



A Subsidiary of PETRONAS Chemicals Group

PRODUCT DATA SHEET

BRB Silanil[®] 258

Silanes

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BRB Silanil® 258

3-Glycidoxypropyltrimethoxysilane



Description

BRB Silanil® 258 is an epoxy silane which contains reactive glycidoxy and methoxy groups. CAS# is specified as 2530-83-8.

Application

BRB Silanil® 258 possesses both organic and inorganic reactivity that allows it to react with or "couple" organic polymers and inorganic surfaces. This dual reactivity should be considered when using *BRB Silanil® 258* in specific applications. *BRB Silanil® 258* is particularly recommended as:

- Treatment on glass fiber for use in reinforced areas.
- Treatment on mineral surfaces for use in mineral filled plastics
- Adhesion promoter to enhance bonding of a polymer coating or adhesive to glass.

Features

- Organic and inorganic reactivity
- Improves adhesion
- Increases composite strength properties
- Increased composite wet and dry tensile strength and modulus
- Increased composite wet and dry flexural strength and modulus
- Increased wet and dry compressive strength

Benefits

- Better appearance without yellowing issue for top coats or clear adhesives
- Better filler wet-out and dispersion
- Lower viscosity of filled liquid resins
- Improved processability and mechanical properties of composites

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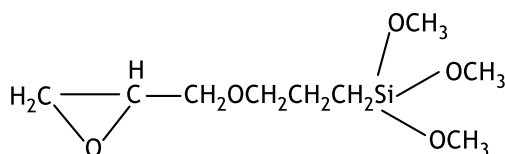


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Typical Data

Parameter	Unit	Value
Appearance		Clear liquid
Specific gravity at 25°C		1.07
Refractive index at 25°C		1.42
Flash Point, closed cup	°C	> 101
Purity	%	> 98
Molecular Weight		236
Viscosity at 25°C	cSt	3

Chemical Structure



How to Use

BRB Silani® 258 will be hydrolyzed when combined with water under to form silanol reactive group and released by product as methanol. Epoxy functional group will be grafted or interacted on organic polymer chain.

Potential Applications

Glass Fiber Size Process

BRB Silani® 258 can be applied in inorganic surfaces e.g. glass fibers and fabrics, as a dilute aqueous solution (0.1 to 0.5% silane concentration). Aqueous solutions are prepared by adjusting the pH of the water from 3.5 to 4.5 with about 0.1% acetic acid and then adding the silane and stirring. After adding the silane to the acidified water, it is necessary to stir the mixture for about 15 minutes before it hydrolyses and forms a clear homogeneous solution. Higher concentrations of *BRB Silani® 258* in water are not stable indefinitely and after standing several days may deposit an oily phase of condensed polysiloxane. *BRB Silani® 258* can also be applied as a solution in many common organic solvents. Solubility and stability of a specific organic solvent should, however, be verified before use in a commercial process.

Mineral Filler Treatment

In the case of mineral fillers, the mineral can be treated by mixing with the silane solution at very low shear for several minutes. The silane solution can be prepared by the mixture of 1:8:1 by volume of *BRB Silani® 258*: isopropanol : water and a few drops of acetic acid can be added to accelerate hydrolysis rate and coupling of silane on filler surface. After applying the silane, the glass or mineral surface should be dried briefly at 104°C to 121°C to effect condensation of silanol groups at the surface and to remove traces of methanol from hydrolysis of the methoxysilane. Optimum application and drying conditions such as time and temperature should be determined for each application prior to use in a commercial process.

Primer Solution

For use as a primer, 49.5 parts of *BRB Silani® 258* and 0.5 parts of an organic amine such as benzyldimethylamine (mixture A) are diluted with about 950 parts methanol, isopropanol or ether glycol. Alternatively, a prehydrolyzed primer may be prepared by adding 5 parts water and 1,000 parts of the above primer solution. In both cases, the primer solution is applied to a solid surface such as glass or metal and a polymer is heat pressed or cured on the surface.

Adhesion Promoter in Paints and Coatings

BRB Silanil® 258 can be added directly to a resin system without other additives or pigments at 0.5 to 2.0 ppm to promote unprimed adhesion. For waterborne resin, pH of resin is preferred near to neutral or pH of resin should be < 8.5 before adding silane.

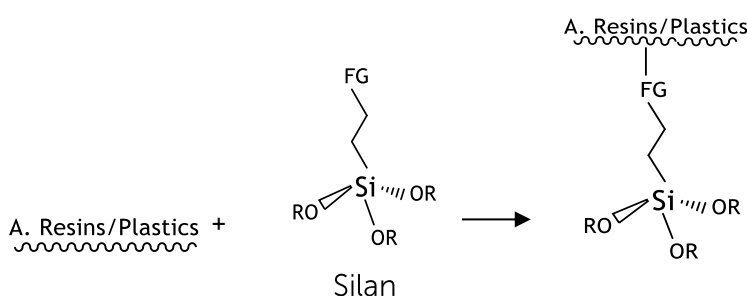
Induction time is needed after adding silane into resin which pH may be increased during induction time comparing to resin without silane. Typical induction time is 5-48 hours. Proper induction time is able to study by pH evolution curve/time until flat point which is pH evolution became stable. High shear and agitation is also able to accelerate the induction time.

Additives, Fillers and Pigments are recommended to add after induction time. If pH adjustment is required for final coatings, it is recommended to adjust pH after the induction time as well.

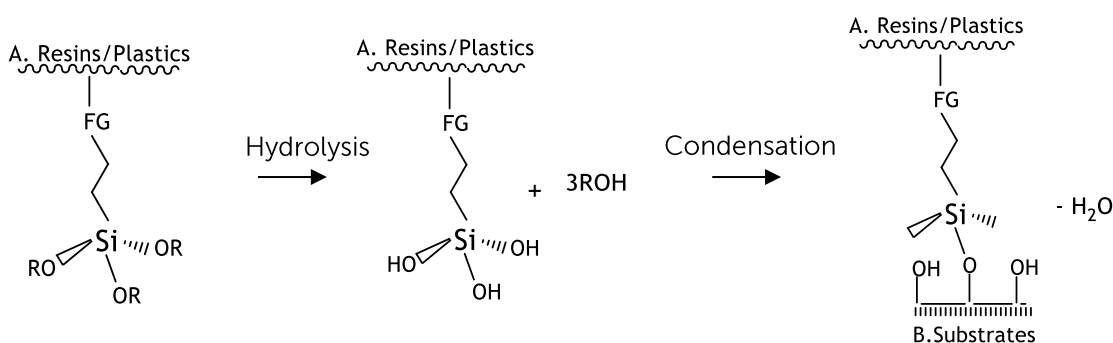
Example of silane as adhesion promoter in post addition process is illustrated below :

2 mechanisms are incurred, 1) functional group grafting and 2) hydrolysis and condensation.

1) Functional group grafting



2) Hydrolysis and condensation



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.

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FOR MORE INFORMATION

Please contact

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IMPORTANT NOTICE

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