Product Technical Manual

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Product Name： Silicate modified polyurethane material for consolidating coal and rock at coal mine Version：V 3.1

Product Introduction

Upon uniform mixing of Components A and B at a 1:1 volume ratio, the system rapidly polymerizes into a non-melting and insoluble polymer material with compressive strength, adhesive force, flame retardancy, solvent corrosion resistance and certain degree of toughness. The material can cure properly and retain excellent strength even in water-containing environments, while maintaining effective sealing and reinforcement performance through coordinated deformation with surrounding rock strata.

Product Usage

Silicate modified polyurethane material for consolidating coal and rock at coal mine are applicable to various fragmented coal/rock reinforcement scenarios in mining and tunneling engineering, etc. These include: Reinforcement of coal wall spalling and roof collapse during excavation, Pre-reinforcement of soft coal seam roadway roofs, Advance reinforcement for geological faults and collapse columns, Full-length anchoring of bolts and anchor cables,Sealing of high-pressure zones. The low-viscosity mixed resin efficiently penetrates micro-fissures in coal/rock masses and rapidly polymerizes into the high-strength, high-toughness polymer. This process binds fragmented coal/rock into high-load-bearing integrity, achieving effective reinforcement of the strata

Product Features

Silicate-modified polyurethane material (A and B components mixed at 1:1 volume ratio) used for coal/ rock mass reinforcement polymerizes into an insoluble and non-melting polymer with the following characteristics:

1.Flame retardancy – Complies with MT 113-1995 standard

2.Exhibits excellent resistance to solvents and chemical corrosion

3.Low viscosity and high permeability

4.Exceptional anti-static performance

5.Rapid construction, low-odor or odorless

6.Strong adhesive force and mechanical strength with toughness to withstand long-term ground pressure

Physical and Chemical Properties

Main Components	Component A	Component B
Appearance	Transparent or semi-transparent liquid	Dark brown liquid
Specific Gravity (23±2 ℃), kg/m ^{3}	1400±100	1230±50
Viscosity (23±2 ℃), mPa s	200-500	200-500
Mixing Volume Ratio	1	1
Effective Storage Period (23±2 ℃), Months	6	6

Physical Properties for Reference

Item	Specification
Start Time of Curing, s	30-40
Completion Time of Curing, s	70-90
Expansion Ratio	≥1.0
Maximum Reaction Temperature, ℃	<100
Oxygen Index, %	≥28
Compressive Strength, MPa	≥40
Tensile Strength, MPa	≥5
Shear Strength, MPa	≥15
Bonding Strength, MPa	≥3
Flame Retardancy	Complies with MT 113-1995

Note: The technical parameters herein are derived from laboratory testing and may deviate under actual application conditions. These values are provided for reference only and do not constitute legally binding obligations.

Packing Details

Component A liquid material: 28 kg/drum

Component B liquid material: 22 kg/drum

Usage Precautions

For the application of silicate-modified polyurethane material for consolidating coal and rock, appropriate construction equipment should be selected, including mixing pumps and spray guns, high-pressure spraying machines (equipped with injection nozzles), or other grouting devices. Prior to construction, ensure calibration of the grouting equipment to verify the component mixing ratio and mixing pressure.

Before commencing formal construction, the buyer must conduct material reliability tests under conditions identical to the actual construction environment to verify the applicability of the composite materials.

All components must be proportioned according to the specified ratio during application. Significant measurement deviation may lead to insufficient reaction and incomplete curing.

Storage (Usage) Precautions

The composite material should be stored in closed containers to avoid absorbing moisture. Therefore, during storage and transportation, the containers must remain dry and tightly sealed.

The composite material should be sealed and stored at room temperature (5 ℃ to 35 ℃), well-ventilated, and shaded area. Avoid direct sunlight or long-term storage above 40 ℃, which may reduce foam performance.

The product should be stored away from food, beverages, and tobacco.

Expiration Date

Under suitable storage conditions, the storage period of silicate modified polyurethane material for consolidating coal and rock at coal mine is 6 months. After exceeding 6 months, the material can continue to be used only after passing reaction time tests and physical property inspections (including strength, maximum reaction temperature, flame retardancy, etc.)

Immediately discontinue use if significant lump formation occurs in either Component A or B, accompanied by abnormal viscosity rise and flow difficulties.

Safety Precautions

Direct contact with the material may cause moderate eye irritation and mild skin irritation, potentially leading to skin allergies. Repeated inhalation of high-concentration vapors can induce respiratory allergies. Immediate medical attention

should be sought, and anti-inflammatory and anti-allergic symptomatic treatment measures should be administered.

During operation, exercise caution to prevent direct contact with skin or splashing into eyes. Wear necessary protective equipment (gloves, protective goggles, work clothes, etc.).

In case of skin or eye contact, rinse immediately with clean water for at least 15 minutes. Wash the skin with soapy water and seek medical attention if necessary. If accidentally ingested, seek immediate medical treatment for symptomatic management.

Fire and Explosion Hazards

This product is not classified as flammable liquids, explosives, oxidizers, corrosives, toxic substances, or radioactive hazardous materials during storage and transportation. It is not categorized as a hazardous product.

Carbon dioxide, foam, or chemical dry-powder fire extinguishers can be used. If no other fire-extinguishing agents are available, a large amount of water mist can be sprayed. Once the fire is extinguished, the spilled materials must be thoroughly cleaned (refer to the "Spill and Leakage Handling" section).

Fire-Fighting Procedure: Standard protective measures.

Spill and Leakage Handling

Small amounts of leaked or spilled materials can be rinsed away with water. In case of large-scale leakage, contain and recover the materials, and wash the contaminated ground with water or detergent. The disposal of waste composite materials must comply with the local government's environmental protection regulations.

For more information, please refer to the Safety Data Sheet (SDS) of our products or contact our Customer Service Center.

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support and customer service center are available to provide consultation and technical services related to our products. We welcome your inquiries and communication via mail or phone.

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