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Non-curable rubber modified asphalt coating for waterproofing

非固化橡胶沥青防水涂料

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Non-curable rubber modified asphalt coating for waterproofing

1 Scope

This document specifies the terms and definitions, marking, general requirements, technical requirements, test methods, inspection rules and signs, packaging, transportation and storage of non-curable rubber modified asphalt coating for waterproofing (hereinafter referred to as non-curable waterproof coating).

This Standard applies to non-curable rubber modified asphalt coating for waterproofing, which is used for non-exposed waterproofing in construction engineering.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 267, *Petroleum products - Determination of flash and fire points - Open cup*

GB/T 3190-2008, *Wrought aluminium and aluminium alloy - Chemical composition*

GB 11614, *Flat glass*

GB/T 16777-2008, *Test methods for building waterproofing coatings*

JC/T 474-2008, *Water-repellent admixture for mortar and concrete*

JC/T 1068-2008, *Waterproof materials for pitched roof - Underlayments of self-adhering polymer modified bituminous*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 non-curable rubber modified asphalt coating for waterproofing

The waterproofing coating that takes rubber and asphalt as the main components, is made by adding additives to keep sticky paste during the service life.

3.2 stress relaxation

After the product is melted, stir it and visually inspected.

7.4 Flash point

According to GB/T 267.

7.5 Solid content

Heat and melt the specimen in a watch glass according to the manufacturer's instructions. Then carry out the test according to Chapter 5 of GB/T 16777-2008. The heating temperature is (105±2)°C.

7.6 Bonding properties

7.6.1 Dry base

Carry out the test according to method B in Chapter 7 of GB/T 16777-2008. Heat and melt the specimen on the surface of the mortar block according to the manufacturer's requirements. After the specimen is prepared, under the standard test conditions, cure for 24h and test. After the test, if there is no exposed part on the surface of the mortar block, it shall be considered to be 100% cohesive failure.

7.6.2 Wet base

Soak the mortar block in water for 24h. Take it out. Use paper to wipe the water off the surface. Prepare according to method B in Chapter 7 of GB/T 16777-2008. Heat and melt the specimen on the surface of the mortar block according to the manufacturer's requirements. After the specimen is prepared, under the standard test conditions, cure for 24h and test. After the test, if there is no exposed part on the surface of the mortar block, it shall be considered to be 100% cohesive failure.

7.7 Extensibility

7.7.1 Preparation of test piece

Butt two 120mm×50mm×(2~4)mm aluminum plates along the short side into a whole. The gap between the two aluminum plates shall not be greater than 0.05mm. Heat and melt the specimen to the aluminum plate as per the manufacturer's specifications. The coating area between the two aluminum plates is 150mm×50mm. The thickness is (2.0 ± 0.2) mm. Prepare 3 test pieces in total. Cure for 24h under the standard test conditions.

7.7.2 Test steps

Clamp the test piece in the center of the grip of the tensile machine. It cannot be twisted or deformed. Record the value L_0 indicated by the pointer of the extended ruler at this time. Start the pulling machine. The pulling speed is 10mm/min. Pull the test piece until the crack cracks or shrinks to 10mm from the edge of the test piece. Record the value L_1 indicated by the pointer of the extension ruler at this time, accurate to 1mm.

7.10.2 Extensibility

Prepare the test piece according to 7.7.1 from the processed specimen. Test according to 7.7.2. The result is calculated according to 7.7.3.

7.10.3 Low temperature flexibility

Test the processed sample in accordance with 7.8.

7.11 Acid resistance

7.11.1 Extensibility

7.11.1.1 Preparation of test piece

Prepare 3 test pieces according to 7.7.1. The substrate is a 120mm×50mm×4mm glass plate or other suitable substrate.

7.11.1.2 Test steps

Put the prepared test piece into 600ml of 2% chemically pure H_2SO_4 solution. The liquid level shall be more than 10mm above the surface of the test piece. Continuously immerse for (168±2)h. Place for 4h under the standard test conditions. Observe whether the surface of the specimen changes. Test according to 7.7.2. Calculate the result in accordance with 7.7.3.

7.11.2 Mass change

7.11.2.1 Test steps

Heat, melt and scrape the specimen onto a 100mm×100mm×4mm glass plate. The coating area is 100mm×80mm. The thickness is (2.0±0.2)mm. Place for 24h under the standard test conditions. Weigh the mass (m_1). Put into 600mL of 2% chemically pure H_2SO_4 solution. The liquid level shall be more than 10mm above the surface of the test piece. Continuously immerse for (168±2)h. Take out. Control it dry. Immerse in acetone for 5s. Take out and place for 5min. Then weigh the mass (m_2).

7.11.2.2 Result calculation

The mass change rate is calculated according to formula (2):

$$\Delta M = \frac{m_1 - m_2}{m_1 - m_0} \times 100\% \quad \text{(2)}$$

Where,

ΔM - The mass change rate, %;

m_0 - The mass of the glass plate, in grams (g);

m_1 - The mass of the specimen before soaking, in grams (g);

m_2 - The mass of the specimen after soaking, in grams (g).

Take the arithmetic mean of 2 parallel tests as the test result. The calculation result is accurate to 0.1%.

7.12 Alkali resistance

7.12.1 Extensibility

7.12.1.1 Preparation of test piece

Prepare 3 test pieces according to 7.7.1. The substrate is a 120mm×50mm×4mm glass plate or other suitable substrate.

7.12.1.2 Test steps

Put the prepared test piece into 600mL of 0.1% chemically pure NaOH solution. Add $Ca(OH)_2$ reagent. Reach supersaturation. The liquid level shall be more than 10mm above the surface of the test piece. Continuously immerse for (168±2)h. Take out. Place for 4h under standard test conditions. Observe whether the surface of the specimen changes. Then test according to 7.7.2. Calculate the result in accordance with 7.7.3.

7.12.2 Mass change

Heat, melt and scrape the specimen a 100mm×100mm×4mm glass plate. The coating area is 100mm×80mm. The thickness is (2.0±0.2)mm. Place for 24h under standard test conditions. Weigh the mass (m_1). Put in 600ml of 0.1% chemically pure NaOH solution. Add $Ca(OH)_2$ reagent. Reach supersaturation. The liquid level shall be more than 10mm above the surface of the test piece. Continuously immerse for (168±2)h. Take out. Dry it. Immerse in acetone for 5s. Take out. Place for 5min. Then weigh the mass (m_2).

Calculate the result according to 7.11.2.2.

7.13 Salt tolerance

7.13.1 Extensibility

7.13.1.1 Preparation of test piece

Prepare 3 sets of test pieces according to 7.7.1. The substrate is a 120mm×50mm×4mm glass plate or other suitable substrate.

7.13.1.2 Test steps

Place the prepared test piece in 600mL of 3% chemically pure sodium chloride (NaCl)

solution. The liquid level shall be more than 10mm above the surface of the specimen. Continuously immerse for (168±2)h. Take out. Place for 4h under standard test conditions. Observe whether there is any change in the surface of the test piece. Then test according to 7.7.2. Calculate the result according to 7.7.3.

7.13.2 Mass change

Heat, melt and scrape the specimen a 100mm×100mm×4mm glass plate. The coating area is 100mm×80mm. The thickness is (2.0±0.2)mm. Place for 24h under standard test conditions. Weigh the mass (m_1). Put in 600ml of 3% chemically pure sodium chloride (NaCl) solution. The liquid level shall be more than 10mm above the surface of the test piece. Continuously immerse for (168±2)h. Take out. Dry it. Immerse in acetone for 5s. Take out. Place for 5min. Then weigh the mass (m_2).

Calculate the result according to 7.11.2.2.

7.14 Self-healing

Test according to 6.11 of JC/T 1068-2008. Heat, melt and scrape the specimen on the plywood. The thickness is (2.0±0.2)mm. Place for 24h under standard test conditions. Then carry out the test.

7.15 Oil permeability

On 5 medium-speed qualitative filter papers of approximately 180mm in diameter, h eat, melt and scrape the specimen. The area is about 50mm×50mm. The thickness is (2.0±0.2)mm. Place a glass plate of the same size about 6mm thick on the test piece. Then put it in an oven that has been adjusted to the specified temperature for heat resistance. Hold the temperature constant for 5h±15min. Take out. Place for 1h under standard test conditions. Then check the number of oil seepage sheets. Test 3 test pieces in total. Use the specimen with the largest number of oil leaks as the test result.

7.16 Stress relaxation

7.16.1 No treatment

7.16.1.1 Preparation of test piece

Heat, melt and scrape the specimen on a 120mm×50mm× (2~4)mm aluminum plate. The thickness is (2.0±0.2)mm. Press another aluminum plate to the bonding surface. The bonding area is 50mm×50mm. After bonding, use a 1kg weight to centrally pressurize for 10min. Then place for 24h under standard test conditions.

7.16.1.2 Test steps

Put the test piece into the tension machine fixture and clamp it. The distance between fixtures is about 150mm. The stretching speed is 10mm/min. Start the pulling machine. Stretch to maximum force (F_{max}). Continue to stretch until the pulling force drops to

Use ordinary Portland cement of which its strength level is 42.5. Add cement and medium sand into the mortar mixer according to the mass ratio of 1:1. Mix. The amount of water added is subject to the consistency of the mortar 70mm~90mm. The mortar specimen shall be impermeable to water under a pressure of at least 0.7MPa. Pour the mortar into a metal mold that complies with 5.2.6 of JC/T 474-2008. Place for 24h at (20±2)°C. Perform demolding. Then put into (20±2)°C water for 7d curing. Then, under the conditions of temperature (20±2)°C and relative humidity greater than 95%, cure it to 28d.

7.17.2 Test steps

Heat, melt ands scrape the specimen at the bottom of the mortar test piece (to facilitate the removal and observation after the test, a glass fiber mesh cloth can be placed in the middle of the specimen). The thickness is (2.0±0.2)mm. Cover a Φ100 mm, 0.15mm thick polyethylene film on the surface of the coating film. Open a hole with a diameter of about 10mm in the middle of the test piece until the surface of the mortar is reached. Load the impermeability test piece into the mortar impermeability tester. The coating surface faces water. Pressurize to 0.6MPa. Keep for 24h.

7.17.3 Test result

After the test, remove the coating film. Observe whether there is clear water on the bonding surface of the mortar block. If there is no water, it means that there is no water channeling.

8 Inspection rules

8.1 Inspection classification

8.1.1 Exit-factory inspection

Exit-factory inspection items include appearance, flash point, solid content, extensibility, low temperature flexibility and heat resistance.

8.1.2 Type inspection

Type inspection items include all the provisions in Chapter 6. Type inspection is carried out in the following cases:

a) When a new product is put into production or product type identification;

b) During normal production, carry out the type inspection once a year;

c) When there are major changes in raw materials, processes, which may affect product quality;

d) When there is a big difference between the exit-factory inspection results and the

last type inspection results;

e) When production is discontinued for more than 6 months and production resumes.

8.2 Batching

Take 10t of products of the same type as a batch. When it is less than 10t, it shall be taken as a batch.

8.3 Sampling

Randomly select two sets of samples from each batch of products. One set of samples is used for inspection, and the other is sealed for future use. A set is at least 4kg.

8.4 Rules for determination

8.4.1 Determination of single item

8.4.1.1 Appearance

When the appearance of the sample taken conforms to the requirements of the standard, it shall be accepted. Otherwise, the batch of products will be rejected.

8.4.1.2 Physical and mechanical properties

8.4.1.2.1 Flash point, solid content, elongation, mass change and stress relaxation shall be accepted if their arithmetic mean reaches the index specified in the standard.

8.4.1.2.2 Adhesion performance, low temperature flexibility, heat resistance, self-healing property, oil permeability and water channeling resistance shall be accepted when each test piece meets the standard requirements.

8.4.1.2.3 If the test results meet the requirements of Article 6.2, the physical and mechanical properties of this batch of products shall be accepted.

8.4.1.2.4 If there are two or more items that do not meet the standard requirements, the batch of products will be rejected.

8.4.1.2.5 If there is only one index that does not meet the standard, it is allowed to use a spare sample to conduct a single re-inspection for the rejected item. When the standard requirements are met, the physical and mechanical properties of the batch of products shall be accepted; otherwise, it shall be rejected.

8.4.2 Total determination

When the test results meet all the requirements specified in Chapter 6 of the standard, the batch of products shall be accepted.

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