



ACID DEMAND VALUE OF CHROMITE SAND

Test Procedure 285

SCOPE:

This procedure outlines the approved method of testing and evaluating the acid demand of foundry aggregates.

SUMMARY:

The time required for a given organic acid catalysed bonded sand to set can be affected by alkaline impurities in the sand. Since most of these alkaline materials are insoluble in water, pH determination does not provide sufficient data which can be used as a control test for adjusting the ratio of the acid component to the organic component in the system. However, the acid demand value does provide data which can be used for control purposes, since the acid reacts with alkaline materials in the sand.

APPARATUS:

pH meter –
250cm³ beaker
2 x 50cm³ pipettes
50cm³ burette
Magnetic stirrer

MATERIALS:

Sample of the foundry aggregate under test
0.1N Sodium Hydroxide solution
0.1N Hydrochloric Acid solution
pH buffer solution 4.0
Distilled or deionised water

	Approval	Date
LM		
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PROCEDURE:

1. Add 50g of dried sample to 50cm³ of distilled or deionised water and 50cm³ of 0.1N HCl
2. Stir for five (5) minutes using the magnetic stirrer
3. Allow mixture to stand for one (1) hour
4. Back-titrate the resulting mixture with 0.1N NaOH to pH 3, 4 and 5 while stirring
5. The amount of acid consumed at each pH level, determined at room temperature, is equivalent to the acid demand value of the sand

TOLERANCE:

The acid demand value at pH:-	3.00	4.00	5.00
shall not exceed:-	10.0cm ³	8.0cm ³	6.0cm ³

EXAMPLE:

Typical data:-	47.0cm ³	0.1N NaOH required to reach pH 3.0
	48.0cm ³	0.1N NaOH required to reach pH 4.0
	48.5cm ³	0.1N NaOH required to reach pH 5.0

50.0cm ³ 0.1N HCl -	47.0cm ³	0.1N NaOH = 3.0cm ³ acid consumed at pH 3.0
50.0cm ³ 0.1N HCl -	48.0cm ³	0.1N NaOH = 2.0cm ³ acid consumed at pH 4.0
50.0cm ³ 0.1N HCl -	48.5cm ³	0.1N NaOH = 1.5cm ³ acid consumed at pH 5.0

STANDARDISATION & CALIBRATION OF EQUIPMENT:

1. pH meter and electrode

Prior to all testing, standardise the equipment according to the manufacturer's recommendations. Use pH buffer solutions for 4.0, 7.0 and 9.0

When the electrode is not in use, immersing it in distilled or deionised water or maintaining an amount of distilled or deionised water in the rubber protective cap, will prevent the separation of Potassium Chloride (KCl) in the electrode. If KCl separates, do not use the electrode.



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MISCELLANEOUS OBSERVATIONS:

1. Samples should be run in duplicate when unknown. The first sample should be titrated more slowly in order to determine the general quantity of acid required and possibly should not be included in the tabulation of results. Rate of titration is important.
2. The fibre electrode is preferred with the use of pH meter. Sand occasionally enters the sleeve type electrode ruining the determination.

RESULTS:

Record results on appropriate Laboratory report sheet.