ARIT奥莱特

PRODUCT DATA SHEET

ART-XFJ

Concrete Crack Microbial Repair Agent

Description

ART-XFJ is a concrete crack repair agent jointly developed by the Research Center for Green Building Materials and Carbon Fixation Utilization of Southeast University and Jiangsu ARIT New Materials Co., Ltd. It utilizes the life activities of microorganisms to achieve a bionic function that can automatically sense and actively and promptly repair micro-cracks. Additionally, it offers secondary repair effects for repeated cracking, effectively addressing issues such as water leakage, ion transport, durability assurance, and aesthetics.

Main benefits/Characteristics

The Concrete Crack Microbial Repair Agent is based on microbial mineralization technology. It relies on the mineralization products generated by microorganisms themselves to fill concrete cracks, achieving self-diagnosis and timely proactive repair of micro-cracks in concrete. While filling the cracks, it enhances the mechanical properties and durability of concrete.

- It can sense crack formation automatically and repair micro-cracks in a timely manner to prevent the development of larger cracks.
- It has a high repair capacity, which improves the mechanical and durability properties of concrete.
- It has the ability to repair cracks for a second time.
- It is highly compatible with concrete and does not affect the conventional physical,

mechanical, and construction properties of concrete.

- It relies on microbially induced stable inorganic mineral repair of cracks, which is environmentally friendly and non-toxic and pollution-free.
- The product is in the form of spherical particles, with simple packaging and convenient and quick usage.

Applications

Microbial repair agents can be used for various types of concrete structures and are especially suitable for places where micro-cracks are prone to occur, where high crack control requirements exist, where manual repair is difficult, where repair construction space is limited, and where cracks are not easily detected in a timely manner. Recommended application fields:

Underground waterproof concrete structures

Hydraulic concrete structures

Marine concrete structures

Exterior walls of various industrial and residential buildings

Road and bridge concrete

Physical and chemical indicators

Items	Performance
Appearance	Brownish-gray spherical particles
Soluble Calcium Ion Content	2900–6900 mg/100g
Water Absorption Rate	≤3.0%
Apparent Density	1900 – 2100 kg/m^3
Particle Outer Diameter	2.36–4.75 mm
Single Particle Compressive Crushing Strength	≥70
Chloride Ion Content	≤0.06%
Sulfate Ion Content	≤7.2%
Alkali Content	≤0.5%

Recommended Dosage

Adjust the dosage of the microbial repair agent for concrete cracks reasonably according to the actual engineering requirements. Under normal circumstances, 20 – 25 kg is added per cubic meter of concrete.

Technical Indicators

- Primary Repair Capability

  Concrete mixed with the microbial repair agent for concrete cracks achieves a crack area repair rate of over 95% after the first cracking, a water penetration resistance repair rate of over 95%, a chloride ion penetration resistance repair rate of over 90%, an ultrasonic wave propagation speed of over 3.0 km/s after crack repair, and an average crack repair depth greater than 25 mm.

- Secondary Repair Capability

  After the second cracking, the crack area repair rate is over 80%, the water penetration resistance repair rate is over 80%, the chloride ion penetration resistance repair rate is over 80%, the ultrasonic wave propagation speed is over 2.5 km/s after crack repair, and the average crack repair depth is greater than 25 mm.

- Effective Viable Bacteria Count

  Tested according to the national standard "Food Safety National Standard — Microbiological Examination of Food: Determination of Total Viable Count," the effective viable bacteria count of this product is above 2.5×10^{8} CFU/g.

- Bacterial Alkali Resistance (Ratio of Viable Bacteria Count after 90 Days)

  Tested according to the industry standard "Technical Regulations for the Application of Microbial Self-Healing Concrete," the alkali resistance of bacteria in the microbial repair agent for concrete cracks is above 95%.

Application

1. Nanjing Metro Line S6—Maqun Station

The microbial repair agent for concrete cracks was added to the side walls, showing good repair effects on cracks with a width of 0.5 mm. Water seepage was stopped after repair.

2. Nanjing Metro Line S6—Qilinmen Station

The microbial repair agent for concrete cracks was added to the side walls, showing good repair effects on cracks with a width of around 0.5 mm.

3. Mangdao River Jiuwu Port Ship Lock

The microbial repair agent for concrete cracks was applied at the connection between the bottom slab and side walls of the lock chamber of the Mangdao River Jiuwu Port Ship Lock. Cracks were repaired in a timely and effective manner after they occurred.

4. Xiamen Jimei New City

The microbial repair agent for concrete cracks was applied to the side walls of the basement in Xiamen Jimei New City, showing good repair effects on the cracks.

5.Underground Space in Nanjing Jiangbei New District

The microbial repair agent for concrete cracks was applied to the side walls, showing good effects on both crack repair and prevention. The average crack spacing was reduced to 1/2.5, the crack length was shortened to 1/2.8, and the number of cracks was reduced to 1/2.3. The ultrasonic wave speed after repair was greater than 3 km/s.

Attention

Control the concrete vibration time based on the principle of compacting the mixture and preventing the solid-carrier microbial repair agent particles from floating up. The vibration time can be appropriately shortened while ensuring compaction. During crack maintenance, measures such as covering, watering, and misting can be taken. Measures that should not be taken include covering with film, spraying, or brushing curing agents that isolate the air. During winter construction, to ensure the crack repair effect, insulation measures can be taken to provide a suitable temperature for microbial mineralization activities, with the concrete surface temperature preferably maintained between 10℃ and 40℃.

Packaging

The product is available in bags with a net weight of 50 kg or 25 kg per bag. Special packaging can also be provided according to customer requirements. Handle with care during transportation to avoid package damage. Cover during transportation to protect from rain, sunlight, and high temperatures. Do not mix or transport with toxic or harmful materials.

Storage

Store in a cool, ventilated, and dry place. Avoid direct sunlight, keep away from heat sources, water, and humid air. The storage temperature should not exceed 60℃, and the storage period should not exceed 24 months.

LEGAL NOTES

It is prohibited to retain or disclose samples of the product without the company's permission.

In addition to the product quality itself, the actual performance also depends on other factors. If there are factors beyond our control, we cannot guarantee the performance of the product. Users are requested to strictly follow the technical guidelines and product instructions for use. The company shall not be held liable for any consequences resulting from unauthorized changes to the product's usage without the company's authorization.