Delshine

product specification

Cold-weather, condensation-resistant aerogel coating

AFGY-B-S40

Product description

This is a single-component water-based thermal insulation and anti-condensation coating, formulated from ultrafine aerogel powder combined with specialized polymer materials.

Compared to traditional rubber-plastic sponge or polyurethane foam coatings, this coating can be applied directly onto various substrate surfaces—including stainless steel, aluminum, and carbon steel—to form an efficient thermal insulation barrier. This effectively prevents condensation formation on pipeline and equipment surfaces due to temperature differences and reduces energy loss.

Cold-weather, condensation-resistant aerogel coating

(AFGY-B-S40)

Features: Cold preservation, energy efficiency, and condensation prevention

Application: Industrial use, pipelines, storage tanks, cooling systems

Specifications: 10 kg/20 L

Dosage: 0.6 (kg/mm/m²)

Product Parameter

Traditional insulation and energy-saving materials require significant labor and auxiliary materials during installation. In contrast, the straightforward application process of aerogel coatings offers an excellent cost-performance ratio across the 40–120°C temperature range.

project	parameter
pigment	**White (Adjustable)**
coefficient of heat conductivity	**≤0.036W/m'K**
density	**0.55±0.02g/cm3**
cohesional strength	**≥4A**
Waterproofing performance	**After 96 hours of water immersion, no abnormalities were observed.**
fire-protection rating	**B2**

VOC content	**Qualified (≤80 g/L)**
Is it wear-resistant?	**flexibility**
Long-term operating temperature	**-40℃~150℃**

Product features

This solution is primarily designed for the treatment of pipeline icing and condensate management. Traditional materials, however, involve complex installation processes—particularly for custom-shaped components or large-scale equipment—where splicing is often the primary method employed, which imposes stringent technical requirements. As a result, condensate and ice formation issues recur frequently, leading to pipeline corrosion. Additionally, these materials have a limited service life, making subsequent maintenance relatively challenging.

In particularly hot-summer regions, it is necessary to draw water from rivers, lakes, or groundwater through pipelines. The significant temperature variations during the summer months cause condensation to form both on the pipelines and on the ground surface, making it impossible to effectively protect the pipelines.

characteristic	explain
Anti-condensation	**Reducing the temperature difference between the pipeline surface and the ambient air effectively prevents the formation of condensate.**
Very low thermal conductivity	**Low thermal conductivity (≤0.036 W/m•K) significantly reduces cooling loss and enhances equipment energy efficiency.**
Water and moisture resistance	**The aerogel's ultra-hydrophobic properties (hydrophobicity ≥ 98%) prevent water penetration and ensure long-term stability.**
Excellent weather resistance	**Suitable for extreme operating temperatures ranging from-40°C to 150°C; exhibits resistance to cracking and deformation at low temperatures.**
Easy installation	**No complex splicing required – can be applied directly to irregular surfaces such as pipelines, storage tanks, and cooling systems; suitable for both new construction and renovation projects.**

Coating System Design

Within the temperature range of-40°C to 180°C, the straightforward application method and the absence of thermal bridging in the aerogel coating process enable seamless implementation, regardless of the complexity of the pipeline system or the condition of the equipment.

scope	thickness
-40~0°C temperature range	**It can effectively reduce the diurnal temperature variation, which is particularly noticeable in regions with extreme heat or extreme cold.**
0–20°C temperature range	**Depending on the operating conditions and intended use, apply a coating with a thickness of 1–3 mm to the exterior of the pipeline.**

Subsurface preparation

Substrate Type: Interlayer Structure	explain
Stainless steel or aluminum substrate + thermal insulation and anti-condensation aerogel coating Stainless steel or aluminum substrate + thermal insulation and anti-condensation aerogel coating	Stainless steel welds shall be subjected to rust prevention treatment; the surface of the thermal insulation anti-condensation gel coating shall be topped with a wear-resistant and waterproof surface coating as required.
Carbon steel or copper-based substrate + rust-preventive primer + thermal insulation and anti-condensation aerogel coating Carbon steel or copper-based substrate + rust-preventive primer + thermal insulation and anti-condensation aerogel coating	
Rusted iron substrate – Substrate + Rust-Inhibiting Primer + Rust Protection Primer + Thermal Insulation and Condensation Prevention Aerogel Coating	

Usage and explanation

Aerogel coatings represent a novel type of thermal insulation material designed to provide effective thermal insulation through their low thermal conductivity and high thermal resistance. Due to their exceptional insulation performance, aerogel coatings perfectly meet the technical requirements for insulation coatings – offering both superior thermal insulation performance and a thin coating film.

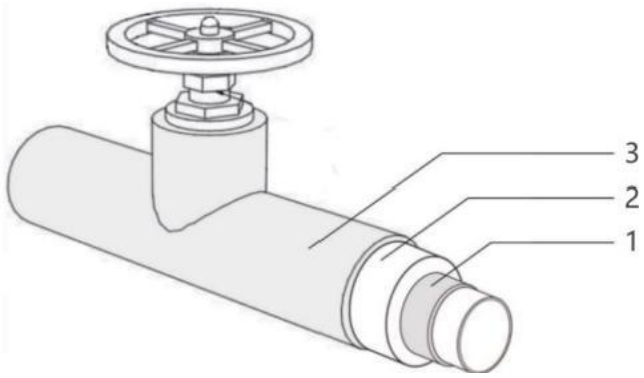
architectural design

All existing coating application techniques are suitable for applying aerogel coatings; no additional training or custom fabrication of specialized application equipment is required.

project	Reference thickness (mm)
Primary level	~
primary coat	**<0.5**
Aerogel insulation intermediate coat	**2~8**
Surface finish	**<0.5**
performance specification	**Prevention of condensation: Reduces equipment damage caused by condensation;** **Energy efficiency: Reduce energy consumption;** **Insulation: reduces heat transfer;**
Appearance Description	**Surface color adjustment**

Structural design

When an aerogel thermal insulation coating system is employed for industrial insulation, the basic structure shall consist of a substrate, a primer coat, a middle coat, and a topcoat.



Basic construction for industrial thermal insulation using a thick aerogel insulation coating system: 1 – Base coat; 2 – Intermediate coat; 3 – Topcoat

Related Cases

- -40~20°C – Anti-condensation & Anti-freezing
- Project Locations: Factories in Ziyang, Foshan, Kunming, Putian, etc.
- Material: Energy-saving, heat-resistant aerogel coating / Insulating, anti-condensation aerogel coating
- Date: October 2024
- Solution: 3 mm thick aerogel coating






Preliminary work for constrution

project	flame plating	Scratch-coating/Roller-coating
Basic Requirements	The substrate surface must be clean, free of debris, free of grease, and dry and flat. If necessary, perform cleaning, degreasing, or plastering treatments.	
Construction tools	Spraying machine, roller, laminating paper, mixer, protective mask, protective clothing, safety rope, safety helmet, protective footwear, goggles, protective film	Putty knife, scraper, roller, decorative paper, mixer, protective mask, protective clothing, safety rope, safety helmet, protective footwear, safety goggles, protective film
Repainting Interval	Apply a second coat only after the first coat has dried completely; it is generally recommended to wait at least 24 hours.	
Construction Conditions	1. The construction temperature shall be no lower than 5°C and no higher than 80°C (equipment may be used for construction at varying temperatures); 2. When the ambient humidity exceeds 85%, the recoating time shall be extended.	
form of construction work	Before construction, stir the mixture using an electric mixer for at least 1 minute.	
Tool Cleaning	Wash promptly with running water.	