

Determination of the Fibre Content of Fresh Concrete (Wash-out Method)

1. Scope

This test method sets out the methodology for determining the fibre content of freshly mixed fibre concrete that is in the plastic state, by using a wash-out process.

Three equal sub-samples are taken from a concrete load, or from concrete made in the laboratory. The sub-samples are combined and compacted into a known volume. The steel or synthetic fibres are washed out, separated and dried. The fibre content is determined from the mass of fibre and the volume of the concrete sample.

2. Apparatus

Apparatus shall be as used in AS 1012.5. The capacity of the container or measure used shall be not less than 5 L, known to the nearest 0.02 L.

The following additional equipment is required:

- (a) a steel trowel or float;
- (b) a magnet for collection of steel fibres;
- (c) alcohol for dispersion of synthetic fibres, and
- (d) a sieve or filter equipment, suitable for washing out cementitious material and other fine materials from fresh concrete.

3. Test Samples

3.1 General

Samples of concrete shall be obtained in accordance with the provisions of AS 1012.1.

Three equal sub-samples shall be taken from the concrete load, from the first, middle and last one third, disregarding the very first 0.2 m³ and very last 0.2 m³ parts of the load.

3.2 Place fibre concrete into container

Mix the sub-samples thoroughly. Place and fully compact the combined sample in the container in accordance with the procedure of AS 1012.5. The concrete shall be levelled off with a trowel, float or glass cover plate to be flush with the top of the container.

3.3 Volume of combined test sample

The volume of the combined test sample will be equal to the volume of the container.

The combined test sample volume (V_{fc}) shall be expressed to the nearest 0.02 L.

3.4 Fibre content

The fibres shall be washed out, separated and collected from the combined fibre concrete test sample. The combined test sample of fibre concrete shall be placed in a sieve or filter equipment where the cementitious materials and other fine materials and aggregates can be washed out such that the fibres can be separated from the concrete mass.

Steel fibres shall be collected directly or by using a magnet.

Where synthetic fibres are used, the samples may be soaked with alcohol, stirred until the fibres float to the surface and the fibres recovered.

Adequate care shall be taken during the fibre wash out and collection process so that loss of any fibres does not occur.

The recovered fibres shall be cleaned and dried to constant mass. The mass (M_f) of the dried fibres shall be measured to the nearest 0.5 g.

3.5 Calculation of fibre content

The fibre content of the combined test sample of fibre concrete shall be calculated as follows:

$$F_c = \frac{M_f}{V_{fc}}$$

where

- F_c = fibre content, in kg/m³;
- M_f = mass of fibre recovered from the combined test sample, in g;
- V_{fc} = volume of the combined test sample, in L.

4. Test Report

The test report shall include the following:

- (a) Identification of the concrete load and test samples;
- (b) Date and time of test.
- (c) Location or laboratory where the test is carried out.
- (d) Volume of the combined test sample of fibre concrete to the nearest 0.02 L;
- (e) Mass of the fibres in the combined test sample to the nearest 0.5 g;
- (f) The calculated fibre content of the combined test sample to the nearest 0.1 kg/m³;
- (g) Identification of the fibres, manufacturer and description of the fibre type;
- (h) Reference to this test method (RC 377.01);
- (i) Any deviation from the test method;
- (j) Such other information contained in the records as may be requested.

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VicRoads Test Method - Revision Summary

RC 377.01 – Determination of the Fibre Content of Fresh Concrete (Wash-out Method)

Date	Clause	Description of Revision	Authorised by
March 2019	Full method	New Issue	Manager – Construction Materials