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JG/T 223-2017

Replacing JG/T 223-2007

Polycarboxylates high performance water-reducing admixture

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces JG/T 223-2007 “Polycarboxylates high performance water-reducing admixture”. As compared to JG/T 223-2007, the main technical changes are as follows:

- ADJUST the code of polycarboxylates high performance water-reducing admixture;
- MODIFY the type of Polycarboxylates high performance water-reducing admixture; DELETE the “non-retarded type” and “classified by product grade”; ADD the early-strength type, slow-release type, reduced type and antifreeze type, GIVE the technical indicator requirements for various type products;
- ADD the ammonia release index; ADJUST such indicators as formaldehyde content and chloride ion content, and so on;
- ADD the tested concrete index of the newly added type of water-reducing admixture; ADJUST the tested concrete index of some original products;
- MODIFY the requirements for test items and the number of test pieces.

This standard was proposed by the Standard Rating Institute of the Ministry of Housing and Urban-Rural Development.

This standard shall be under the jurisdiction of the Standardization Technical Committee for Building Products and Components of the Ministry of Housing and Urban-Rural Development.

Drafting organizations of this standard: China Academy of Building Research, China Building Materials Science Research Institute, Jiangsu Subote New Materials Co., Ltd., Guangdong Red Wall New Materials Co., Ltd., Jiangsu Zhongtie OLET New Materials Co., Ltd., Shanghai Building Science Research Institute (Group) Co., Ltd., Shenzhen Weihai Building Materials Co., Ltd., Kezhijie New Materials Group Co., Ltd., BASF Chemical Building Materials (China) Co., Ltd., Beijing University of Technology, Liaoning Cologne Fine Chemical Co., Ltd., Tianjin Feilong Concrete Admixture Co., Ltd., Tongji University, Zhejiang Wulong New Material Co., Ltd., Shandong Huawei Yinkai Building Materials Technology Co., Ltd., China Metallurgical Construction Research Institute Co., Ltd., Beijing Construction Engineering Quality First Testing Institute Co., Ltd., Guangdong Rui'an Technology Industrial Co., Ltd., Shenzhen Maidi Concrete Admixture Co., Ltd.

Polycarboxylates high performance water-reducing admixture

1 Scope

This standard specifies the terms and definitions, classification and marking, requirements, test methods, inspection rules, product specifications and certificates, packaging, exit-factory, transportation and storage of polycarboxylates high performance water-reducing admixture which is used in concrete.

This standard applies to polycarboxylates high performance water-reducing admixture for cement concrete.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB 8076 Concrete admixture

GB/T 8077 Methods for testing uniformity of concrete admixture

GB 18588 Limit of ammonia emitted from the concrete admixtures

GB 31040 Limit of residual formaldehyde from the concrete admixtures

GB/T 50080 Standard for test method of performance on ordinary fresh concrete

JGJ 52 Standard for gravel and stone quality and test methods for ordinary concrete

JGJ 55 Test method for the crawler crane structures

JG/T 377 Anti-freezing and pumping admixtures for concrete

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Polycarboxylates high performance water-reducing admixture

The water-reducing admixture which uses the polymer, that is synthesized from a carboxyl-unsaturated monomer and other monomers, as a parent.

3.2

Reference concrete

Concrete which is prepared without adding water-reducing agent and subjected to standard curing.

3.3

Tested concrete

Concrete which is added with polycarboxylates high performance water-reducing admixture and is cured under specified temperature and humidity conditions.

3.4

Tested concrete curing in standard condition

Concrete which is prepared as specified, added with polycarboxylates high performance water-reducing admixture, cured under specified temperature conditions.

3.5

Tested concrete curing at negative temperature

Concrete which is prepared as specified, added with the tested antifreeze polycarboxylates high performance water-reducing admixture, cured under specified temperature conditions.

4 Classification and marking

4.1 Classification

4.1.1 The classification by product type is as shown in Table 1.

reducing admixture to be tested.

5.1.2 Mix ratio

In accordance with JGJ 55, perform the mix ratio design for the reference concrete. The ratio of cement, gravel, and aggregate for the tested concrete and the reference concrete is same. The design of mix ratio shall comply with the following provisions:

- Cement consumption: 360 kg/m³;
- Gravel ratio: 43% ~ 47%;
- Dosage of polycarboxylates high performance water-reducing admixture: Use the dosage as specified by the manufacturer of polycarboxylates high performance water-reducing admixture;
- Water consumption: The initial slump of the tested concrete which is added with slow-release admixture shall be controlled at (120 ± 10) mm; the initial slump of the tested concrete which is added with other types of products shall be controlled at (210 ± 10) mm; the initial slump of the reference concrete shall be controlled at (210 ± 10) mm; the water consumption is the minimum water consumption when the initial slump of the reference concrete and the tested concrete reaches the corresponding control value; the water consumption includes the water which is contained in the water-reducing admixture, gravel, and aggregate material.

5.1.3 Concrete mixing

It is performed in accordance with the provisions of GB 8076.

5.1.4 Production of specimens

The production of concrete specimens which is added with antifreeze product shall be carried out in accordance with the provisions of JG/T 377. The preparation of concrete specimens which is added with other types of products shall be carried out in accordance with the provisions of GB 8076.

5.1.5 Test items and number of specimens

The number of test items and the number of specimens is shown in Table 3.

It is performed in accordance with the provisions of GB 18588.

6.2 Concrete performance

6.2.1 Water reduction ratio, bleeding rate ratio, difference of set time and shrinkage ratio

The test methods of the water reduction ratio, bleeding rate ratio, difference of set time and shrinkage ratio shall meet the following requirements:

- The water reduction ratio test of the polycarboxylates high performance water-reducing admixture is carried out in accordance with the provisions of GB 8076, the initial slump of the tested concrete which is added with the slow-release product is controlled at (120 ± 10) mm, meanwhile the 1 h, 2 h, and 3 h slump loss over time shall comply with the requirements of Table 4;
- The bleeding rate ratio, the difference of set time, and the shrinkage ratio are tested in accordance with the provisions of GB 8076.

6.2.2 Gas content, slump, slump loss over time

It is performed in accordance with the provisions of GB/T 50080.

6.2.3 Compressive strength ratio

The test method for the compressive strength ratio shall meet the following requirements:

- The compressive strength ratio test of antifreeze products is carried out in accordance with the provisions of JG/T 377;
- The compressive strength ratio test of other types of products is carried out in accordance with the provisions of GB 8076.

6.2.4 Strength loss ratio after 50 freeze-thaw

It is performed in accordance with the provisions of JG/T 377.

7 Inspection rules

7.1 Inspection classification

7.1.1 Exit-factory inspection

The exit-factory inspection items shall include formaldehyde content, chloride ion content, total alkali content, solid content, moisture content, density, fineness, pH value. The chloride ion content is tested at least once every 3

inspection.

7.3 Judgment rules

7.3.1 Judgment of exit-factory inspection

If the type inspection qualified report is within the validity period, the exit-factory inspection result meets the requirements of Table 4, this batch of products is judged to be qualified.

7.3.2 Judgement of type inspection

The qualification judgement for the product's type inspection shall meet the following requirements:

- a) The product has been tested and the homogeneity test results shall comply with the requirements of Table 4;
- b) All concrete performance index's test results of antifreeze products shall meet the requirements of Table 5, Table 6 and clause 5.4;
- c) Except that the difference of set time in the concrete performance index of other types of product is used as the reference index, the test results of other performance indicators shall comply with the requirements of Table 5 and clause 5.4.

7.4 Re-inspection

The re-inspection is carried out by using the retained sample. If the user organization requires on-site sampling, it shall be specified in the supply contract in advance. Take the mixed sample on site in the presence of the personnel of production and user organization. The re-inspection shall be carried out in accordance with the type inspection items.

8 Product specification and certificate, packaging

8.1 Product specification

It shall provide the product specification when the product is exit-factory. The product specification shall include at least the following contents:

- a) The name of the manufacturer;
- b) The name and type of the product;
- c) The product performance characteristics, main components and technical indicators;

- d) The scope of application;
- e) The recommended dosage;
- f) Storage conditions and validity period, the validity period is calculated from the date of production, which is specified by the enterprise itself in accordance with the product performance;
- g) The methods of use, precautions, safety precautions, etc.

8.2 Certificate

It shall provide the product certificate when the product is delivered. The product certificate shall include at least the following contents:

- a) The product name;
- b) The date of manufacture and batch number;
- c) The name and address of the production unit;
- d) The conclusions of exit-factory inspection;
- e) Enterprise's quality inspection seal or quality inspection personnel's signature, code.

8.3 Packaging

Powder products can be packaged in woven bags or paper bags lined with plastic bags, or other packaging that can be agreed upon by the supplier and the purchaser; liquid products can be contained in plastic containers or in tank cars. The packaging containers shall be indicated of the product name and type, implemented standard number, trademark, net mass, production unit's name and validity period in an obvious position.

9 Exit-factory, transportation and storage

9.1 Exit-factory

The contents of the cargo-accompanied technical documents provided by the manufacturer include: product specification, certificate, inspection report. Under one of the following conditions, it shall not exit factory:

- a) The technical documents (product specifications, certificates, inspection reports) are incomplete;
- b) The packaging is inconsistent;

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