

Test Procedure 283**pH DETERMINATION OF SANDS & OTHER FOUNDRY AGGREGATES****SCOPE:**

This procedure outlines the approved method for determining the pH of foundry aggregates.

SUMMARY:

The alkalinity or acidity of a solution or suspension is usually expressed in terms of pH. Technically, pH is a symbol which can be defined as the reciprocal of the logarithm of the hydrogen ion concentration.

The pH of a neutral solution at room temperature is 7.0. Acid solutions vary in pH from 7.0 to 0, while the pH range of alkaline solutions is from 7.0 to 14.0. The pH scale is logarithmic; therefore, the intensity of an alkaline at a pH of 9.7 is twice the magnitude as it would be at 9.4, but 100 times the strength which existed at a pH of 7.7. pH should be determined using electrometric method of measuring the voltage which is developed by a calomel electrode system. The colorimetric method (litmus paper, etc.) is not recommended since the results cannot be measured precisely.

APPARATUS:

250cm³ glass beaker
100cm³ graduated cylinder
Magnetic stirrer
Digital pH meter or similar
Electronic balance capable of weighing to 2 decimal places.

MATERIALS:

Buffer solutions pH 4.0, 7.0 and 9.0.
Distilled or deionised water
Sand sample to be tested

	Approval	Date
LM		
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PROCEDURE:

1. Prepare pH meter as follows:-
 - a. Switch to on position
 - b. Insert electrode into buffer solution, adjust until the meter reads the true pH of the buffer
 - c. Remove buffer solution, rinse electrode with distilled or deionised water and dry with absorbent paper

Note: It is common to standardise the machine with a buffer in the range in which normal samples will be measured, as by using pH 9.0 standard for Sodium Bentonite and pH 7.0 standard for Calcium Bentonite. To verify equipment accuracy, standardise with a given buffer, check with buffers with a wide variety of ranges as:-

Standardise at pH 7.0
Checked at pH 4.0 and 9.0

Machine should read ± 0.1 pH unit on each trial

2. To 100cm³ of distilled or deionised water, add 50g of dried sand. Stir at high speed without splashing until measurement of pH with meter is constant (check every 5 minutes). The pH is measured at room temperature.

RESULTS:

Record and report results to 1 decimal place.