

XRF Scientific Ltd

XRF SCIENTIFIC CASE STUDY

CEMENT

Reproducibility Test:

Phoenix Fusion Machine (FM) 4000

The aim of this Reproducibility Test is to test the beads prepared from each position in the Fusion Machine and to make sure that the analysis of the elements of interest, fall within the required error margins.

In this case, 1.0000g of cement was fused with 6.0000g of lithium tetraborate at 1100°C and the melt cast into a 32mm mould. An ammonium iodide pellet (from XRF Scientific Ltd.) was added as a wetting agent just after completion of melting.

Four beads were prepared in each position of the four FM positions. Three extra beads were prepared in position 3.

The statistical tables show data for all of the elements analysed. We will describe the situation for CaO in cement.

Note: Optimum XRF excitation conditions were used -

Table 1. Shows the analysis of bead ECH3-1 four times. CaO at about 62% should give a standard deviation - S.D. of 0.02 (or 0.03%RSD).

Table 2. Shows the analysis of four separated beads prepared in the third FM position - Beads ECH3-1, ECH3-2, ECH3-3 and ECH3-4. CaO at about 62% gives a standard deviation - S.D. of 0.21 (or 0.34%RSD).

Table 3. Shows the analysis of four separate beads prepared in the four FM positions - Beads ECH1-1, ECH2-1, ECH3-1 and ECH4-1. CaO at about 62% should give a standard deviation - S.D. of 0.20 (or 0.32%RSD).

In the case of CaO, there is no significant difference in reproducibility from one position to the other. There is a slight deterioration in S.D. for the other elements, but the error involved is within the required limits for the cement industry. Greater reduction in these errors can be achieved by fine-tuning each burner.

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AFT_CS_CEMENT_REP Type: Macintosh BinHex Archive
(Application/mac-binhex40)

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