

## STANDARDS ASSOCIATION OF AUSTRALIA

**Australian Standard**  
**METHODS FOR TESTING PORTLAND AND BLENDED CEMENTS****AS 2350.10**  
**ACID SOLUBLE CALCIUM OXIDE CONTENT OF**  
**BLENDED CEMENT**

**1 SCOPE.** This standard sets out the method for the determination of the acid soluble calcium oxide content of blended cement and of the constituents.

**2 REAGENTS.** The following reagents shall be used:

*Concentrated hydrochloric acid* ( $\rho_{20}$  1180 kg/m<sup>3</sup>).

*Triethanolamine* (50 percent by volume). Mix equal parts of triethanolamine and water. Discard the solution if it becomes darker or more yellow than a pale straw colour.

*Potassium hydroxide.* 20 percent solution in water.

*Screened calcein indicator* (for calcium). Mix 0.2 g calcein indicator, 0.12 g thymolphthalein, 20 g dry potassium chloride. Grind to homogeneous powder.

*Nile blue aqueous solution* 0.05 percent.

*EDTA solution* (0.05 mol/L). Dissolve 18.613 g of ethylenediamine tetra-acetic acid disodium salt per litre of water.

*Concentrated ammonia solution* ( $\rho_{20}$  880 kg/m<sup>3</sup>).

*Calcium carbonate* (CaCO<sub>3</sub>). For standardization of EDTA (a guaranteed grade analysed reagent is necessary).

**3 PROCEDURE.**

**3.1 General.** The acid soluble calcium oxide content shall be determined using the procedure described in Clauses 3.2 and 3.3.

**3.2 Standardization of the EDTA Solution.**

- (a) The CaCO<sub>3</sub> is treated in accordance with the instructions on the container just prior to weighing out. Weigh 0.1000 g into a 400 mL conical beaker. Add 20 mL of cold water followed by 5 mL of concentrated hydrochloric acid.
- (b) Cover beaker with watch glass and shake to assist dissolving of the CaCO<sub>3</sub>.
- (c) Add 100 mL of water, re-cover and boil for 2 min.
- (d) Cool solution to room temperature and add 20 mL of 50 percent triethanolamine with shaking.
- (e) If turbidity appears, re-dissolve by adding 50 percent hydrochloric acid dropwise.
- (f) Add 20 mL concentrated ammonia solution.
- (g) Add 2 drops to 5 drops 0.05 percent Nile blue solution, then 20 percent potassium hydroxide dropwise to pink colour, then a further 2 mL.
- (h) Add calcein indicator (sufficient to give greenish fluorescence).
- (j) Titrate with EDTA till colour changes to clear purple. A titre of approximately 20 mL of EDTA should be obtained.
- (k) The titre is noted for the calculation.

**3.3 Estimation of Acid Soluble Calcium Oxide in Samples.**

- (a) Weigh 0.5000 ± 0.0002 g of the sample into a 250 mL beaker.
- (b) Add 20 mL of water followed by 5 mL of concentrated hydrochloric acid. Cover with watch glass and swirl.
- (c) Add 100 mL of water and boil for 3 min.
- (d) Cool solution to room temperature.
- (e) Filter solution into a 250 mL flask through a Whatman No 41 filter paper.