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PEOPLE'S REPUBLIC OF CHINA**

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**Test method for determining alkali resistance of glass fiber
reinforcing mesh - Exposure to a sodium hydroxide solution**
(English Translation)

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1 Scope

This document describes the principle, instruments and reagents, samples, laboratory environment, operating procedures, and result calculation for the alkali resistance test of glass fiber mesh.

The calculation and test report provide two test methods. the conventional method and the rapid method.

This document applies to the alkali resistance testing of fiberglass mesh fabrics that require alkali resistance.

4 Principles

The tensile breaking strength of samples soaked in sodium hydroxide alkaline solution (hereinafter referred to as "alkaline solution") and samples not soaked in alkaline solution were tested respectively.

The retention rate of tensile breaking strength is calculated to characterize the alkali resistance of the glass fiber mesh.

5 Instruments and reagents

5.1

Tensile testing machine. constant rate elongation type conforming to GB/T 7689.5.

5.2

Electronic balance. scale division value not greater than 0.01g, accuracy class not lower than III.

5.3

Graduated cylinder. 1000mL, graduation value 10mL, commercially available.

5.4

Covered Container. Made of a material that does not chemically react with alkaline solutions, with a built-in sample holder, sized to allow the sample to be placed flat.

The container should be kept within the alkaline solution, ensuring the liquid level is at least 25 mm above the sample. The container lid should be sealed to prevent evaporation of water from the alkaline solution.

5.5

Heating device. capable of heating covered containers, keeping the temperature of covered containers controlled at $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$.

5.6

Pure water. not lower than laboratory grade III water.

5.7

Sodium hydroxide. analytical grade, commercially available.

5.8

Absorbent paper. Commercially available.

6 Samples

6.1

Cut 30 sample strips from the roll, each with a width of $50\text{mm} \pm 3\text{mm}$ and a length of $600\text{mm} \pm 13\text{mm}$. Of these, 15 are warp-oriented.

The specimen, i.e., the long side of the specimen strip is parallel to the warp direction of the fiberglass mesh; 15 weft specimens, i.e., the long side of the specimen strip is parallel to the fiberglass mesh.

The weft direction of the fabric.

6.2

Each sample strip should contain the same number of yarns.

6.3

Warp samples should be cut over the entire width of the fiberglass mesh, at least 100 mm from the edge, to ensure they represent different warp directions.

For yarn, the weft sample should be cut within a range of not less than 100 mm from the edge of the fiberglass mesh.

6.4

Number each test strip at both ends, ensuring the markings are clear and not damaged by the alkaline solution. Divide the test strip transversely from the middle.

The test specimens are divided into two parts. one half is used to determine the tensile breaking strength of specimens that have not been soaked in the alkaline solution, and the other half is used to determine the tensile breaking strength of specimens that have been soaked in the alkaline solution.

Tensile strength.

Note: Samples before and after soaking are from the same sample strip, which makes the samples soaked in alkaline solution directly comparable to those that have not been soaked in alkaline solution.

7 Laboratory Environment

Temperature $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$, relative humidity $50\%\pm 10\%$.

8.1 Method A - Conventional Method (Arbitration Trial)

8.1.1

Record the number and location of each sample to ensure that the obtained pair of samples untreated and treated with alkali solution are consistent.

The tensile breaking strength values are from the same specimen strip.

8.1.2

Weigh sodium hydroxide (5.7) using an electronic balance (5.2), reading to 0.01 g. Measure pure water (5.6) using a graduated cylinder (5.3), reading to 10 mL, and prepare...

Prepare an alkaline solution with a mass concentration of 50 g/L and place it in a covered container (5.4). The amount of alkaline solution should ensure that the sample is submerged in the solution for at least [amount missing].

25mm, keep the temperature of the alkaline solution at $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$.

8.1.3

Place the sample for alkaline solution immersion treatment on the sample holder inside the

covered container (5.4) and immerse it in the alkaline solution. The sample should be level.

Place the samples neatly, leaving a certain gap between them. If the samples tend to curl, small weights such as ceramic pieces can be used to press them down.

Mark the liquid level on the inner surface of the container, cap and seal. If a visible change in liquid level occurs when the sample is removed, then...

The sample should be resampled and tested.

8.1.4

The sample was soaked in an alkaline solution at a temperature of $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 28 days ± 4 hours.

8.1.5

After removing the sample, rinse it thoroughly with running water to remove any residual alkaline solution until the pH value of the sample surface is less than 8.(Cleaning) Avoid causing any damage to the sample during the process.

8.1.6

Use absorbent paper (5.8) to dry the surface moisture of the sample, and then place the sample in an environment with a temperature of $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and a relative humidity of $50\%\pm 10\%$.

Place under environmental conditions for at least 1 day.

8.1.7

Samples that have not been soaked in alkaline solution shall be placed together under the environmental conditions of $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and $50\%\pm 10\%$ relative humidity.

8.1.8

Using a tensile testing machine (5.1), and according to the test conditions for Type I specimens specified in GB/T 7689.5, determine the tensile strength of specimens soaked in alkali solution and those not soaked in alkali solution.

The tensile breaking strength of the warp and weft specimens immersed in the solution was measured, and the test values were retained to the nearest integer. Five pairs of valid test results were obtained for each type of specimen.

When performing tensile tests, the clamping ends of the specimen should be coated with an acrylic waterproof coating to protect them and prevent damage from occurring inside the clamps.