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Cementitious self-leveling floor mortar

地面用水泥基自流平砂浆

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Cementitious self-leveling floor mortar

1 Scope

This standard specifies the scope, terms and definitions, classification and marking, requirements, test methods, inspection rules, product marks, packaging, transportation, storage of cementitious self-leveling floor mortar.

This standard applies to cementitious self-leveling floor mortar.

The products, which are included in this standard, shall NEITHER cause harmful effects on human body, organisms, environment, NOR involve safety and environmental protection issues related to use. It shall comply with the relevant standards and codes of China.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent amendments (excluding corrections) or revisions do not apply to this Standard; however, parties who reach an agreement based on this Standard are encouraged to study if the latest versions of these documents are applicable. For undated references, the latest edition of the referenced document applies.

GB/T 1768 Method of test for abrasion resistance of paint films

GB 3186 Paints varnishes and raw materials for paints and varnishes - Sampling

GB/T 17671 Test method of cement mortar strength (ISO method) (idt ISO 679:1989)

JC/T 547-2005 Adhesives for ceramic wall and floor tiles

JC/T 681 Mixer for mixing mortars

JGJ 70 Standard for test method of basic properties of construction mortar

3 Terms and definitions

The following terms and definitions apply to this standard.

Cementitious self-leveling floor mortar

It is a floor material, which is composed of cement-based cementitious materials, fine aggregates, fillers, additives, has fluidity after mixing with water (or emulsion) OR can be self-leveling with a little auxiliary paving.

4 Classification and marking

4.1 Classification

4.1.1 Cementitious self-leveling floor mortar (codenamed CSLM) is divided into the following, based on the composition:

Single-component (code S): It is a single-component product, which is prepared by the manufacturer, through mixing raw materials, including cement-based cementitious materials, fine aggregates, fillers, and other powder additives. When using, add water according to the manufacturer's instructions. Stir well before use.

Two-component (code D): It is a two-component product, which is prepared by the manufacturer, through mixing raw materials, including cement-based cementitious materials, fine aggregates, fillers, other additives, polymer emulsions. When using, follow the instruction for use of the manufacturer, to mix the two components uniformly.

4.1.2 Cementitious self-leveling floor mortar is divided into C16, C20, C25, C30, C35, C40 according to its compressive strength grade; OR it is divided into F4, F6, F7, F10 according to its flexural strength grade.

4.2 Marking

Products are marked in the following order: product name, component, strength grade, standard number.

For example, the cementitious self-leveling floor mortar, which has a one-component compressive strength grade of C30 and a flexural strength grade of F6, is marked as:

CSLM S C30 F6 JC/T 985-2005

5 Requirements

5.1 Appearance

The appearance of the one-component product shall be uniform and free from agglomeration.

The liquid material component of the two-component product shall be in a uniform state after stirring; the powder material component shall be uniform without agglomeration.

5.2 Physical and mechanical properties

Note 1: Thickness: 5 mm.

Note 2: Hole size: 50 mm x 50 mm.

Figure 1 -- Forming frame for tensile bond strength

6.4.6 Pull connector

A square steel plate, which has a size of (50 mm ± 1 mm) x (50 mm ± 1 mm) and sufficient strength, a minimum thickness of 10 mm, as well as parts connected to the test instrument.

6.4.7 Abrasion testing machine

Taber type or equivalent abrasion testing machine; the rotation speed of working bench is 60 r/min ± 2 r/min.

6.4.8 Mold testing of abrasion test pieces

Test mold for abrasion: A metal or plastic mold, which has a minimum inner diameter of 105 mm and a height of 5 mm.

6.4.9 Abrasive cloth

Brown corundum P60 dry abrasive cloth or self-adhesive abrasive cloth of the same particle size.

6.4.10 Shrinkage meter

Vertical mortar shrinkage tester, which meets the requirements of JGJ 70; the standard rod length is 176 mm ± 1 mm; the measurement accuracy is 0.01 mm.

Planetary cement mortar mixer meets the requirements of standard JC/T 681.

6.4.11 Test mold of dimensional change rate and shrinkage head

Test mold of dimensional change rate: A metal or plastic mold, which has an internal size of 10 mm x 40 mm x 160 mm; a hole with a diameter of 6.5 mm is opened in the center of the two end faces of the test mold.

Shrinkage head: It is made of brass or stainless steel, in line with the requirements of standard JGJ 70.

6.4.12 Drop hammer device

It consists of a steel base with a horizontal adjustment knob, a vertical steel frame with an electromagnet suspended, a conduit, and a metal drop hammer of 1 kg ± 0.015 kg. The hammer head is as shown in Figure 2.

Figure 3 -- Schematic diagram of forming of tensile bond strength test piece

6.8.3 Bond strength is calculated, according to formula (1):

$$P = \frac{F}{S} \qquad \cdots\cdots (1)$$

Where:

P - Tensile bond strength, in megapascals (MPa);

F - Maximum failure load, in Newton (N):

S - Bonding area, in square millimeters (2500 mm^2).

The calculation of test results is accurate to 0.1 MPa,

6.8.4 Evaluation of test results

Calculate the average value of 10 data. Discard the data, which is beyond the range of ±20% of the average value. If there are still 5 or more data retained, calculate a new average value. If the retained data is less than 5, re-test. If it is interfacial failure -- between the high-strength binder and the pull connector, it shall be re-determined.

6.9 Wear resistance

6.9.1 Principle

Referring to GB 1768, when the surface of the product is rubbed against the grinding wheel to the specified number of revolutions, measure the amount of wear on the surface of the product.

6.9.2 Preparation of test piece

Prepare the specimen, according to 6.5. Pour the specimen into the wear-resistant test mold, without requiring vibration. Remove it out of mold after 24 h. Continue to stand in the standard state for 27 d, before measurement.

6.9.3 Fabrication of grinding wheel

a) Cut the brown corundum P60 dry abrasive cloth to the thickness of the rubber wheel:

b) Stick the cut abrasive cloth on the rubber wheel, using the polyvinyl acetate emulsion, to prevent the glue from polluting the sand grains. If it is a self-adhesive abrasive cloth, stick it directly;

c) Ensure that the joints of the abrasive cloths shall neither overlap nor leave the

joints. Each abrasive cloth can only be used once; it must be replaced, when the test piece is replaced:

d) Place the grinding wheel, which was glued with abrasive cloth, under standard test conditions for more than 24 hours, to prepare for use.

6.9.4 Test procedure

a) Wipe the surface of the test piece, using a degreasing gauze. Weigh it to the nearest 10 mg.

b) Install the test piece on the abrasion testing machine, with the air forming side facing up. Install the grinding wheel on the support. Wear 100 r, under the condition of adding 500 g to each grinding wheel. Remove the test piece. Remove the surface ash. Weigh it.

c) Each test piece is tested once. Take the average value of the two test pieces, as the test result, accurate to 10 mg. The relative error of the two test pieces shall not be greater than 5%; otherwise, the test shall be repeated.

6.9.5 Calculation of wear resistance

The calculation of wear resistance is calculated, according to formula (2):

$$F = G_0 - G_1 \qquad \cdots\cdots (2)$$

Where:

F - Abrasion value, in gram (g):

G_0 - Mass of the test piece before grinding, in grams (g):

G_1 - Mass of the test piece after grinding, in grams (g).

6.10 Dimensional change rate

6.10.1 Apply a thin layer of release oil to the inner surface of the shrinking mold. Fix the shrinking head, in the holes on both sides of the test mold. Make the shrinking head expose 8 mm ± 1 mm, from the end surface of the test piece.

6.10.2 Prepare the specimen, according to 6.5. Pour the specimen into the shrinkage test mold, without requiring vibration. Use a metallic scraper to remove the excessive mortar, to make the mortar fully fill the mold well AND make the surface flat. Three test pieces form a group.

6.10.3 Remove the formwork, after 24 h under standard test conditions. Number it. Mark the test direction. Measure the length of the specimen, according to the marked

of 6.3. Continue to place it, under standard test conditions for 24 hours, before measuring.

6.11.2 Place the test piece horizontally on the base of the impact device, to ensure that the falling weight falls on the center of the test piece. Fix the 1 kg ± 0.015 kg drop hammer, at a height of 1 m. Let it fall freely. Visually test whether the surface of the piece is cracked or detached from the bottom plate.

6.11.3 Evaluation of test results

Each test piece is impacted once. The three test pieces are judged as qualified, when there is no crack or detachment from the bottom plate.

6.12 Compressive and flexural strength

Prepare the specimen, according to 6.5. The test piece is molded, according to the provisions of GB/T 17671, without requiring vibration. There are two groups of test pieces: 24 hours and 28 days. There are 3 test pieces for each group. After 24 hours, the remove it out of mold, to measure the 24 h strength, according to GB/T 17671. The rest of the test pieces are placed under standard test conditions for 27 days, after removal from mold, to measure the strength at 28 days.

7 Inspection rules

7.1 Inspection classification

Product inspection is divided into exit-factory inspection and type inspection.

7.1.1 Inspection items

The exit-factory inspection items include appearance, fluidity, compressive and flexural strength (24 h, 28 d).

The type inspection items shall be inspected in accordance with the technical requirements in Chapter 5.

7.1.2 Type inspection

Type inspection shall be carried out, in one of the following situations:

a) Under normal production conditions, at least once every six months;

b) When a new product is put into production or when the product is type finalized and identified;

c) When there is a major change in the main raw materials, proportions or production process of the product;

d) When production is resumed, after suspension of production for more than half a year;

e) When the exit-factory inspection result is significantly different from the previous type inspection;

f) When the national technical supervision and inspection agency makes a request.

7.2 Batch and sampling

a) Batch size: 100 t products of the same category and same strength shall be counted as one batch; products less than 100 t may also be counted as one batch;

b) Single-component sampling: Take samples from the production line, at a certain time interval from a batch; OR randomly select 5 bags from the delivered product, take about 4 kg from each bag, the total is not less than 20 kg. The sample is divided into two parts: one for testing and one for reserve;

c) For the two-component powder products, 5 bags can be randomly selected from the delivered product, take about 4 kg from each bag, the total weight is not less than 20 kg. Sampling of liquid material shall be carried out, according to GB 3186. The sample is divided in two parts: one for testing and one for reserve.

7.3 Judgment rules

The product is tested, according to Chapter 6. If the test results meet the technical requirements in Chapter 5, it is judged as qualified. If there is one item that does not meet the standard requirements, the batch of products will be judged as non-conforming products.

8 Marking, packaging, transportation, storage

8.1 Marking

The product packaging shall include the following information:

a) The name and address of the manufacturer;

b) Trademarks;

c) Product marking;

d) Product ratio and product net mass;

e) Instructions for use;

f) Date of manufacture or batch number;

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