SIO-9219 Room Temperature Curing Polysilazane

Product Description

SIO-9219 is a solvent-free, room-temperature self-curing polysilazane product. During curing, the main reactions involve the hydrolysis and oxidation of Si-NH-Si bonds. Meanwhile, Si-NH-Si groups can react with hydroxyl groups (-OH) on the substrate surface, providing excellent adhesion between the coating and the substrate.

With the addition of appropriate catalysts, the reactions between Si-H and Si-NH-Si groups can be promoted, forming a three-dimensional crosslinked structure after curing. This structure provides the coating with excellent mechanical properties.

The cured coating exhibits pencil hardness above 4H, excellent non-yellowing properties, and strong chemical bonding with substrates. It is suitable for applications including electrical insulation coatings, wear-resistant and fire-resistant coatings, outdoor hydrophobic self-cleaning and anti-aging coatings, and skin-friendly antibacterial topcoats. Through covalent bonding with the substrate, the coating achieves significantly enhanced mechanical strength and durability.

Applicable Substrates

Suitable for:

- Carbon steel;
- Stainless steel;
- Cast iron;
- Aluminum alloys;
- Titanium alloys;
- High-temperature alloy steels;
- Microcrystalline glass panels;
- Ceramics;
- Cement and other inorganic substrates.

Operating Temperature Range

Suitable for:

- Outdoor applications with continuous service temperatures below 400°C;
- Short-term exposure applications up to 600°C.

The actual temperature resistance of the coating may vary depending on the thermal resistance of different substrates.

The coating also demonstrates excellent thermal shock resistance and resistance to rapid heating and cooling cycles.

Coating Performance

Test Item	Performance Specification	Test Method
Color and Appearance	Light yellow to colorless transparent liquid	GB/T 1721-79
Solid Content ((120±2)℃)	>90%	GB/T 1725-2007
Density (g/mL)	0.88±0.1	GB/T 6750-2007
Pencil Hardness	≥4H	GB/T 6739-2006
Adhesion	Grade 0	GB/T 9286-1998
Neutral Salt Spray Resistance	>500 h	GB/T 10125-2021
Water Contact Angle	>100°	GB/T 26490-2011
Artificial Weathering Resistance	30 days: No rust, chalking, cracking, or discoloration	GB/T 1865-2009
Dielectric Strength (V/mm)	$\geq 10^5$	ASTM D149
Electrical Resistivity (Ω·m)	$\geq 10^{12}$	GB/T 35856-2018

Basic Application Parameters

Item	Specification
Coating Solid Content	>90%
Volatility	Solvent evaporates easily
Theoretical Coverage	6–8 m^2/kg
Curing Temperature	Room temperature
Dry Film Thickness	20–50 μm
Curing Time	>24 h
Pot Life / Working Time	4 h
Maximum Short-Term Temperature Resistance	600°C
Recommended Thinner	Aromatic hydrocarbons, esters, ethers, etc.
Recommended Operating Temperature	-30°C to 400°C
Flash Point	<22°C (solvent flash point)
Storage Temperature	0–30°C

Special Notes

- This product is a single-component self-curing coating.
- Once opened, the coating should be used within 4 hours.
- For longer intervals between coating operations, application tools must be cleaned promptly to prevent cured coating buildup.
- One-pass spraying is recommended.
- The dry film thickness should not exceed 50 μm; excessive thickness may negatively affect coating performance.

Standard Application Process

Surface Cleaning → Surface Roughening → Cleaning and Air Blowing → Spraying → Curing

Application Procedure

1. Surface Roughening Treatment

Before coating, the substrate surface should be mechanically ground or sandblasted to remove rust, dust, dirt, and other contaminants.

Surface roughening has a significant influence on coating performance:

- Recommended surface preparation: Sa 2.5;
- Minimum requirement: St3 level without oxide scale;

According to GB/T 30790.4-2014.

Proper surface preparation is essential for achieving optimal coating performance.

2. Cleaning

Use a suitable cleaning agent or degreaser to remove residual oil, dust, and contaminants after surface roughening.

3. Substrate Drying

Before coating application, ensure that the substrate surface is completely dry and clean.

4. Coating Preparation

- This is a single-component product.
- Take the required amount of coating and filter through a 120-mesh filter before use.

5. Coating Application

- Laboratory spraying recommendation:
    - Spray gun nozzle size: 1.0 mm;
- The cured coating has certain hydrophobic and oleophobic properties; therefore, repeated recoating is not recommended.

6. Curing

After spraying:

- Surface dry: approximately 2 hours;
- Touch dry: more than 3 hours;
- Fully cured: more than 24 hours.

Storage and Shelf Life

1. Store according to national regulations. The storage area should be dry, cool, well ventilated, and away from heat sources and open flames. Keep containers tightly sealed and handle carefully.
2. Storage temperature should be maintained between 5°C and 30°C. Shelf life is 6 months.
3. Any unused coating after opening must be resealed tightly and stored properly.
4. Mixed or prepared coating leftovers cannot be returned to the original container and should be disposed of according to local regulations.
5. Products beyond the shelf life may only be used after passing quality verification tests.

Disclaimer

All information provided above is based on knowledge obtained from laboratory testing and practical experience. Since product application conditions are generally beyond our control, we only guarantee the inherent quality of the product itself.

To comply with local regulations, product formulations may be adjusted when necessary. We reserve the right to modify this technical document without prior notice.

Users should consult our company for product suitability evaluation and technical guidance according to their specific requirements and application conditions.