



## Specialty Resins (Polyvinylidene Fluoride (PVDF) and Silicone-based)

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<b>Product Category</b>	<ul style="list-style-type: none"> <li>● PVDF (Polyvinylidene Difluoride) Resin</li> <li>● Silicone based Resin</li> </ul>
<b>Application</b>	<ul style="list-style-type: none"> <li>● PVDF: Super durable paint for facade, bridge, museum, and building construction</li> <li>● PVDF: More than 25 years of UV and weathering durability</li> <li>● Silicone-based: High temp resistant paints</li> </ul>
<b>Key Function(s)</b>	<ul style="list-style-type: none"> <li>● PVDF to provide highly durable paints more than 25 years</li> <li>● Silicone based for high temperature resistant paint ie 650-850 °C</li> </ul>

1. **PVDF resin** (Polyvinylidene Fluoride) is a high-performance thermoplastic polymer known for its excellent chemical resistance, thermal stability, and mechanical properties. It is widely used in industries that require materials capable of withstanding harsh environments, such as paint and coatings, industrial, aerospace, electrical applications.

### Key Characteristics of PVDF Resin:

- **Chemical Resistance:** PVDF is highly resistant to a wide range of chemicals, including acids, bases, solvents, and halogens. This makes it ideal for use in chemical processing industries, where it is exposed to aggressive substances.
- **Thermal Stability:** PVDF has a high melting point (around 177°C or 350°F), which gives it good thermal stability, enabling it to perform well in high-temperature applications.
- **Mechanical Properties:** It offers good mechanical strength, flexibility, and impact resistance, making it suitable for a variety of structural applications.
- **Electrical Insulation:** PVDF has excellent electrical insulating properties, which makes it useful in the production of cables and wires, especially in demanding environments.
- **Weather Resistance:** PVDF exhibits excellent resistance to UV radiation and weathering, making it suitable for outdoor applications, including architectural coatings and protective films.
- **Flame Retardant:** PVDF has good flame retardant properties, making it ideal for use in fire-resistant applications.
- **Low Friction:** PVDF has a low coefficient of friction, which makes it useful in applications requiring wear resistance and smooth movement.



For more information of product



Website : [www.s-unity.com](http://www.s-unity.com)

Stellar Unity has been working with one of the top advanced chemical manufacturers to provide PVDF resins in paint and coating industries. PVDF is often used in **architectural coatings** (e.g., for buildings, facades) due to its durability, UV resistance, and ability to maintain color over long period of time, ie more than 25 years.

#### Advantages of PVDF Resin:

- **Durability:** PVDF is known for its long-lasting performance, even in aggressive environments.
- **Versatility:** It can be used in a wide range of applications, from coatings to industrial and electrical components.
- **Non-toxicity:** PVDF is safe to use in applications where it may come into contact with food or medical devices.

#### Conclusion:

**PVDF resin** is a high-performance polymer valued for its exceptional properties, including chemical resistance, thermal stability, and mechanical strength. These qualities make it an ideal material for use in industries such as chemicals, coatings, electronics, aerospace, and healthcare. **Hylar 5000S** is a commercial-grade PVDF resin that is widely used in architectural coatings and other high-performance applications. **Kynar** is also another commercial resins based on PVDF.

**2. Silicone-based resins** are a type of synthetic polymer that is commonly used in **high-temperature resistant paints** due to their exceptional thermal stability, chemical resistance, and durability. These resins are designed to withstand extreme heat, making them ideal for applications where high temperatures are a concern, such as in industrial equipment, engines, exhaust systems, and other high-heat environments.

#### Key Characteristics of Silicone-Based Resins for High-Temperature Resistant Paints:

- **High-Temperature Resistance:** Silicone-based resins can tolerate temperatures ranging from 650°C to 850°C, depending on the specific formulation. This makes them highly effective in protecting surfaces exposed to heat, such as automotive engines, industrial furnaces, and exhaust systems.
- **Thermal Stability:** Silicone resins remain stable and maintain their physical properties (such as flexibility and adhesion) even at high temperatures. Unlike conventional resins that may degrade under heat, silicone-based resins do not soften, degrade, or lose their strength, which makes them particularly useful for long-lasting protection in extreme conditions.
- **Chemical Resistance:** These resins offer excellent resistance to harsh chemicals, oils, solvents, and fuel. This characteristic is essential in high-heat environments where there may be exposure to industrial chemicals or other corrosive substances.
- **Weather and UV Resistance:** Silicone-based resins are inherently resistant to UV radiation and weathering. This makes them ideal for both **outdoor** and **high-temperature applications** where prolonged exposure to sunlight and the elements can degrade other types of coatings.
- **Flexibility and Adhesion:** Silicone resins offer excellent adhesion to various substrates, including metals, plastics, and ceramics. They also retain flexibility at high temperatures, which helps prevent cracking or peeling of the paint when exposed to thermal expansion and contraction.
- **Heat Reflectivity:** Some silicone-based paints contain **pigments** or fillers that enhance heat reflectivity, which can help in reducing the temperature of the surface itself, thereby improving energy efficiency and reducing wear on the underlying material.
- **Low Surface Tension:** Silicone resins have low surface tension, which allows for smoother application and better coverage when used in paints, reducing the likelihood of bubbling or uneven coats.



Stellar Unity has been working with one of the top advanced chemical manufacturers to provide silicone-based resins in paint and coating industries. The main market application is exhaust pipes and mufflers. The temperature resistance of our silicone-based resins can be as high as 650-850 °C. Not so many available products could stand up to 850 °C.

For more information of product



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### Applications of Silicone-Based Resins in High-Temperature Paints:

- **Automotive and Aerospace Industries:** Silicone-based resins are often used for **engine paints, exhaust coatings, and heat shields** in both automotive and aerospace industries. The ability of these coatings to withstand high temperatures and prevent corrosion makes them valuable in these sectors.
- **Industrial Equipment:** High-temperature silicone-based paints are applied to **industrial machinery, furnaces, and kilns** where consistent exposure to elevated temperatures is common. These coatings help protect equipment from heat-related damage and prolong the life of the machinery.
- **Exhaust Systems:** Silicone-based coatings are used on **exhaust pipes, mufflers, and other components** that are exposed to extreme heat and exhaust gases. These coatings provide a durable, heat-resistant layer that prevents rust, corrosion, and degradation.
- **Ovens and Heat Exchangers:** Silicone-based paints are used on **ovens, heat exchangers, and thermal processing equipment** to maintain their performance under prolonged high-temperature conditions.
- **High-Temperature Appliances:** Kitchen appliances such as **grills, stoves, and barbecues** are often coated with silicone-based high-temperature paints to protect against heat and maintain appearance.

### Advantages of Silicone-Based Resins in High-Temperature Paints:

- **Long-Lasting Protection:** Silicone-based resins offer superior durability, providing long-lasting protection from high temperatures, weathering, and chemical exposure.
- **Enhanced Performance in Extreme Conditions:** Unlike other types of resins, silicone resins can withstand much higher temperatures without breaking down, making them ideal for environments that involve constant exposure to heat.
- **Versatility:** Silicone resins can be formulated to create various types of finishes, from glossy to matte, and they can be used for a wide range of applications across industries.
- **Ease of Application:** These resins are often easier to apply than other high-temperature-resistant coatings, as they flow smoothly, adhere well, and do not require complex curing processes.

### Conclusion:

**Silicone-based resins** are a critical component of **high-temperature resistant paints**. They offer unparalleled resistance to extreme heat, chemical exposure, and UV degradation, making them ideal for protecting equipment, vehicles, and structures exposed to elevated temperatures. Whether used in **automotive exhaust systems, industrial machinery, or aerospace applications**, these paints provide long-lasting performance and protection in demanding environments.

Please contact our sales representative to exchange more details of our products whether they can be part of your new product development for specific market demands.



For more information of product



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