



Specifications For Manufactured Materials

Section: TRAFFIC PAINT

Subject: FAST DRY ALKYD-WHITE AND YELLOW

1. SCOPE

This specification covers the requirements for white and yellow fast dry alkyd traffic paint, suitable for airless and air atomized spray application on bituminous highways for marking traffic lines.

Prequalification testing for next year's production traffic paint is performed in the current year.

2. GENERAL REQUIREMENTS

This specification specifies the most efficient traffic paint possible with regard to service and cost. Service includes general appearance, colour, night visibility, and durability. The composition of the paint shall be left to the discretion of the manufacturer, and it is their responsibility to formulate and produce a paint meeting the requirements specified herein.

Reflectorization of the paint lines will be obtained by the introduction of overlay-type glass beads during paint application. The application rate will be 550 grams of glass beads per litre of paint sprayed on the road surface.

The glass beads will be introduced or applied to the wet paint film by means of automatic spray guns and under air pressure.

2.1 Uniformity

The paint shall be homogenous and shall be well dispersed to a uniform and smooth consistency.

The paint shall be capable of easy application with an automatic spray gun. It shall flow evenly and smoothly without overspray, between 20°C to 60°C, using the internal atomization or airless spray.

2.2 Storage Stability

The paint shall not cake, liver, curdle, gel, thicken excessively, settle badly or show any objectionable properties for six months from date of delivery, in the original unopened container when stored at a temperature not exceeding 40°C. At the end of this time, it should be capable of being mixed without difficulty to a uniform condition by simple stirring.

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2.3 Colour

After drying, the paint shall be free from dirt or tint, and shall match the colours specified in Section 3.4 - Colour.

2.4 Packaging

The paint shall be packaged in 205 litre returnable "open head" drums or maximum 1230 litre tote tanks as specified in order.

All containers are to be Canadian General Standards Board approved and certified for the transport of dangerous goods.

Each container shall be plainly marked showing quantity of content, lot and batch number, name and address of manufacturer, manufacturer's code number for the paint and date of packaging.

Drums are to be good quality open head "returnable" type with 6.0 mil open top poly liners draped outside of containers with separate poly top.

Tote tanks will be mild steel construction with drum type lid. Tanks will contain 6.0 mil open top poly liners draped outside of tank with separate poly top. Outlet will be a 50 mm steel ball valve.

Container liners required for packaging are to be supplied by the supplier.

Tanks and drums are to be thoroughly cleaned including outlets and threaded connections, prior to refilling.

Top tied liners are not acceptable.

Supplier is to be responsible for transporting empty containers, tote tanks and liners returned to factory from Saskatchewan Highways and Infrastructure warehouses.

At the end of the season the supplier shall pick up the containers and tote tanks no later than December 15 of the current year.

The Ministry will be responsible for returning any containers and tote tanks to the supplier that are emptied after pick up date.

There will not be a deposit charge to the Ministry for delivered or returned containers.

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The Ministry will not accept bent or damaged containers that are delivered to their sites.

Colour of paint shall be clearly identified on each container. Containers shall be vapour-proof sealed.

2.5 Samples for Pre-qualification

Each prospective bidder shall submit seven-one litre cans of the paint they wish to furnish at no charge to the Ministry. All samples shall be plainly marked showing manufacturer's name code number. The labels shall be the type that can be easily removed. The test results for each type of paint formulation shall accompany the respective samples.

Only those manufacturers whose samples meet all the requirements of this specification shall be considered for eligibility to tender.

Manufacturers may submit up to three different samples for each colour. Samples shall be delivered to:

Saskatchewan Highways and Infrastructure
Engineering Standards Branch
Materials and Testing
1610 Park Street
REGINA SK S4P 3V7

not later than 4:00 PM the last Friday of May of each year, unless an extension has been granted by the Ministry. Failure to receive samples by the specified date and time may be considered sufficient cause for rejection of the sample.

2.6 Acceptance and Rejection

Paint furnished under contract shall be identical to the sample submitted for performance tests and subsequently approved. In the event that the traffic paint does not comply with these specifications or is not identical with the sample approved, the manufacturer shall be required to replace all such paint at their own expense, including all handling and transportation.

The paint that will be approved during the prequalification stage will be analyzed by infrared spectroscopy (finger printed). Throughout the season periodic infrared spectroscopy checks will be made on the supplied paint and compared to the original approved sample.

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Supplier may be required to supply production quantities of paint prior to acceptance of total order for evaluation of drying characteristics as outlined in the specification requirements under Section 3.5-Drying Properties.

2.7 Late Delivery

If the Ministry's Pavement Marking Program is jeopardized by late deliveries, the Ministry retains the option to cancel the contract and procure material from alternate prequalified suppliers.

3. SPECIFIC REQUIREMENTS

3.1 Hiding Power

It shall flow evenly and smoothly and cover solidly in one coat when applied at a rate of 6.15 m² per litre when tested using a PFUND CRYPTOMETER.

3.2 Viscosity

The viscosity of the paint shall be 80-95 Krebs Units at 25°C in accordance with ASTM D562.

While the viscosity of the original test sample may be anywhere within the stipulated range, the viscosity of all paint purchased on the basis of these performance tests shall be within plus or minus 5 Krebs Units of the original test sample throughout the production of the entire order providing such variation shall be entirely within the specified limits.

The paint shall have acceptable spraying characteristics within the required working temperature ranges.

3.3 Settling Rate

Shall provide a rating of 6 or higher according to ASTM D869.

3.4 Colour

White paint shall conform to Federal Standard 595 B Colours, number 37925. The yellow paint shall conform to Saskatchewan Highways and Infrastructure Yellow Traffic Paint Standard number 88001-SM.

The colour shall provide a rating of 6 or higher, based on the Ministry's Reference Standards.

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3.5 Drying Properties

The paint should dry in not more than 3 minutes when pre-heated to 60°C and tested according to ASTM Method D711.

However, the paint must dry to no-traffic pick up in 30 seconds or less when heated to a temperature not exceeding 60°C, when applied to pavement by means of a conventional spray striping machine at a wet film thickness of $380 \pm 25 \mu\text{m}$; with the atmospheric temperature above 20°C.

3.6 Bleeding

The bleeding characteristics shall provide a rating of 6 or higher in accordance with ASTM D969 and ASTM D868.

3.7 Flexibility

The preparation of the test panels shall be in accordance with ASTM D609.

One coat of the paint shall be applied to the clean abraded tin-plate panels. The coated panels shall then be air dried at room temperature for 18 h and subsequent force dried in an oven for 1 h at $105 \pm 2^\circ\text{C}$. The panels shall be removed from the oven and conditioned under room temperature for 24 h.

The panels shall be bent at room temperature through 180° over a 12.7 mm mandrel in not less than 1 s and not more than 1.5 s while keeping the coated side uppermost. The bent area shall be examined under 10-power magnification. The paint shall not crack or peel when subjected to the bending test.

3.8 Solids by Volume

The Solids by Volume must be greater or equal to 50%, by comparing wet to dry film measurements, when tested in accordance with ASTM D2697.

3.9 Pigment Content By Mass

The total pigment content shall be greater than or equal to 50% by mass, when tested in accordance to ASTM D2371.

4. Road Durability Test

The paint shall be subjected to a six month road durability test. The test section will be on a bituminous surfaced highway surface that is at least 24 months old with a minimum average daily traffic volume of 15,000 vehicles.

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Three transverse lines, of each sample submitted, will be applied on the test site. The first line will be applied without beads and the next two lines will be applied with beads.

The dimensions of the lines will be approximately 150 mm wide by 3700 mm long. The paint on all the lines will be applied to deposit a uniform wet film thickness of $381 \pm 25 \mu\text{m}$ (15 ± 1 mils).

A test plate will be placed on the unbeaded transverse line and sprayed with paint, as part of the paint applicator run, to measure and document the thickness of paint deposited. The plates will be flat galvanized steel, at least 0.6 mm thick, 250 mm long and 100 mm wide. The plates will be prepared in accordance with ASTM D 609 and CGSB Method 101.1.

Whenever feasible, a number of controlled test lines will be applied using the current year's approved production paint.

If thinners are used, only the minimum amount will be added to achieve a workable application. The amount of thinner added will be recorded and documented.

The two beaded lines shall be rated for degree of wear after the 6 month service period by a panel of Ministry's officials.

The degree of wear will be evaluated and a rating will be given. The rating will be based on an estimate of the remaining intact film by each panel member on a scale of 1 to 10.

Only those samples with average ratings of 5.0 or higher, in the wheel path, will be considered as having passed this test.

The rating panel will consist of a minimum of 5 of the following; Testing Standards Engineer, Manager of Testing Laboratory, Pavement Marking Manager, Pavement Marking Supervisors, and Paint Testing Specialist.

4.1 Retro-reflectivity

Suppliers must indicate the volume of solids for each sample. The ministry will ensure a dry film thickness of 180-210 μm on the test stripe. The initial minimum retro-reflectivity shall be: white $> 300 \text{ mcd/m}^2/\text{lux}$, yellow 210-280 $\text{mcd/m}^2/\text{lux}$. After the 6 month road service test, the final minimum reflectivity shall be: white $115 \text{ mcd/m}^2/\text{lux}$, yellow $100 \text{ mcd/m}^2/\text{lux}$.