test future paint samples of that particular formulation. (see Appendix 'A')

SAMPLING REQUIREMENTS

Because we no longer purchase traffic paint directly we must collect samples from the paint applicators as a matter of providing due diligence in ensuring that the supplier is providing an approved product and the applicator is not modifying it prior to application.

The collected samples are tested in the laboratory and the results are compared to the benchmarks for the approved formulations. If any particular paint sample is outside the specifications for that formulation, payment adjustments are warranted. At this time we employ an all or nothing approach to payment adjustments. If a paint sample is out of specification, the applicator is not to be paid for the work and they are to reapply a product that meets our specification.

Therefore, it is imperative that representative samples are collected to avoid unjustified penalties as a result of poor sampling techniques. Any test performed on the sample, regardless of how carefully and accurately performed, is worthless unless the sample is truly representative of the paint material offered for use on the project.

Care should be taken to assure that all containers, agitators and sampling apparatus are clean and that they can in no way contribute to contaminating the sample. Airtight metal storage containers are necessary to prevent evaporation of sample material as volatile solvents may diffuse through the walls of plastic containers. The loss of volatiles can introduce significant error in such tests as viscosity, density and nonvolatile content. It is also very important in all stages of sampling/analysis that the samples are kept at

fairly constant and consistent temperatures. Extremes of temperature may change the properties of some paint.

SAMPLING FREQUENCIES

The department's sampling of traffic paint is to fulfil Quality Assurance audit requirements. Therefore we do not require samples from every barrel/tote of paint used. However a sufficient amount of random samples are needed to fulfil our requirements.

The purpose of random selection of test samples and test locations is to avoid bias. Random selection provides 'best chance' sampling to provide any unit the possibility of being sampled or tested. Random selections do not preclude selective testing of any unit that exhibits a non-uniform appearance.

Samples of traffic paint materials may be taken at any time. Traffic paint samples found to be out of specification will cause the material to be rejected and removed from the project site at the applicator's expense or be subject to applicable price adjustments.

To ensure that an appropriate amount of paint is tested, it is recommended that a minimum of one random sample per week be taken from each Contract Maintenance Area where traffic line paint-stripping operations are occurring.

SAMPLING PROCEDURES

There are basically three acceptable ways to collect a representative sample from the applicator as specified in the department's TLT-636 protocol. The method of choice may be a matter of convenience or may be dictated by the operations of the applicator. Appendix 'B' contains a checklist of sampling apparatus.

The preferred method is to collect the samples during the transfer of the product from the supplier's shipping containers to the truck mounted storage tanks. The sample should be taken when about half of the material in the shipping container has been transferred. If the paint has been shipped in "totes", it is quite simple to fill a sample container from the tote's spigot.

An acceptable alternative is to collect a sample directly from the applicator's gun while the truck is pulled over in a safe location. However, slightly more care is required to prevent contamination of the paint sample by materials that fall off the gun's exterior. To collect a sample in this fashion, all atomized/air pressure guns must be turned off prior to collecting the sample; the applicator must remove the nozzle and then activate the gun to provide a low-pressure discharge. To prevent contamination from falling debris, a filter funnel should be placed between the gun and the sample container.

The third method requires considerably more care and equipment to collect a sample from the truck's storage tanks or barrels/totes provided by the supplier. This method requires sampling from an open container. The paint must be stirred to ensure

homogeneity (therefore you need a stirring paddle) and a sample is to be taken from the center of the container with a clean scoop (therefore you need an appropriate scoop).

In all cases familiarize yourself with the Material Safety Data Sheet for the product. Ensure all necessary safety equipment such as vapour mask, face shield and rubber gloves are used when required and that eye wash bottles are available to protect the sampler. The vapour mask helps protect against certain organic vapours and acid gases.

Regardless of the sampling procedure used, a sample consists of a full 3.78 or 4.5 litre metal container. Empty paint cans are available from most hardware stores. Lined containers are commonly used for all paint samples and are mandatory for samples of waterborne paints.

The container used for collecting the sample must be filled to the top of the can to reduce solvent loss and to prevent skinning. The sample collected should be sealed as soon as possible to reduce any loss of volatile solvents from the paint. Avoid contaminating the sample with any cleaning solutions.

Each sample is to be labeled with the formulation number, batch number, color, sampling date, site location, the name and phone number of the individual who obtained the sample and the sampling procedure used (tote transfer, gun, tank). The formulation and batch numbers are available from the applicator.

Following is a sample label, which can be used by field staff:

FORMULATION NO. _____

BATCH NO. _____

COLOR _____

DATE SAMPLED _____

SITE LOCATION _____

SAMPLER'S NAME _____

SAMPLER'S PHONE NO. _____

APPLICATORS NAME _____

Ensure samples are labeled correctly and sent to AMEC Laboratory at 5671 – 70 Street, Edmonton, Alberta T6B 3P6.

APPENDIX 'A'

Batch/Tender Comparison Tests

TEST METHOD		BATCH ALLOWANCES	REMARKS
a.	Specific Gravity ASTM D1475	Within ± 0.025 kg/P of approved formulation	
b.	Degree of settling (Accelerated) ASTM D1309	Within ± 1 unit of approved formulation	Out of ten (500 ml Containers)
c.	45° - 0° Directional Reflectance (ASTM E313)	Allowable variation from approved formulation: BRIGHTNESS YELLOWNESS WHITE ± 5% ± 10% YELLOW ± 5% ± 10%	Using BYK Gardner Color Guide Spectrophotometer.
d.	60° Gloss ASTM D523	Within 3 units of approved formulation	Using Photovolt Gloss Meter, Model 660
e.	Hiding Power CGSB 1-GP-71(14.7)	Within 10% of approved formulation M^2/P.	
f.	Set-To-Touch Time ASTM D1640	Within 2 minutes of approved formulation	375 microns thickness 25° C & 55% R.H.
g.	Skinning CGSB 1-GP-71 (10.1)	No skinning allowed.	250 ml containers
h.	Abrasion Resistance ASTM D968	From 90 - 120% of approved formulation (litres/mil)	Sand weighed and volume calculated. Glass panels Wet film thickness = 100 micron, Cured at 25°C and 55% R.H.
i.	Flexibility ASTM D522	Within 20% of the mandrel diameter, at which cracking occurred on approved formulation	Using conical mandrel 375 microns thickness.
j.	Water Resistance ASTM D870	Within 1 unit of approved formulation	Out of 10. Cure 48 hours, 75 microns (dry) thickness.
k.	Particle Coarseness ASTM D185	Within ± 0.3% (Absolute) of approved formulation (% retained on 45 μm sieve) and not to exceed 1%.	Using methyl ethyl ketone on 100 g sample, dried at 105°C.

TEST METHOD		BATCH ALLOWANCES	REMARKS
l.	Fineness of Grind ASTM D1210	Within 1 Hegman unit of approved formulation	
m.	Pigment Content CGSB 1-GP-71(21.1)	Within 2% of approved formulation, (absolute) (wt.)	
n.	Non-volatile vehicle content CGSB 1-GP-71(17.1)	Within 2% of approved formulation, (absolute) (wt.)	
o.	Non-volatile vehicle content CGSB 1-GP-71(19.1)	Within 2% of approved formulation, (absolute) (wt.)	
p.	Water content CGSB 1-GP-71(24.1)	Within 0.2% of approved formulation, (absolute) (%)	
q.	Other tests as seemed suitable such as: - Chemical Analysis - Colour Tests - Drying Times - Storage Properties - Handling Properties - Resistance to Handling - Flash Point, etc.		

APPENDIX 'B'

Apparatus Checklist

	Sampling Method		
Apparatus	**Container Transfer**	**Applicator's Gun**	**Open Container**
Metal container (lined)	4	4	4
Sampling scoop			4
Stirring paddle			4
Lid remover	4	4	4
Filter funnel		4	
Rubber mallet	4	4	4
Pen/pencil	4	4	4
Label(s)	4	4	4
Cleaning fluid	4	4	4
Paper towels	4	4	4
Garbage bag	4	4	4

Safety Equipment Checklist

	Sampling Method		
Apparatus	**Container Transfer**	**Applicator's Gun**	**Open Container**
Vapour mask	**optional**	**optional**	4
Face shield/Safety glasses	**optional**	**desired**	4
Rubber gloves	4	4	4
Eye wash bottle	4	4	4

Note: Waterborne paint requires lined metal containers

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