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Technical Data Sheet

# SYLGARD™ 577 Primerless Silicone Adhesive

Gray, flowable adhesive with high tensile strength and good flame resistance, MIL-PRF-23586F tested

## Features & Benefits

- Flowable
- Heat cure
- High tensile strength
- Long working time after mixing
- UL 94 V-0 flammability rating
- Rapid, versatile cure processing controlled by temperature
- Able to flow, fill or self-leveling after dispensing
- Long working time reduces need for equipment purging/clean-up
- Can be considered for uses requiring added flame resistance

## Composition

- Two-part
- 10 to 1 mix ratio
- Polydimethylsiloxane adhesive

## Applications

SYLGARD™ 577 Primerless Silicone Adhesive is suitable for:

- Sealing lids and housings
- Attaching baseplates
- Gasketing
- Connector sealing

## Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

| Property | Unit | Result |
|---|---|---|
| One Part or Two Part | | Two |
| Color | | Gray |
| Viscosity (Base) | cP<br>Pa-sec | 121,500<br>121.5 |
| Viscosity (Curing Agent) | cP<br>Pa-sec | 1300<br>1.3 |
| Viscosity (Mixed) | cP<br>Pa-sec | 98,000<br>98 |
| Working Time at 25°C (Pot Life - Hours) | hr | 22 |


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## Typical Properties (Cont.)

| Property | Unit | Result |
|---|---|---|
| Heat Cure Time at 125°C | minutes | 60 |
| Specific Gravity (Cured) | | 1.29 |
| Durometer Shore A | | 60 |
| Tensile Strength | psi<br>MPa<br>kg/cm$^2$ | 988<br>6.8<br>68 |
| Elongation | | 224 |
| Unprimed Adhesion - Lap Shear to Aluminum | psi<br>MPa<br>N/cm$^2$ | 984<br>6.8<br>678 |
| Dielectric Strength | volts/mil<br>kV/mm | 500<br>19 |
| Volume Resistivity | Ohm-cm | 1.3E+15 |
| Dielectric Constant at 100 Hz | | 2.83 |
| Dielectric Constant at 100 kHz | | 2.78 |
| Dissipation Factor at 100 Hz | | 0.00065 |
| Dissipation Factor at 100 kHz | | < 0.0004 |
| UL Flammability Classification | NA | 94 V-0 |
| Mil Specification | NA | PRF-23586F |

## Description

Dow two-part heat cure (addition-curing) adhesives cure rate is rapidly accelerated with heat (see cure schedules in table) and an optimum cure schedule will balance processing performance and costs. For thicker sections or if voiding is observed the use of a 30-minute pre-cure at 70°C (158°F) or the use of an adhesive with low-void technology may reduce voids. Addition-cure silicones are formulated with all necessary ingredients for cure and there are no by-products generated during the cure process. Deep-section or confined cures are possible as cure reactions progress evenly throughout the material. These adhesives generally have long working times so users can enjoy the greatest manufacturing flexibility and reduce waste. Dow silicone adhesives retain their original physical and electrical properties over a broad range of operating conditions which enhance the reliability of and service life of PCB system assemblies.

## Mixing And De-Airing

The 10:1 mix ratio these products are supplied in gives one latitude to tune the modulus and hardness for specific application needs and production lines. In most cases de-airing is not required. When thoroughly blended, the Part A and B liquid mixture should have a uniform appearance. The presence of light colored streaks or marbling indicates inadequate mixing and will result in incomplete cure. For fast-curing adhesives automated mix and dispense equipment should be utilized. In applications sensitive to air entrapment, de-airing with 28 to 30 inches Hg vacuum is required.

## Adhesion

In general, increasing the cure temperature and/or cure time will improve the ultimate adhesion. Dow silicone adhesives are specially formulated to provide unprimed adhesion to many reactive metals, ceramics and glass, as well as to selected laminates, resins and plastics. However, good adhesion cannot be expected on non-reactive metal substrates or non-reactive plastic surfaces such as Teflon®, polyethylene or polypropylene.

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## Adhesion (Cont.)

Special surface treatments such as chemical etching or plasma treatment can sometimes provide a reactive surface and promote adhesion to these types of substrates. Dow primers can be used to increase the chemical activity on difficult substrates. Poor adhesion may be experienced on plastic or rubber substrates that are highly plasticized, because the mobile plasticizers act as release agents. Small-scale laboratory evaluation of all substrates is recommended before production trials are made.

## Compatibility

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of addition cure adhesives. Most notable of these include: organotin and other organometallic compounds, silicone rubber containing organotin catalyst, sulfur, polysulfides, polysulfones or other sulfur containing materials, unsaturated hydrocarbon plasitcizers, and some solder flux residues. If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a small scale compatibility test be run to ascertain suitability in a given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

## Preparing Surfaces

All surfaces should be thoroughly cleaned and/or degreased with Dow OS fluids, naphtha, mineral spirits, methyl ethyl ketone (MEK) or other suitable solvent. Solvents such as acetone or isopropyl alcohol (IPA) do not tend to remove oils well, and any oils remaining on the surface may interfere with adhesion. Light surface abrasion is recommended whenever possible, because it promotes good cleaning and increases the surface area for bonding. A final surface wipe with acetone or IPA is also useful. Some cleaning techniques may provide better results than others; users should determine the best techniques for their particular applications.

## Substrate Testing

Due to the wide variety of substrate types and differences in substrate surface conditions, general statements on adhesion and bond strength are impossible. To ensure maximum bond strength on a particular substrate, cohesive failure of the product in a lap shear or similar test is needed to ensure compatibility of the adhesive with the substrate being considered. Also, this test can be used to determine minimum cure time or to detect the presence of surface contaminants such as mold release agents, oils, greases and oxide films.

## Useful Temperature Ranges

For most uses, silicone adhesives should be operational over a temperature range of -45 to 200°C (-49 to 392°F) for long periods of time. However, at both the low and high temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations. For low-temperature performance, thermal cycling to conditions such as -55°C (-67°F) may be possible but performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history. At the high-temperature end, the durability of the cured silicone elastomer is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

## Solvent Exposure

The silicone adhesive discussed in this literature is intended only to survive splash or intermittent exposures. It is not suited for continuous solvent or fuel exposure. Testing should be done to confirm performance of the adhesives under these conditions.

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| Packaging Information | Multiple packaging sizes are available for this product. |
| Usable Life And Storage | The product should be stored in its original packaging with the cover tightly attached to avoid any contamination. Store in accordance with any special instructions listed on the product label. The product should be used by its Use Before date as indicated on the product label. |
| Handling Precautions | PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT WWW.CONSUMER.DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE. |
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