



Methods for sampling and testing aggregates

Method 34: Organic impurities other than sugar



AS 1141.34:2018

This Australian Standard® was prepared by CE-012, Aggregates and Rock for Engineering Purposes. It was approved on behalf of the Council of Standards Australia on 7 December 2018.

This Standard was published on 21 December 2018.

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- Australasian (iron and steel) Slag Association
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This Standard was issued in draft form for comment as DR AS 1141.34:2018.

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ISBN 978 1 76072 339 2



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Originated as part of AS 1141—1974.
Revised and redesignated in part as AS 1141.34—1997.
Previous edition 2007.
Fifth edition 2018.

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Preface

This Standard was prepared by the Standards Australia Committee CE-012, Aggregates and Rock for Engineering Purposes, to supersede AS 1141.34—2007.

This edition of the Standard has improved the requirements for standardization of the light path to be used in comparing the test solution with the reference colour Standard. This revision of the Standard has included an explanation of the principle supporting the test and a safety warning.

Contents

Preface	ii
1 Scope	1
2 Principle	1
3 Normative references	1
4 Definitions	1
5 Safety precautions	1
6 Apparatus	1
7 Reagents	2
8 Test portion	2
9 Solutions required	2
10 Test procedure	2
11 Test indications	3
12 Report	3
Bibliography	4

NOTES

Australian Standard®

Methods for sampling and testing aggregates

Method 34: Organic impurities other than sugar

1 Scope

This Standard sets out a method for an approximate determination of the presence of organic materials, other than sugar, present in fine aggregate.

2 Principle

The test relies on the reaction of humus material with a sodium hydroxide solution to produce a dark colour in the liquid the intensity of which is approximately proportionate with the mass content of humus in the fine aggregate. Based on 1917 research, fine aggregate with humus contents that have a resultant solution colour lighter than, or equal to, the Standard colour are expected to have no detrimental effects when used in concrete or mortar products. A darker coloured solution may be the result of humus content and/or reactions from other contaminants and may require further investigation to determine the extent of possible effects to concrete or mortar properties.

3 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

AS 1141.2, *Methods for sampling and testing aggregates, Part 1: Definitions*

AS 1141.2, *Methods for sampling and testing aggregates, Method 2: Basic testing equipment*

AS 1141.3.1, *Methods for sampling and testing aggregates, Method 3.1: Sampling Aggregates*

4 Definitions

For the purpose of this Standard the definitions in AS 1141.1 apply.

5 Safety precautions

Procedures using strong alkalis, including the preparation of dilute solutions of these chemicals, should be carried out with care.

WARNING — STRONG ALKALIS ARE HAZARDOUS AND CAN RESULT IN OFTEN IRREVERSIBLE DAMAGE TO THE SKIN OR EYES. INGESTION OF THE CHEMICAL, INHALATION OF THE FUMES, OR SKIN CONTACT CONSTITUTES A SERIOUS HEALTH HAZARD.

Appropriate documentation should be consulted as to safety precautions.

6 Apparatus

The following apparatus, conforming to the relevant provisions of AS 1141.2, is required:

- (a) *Stoppered rectangular clear glass bottles* — of approximately 350 mL or greater capacity.

NOTE Suitable bottles were known as graduated prescription bottles. Other containers may be used provided the light path for the comparison test is the same for the test solution and the standard solution [see [Clause 10\(c\)](#)]. European Standard EN 1744-1:2009 specifies a clear, cylindrical stoppered glass bottle approximately 450 mL with an external diameter of 70 mm.

- (b) *Stoppered glass measuring cylinders* — as required.

7 Reagents

All reagents shall be of analytical grade. The following reagents are required:

- (a) Sodium hydroxide.
- (b) Tannic acid.
- (c) Ethanol.
- (d) Distilled or deionized water.

8 Test portion

By coning and quartering or using sample dividers, take a test portion of approximately 100 g from a laboratory sample obtained in accordance with the procedures of AS 1141.3.1. The test portion shall be used in the condition in which it was received.

9 Solutions required

The following solutions are required:

- (a) *Sodium hydroxide solution* — A solution of 30 g of sodium hydroxide in 970 mL of distilled or deionized water.
- (b) *Reference colour solution* — Two grams of tannic acid shall be dissolved in 10 mL of ethanol (ethyl alcohol), and the solution diluted to 100 mL with distilled water, then 2.5 mL of the resultant solution shall be added to 97.5 mL of the 3 % sodium hydroxide solution. The mixture shall be shaken vigorously and then allowed to stand in subdued light for 1 h before use. The reference colour solution shall be used within 2 h of its preparation [see [Clause 10\(c\)](#)].

10 Test procedure

The test procedure shall be as follows:

- (a) Pour about 50 mL of 3 % sodium hydroxide solution into a 250 mL measuring cylinder or similar calibrated clear vessel. Add the fine aggregate to the 125 mL mark and adjust the sodium hydroxide level to the 200 mL mark with more solution (after removal of bubbles by shaking).
- (b) Vigorously shake the mixture for not less than 30 s, taking care to ensure that all the fine aggregates are thoroughly wetted by the sodium hydroxide solution and that any lumps are dispersed. After shaking, allow the mixture to stand for 24 h \pm 15 min.
- (c) At the end of the 24 h standing period, place 100 mL of reference colour solution in a rectangular clear glass bottle, and transfer 100 mL of the supernatant liquid from the test to a similar bottle.
- (d) Compare the colour of the test solution to the colour of the reference when both are viewed in similar light conditions and the light paths through the solutions to the viewer are of the same length and angle.

Or, as an alternative to Item (d), either:

- (i) Compare the colour of the supernatant liquid, viewed through the thickness of the glass bottle with the colour of a standardized glass sheet. In this case the standardized glass plate shall be compared to the reference solution in a bottle with a light path that allows the viewed colour of the solution to match the colour of the glass plate. Once this is determined, the test solution shall be contained in a bottle with the same length light path; or

- (ii) Test the supernatant liquid in a colour comparator designed specifically for this test.

In either of these alternatives, the medium used for the standardized colour shall be compared with the tannic acid colour solution on an annual basis and the currency of this comparison shall be verified before each test.

NOTE European Standard EN 1744-1:2009 provides details of suitable standardized plates and colour comparators.

11 Test indications

If the resultant solution is lighter than or equal to the reference colour, the test shall be reported as "Lighter than standard".

If the resultant solution is darker than the reference colour, the test shall be reported as "Darker than standard".

12 Report

The following shall be reported:

- (a) Result of the test.
- (b) Method by which the colour assessment was made (for example, visual using a reference solution or coloured glass sheet, or using an instrument).
- (c) Reference to this Australian Standard, i.e. AS 1141.34.

Bibliography

EN 1744-1:2009+A1:2012, *Tests for chemical properties of aggregates —Part 1: Chemical analysis*

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ISBN 978 1 76072 339 2

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