



A Subsidiary of PETRONAS Chemicals Group

PRODUCT DATA SHEET

BRB Siloen[®] 694 Constructions

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BRB Siloen® 694

Masonry water repellent



Description

BRB Siloen® 694 is a reactive chemical based on octyl-trietoxysilane.

BRB Siloen® 694 is used in undiluted form as hydrophobic primer and impregnation of concrete, reinforced concrete, autoclaved aerated concrete as well: commercial buildings, parking decks, bridges. *BRB Siloen® 694* is also suitable as hydrophobic surface modifier of

mineral fillers.

Features

Produces a hydrophobic treatment that inhibits water absorption.

Helps dispersion of polar filler into non polar polymers (plastics, binders)

Benefits

- Small molecular weight providing excellent penetration into the substrates thus preventing water and chloride absorption
- Very good water repellency on concrete and aerated concrete.
- No loss in breathability
- Provides good adhesion of the paints
- Typically used undiluted but easily dissolvable in various organic solvents, low molecular weight cyclic PDMS and alcohols whenever necessary
- Applicable to many natural fillers and different polymers

Typical Data

Parameter	Unit	Value
Specific gravity at 20°C		0.875
Refractive index at 25°C		1.1415
Viscosity at 25°C	cSt	2
Flash Point	°C	65
Molecular Weight		276.6

How to Use

BRB Siloen® 694 will be hydrolyzed when combined with atmospheric moisture and/or with the water in the building material pores: reaction forms silanol reactive and release ethanol as by product. Silanol groups bonds to the mineral substrate while octyl functional group creates water repellent structure on the treated surface or enhances compatibility of the polar filler with non-polar organic polymers.

Potential Applications

Sealers for Construction Materials

BRB Siloen® 694 is excellent penetrating sealer to be used mainly with construction materials such as concrete and reinforced concrete. *BRB Siloen® 694* triethoxy groups reacts with moisture in the air and in the substrate in the presence of alkalis to produce hydroxyl group eliminating alcohol. Hydroxyl groups bond to the substrate whilst the alkyl chain will provide the water repellency.

Pores and capillaries are not clogged so substrate maintain its water-vapor permeability

BRB Siloen® 694 can be applied with low airless sprayer, roller or brush; apply in almost two coats wet on wet to ensure an even coating; **BRB Siloen® 694** might be also applied on damp surfaces even if dry ones are better to achieve the best penetration; in general moist content should not exceed 4%.

BRB Siloen® 694 should be applied on surfaces free of dirt, dust, oils, standing water and other contaminant; in case of soiled surfaces, clean first with steam or high pressure water being carefully to dry immediately after cleaning to prevent excessive moisture in the concrete.

BRB Siloen® 694 might be used on a fresh concrete, however is preferable to wait almost four weeks to let the concrete setting properly.

BRB Siloen® 694 is generally applies undiluted but, whenever necessary, it can be easily thinned with organic solvents e.g. mineral spirits or anhydrous (absolute) alcohols (ethanol and/or isopropanol). 20% or 40% **BRB Siloen® 694** in solvent are the most typical dilution rate. Solvent can be selected in function of the required evaporation rate; preliminary test are recommended because some silane/solvent blend might darken the surface.

Mineral Filler Treatment

In the case of siliceous mineral fillers, the mineral can be treated by slurring in the aqueous solution at 0.1-2 % **BRB Siloen® 694** based on filler weight. The dosage is up to particle size or surface area of fillers which is shown in the table I. The filler treatment recommendation is mixing with the silane at very high shear (with a Waring 2 or Welex 3 blender) as a 10 percent solution in isopropanol which ratio of solution is recommended at 1:8:1 of **BRB Siloen® 694**: isopropanol : water.

The hydrolysis rate of **BRB Siloen® 694** can be accelerated by pH adjustment. The addition of glacial acetic acid to pH 4-5 is recommended which pH 4.5 provides minimal condensation and long shelf life of solution.

After applying this silane, the mineral surface can be air-dried or dried briefly at 104 to 121°C (220-250°F) to effect complete condensation of silanol groups at the surface and to remove water and/or traces of ethanol from hydrolysis. Optimum application and drying conditions, such as time and temperature, should be determined for each application before use in a commercial process.

Table I. Silane dosage recommendation based on particle size of mineral fillers

Average particle size of fillers	Siloen® 694 dosage (% on filler wt.)
< 1 micron	1.50%
1 to 10 microns	1.00%
10 to 20 microns	0.75%
> 20 microns	0.10%

Storage Recommendation

Store in dry and cool (approx. 20-25 ° C) condition. After opening, avoid exposure to atmospheric moisture. Inert gas e.g. N₂ gas is required to purge into the container after opening to prevent hydrolysis by moisture.

A Product Safety Data Sheet should be obtained from your BRB office prior to use.

ATTENTION: Before handling, read product information, Product Safety Data Sheets and container labels for safe use, and any physical and/or health hazard information.

FOR MORE INFORMATION

Please contact

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