

Silicone Primers

Priming of surfaces to achieve improved adhesion has been employed in industry for many years and is of particular importance in the use of silicone adhesive sealants and 2-part RTV silicone rubbers. Silicone adhesives and some 2-Part rubbers have built in adhesion promoters; with these products the use of a primer will only be required for use with substrates that are exceptionally difficult to bond to. Most 2-Part silicone rubbers will not have any adhesive qualities and the use of a primer will be essential if adhesion is required (see individual product data sheets).

Due to the large variety of substrates any recommendations regarding adhesion and the use of primers can only be taken as a guide, we always recommend thorough testing for adhesion of any system prior to production.

Silicone primers are normally supplied in the form of quick drying solvent solutions and are available in bottle or can packages.

A good primer must have certain properties and sometimes, perform several functions:

- It must be easy to apply
- It must dry quickly to a uniform dry film (say in less than 30 minutes)
- The improvement in adhesion must be demonstrable
- Adhesion to the substrate should not be affected over the temperature range of the rubber

Application Methods

It is essential that a uniform, thin coating of the selected primer is applied and allowed to dry completely before bring it into contact with the silicone elastomer system.

All silicone primers are supplied as solutions in a wide variety of organic solvents.

Some of these solvents present a greater hazard to the user than others.

Full details of the solvents and any other potentially hazardous components are given in the individual product Material Safety Data Sheets, available on request.

NOTE: Always handle primers in well-ventilated areas away from any potential sources of ignition.

1. Select the primer of choice or contact Technical Service for advice on the best primer for a specific application.
2. Degrease all surfaces to which the primer and silicone rubber are to be applied. Care should be taken to avoid high boiling point solvent fractions, which often leave undesirable residues.
3. Allow the surface to dry or wipe dry with a clean, felt-free rag.
4. If applying by brush, apply sparingly and clean brushes in a suitable solvent after use.
5. Apply primer to the degreased dry surface to be bonded using single light applications.
6. If possible, avoid multiple applications – a thin uniform film of primer is more effective.
7. After sufficient surface coverage has been achieved, close the primer container.

8. Leave primed articles to dry and cure for between 20 and 60 minutes depending on ambient temperature conditions (the use of elevated temperatures is not recommended). See product data for details.
9. Apply adhesive as soon as possible after the primer has dried. Some primers will continue to react with moisture in the atmosphere and will lose their ability to chemically bond to the adhesive if left for more than 24 hrs.
10. If using a one-component silicone sealant, apply it to one primed surface and immediately bring the other primed (or un-primed if desired) surface into contact. Apply gentle pressure to attain intimate contact, whilst leaving sufficient sealant (normally a minimum of 1mm) to produce a good joint.
10. If, for example, adhesion between two substrates employs a 2-part silicone rubber, catalyse and degas the chosen rubber during the primer drying cycle and then pour the rubber in the normal manner

Silicones Primers

The list below details many of the standard primers. Before selecting a material careful consideration should be given to the relevant Technical Data Sheet.

Name	Type	For use with	Recommended Substrates
Silcoset Primer	Resin based	1&2-Part condensation cure RTV's	<ul style="list-style-type: none"> • Most metals • Glass • Plastics • Composites • Silicone elastomers
OP2N-1	Resin based	1-Part condensation cure RTV's	<ul style="list-style-type: none"> • Plastics • Natural & synthetic rubber • Polyester • Nylon fabrics
No 3	Silicone based	1&2-Part addition cure silicone rubbers.	<ul style="list-style-type: none"> • Most metals • Natural & synthetic rubber • Polyester • Nylon fabrics • Non-porous surfaces
No 6	Silicone based	1-Part condensation cure RTV's	<ul style="list-style-type: none"> • Most metals


NOTES

Primer No 3 has also been found to act as a barrier to substrates that usually cause inhibition to platinum or addition cure systems.

Substrate Adhesion Guide

The following chart provides information regarding the adhesion of silicones to most common substrates. First select your substrate and then the type of adhesive or encapsulant being used. The Chart below will show the level of adhesion expected without primer and which primer to use if the result is less than excellent. If the adhesion is graded as good this will probably be sufficient in most cases but should you wish to improve adhesion, then follow the recommendation.

Please note this is a general guide to help in the selection process and cannot take into account all product and substrate variations. Customers should always conduct their own adhesion test.

	1-Part Adhesive Sealants										2-Part Potting & Encapsulation	
	Acetoxy Cure		Oxime Cure		Alkoxy/Methoxy Cure		Acetone		Addition Heat Cured		2-Part Platinum Addition	2-Part Tin Condensation
Substrate	Primerless	Primer	Primerless	Primer	Primerless	Primer	Primerless	Primer	Primerless	Primer	Primer	Primer
ABS	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Aluminium	Good	No 6	Good	No 6	Fair	No 6	Excellent	N/A	>150°C	No 3	No 3	Silcoset Primer
Brass	Do not use	Do not use	Do not use	Do not use	Excellent	N/A	Excellent	N/A	>150°C	No 3	No 3	Silcoset Primer
Bronze	Do not use	Do not use	Do not use	Do not use	Excellent	N/A	Excellent	N/A	>150°C	No 3	No 3	Silcoset Primer
Ceramic tiles	Excellent	N/A	Excellent	N/A	Excellent	N/A	Excellent	N/A	>150°C	No 3	No 3	Silcoset Primer
Copper	Do not use	Do not use	Do not use	Do not use	Excellent	N/A	Excellent	No 6	>150°C	No 3	No 3	Silcoset Primer
Corona treated Polypropylene	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	Do not use	No 3	Silcoset Primer
Fibreglass	Excellent	N/A	Excellent	N/A	Excellent	N/A	Excellent	N/A	>150°C	No 3	No 3	Silcoset Primer
Fluoroplastics	Fair	OP2N-1	Excellent	N/A	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Glass	Excellent	N/A	Excellent	N/A	Excellent	N/A	Excellent	N/A	>150°C	No 3	None	None
Iron	Do not use	Do not use	Good	No 6	Good	No 6	Good	No 6	>150°C	No 3	No 3	Silcoset Primer
Lead	Do not use	Do not use	Good	No 6	Good	No 6	Good	No 6	>150°C	No 3	No 3	Silcoset Primer
Masonry (Porous)	Do not use	Do not use	Good	No 4	Good	No 4	Good	No 4	>150°C	None	None	Silcoset Primer
Neoprene	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Nylon	Fair	OP2N-1	Good	OP2N-1	Fair	OP2N-1	Excellent	N/A	Do not use	No 3	No 3	Silcoset Primer
Perspex	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Fair	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Polycarbonate	Fair	OP2N-1	Good	OP2N-1	Good	None	Do not use	Do not use	145°C Max	No 3	No 3	Silcoset Primer
Polyester	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	>150°C	No 3	No 3	Silcoset Primer
Polyethylene	No Bond	No Bond	No Bond	No Bond	No Bond	No Bond	No Bond	No Bond	Do not use	Do not use	No Bond	No Bond
Polystyrene	Good	Do not use	Excellent	N/A	Good	Do not use	No Bond	No Bond	>150°C	No 3	No 3	Silcoset Primer
Polysulphide	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Polyurethane	Fair	OP2N-1	Excellent	N/A	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Printed Circuit Boards	Do not use	None	Not advisable	Not advisable	Excellent	N/A	Good	OP2N-1	>150°C	No 3	No 3	Silcoset Primer
PVC	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
PVF	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Silicone	Excellent	N/A	Excellent	N/A	Excellent	N/A	Excellent	N/A	>90	N/A	None	None
Stainless steel	Good	No 6	Excellent	N/A	Good	No 6	Excellent	N/A	>150°C	No 3	No 3	Silcoset Primer
Steel	Do not use	None	Good	No 6	Good	No 6	Good	No 6	>150°C	No 3	No 3	Silcoset Primer
Synthetic rubbers (Butyl)	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Synthetic rubbers (SBR, Nitrile, EPDM)	Fair	OP2N-1	Good	OP2N-1	Good	OP2N-1	Good	OP2N-1	Do not use	No 3	No 3	Silcoset Primer
Untreated wood	Good		Good		Good		Good		Do not use	Do not use	No bond	No Bond
Varnished wood	Fair	Do not use	Good	Do not use	Good	Do not use	Good	Do not use	Do not use	Do not use	Do not use	Do not use