Dow Corning® brand Primers, Prime Coats and Adhesion Promoters

Enhancing Adhesion of Silicones

Many silicones are designed to adhere well to a wide variety of substrates, but some silicone products and some surfaces require adhesion enhancement to achieve adequate bond strength. Surface treatments to improve adhesion can range from simple cleaning to more complex etching, and may require the application of reactive silane coupling agents to achieve optimal bonding.

Dow Corning® brand primers, prime coats and adhesion promoters are dilute solutions of silane coupling agents and other active ingredients. The surface reactive components typically must be applied in a very thin layer for best bonding. The solvents used in these products serve to deliver the active ingredients in a thin, uniform coating, enhance surface cleaning, and in some cases, aid in the penetration of the active ingredients into the bonding surface.

SURFACE PREPARATION

The active ingredients must thoroughly wet-out and coat the bonding surfaces. Mild abrasion, solvent cleaning, plasma, corona discharge and other pre-treatments have been used to clean and enhance surface reactivity to bonding. In general, light surface abrasion is recommended whenever possible, because it promotes good cleaning and increases the surface area for bonding. Surfaces should be cleaned and / or degreased with *Dow Corning*® brand OS Fluids, naphtha, mineral spirits, methyl ethyl ketone (MEK) or other suitable solvents that will remove oils and other contaminants that may be present. A final surface wipe with acetone or IPA may also be helpful. Different cleaning techniques may give better results than others. Users should determine the best technique for their applications. Note: Because *Dow Corning*®1593 Cleaner / Primer has been formulated to both clean and prime in one step, no additional solvent cleaning may be necessary for most surfaces. For especially difficult-to-bond-to surfaces, it may be necessary to increase the surface reactivity by chemical etchants or oxidizers, or by exposing the surface to UV, corona, plasma or flame sources. Allow solvents to completely evaporate before applying the primer.

Primers, Prime Coats and Adhesion Promoters

Type – Dilute solutions of silane coupling agents and other active ingredients

Physical Form – Liquid

Special Properties – Enhance the adhesion and bonding of silicones to a variety of substrates

APPLICATION

These products should be applied in a very light, even coat by wiping, dipping or spraying. Excess material should be wiped off to avoid over-application, which generally appears as a white, chalky surface. When dip or spray coating, diluting by a factor of 2 to 4 with additional solvent may avoid excessive build-up. When applying *Dow Corning* 1593 Cleaner / Primer with a clean cloth, vigorously wipe the bonding surface, rotating the cloth to expose fresh product and to remove any contaminants from the surface. Apply additional cleaner / primer to the cloth every 3 to 5 minutes to ensure fresh material can react with the substrate.

CURE CONDITIONS

These products require moisture in the air to cure, and are generally cured at room temperature and in a range of 20 to 90 percent relative humidity for 1 to 2 hours. Low humidity and / or low temperature conditions require longer cure times. Mild heat acceleration of the cure rate may be possible but temperatures above 60°C (140°F) are not recommended. During application, the carrier solvent typically evaporates off quickly (except in the case of *Dow Corning* 1593 Cleaner / Primer, where the solvent does not evaporate at all), allowing the active ingredients to begin to react with atmospheric moisture and bonding surfaces. For optimal bonding, different cure times may be required for different temperature and humidity conditions. Users should determine the best cure schedule and conditions for their applications.

Dow Corning® brand Primer, Prime Coat or Adhesion Promoter	Special Properties	Substrates	Compatible Silicones
1200 Clear			All
P5200 Clear	Low-VOC alternative to 1200 Clear	Most metals, glass, ceramics, masonry, wood, fabrics and some plastics	
1200 Red	Colored for easier identification		
P5200 Red	Low-VOC alternative to 1200 Red		
1593	Low-VOC, non-flammable cleaner / primer alternative to 1200 Clear	Most metals, glass and ceramics	
1204			All one-part alcohol cure and two-part condensation cure
P5204	Low-VOC alternative to 1204		All one-part alcohol cure and two-part condensation cure except 93-076
S-2260		Most metals, glass, ceramics and fabrics	Peroxide cure
A-4040			Fluorosilicone peroxide cures
1201		Most metals, glass	3110, 3112, 3120
1205	Film forming	Most plastics, ceramics, composites, masonry	All
3-6060	Improves inhibition resistance for addition cure products	Most plastics, ceramics, composites and metals	Two-part addition cure and peroxide cure
92-023		Most metals, glass and ceramics	Non-pigmented two-part addition cure
Sylgard® Prime Coat			

The desired silicone elastomer should be applied after the primer, prime coat or adhesion promoter has fully cured.

APPLYING ADHESIVE

Keeping the primed surface clean may allow application of the silicone elastomer to be delayed, but in some cases lower adhesion can result if too much time elapses; users are encouraged to determine the optimal cure conditions for their specific applications and the effects of any hold times imposed between applications of the primer and elastomer. In some cases it may be recommended to reprime surfaces if 8 to 24 hours elapse before the silicone elastomer can be applied.

STORAGE AND SHELF LIFE

Shelf life is indicated by the "Use Before" date found on the product label. For best results, *Dow Corning* primers, prime coats and adhesion promoters should be stored below 32°C (90°F). Special precautions must be taken to prevent moisture from contacting these materials before use. Containers should be kept tightly closed and head or air space minimized. Partially filled containers should be purged with dry air or other gases such as nitrogen to maximize shelf life. Small amounts for immediate use should be poured into clean, dry containers and discarded when finished.

Material should not be used once it takes on a milky appearance or a large amount of white precipitate is observed, indicating moisture contamination. Repeated opening of the container can cause a small amount of white precipitate to form inside the container cap area, which does not affect the bulk material.

LIMITATIONS

These products are neither tested nor represented as suitable for medical or pharmaceutical uses.

PACKAGING

In general, *Dow Corning* primers, prime coats and adhesion promoters are supplied in nominal 1-gallon (3.8-L) and 13.5-fl oz (400-mL) or 1-pint (473-mL) containers, net volume. Not all products may be available in all packages and some additional packages may be available for certain products.

TYPICAL PROPERTIES
These values are not intended for use in preparing specifications.

Dow Corning ® brand Primer, Prime Coat or Adhesion Promoter	Color	Solvent	Shelf Life from Date of Manufacture, months	Flash Point,[1] °C (°F)	Volatile Organic Content (VOC), grams/liter[2]
1200 Clear	Clear	Naphtha	18	13 (55)	748
P5200 Clear	Clear	OS-20[3]	18	31 (88)	110 (476)
1200 Red	Red	Naphtha	18	13 (55)	774
P5200 Red	Red	OS-20[3]	18	31 (88)	110 (476)
1593	Clear	*200* ® Fluid, 10 cSt[4]	12	68 (154)	51
1204	Clear	Naphtha	12	8 (46)	774
P5204	Clear	OS-20[3]	12	14 (57)	205 (503)
S-2260	Light straw	Naphtha	24	9 (48)	729
A-4040	Clear to light straw	Naphtha	24	8 (46)	720
1201	Light yellow	Acetone/toluene	12	-20 (-4)	138 (467)
1205	Clear	Mixture	12	13 (55)	861
3-6060	Clear to yellow	MIBK	12	15 (59)	780
92-023	Clear	Heptane	18	-13 (9)	678
Sylgard ® Prime Coat	Clear	Heptane	18	-13 (9)	687

[1]Closed cup, tested to Dow Corning Corporate Test Method 0917, based on ASTM D 3278.

[2]The lower VOC value is for states and air quality management districts that have recognized the solvent as VOC exempt.

[3]*Dow Corning* ® OS-20 is a 1-cSt ozone-safe volatile methylsiloxane fluid.

[4]*200* Fluid, 10 cSt, from Dow Corning, is a methylsiloxane fluid that does not evaporate or dry, but instead is absorbed into the silicone elastomer when it is applied.

Specification Writers: Please obtain copies of the Dow Corning Sales Specifications for these products and use them as a basis for your specifications. They may be obtained from any Dow Corning Sales Office, or from Dow Corning Customer Service in Midland, MI. Call (517) 496-6000.

SAFE HANDLING INFORMATION

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY WRITING TO DOW CORNING CUSTOMER SERVICE, OR BY CALLING (517) 496-6000.

WARRANTY INFORMATION – PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Dow Corning's products are safe, effective, and fully satisfactory for the intended end use.

Dow Corning's sole warranty is that the product will meet the Dow Corning sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. Dow Corning specifically disclaims any other express or implied warranty of fitness for a particular purpose or merchantability. Unless Dow Corning provides you with a specific, duly signed endorsement of fitness for use, Dow Corning disclaims liability for any incidental or consequential damages. Suggestions of use shall not be taken as inducements to infringe any patent.

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