

Australian/New Zealand Standard™

AS/NZS 2891.1.1:2013

Methods of sampling and testing asphalt

Method 1.1: Sampling—Loose asphalt

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CE-006, Asphalt and Sprayed Surfacing, to supersede AS 2891.1.1—2008.

METHOD

1 SCOPE

This Standard sets out procedures for obtaining samples of loose asphalt using manual or mechanical methods and includes sampling from stockpiles.

The Standard also specifies methods for the preparation of bulk samples to produce test portions ready for testing. It does not include methods of sampling asphalt from a road pavement, whether compacted or not.

NOTE: Guidance on the principles of obtaining samples of asphalt is given in Appendix A.

2 REFERENCED DOCUMENTS

The following document is referred to in this Standard:

AS

1141 Methods for sampling and testing aggregates

1141.2 Method 2: Basic testing equipment

3 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

3.1 Asphalt

A mixture of bituminous binder and aggregate with or without added mineral filler.

3.2 Bulk sample

Approximately equal sized sample increments, mixed thoroughly until uniform throughout.

3.3 Nominal size of mix

A designation for a mix, chosen to give an indication of the largest size particle present expressed as a convenient whole number above the largest sieve size to retain greater than 0% and less than 10% of the aggregate material.

3.4 Sample increment

The basic unit of sampling being a quantity of the material taken directly from the sample site.

3.5 Sample site

The location within the quantity of asphalt at which a sample increment is taken.

3.6 Stockpile

A heap or stack of material held in stock for future use.

3.7 Test portion

Material derived from a bulk sample by further division and used for a particular test.

4 SAFETY PRECAUTIONS

This Standard may involve hazardous material, operations and equipment. This Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

5 APPARATUS

The following apparatus may be required to undertake the sampling and preparation procedures described in Clauses 7 and 8.

5.1 Mechanical sampling device

Consisting of a mechanical sampling head that can be inserted and withdrawn from the asphalt within the truck or trailer body. The sampling head shall be capable of being heated and closed and opened remotely (see Figure 1). (Optional.)

5.2 Oven

Thermostatically controlled capable of maintaining temperatures of up to 180°C.

5.3 Personal protective equipment

Gloves, glasses, safety footwear, long sleeved apparel, long trousers.

5.4 Quartering tray

5.5 Quartering tool

Either a straight metal plate or sheet metal formed in the shape of a cross. The dimensions of the tool should be wider and higher than the asphalt cone to be quartered.

5.6 Sample container

Where a sample is to be tested immediately after sampling a dish, a tray or bucket may be used. Where a sample is to be transported or stored, a container with a closely fitting lid is to be used. The container shall be free of contaminants (e.g. dust, water or fuels) that could alter the nature and condition of the asphalt and shall be sufficiently durable to ensure the sample is not spilt or contaminated. When the moisture and/or volatiles content is to be determined a metal container with a close fitting lid shall be used.

5.7 Sample divider

Complying with the requirements of AS 1141.2. Due to the adhesive nature of asphalt, 50 mm wide slots should be used for all mixes of 10 mm nominal size and greater, whilst 25 mm wide slots should be used for smaller nominal size dense graded mixes and all fine gap graded mixes (optional).

5.8 Sampling tool

Tool for hand sampling, e.g. a scoop or shovel.

5.9 Thermometer

Covering the range 0°C to 200°C and readable and accurate to 1°C (optional).



FIGURE 1 MECHANICAL SAMPLING DEVICE

6 SAMPLE SIZES

The size of the samples shall be commensurate with the required testing but the minimum mass of a bulk sample shall not be less than the quantities shown in Table 1.

TABLE 1
SAMPLE MASSES

Nominal mix size	Less than 10 mm	10–20 mm	Greater than 20 mm
Mass (kg)	4	6	12

7 SAMPLING PROCEDURE

7.1 General

Sampling of loose asphalt is carried out for, amongst other purposes, the following:

- (a) Quality control, quality assurance or auditing of mix production.
- (b) Mix design evaluation.

The reason for sampling should be considered and one of the following five procedures described in this Standard adopted:

- (i) Sampling from a truck, front end loader or trailer by hand sampling. See Clause 7.2.2.
- (ii) Sampling from a truck or trailer using a mechanical sampling device. See Clause 7.2.3.
- (iii) Sampling during discharge from a plant. See Clause 7.3.
- (iv) Sampling from stockpiles. See Clause 7.4.
- (v) Sampling from paver augers. See Clause 7.5.

Sampling tools and mechanical sampling devices should be clean with all adhering asphalt removed and may be coated with a film of release agent which is sufficiently thin not to contaminate the sample. The release agent shall not alter the nature or condition of the asphalt or affect test properties.

Care shall be taken in selecting the site for obtaining a sample to ensure that the sampling process is not biased. Where more than one sample increment is taken to form a bulk sample, the sampling shall be undertaken within the shortest period of time possible.

7.2 Sampling from a truck, front-end loader or trailer

7.2.1 General

When required and where practical, measure and record the temperature of the asphalt to the nearest 1°C ensuring that the thermometer or probe is placed in the asphalt without air pockets surrounding the device.

7.2.2 Hand sampling

The procedure for obtaining a bulk sample or sample increment from a truck, front-end loader or trailer (referred to as truck) shall be as follows:

- (a) Remove at least 80 mm thickness of asphalt from the surface of the sample site.
- (b) Expose a horizontal bench of asphalt (see Figure 2) at least 1m wide and 200 mm deep.
- (c) Cut a vertical face through the horizontal bench exposed, as described in Step (b), by removing at least 80 mm thickness of asphalt from the front of the horizontal bench.
- (d) Insert the sampling tool completely at a centre point of the face of the exposed bench and withdraw the sampling tool without spilling its contents.
- (e) Place the sample increment in a sample container without loss of the asphalt. When testing for moisture content or volatile oils seal the sample container immediately.
- (f) Repeat Steps (d) and (e) taking one increment near each end of the face.
- (g) Combine all of the sample increments to form a bulk sample. Take sufficient material to satisfy the requirements of Table 1 for all proposed tests.
- (h) Place each bulk sample in a separate sample container, and record and identify each bulk sample in accordance with Clause 9.



FIGURE 2 EXPOSED BENCH OF ASPHALT

7.2.3 *Using a mechanical sampling device*

The procedure for obtaining a bulk sample or sample increment from a truck using a mechanical sampling device shall be as follows:

- (a) Preheat the head of the mechanical sampling device to its operating temperature.
- (b) Select a sampling site within the load in the truck being sampled. The site shall be not less than 300 mm from any side of the truck body.
- (c) Insert the sampling head in a closed position into the asphalt in the truck to an initial depth of about 400 mm.
- (d) Open the sampling head and let it fill with asphalt. Withdraw the sampling head from the asphalt to a safe height.
- (e) Remove loose material from the head then place the head over a sample container. Open the head and eject the sample increment into the sample container.
- (f) If more than one sample increment has been taken for each sample, combine each set of sample increments to form a bulk sample. Take sufficient material to satisfy the requirements of Table 1 for all proposed tests.
- (g) Place each bulk sample in a separate sample container, and record and identify each bulk sample in accordance with Clause 9.

7.3 **Sampling during discharge from a plant**

Care needs to be taken when sampling through a stream of asphalt. Sampling during discharge from a mixing plant shall only be carried out when it is safe to do so, and shall be in accordance with a documented process. Where more than one sample increment is taken to form a bulk sample, the sampling shall be undertaken within the shortest period of time possible. The procedure for obtaining a bulk sample or sample increment during discharge from an asphalt plant shall be as follows:

- (a) Pass the sampling tool across the full cross-section of discharge or through the centre part of the curtain of falling material, at a rate that prevents spillage of asphalt over the sides of the sampling tool. If spillage occurs, discard the sample increment and repeat the procedure.

- (b) If more than one sample increment has been taken for each sample, combine each set of sample increments to form a bulk sample. Take sufficient material to satisfy the requirements of Table 1 for all proposed tests.
- (c) Place each bulk sample in a separate sample container, and record and identify each bulk sample in accordance with Clause 9.

7.4 Sampling from stockpiles

Where a stockpile of cold mixed asphalt is being sampled, the sample should be taken without delay to minimize loss of light oil and/or contamination by other materials (e.g. dust or moisture). The procedure for obtaining a bulk sample or sample increment from a stockpile shall be as follows:

- (a) Select at least two sampling sites.
- (b) Remove the surface material at each sample site to a depth of approximately 100 mm.
- (c) Bench the asphalt and take a single sample increment using the sampling tool and place the material in a sample container.
- (d) Repeat Steps (b) and (c) at other sampling sites.
- (e) Combine all of the sample increments to form a bulk sample. When testing for moisture content or volatile oils content, immediately seal the sample container. Take sufficient material to satisfy the requirements of Table 1 for all proposed tests.
- (f) Place each bulk sample in a separate sample container, and record and identify each bulk sample in accordance with Clause 9.

7.5 Sampling from paver augers

Sampling from paver augers shall only be undertaken where there is reasonable access to the augers and the paver and augers are stationary. Sampling shall not occur unless the augers or extension box is completely charged with asphalt. The procedure for obtaining a bulk sample or sample increment from a paver auger shall be as follows:

- (a) Take a single sample increment using the sampling tool and place the material in a sample container.
- (b) Repeat Step (a) to obtain at least two sample increments.
- (c) Combine all of the sample increments to form a bulk sample. Take sufficient material to satisfy the requirements of Table 1 for all proposed tests.
- (d) Place each bulk sample in a separate sample container, and record and identify each bulk sample in accordance with Clause 9.

8 PREPARATION OF TEST PORTIONS

8.1 General

Care needs to be taken when preparing samples to avoid segregation, minimize the loss of temperature, which is particularly important when preparing specimens for laboratory compaction, and minimize the loss of moisture or volatile oils.

Two methods are described for preparing the test sample, cone and quartering, and the use of a sample divider.

Sample dividers have typically been used for the preparation of test portions of larger sized asphalt mixes. The use of a sample divider may result in significant loss in the temperature of the asphalt. Equipment used to prepare test portions should be clean and may be coated with a film of release agent which is sufficiently thin not to contaminate the sample.

The release agent shall not alter the nature or condition of the asphalt or affect test properties.