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Testing method for heat of hydration of cement

ICS 91.100.10

Descriptors : cements, heat of reaction, hydration, testing

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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In the event of any doubts arising as to the contents,
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Testing method for heat of hydration of cement

1 Scope This Japanese Industrial Standard specifies the testing method for heat of hydration of portland cement, portland blast-furnace slag cement, and portland fly-ash cement.

Remarks : The normative references to this Standard are as follows.

JIS K 8405 *Zinc oxide*

JIS K 8541 *Nitric acid*

JIS R 5201 *Physical testing methods for cement*

JIS Z 8401 *Rules for rounding off of numerical values*

JIS Z 8801 *Test sieves*

2 Sampling Weigh out 500 g of the sample in accordance with the prescription in 4 of JIS R 5201.

3 Apparatus and instruments

3.1 Calorimeter The construction of calorimeter shall be as shown in Attached Fig. 1.

- (1) **Vacuum jar** When put about 425 ml of warm water⁽¹⁾ in a vacuum jar, stoppered with a cork plug, allowed to stand for 30 min, if the temperature descent of 0.001 °C or more per minute is found to the difference of 1 °C between the temperature of warm water and room temperature, the vacuum jar shall be rejected.

The inside surface of the jar shall be coated with polyethylene, bees wax, fluororesin, or other suitable hydrofluoric acid-resistance material.

Note (1) This water is about 5 °C higher than a room temperature.

- (2) **Inner cylinder** The inner cylinder for keeping the vacuum jar shall measure 150 mm in inside diameter and 230 mm in depth, and be lined with thermal insulating cork about 25 mm thick. The lid of the inner cylinder shall be equipped with the cork lid for vacuum jar and have three openings. The central opening is for a stirring rod for acid solution, and the other two openings for a thermometer and a funnel.

These openings are constructed so that it prevents the water from entering. The lid of inner cylinder is fastened with a wing nut to the inner cylinder using an O-ring.

- (3) **Thermometer** A sensor type thermometer or a Beckmann's thermometer shall be used.

The sensor-type thermometer shall be a thermistor type or quartz type one which has a resolution power as accurate as 0.001 °C.

Beckmann's thermometer shall be graduated to 0.01 °C, have measurable range of about 6 °C, which has been guaranteed.