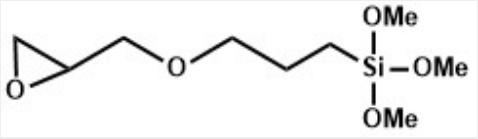
GENIOSIL® GPTM

Organofunctional Silanes

3-Glycidoxypropyltrimethoxysilane

GENIOSIL® GPTM is a clear, colorless liquid with a characteristic gasoline-like odor.

CAS No. 2530-83-8 | Empirical formula $C_9H_{20}O_5Si$ | Molecular weight 236.34



Properties

GENIOSIL® GPTM is an epoxyfunctional alkoxysilane. It´s a clear, colorless liquid with a characteristic odor. The silane hydrolyzes in the presence of moisture (methanol is released) to form silanols, which can then react with themselves to produce siloxanes. The epoxy group on GENIOSIL® GPTM can undergo a ring-opening reaction with nucleophiles such as alcohols and amines. An acidic or basic catalyst may be required. As a bifunctional, organic molecule with a silyl group, GENIOSIL® GPTM is able to function as a molecular bridge between inorganic and organic substrates.
The use of GENIOSIL® GPTM as a coupling agent in mineral-filled plastics improves filler dispersibility, reduces its sedimentation tendency and greatly lowers the resin's viscosity. In addition, it leads to higher filler loading and a marked increase in water (vapor) resistance, as well as resistance to acids and bases. As a component of adhesives and sealants, GENIOSIL® GPTM improves both adhesion to the substrate and mechanical properties such as flexural strength, tensile strength and modulus of elasticity.

Technical data

General Characteristics

Property	Condition	Value	Method
Boiling point	1013 hPa	248 °C	-
Density	20 °C	approx. 1.07 g/cm^3	DIN 51757
Flash point	-	122 °C	EN 22719
Ignition temperature	-	400 °C	DIN 51794
Purity	-	> 98.0 %	-
Refractive index	25 °C	1.427	DIN 51423

These figures are only intended as a guide and should not be used in preparing specifications.

Applications

- Adhesives
- Building & Construction Adhesives
- Chemical Industry
- Composites
- Industrial Adhesives
- Industrial Coatings
- Primers for Paints & Coatings
- Sealants
- Thermoplastics & Elastomers

Application details

1. General processing information:
GENIOSIL® GPTM is highly miscible with standard organic solvents, such as alcohols, hydrocarbons and acetone.
GENIOSIL® GPTM can be physically dissolved in neutral water to an extent upward of 5 wt %.
Much stronger homogeneous aqueous concentrations (up to 50% by weight) can be obtained by way of hydrolysis.
By incorporating a hydrolysis catalyst (e.g acetic acid), hydrolysis can be greatly accelerated at pH values of 3 to 4.
However, at pH values below 4, the epoxy ring may start to open.

2. GENIOSIL® GPTM as a surface modifier:
Fillers are treated either with pure GENIOSIL® GPTM or a solution thereof. It may be necessary to pretreat the substrate with water and/or a catalyst (e.g. ammonia). Subsequent binding of the treated filler, for example to epoxy resins, is preferably effected during the normal crosslinking process. In an alternative procedure referred to as blending, GENIOSIL® GPTM is added directly to the polymer - either before the filler is incorporated or at the same time. A prerequisite for the blending process is that GENIOSIL® GPTM and the polymer are compatible and that the resin and GENIOSIL® GPTM do not react prematurely.

3. GENIOSIL® GPTM as an adhesion promoter in formulations:
Used as a primer, GENIOSIL® GPTM is applied as an aqueous or organic solution to an inorganic substrate (e.g. metal or glass surfaces). Once GENIOSIL® GPTM has dried and bonded to the surface, an organic coating may be applied using a standard technique (e.g. spraying or knife coating).
In adhesives and sealants GENIOSIL® GPTM may be added to the formulation as an adhesion promoter. Processing is effected by means of standard mixing methods.

GENIOSIL® GPTM is mainly used in the treatment of inorganic fillers (e.g. glass, mineral and glass wools, ATH, kaolin, mica, metallic oxides) for various polymer types, such as epoxy resins, urethane, melamine resins, EPDM, and for polysulfides, and an additive or primer in coatings, paints, adhesives and sealants.

Packaging and storage

Packaging

Information on available container sizes is obtainable from WACKER subsidiaries.

Storage

The 'Best use before end' date of each batch is shown 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.

Safety notes

Comprehensive instructions are given in the corresponding Material Safety Data Sheets. They are available on request from WACKER subsidiaries or may be printed via WACKER web site http://www.wacker.com.

QR Code GENIOSIL® GPTM

For technical, quality or product safety questions, please contact:

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