

WACKER

CREATING TOMORROW'S SOLUTIONS

ELASTOSIL®

PRODUCT GUIDE | PRIMER | SILICONE RUBBER

EXCELLENT SILICONE SEALANTS: PRIMERS

ELASTOSIL® SILICONE RUBBER OFFERS EXCELLENT ADHESION AND COMBINES PERFECTLY WITH PRIMERS

In the kitchen areas of the new WACKER House in Munich, ELASTOSIL® eco seals work surfaces and metal claddings cleanly and reliably. The joints were prepared with a primer in advance to ensure optimum adhesion of the silicone sealant.



ELASTOSIL® is a registered trademark of Wacker Chemie AG.

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IS PRIMING YOUR PRIME CONSIDERATION?

ELASTOSIL® RTV-1 silicone rubber adheres to a wide range of substrates, including those which have not been primed. Sometimes, however, priming is advisable and even essential for perfect results: for example, when the application involves fluctuating temperatures, damp, tensile or compressive stress, shear, or when the surface is porous.

This comprehensive product guide features four widely used primers with detailed instructions for use. The grade you choose will depend on the chemistry and the surface properties of the substrate and will require some preliminary testing by you.

Note
Should you have any queries, feel free to call our technical service staff, who will gladly assist you.



Metal, natural stone or concrete are substrate materials to which sealants often do not adhere properly. Joints should therefore be coated with a primer before the sealant is applied.

THE “ABC” OF PROCESSING PRIMERS



Make the right preparations

Substrates must be thoroughly cleaned to ensure proper adhesion of ELASTOSIL® RTV-1 silicone rubber. Therefore, all surfaces to be primed must be dry, clean and free of dust, dirt, rust, oil, etc. Porous surfaces should be brushed, rubbed down or sandblasted and smooth surfaces should be mechanically roughened.

Lubricants and release agents are often present on plastic surfaces. They should be removed by rubbing with steel wool. This will also increase the surface area.

Greases, oils, waxes and other substances that might impair adhesion to nonporous substrates can be removed with highly volatile organic solvents¹ that evaporate completely.

Use methyl ethyl ketone¹ (MEK) to clean metals and nonporous silicate materials, such as glass, tile, porcelain and ceramics. Ethanol¹ is best for cleaning plastics.



Squirt the MEK or ethanol onto a clean, white, lint-free cotton cloth and wipe down the surface. Before the solvent evaporates, use a second clean cloth to rub the surface dry.

Certain plastics, such as polyolefins (e.g. polyethylene, polypropylene and Teflon®), require special treatment before ELASTOSIL® RTV-1 silicone rubber will adhere to them. Please contact our service department about this.

ELASTOSIL® RTV-1 silicone rubber usually does not adhere properly to plastics containing plasticizers and other readily migrating or exuding organic additives, or to bituminous or tarry surfaces, even if these have been carefully primed. The reason is that these substances interfere with the adhesion of the primer to the surface and penetrate into the primer film, where they can act as release agents. They may also discolor the silicone rubber.

How to apply the primer and rubber

Unless otherwise specified, apply a thin, bubble-free coat of primer to the cleaned surface, e.g. by brushing, spraying or dipping.

The absorbency of the surface will determine the thickness of the primer coat. Highly porous surfaces should be treated repeatedly until the coat is intact and uniform.

The drying times (flash-off times) apply to room temperature and must be observed. Otherwise, the ELASTOSIL® RTV-1 silicone rubber may not adhere properly.



Drying times vary with the ambient temperature and the type of solvent contained in the primer.

Apply the silicone sealant and adhesive as soon as possible after the drying time has elapsed, but always on the same day. The longer the delay, the greater is the risk of contamination, which will weaken the adhesion of the sealant to the primed surface.

Additional intermediate steps

In general, cured ELASTOSIL® RTV-1 silicone rubber adheres well to the recommended primer. However, it is sometimes necessary to bake the primer before applying the rubber.

Note that the primer will form an inflexible resin film. When used in conjunction with readily deformed substrates, such as silicone rubber, natural rubber and

synthetic rubber, or with flexible substrates such as plastics, the primer film will be deformed. This will cause the film to become brittle and flake off and adhesion will suffer. Therefore, materials to be bonded or joined should be rigid if they are to be primed with such resin solutions. Unlike the primer, the silicone sealant can of course be deformed to the full extent of the specified limits because it is permanently elastic.

Best used before

WACKER primers have a shelf life of at least 6 months when stored in unopened, original containers at 25 °C. The shelf life of each batch is printed on the product label. Storage beyond the date specified on the label does not necessarily mean that the product is no longer usable. In this case, however, the properties required for the intended use must be checked for quality assurance reasons.

For your safety

Detailed safety information can be found in the relevant safety data sheets. These are included with our products on delivery. However, you may also request them at any time from our sales subsidiaries.

QUICK-DECISION GUIDE



The products in our primers portfolio for silicone rubber serve as adhesion promoters between silicone elastomers and other substrates, such as metal, natural stone and concrete. They are solvent-based and contain a mixture of reactive silanes and siloxanes. Application of a silicone rubber onto the primed substrate and subsequent vulcanization will then result in a strong bond between the silicone rubber and the substrate.

WACKER® PRIMER G 790 TOLUENE FREE

This primer forms a silicone-resin film and is unsuitable for highly alkaline surfaces.

WACKER® PRIMER G 790 TOLUENE FREE improves adhesion of ELASTOSIL® RTV-1 silicone rubber to steel, many plastics, natural stone and wood surfaces that may have been surface-treated. Brief baking of the substrate (where feasible) at 120 to 150 °C after the primer film has formed will further enhance adhesion. Baking will improve adhesion to metals, in particular. It also increases the primer's resistance to silicone rubbers with a high solvent content.

The application rate for WACKER® PRIMER G 790 TOLUENE FREE is 30 – 50 g/m².

WACKER® PRIMER G 783

WACKER® PRIMER G 783 is a one-component synthetic resin primer consisting of an acrylate-silicone copolymer solution in toluene.

It is suitable for porous, highly absorbent surfaces, which may also be alkaline. An additional benefit is that the resin film will not emulsify even if the primed surfaces are exposed to continuous wetting.

WACKER® PRIMER G 786

WACKER® PRIMER G 786 is a one-component synthetic resin primer dissolved in xylene and is recommended in conjunction with ELASTOSIL® RTV1 silicone rubber for porous, absorbent, neutral and alkaline surfaces, such as concrete, aerated concrete, fiber-reinforced concrete and brick.

In most cases, WACKER® PRIMER G 786 can also be used as a substitute for toluene WACKER® PRIMER G 783, if desired.

WACKER® PRIMER FDX

WACKER® PRIMER FDX is a neutral one-component silicone resin primer. It is mainly used for construction joints in building structures, provided that the substrate is not too alkaline. Highly absorbent surfaces should be coated repeatedly until the resin film is visible.

WACKER® PRIMER FDX is also often used as an adhesion promoter and for corrosion protection when metal parts are embedded in or bonded together with ELASTOSIL® RTV-1 silicone rubber. It can be baked and is suitable for movement joints between porous substrates and metals.

Note

The application rates for WACKER® PRIMER G 783, PRIMER G 786 and PRIMER FDX depend on the absorbency of the substrate, but range from 100 to 300 g/m².

CHOOSE THE RIGHT PRIMER

Properties of WACKER® primers

Property	PRIMER G 790 TF	PRIMER G 783	PRIMER G 786	PRIMER FDX
Flash-off time at room temperature [min]	60	60	60	60
Active agent content [%]	39	62	62	54
Density [g/cm ³] DIN 51757	0.76 (23 °C)	0.95 (25 °C)	0.94 (20 °C)	0.90 (20 °C)
Color	Colorless to yellowish	Colorless to yellowish	Colorless to yellowish	Colorless to yellowish
Solvent	Isopar E	Toluene	Xylene	Acetone, xylene
Flash point [°C] DIN 51755	2	8	6	-18
Ignition temperature [°C] DIN 51794	370	420	505	469

More detailed information on substance data and ingredients can be found in our safety data sheets.

¹ Please consult the corresponding safety data sheet about this.

PRIMERS TO USE WITH ACETOXY AND ALKOXY SILICONE SEALANTS

Adhesion matrix: primer and curing-technology combinations for different substrates						
	Acetoxy, transparent	Alkoxy, transparent, 100% silicone	Alkoxy, transparent, extended (with organic plasticizer)	Alkoxy, transparent, natural stone	Alkoxy, filled, 100% silicone, tin catalyzed	Alkoxy, filled, 100% silicone, titanium catalyzed
Metal						
Aluminum, anodized (E6EV1)	FDX, G 783, G 786	n.n.	n.n.	n.n.	n.n.	n.n.
Aluminum, automotive alloy 6016	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
Aluminum, unanodized (Int. 5005A)	n.n.	n.n.	n.n.	FDX, G 783, G 786, G 790 TF	n.n.	n.n.
Copper	n.n.	FDX, G 783, G 786	n.n.	FDX, G 783, G 786	FDX, G 783	n.n.
Brass	G 783, G 786	FDX, G 783, G 786	n.n.	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786	n.n.
Stainless steel	FDX, G 783, G 786, G 790 TF	n.n.	n.n.	FDX, G 783, G 786, G 790 TF	n.n.	n.n.
Steel DC04	FDX, G 790 TF	n.n.	n.n.	FDX, G 783, G 786, G 790 TF	n.n.	n.n.
Steel, hot-dip galvanized	G 786, G 790 TF	n.n.	n.n.	n.n.	n.n.	n.n.
Zinc	G 783	n.n.	n.n.	n.n.	n.n.	n.n.
Plastic						
Acrylonitrile-butadiene-styrene (ABS)	FDX, G 786	G 783, G 786	G 783, G 786	FDX, G 783, G 786	n.n.	n.n.
EPDM	Not applicable	G 790 TF	G 790 TF	Not applicable	FDX, G 790 TF	G 790 TF
Epoxide	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
PMMA Sanitary Perspex	FDX, G 786	FDX, G 783, G 786	FDX, G 783, G 786	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786	n.n.
PMMA XT	FDX, G 783, G 786	FDX, G 783, G 786	FDX, G 783, G 786	FDX, G 783, G 786	FDX, G 783, G 786	G 783, G 786
Polyamide	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
Polycarbonate Lexan	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
Polycarbonate Makrolon	n.n.	FDX, G 783, G 786, G 790 TF	n.n.	n.n.	n.n.	n.n.
Polyester	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
Polyethylene terephthalate (PET)	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
Polystyrene	FDX, G 783	FDX, G 783, G 786, G 790 TF	FDX, G 783	FDX, G 783, G 790 TF	n.n.	n.n.
Polyurethane	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
PVC Koemadur	FDX, G 786	FDX, G 783, G 786	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	G 783, G 786
PVC Röchling	G 786	n.n.	n.n.	n.n.	n.n.	n.n.
PVC Simona	n.n.	n.n.	n.n.	n.n.	n.n.	FDX, G 783, G 786, G 790 TF
PVC Soft	n.n.	G 783, G 786	n.n.	n.n.	FDX, G 783, G 786	n.n.
Resopal	n.n.	n.n.	n.n.	n.n.	n.n.	n.n.
Stone						
Carrara marble	G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	n.n.	n.n.	n.n.
Cement - ISO 13640 - Method 1	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	n.n.	G 783, G 786
Cement - ISO 13640 - Method 2	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	n.n.	n.n.	n.n.
Granite	n.n.	n.n.	n.n.	n.n.	FDX, G 783, G 790 TF	n.n.
Jura marble	n.n.	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786, G 790 TF
Poroton bricks	n.n.	n.n.	G 783, G 786	n.n.	FDX, G 783, G 790 TF	FDX, G 783, G 786, G 790 TF
Red sandstone	n.n.	FDX, G 783, G 786, G 790 TF	n.n.	FDX, G 783, G 786, G 790 TF	FDX, G 783, G 786	FDX, G 783, G 786
Wood						
Beech	FDX	FDX	G 786	FDX	Not applicable	Not applicable
Oak	FDX, G 783, G 786, G 790 TF	FDX, G 783	n.n.	FDX, G 783, G 786, G 790 TF	FDX	FDX
Pine	FDX	FDX, G 790 TF	FDX	Not applicable	G 790 TF	G 790 TF
Spruce	FDX, G 783, G 786, G 790 TF	n.n.	n.n.	FDX, G 783	n.n.	FDX, G 783, G 786
Teak	FDX, G 783, G 786, G 790 TF	n.n.	n.n.	n.n.	FDX, G 783, G 790 TF	FDX, G 783, G 786, G 790 TF
Other						
Glass	n.n.	n.n.	n.n.	FDX, G 783, G 786, G 790 TF	n.n.	n.n.
Tile	n.n.	n.n.	n.n.	n.n.	n.n.	FDX, G 783, G 786, G 790 TF

n.n. = No need to use a primer

Disclaimer: The table is based on standard test specimens as substrates as well as on WACKER products and sealants manufactured from WACKER raw materials. Each sealant formulation can vary in composition and must therefore be explicitly tested before use in conjunction with a primer. Possible incompatibilities between the substrate and sealant must also be checked. The primer does not protect against, e.g. discoloration or chemical attack.

PRIMER FOR SILICONE RUBBER AT A GLANCE



Function
Adhesion promoter



Chemistry
Reactive silanes and siloxanes



System
Solvent-based



Properties

- Bonding agent preferably used with addition-curing silicone rubbers
- Suitable for various coating techniques, like dipping, brushing or spraying

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598.1 en/03.25 replaces 598.1 e/08.03

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