Product Technical Manual

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Product Name： Silicate-modified polyurethane material for spraying sealing of air leaks 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 the infusible and insoluble polymer foam. This foam exhibits exceptional adhesion, flame retardancy, water resistance and corrosion resistance, and retains flexibility to deform with rock strata/ wall while simultaneously achieving air leakage sealing and structural reinforcement.

Product Usage

Silicate-modified polyurethane material for spraying sealing of air leaks at coal mine is applicable to reinforcement and sealing of roadways, rock mass stabilization, and air-leakage blocking in mining, tunneling, and related engineering fields, particularly suitable for spray sealing in mine roadways and containment walls. The mixed resin with ultra-low initial viscosity rapidly penetrates into micro-fissures and initiates polymerization within seconds, forming the high-polymer foam with exceptional flexibility and structural strength. The solidified foam exhibits robust adhesion to diverse substrates including rock strata, concrete, brick walls, and timber

Product Features

Silicate-modified polyurethane material (A and B components mixed at 1:1 volume ratio) for spraying sealing of air leaks at coal mine polymerizes into an insoluble and infusible polymer with the following characteristics:

1. Flame retardancy – Complies with MT 113-1995 standard
2. Exceptional anti-static performance
3. Low thermal conductivity with superior insulation performance

4. Spray-applied foam with rapid curing and low-odor characteristics
5. 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	Colorless to pale yellow 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

Item	Specification
Curing time	10-30s
Expansion Ratio	≥20
Maximum Reaction Temperature, ℃	＜100
Oxygen Index, %	≥28
Flame retardancy	Complies with MT 113-1995
Surface resistance，Ω	$\leq 3x10^8$
Air permeability，L（$S.m^2$）	≤0.05

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.

Usage Precautions

Construction equipment requires proper selection of low-pressure/high-pressure sprayers or compatible spray equipment. Prior to application, calibrate the spray system to verify the proportioning ratio of composite materials 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.

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.

Expiration Date

Under suitable storage conditions, the storage period of 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 the inspections.

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.

The indicators and data provided in this document are based on our current level of technical knowledge and practical experience, and are for reference only. Specific guaranteed indicators are subject to the quality assurance certificate or supply contract. The user is responsible for testing the products purchased from our company to verify their suitability for their intended processes and applications, and to achieve the desired objectives. Further application and processing of our products are beyond our control. Therefore, our liability for the products provided is limited to the portion delivered by us and used by you. We do not assume responsibility for indirect losses incurred during the production process using our products as raw materials. Our technical 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.

联系地址：山东省烟台市经济技术开发区太原路 56 号　　邮编：264006

全国客户服务电话：400-059-1116　　传真：(86)-0535-3387032
