



Transport
Roads & Maritime
Services

Test method T269

Sugar in aggregate

OCTOBER 2012



Revision Summary

Ed/Rev Number	Clause Number	Description of Revision	Authorisation	Date
		Reformatted and Revision Summary Added	D.Dash	May 1999
		Date on Test Method Revised to Agree with Date on Revision Summary	D.Dash	Feb 2001
Ed 2/ Rev 0	All	Reformatted RMS template	J Friedrich	October 2012

Note that Roads and Maritime Services is hereafter referred to as 'RMS'.

The most recent revision to Test method T269 (other than minor editorial changes) are indicated by a vertical line in the margin as shown here.

Test method T269

Sugar in aggregate

1. Scope

This test method sets out the procedure for estimating whether sugar is present in aggregates in sufficient quantity to have a harmful effect on concrete-making properties.

This method is derived from the method described in Australian Standard 1141.

2. Apparatus

- (a) Laboratory glassware including beakers, measuring cylinders, filter funnel and test tubes
- (b) Filter paper
- (c) Reagents
 - (i) Copper sulphate
 - (ii) Sodium hydroxide
 - (iii) (Crystalline sodium potassium tartrate (Rochelle salt)
 - (iv) Hydrochloric acid (1N)

3. Test Portion

- (a) Aggregate shall be tested in the condition in which it is received.
- (b) (Obtain, by quartering, a test portion of approximately 300 g.

4. Solutions Required

- (a) Prepare equal volumes of stock solutions as follows:

Solution A. Dissolve 17.3 g of powdered copper sulphate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) in water, and dilute the solution to 250 mL.

Solution B. Dissolve 30 g of sodium hydroxide in water and warm the solution. Dissolve 86.5 g of crystalline sodium potassium tartrate (Rochelle salt) in the warm sodium hydroxide solution. Cool the solution and dilute to 250 mL.

- (b) Prepare Fehling's solution by mixing equal volumes of stock solutions A and B. This solution is used for detection of sugar. Fehling's solution must be made immediately before use. It is not stable and so must not be kept for more than 12 hours.

5. Procedure

- (a) Place the test portion of aggregate in a 250 mL beaker and cover it with water. Add 50 mL of 1N hydrochloric acid and boil the mixture for five minutes, then filter while still hot into a test tube.
- (b) If the filtrate is acid to litmus paper, cool 5 mL of it, neutralise it with 1N sodium hydroxide solution and remove any precipitate by filtration. Add 3 mL of Fehling's solution, thoroughly stir the resultant mixture and place test tube containing the mixture in a beaker of boiling water for five minutes.
- (c) If the original filtrate is not acid to litmus paper, add a further 50 mL of 1N hydrochloric acid and boil the mixture for a further five minutes (this should ensure that the filtrate is acid to litmus paper), then continue as above for filtrate acid to litmus paper.
- (d) (Observe whether a reddish brown precipitate has formed. A positive reaction is given by one part of sugar in one thousand parts of aggregate. No visible reaction is given by one part of sugar in ten thousand parts of aggregates.

6. Reporting

- (a) If a reddish brown precipitate has formed after the addition of Fehling's solution sugar is present, and the sample is reported as "sugar detected".
- (b) If a reddish brown precipitate has not formed after the addition of Fehling's solution sugar is not present in harmful quantities, and the sample is reported as "no sugar detected".