

Australian/New Zealand Standard™

AS/NZS 2891.3.3:2013

Methods of sampling and testing asphalt

Method 3.3: Binder content and aggregate grading—Pressure filter method

PREFACE

This Standard was prepared by the Joint Standards/Standards New Zealand Committee CE-006, Asphalt and Sprayed Surfacing, to supersede AS/NZS 2891.3.3:1997, *Methods of sampling and testing asphalt, Method 3.3: Bitumen content and aggregate grading—Pressure filter method*.

METHOD

1 SCOPE

This Standard sets out the method for determining, by pressure filtering, the binder content of mixes containing a bituminous binder, and subsequently the particle size distribution of aggregate by sieve analysis.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

- 1141 Methods for sampling and testing aggregates
- 1141.11.1 Method 11.1: Particle size distribution—Sieving method
- 1152 Specification for test sieves
- 1681 Safety requirements for electrically heated Type 1 ovens in which flammable volatiles occur

AS/NZS

- 2243 Safety in laboratories
- 2243.8 Part 8: Fume cupboards
- 2891 Methods of sampling and testing asphalt
- 2891.1.1 Method 1.1: Sampling—Loose asphalt

Safe Work Australia

Exposure standards for atmospheric contaminants in the occupational environment

3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 2891.1.1 apply.

4 MATERIAL

A solvent that is totally miscible with bitumen and will remove all of the bituminous binder from the aggregate including permeable voids within the aggregate particles. The solvent shall not leave a residue on the aggregate.

NOTE: All solvents should meet occupational, health and safety requirements (see Clause 5).

5 SAFETY PRECAUTIONS

Extreme care shall be taken in the use of solvents. All operations that involve the use of solvents shall be carried out in a fume cupboard complying with AS/NZS 2243.8. The values as given in the Safe Work Australia Standard, *Exposure standards for atmospheric contaminants in the occupational environment*, shall be observed.

6 APPARATUS

6.1 Air compressor or hand pump

Capable of providing a pressure of 100 kPa.

6.2 Balance

Readable to at least 0.1 g with a limit of performance not exceeding 0.5 g.

6.3 Containers

Suitable containers to wash the asphalt and to collect wash liquid.

NOTE: Aluminium containers should not be used with certain solvents as this causes accelerated oxidation of the aluminium.

6.4 Dishes

Made of metal, of suitable size.

6.5 Drying oven

Thermostatically controlled to operate at a temperature of 105°C to 110°C, with mechanical ventilation exhausting to a fume cupboard duct or outside atmosphere. The oven shall have low temperature sheathed elements and, where flammable solvents are used, shall be fitted with a blow-out panel and locking door complying with AS 1681.

6.6 Filter aid

Such as diatomaceous earth.

6.7 Filter pads

Of appropriate diameter and porosity. An appropriate porosity is the coarsest grade which can be shown to retain 95% of the material passing a 75 µm sieve.

6.8 Filter unit

Made of glass or metal and located in a fume cupboard.

6.9 Flasks

A 1 L and a 2 L Erlenmeyer or round-bottom type, provided with a stopper for sealing the flask during weighing.

6.10 Fume cupboard

In accordance with the appropriate requirements specified in AS/NZS 2243.8.

6.11 Funnel

Made of metal, fitted with a 75 µm mesh strainer and an underlying supporting mesh.

6.12 Heating device

A hotplate or heating mantle with adjustable temperature control. The hotplate shall be covered with a mat of appropriate material to diffuse heat evenly.

6.13 Sieves

Sieves as required, complying with AS 1152.

6.14 Wash bottle

Suitable for containing solvent.

7 SAMPLE PREPARATION

The test sample shall be prepared as follows:

- (a) If necessary, warm the test sample just sufficiently by heating, preferably in an oven, to loosen the mass of material.
- (b) Reduce the size of the test sample by sample division to obtain a test portion of minimum mass given in Table 1.
- (c) Unless the test sample is known to contain no or low moisture content based on plant production history and type of aggregate, the test portion for the binder content test shall be prepared by either—
 - (i) drying the test portion to constant mass at a temperature of 105°C to 110°C and using this portion in Clause 8.1(d); or
 - (ii) using the test portion without drying in Clause 8.1(d) and on a separate test portion from the same test sample determine the moisture content (w) by drying the separate test portion to constant mass at a temperature of 105°C to 110°C.

TABLE 1
MINIMUM MASS OF TEST PORTION

Nominal size of mix mm	Minimum mass of test portion g
<10	600
10	800
14	800
20	1000
>20	1200

8 METHOD FOR DETERMINING BINDER CONTENT

8.1 Procedure for washing

The procedure for washing shall be as follows:

- (a) Place filter pad and filter aid in the oven to dry at 105°C to 110°C, to constant mass.
NOTE: About 30 g of filter aid has been found to be suitable.
- (b) Allow the dried filter aid to cool then weigh and record the mass (m_1) to the nearest 0.1 g. Place the filter aid in a clean 2 L flask.
- (c) Weigh the 1 L flask and record the mass (m_2) to the nearest 0.1 g.
- (d) Transfer the test portion to the 1 L flask. Weigh the flask and test portion and record the mass (m_3) to the nearest 0.1 g.