

ATT-42/21 SAMPLING, Asphalt

1.0 SCOPE

This method describes the procedures for obtaining representative samples of liquid asphalt binder/emulsion, crack sealer and crack sealing materials for quality audit purposes to ensure the asphalt provided by the Contractor meets the standard specifications. Products not listed in the Approved Products List require Department approval prior to use.

Liquid asphalt binder is a major factor impacting the cost and quality of asphalt concrete paving. It is important to ensure that an adequate quality assurance mechanism is in place for the sampling and testing of liquid asphalt binder.

2.0 EQUIPMENT

The following container types are used for sampling asphalt:

a) A one litre, oblong, screw top, metal can is used for all cutback asphalt with the exception of SC 3000.	
b) A one litre, round, wide mouth, friction top, metal can is used for all asphalt cements and SC 3000 asphalt.	
c) A two litre, wide mouth, screw top, plastic jar is used for all emulsified asphalt.	
d) Heavy Duty Plastic bags are used for unheated crack sealing materials.	

Prevent Contamination: All containers must be new, clean, and free of moisture, dirt, or any other foreign matter at the time of sampling. **DO NOT wash, rinse or wipe out the containers with any type of cleaning solvent.** There should be no rust, dirt, or debris in the container no asphalt should be on the outside of the container. Emulsion samples should NOT be taken from distributor spray bars.

Wear appropriate PPE. Including but not limited to: Gloves must be worn and sleeves must be rolled down and fastened over the gloves at the wrist while sampling and while sealing containers. Face shields must be worn while sampling.

3.0 PROCEDURE

3.1 General

Importance of proper sampling: Sampling is equally as important as the testing, and every precaution must be taken to obtain samples that demonstrate the true nature and condition of the materials they represent. To be meaningful, a sample of asphalt must be representative of the material being tested.

All samples must be obtained by a person experienced with procedures for sampling and handling liquid asphalt binder. This person shall be responsible for following proper sampling procedure, so as to avoid the procurement of non-representative samples or related safety issues.

Some samples have low flash points, high penetrations, low viscosities and erratic distillation test results. All of these are typical of solvent-type contamination. For example, experiments indicate that 0.1% diesel oil in asphalt cement (only one litre of fuel oil in 1000 litres of asphalt) may lower the flash point by as much as 17° C (Pensky-Martens flash point test), and increase the penetration by up to 10 points.

3.2 Sample Size and Frequency

The required size of each sample is:

- 2 x 1 litre containers for asphalt cement samples.
One for initial testing, and one as a backup in case of an appeal.
- 1 litre container for cutback asphalt samples
- 2 litres for emulsified asphalts.
- 5 kg for unheated crack sealants.

The Contractor shall deliver all quality assurance samples to the Consultant on the day they were sampled. The Consultant will then forward the samples to the Departments designated quality assurance laboratory for testing and will accept, penalize, or reject asphalt material based on the test results. The Sampling and Testing Frequency is outlined in the Alberta Transportation, Standard Specification for Highway Construction, Specification 5.7, Supply of Asphalt, Sampling Frequency for Quality Assurance.

When a liquid Anti-stripping agent is to be incorporated into the binder, samples of binder are to be taken after the anti-stripping agent has been added to the asphalt. Liquid anti-strip can be blended to the asphalt at the refinery prior to shipping to the asphalt plant, or added to the virgin asphalt cement at the mixing plant. The additive shall be introduced through a separate, calibrated pumping and metering system electronically interlocked with the operating controls of the mixing plant. The Contractor shall have a procedure in-place enabling the safe sampling of treated asphalt including, where practicable, and in-line valve and sampling system.

3.3 Sample Location

Asphalt samples may be obtained from an in-line sampling valve, as shown in Figure 1, or from a tanker mounted sampling valve, as shown in Figure 2.

Samples from an in-line sampling valve must be taken during the unloading operation. Take the sample after approximately half of the product has been unloaded and the unloading pump is turned off.

Samples from a tanker mounted sampling valve must be taken prior to, or at the beginning of the unloading operation. ***At no time shall samples be taken at the end of the unloading operation, or from the discharge valve, or from the unloading hose.***



IN-LINE SAMPLING VALVE

The sampling pipe shall be not more than one eighth the diameter of the pipe and its opening should be turned to face the flow of the liquid. This pipe shall be provided with a valve or plug cock and shall discharge into a sample receiver.

FIGURE 1

TANKER MOUNTED SAMPLING VALVE

The sampling valve shall be mounted in the lower half of the rear bulk head, at least 300 mm from the shell. The valve control and the outlet shall be located so as to permit safe and convenient operation and sample gathering.

The inlet to the sampling valve assembly shall be at least 150 mm from the internal surfaces, and at least 300 mm from heating surfaces. The inlet shall be tipped downward at 20° to permit ready drainage when the asphalt level is below the level of the inlet.

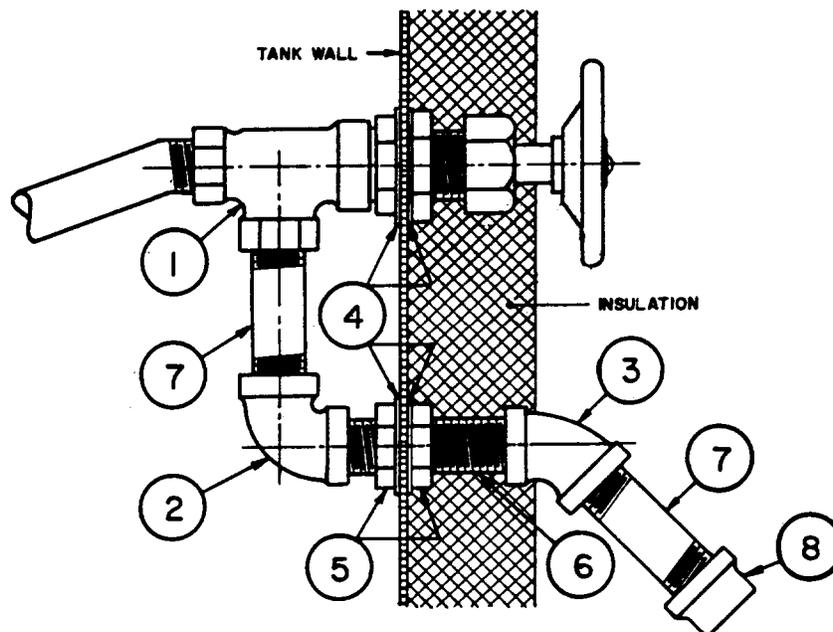


FIGURE 2

3.4 Sampling Asphalt Using the Sampling Valve

Notify the truck operator or contractor before obtaining the asphalt sample. If the tanker mounted or in-line sampling valve is plugged, it is the responsibility of the truck driver to unplug the valve.

Wear appropriate PPE while obtaining the asphalt sample.

Obtain a representative sample of asphalt as follows:

1. Ensure the sample container is clean and free of water.
2. Ensure the valve is closed.
3. Unscrew the metal cap at the end of the spout.
4. Make sure the opening in the spout is not plugged with solidified asphalt.
5. Stand away and upwind from the sampling valve and open the valve.
6. Bleed off about four litres of asphalt into a container to clean out the line then close the valve.
7. Wrap a sheet of paper around the sample container, covering it entirely. This will help keep the exterior of the container clean while sampling.
8. Hold the sample container under the opening. Tongs or some other device should be used to hold the container while the sample is being taken.
9. Open the valve very slowly, so that the asphalt stream is slow and steady.
10. Fill the oblong cans with cutback asphalt to within 10 mm of the top. Fill the round cans with asphalt cement, and the wide-mouth plastic jugs with emulsified asphalt to within 20 mm of the top.
11. Shut off the valve, remove the container and allow the asphalt remaining in the spout to drip into a container or onto a piece of paper.
12. If sampling cutback or emulsified asphalt, screw the top on immediately after sampling, to prevent evaporation. If sampling asphalt cements, **loosely** place the lid on the container immediately after sampling until the contents cool so that contraction of the asphalt will not collapse the container, and to prevent contamination.
13. When the asphalt stops dripping, wipe the spout clean and replace the cap.
14. Once the asphalt cement sample has cooled, tightly seal the friction top container.
15. There are sampling systems such as the Maxam Safe-Sampler which is an in-line capture which features an enclosed sampling system to dispense the asphalt into quart or gallon containers without exposing workers to hot liquid.



3.5 Safety

Observe the following safety precautions when sampling asphalt:

1. Wear the appropriate PPE (including hard hat, gloves and a full face shield).
2. Pull down and fasten the shirt sleeves on the coveralls over the top of each glove.
3. **Do not smoke** when near the delivery truck tank or asphalt storage tank.
4. If possible, stand above and away from the sampling valve, to the upwind side. Avoid breathing any fumes, mists and/or vapors.
5. Open the sampling valve very slowly, so that the asphalt stream is slow and steady, preventing splashing and spillage.
6. Keep cool clean water near the sampling site, in case of an accidental asphalt spill.
7. The sampler should be aware of the Workplace Hazardous Materials Information System (WHMIS) and Dangerous Goods regulations for handling and shipping of these asphalt materials.

3.6 Treatment of Asphalt Burns

Should hot asphalt cement contact your skin:

1. Cool the affected area immediately.
Methods of Cooling (in order of preference):
 - a. Completely submerge affected area in ice water.
 - b. Completely submerge affected area in tap water.
 - c. Place affected area under running water.

DO NOT DELAY

CAUTION: DO NOT apply ice directly to affected area.

2. **DO NOT REMOVE** the asphalt adhering to the skin as it will fall off after a week of healing. Since the asphalt is very hot, the burn will be sterile.
3. For **minor asphalt burns**:
Once the area has been cooled, seek medical aid.
Includes: Injury to small areas of fairly insensitive flesh;
Injury involving a small quantity of asphalt cement.

For **serious asphalt burns**:

As soon as possible, get the victim to a hospital, clinic, or physician's office.
Includes: Injury to head, face, or extremities;
Injury when large amounts of asphalt cement are involved;
Evidence of nausea or faintness.

3.7 Sample Identification and Shipping

1. The sample container shall not be overfilled. Ideally allow for 12-15 mm free space on top of the liquid asphalt binder in the sample container.
2. Friction lids shall be placed loosely on the sample container until the sample has cooled to room temperature. At this point the lids can then be firmly tapped in place. ***If the lid is sealed immediately after sampling the hot liquid, the can may collapse due to a decrease in pressure inside the can during the cooling process.***
3. Prior to shipping, ensure that the lid of the asphalt sample container is secure and protected from damage during shipment. If the lid comes off during transport, the laboratory will not be able to test it. Duct tape can be used around the plastic container lid to ensure the container lid doesn't leak or come off.
4. If required and while the sample is hot, use a dry clean cloth or paper towel to clean the outside of the container. ***Never submerge the container in solvent and never use a solvent soaked rag to clean the container.***
5. ***Complete the Asphalt Sample Identification form, with ALL the following information, and attach it to the side of the container. DO NOT attach the form to the lid.***
6. ***All samples are to be shipped on a weekly basis. (Except emulsions which must be shipped within 3 days of sampling).***

		ASPHALT SAMPLE IDENTIFICATION					
PROJECT	FROM	TO	CONTRACT NO.	PROJECT MANAGER	CONTRACTOR	SAMPLED BY	DATE SAMPLED
ASPHALT SUPPLIER	REFINERY LOC.	ASP. TYPE	BATCH NO.	TRUCK NO.	BILL OF LADING NO.	SAMPLE NO.	DATE SUBMITTED

3.8 Sampling Cold Pour Emulsified Crack Filler

Products not listed as proven in the AT Products List require Department approval prior to use.

The Consultant will obtain a sample of crack sealant material for each Lot. Obtain the sample as follows:

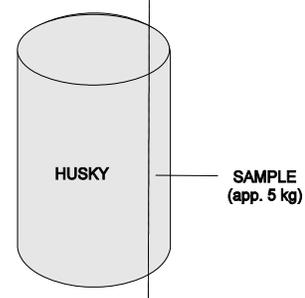
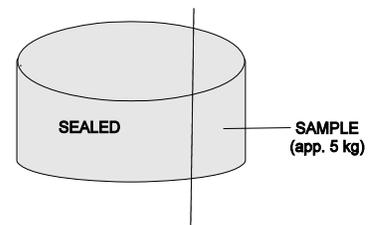
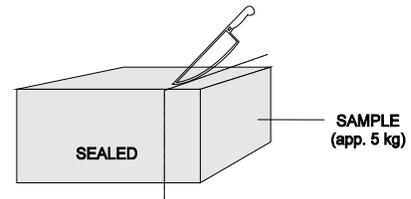
1. Ensure that the drums are well mixed with a drill and mixing paddle.
2. Pump the material from one of the mixed drums into a distributor tank.
3. When the drum is about half empty, stop pumping into the distributor tank and pump some of the material into a 2 litre emulsion container.
4. When the container is full, securely tighten the lid.
5. Complete a Crackfiller Sample Identification form and attach it to the container, or mark the container with the following information:

- Name and address of the supplier	-Type of material
- Batch number(s)	-Date
- Delivery slip number	-Sample location

3.9 Sampling Crack Sealer

The Contractor shall obtain and submit to the Consultant two representative samples of crack sealant material for each Lot of production, or as defined in the AT Standard Specifications for Highway Construction. A Lot is defined as a day's production of at least 5 km of roadway. Obtain the sample as follows:

1. For each lot, randomly select a block or a drum of the delivered crack sealer.
2. Insert a plastic bag into another.
3. Use a clean knife to cut off a slice of material straight down to the full depth of the block, as shown in Figure 3.
4. Take a representative sample of the sealer of approximately 5 kg.
5. Place the sample in the inside plastic bag and tightly seal the bag.
6. Complete a Crackfiller Sample Identification form and fold the form.
7. Insert the form in the outside bag and tightly seal the bag.



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