

GENIOSIL® DAPDM

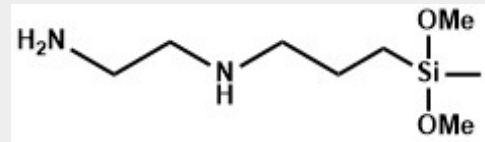


Organofunctional Silanes

N-(2-Aminoethyl)-3-aminopropylmethyldimethoxysilane

GENIOSIL® DAPDM is a clear, colorless liquid with a characteristic amine odor.

CAS No. 3069-29-2 | Empirical formula $C_8H_{22}N_2O_2Si$ | Molecular weight 206.4



Properties

GENIOSIL® DAPDM is an alkoxy silane with an aminofunctional group. Due to the nature of the amino group, this substance reacts as a strong base. The silane hydrolyzes autocatalytically in the presence of moisture (methanol is released) to form silanols, which then react with themselves to produce siloxanes or can bind to inorganic substrates. As a bifunctional amine, GENIOSIL® DAPDM can also interact with numerous organic polymers and thus function as a molecular bridge between organic and inorganic substrates. An additional bonus deriving from the dialkoxy silyl group in GENIOSIL® DAPDM is that VOC (volatile organic compound) emissions during hydrolysis reactions are reduced by one third compared to trialkoxy silanes.

GENIOSIL® DAPDM is mainly used in glass-fiber or glass-fabric reinforced polyesters and polyolefin molded parts, and as a surface modifier for fillers (e.g. glass or mineral wool, mica, talc, wollastonite, kaolin, cristobalite, metal oxides) and pigments for various plastics, including epoxy resins, polyamides, polyacrylates, polyurethanes, ethylene/vinyl acetate polymers and many others. Other important applications include its uses as a silicone-modifying building block for textile finishing and as an additive or primer for sealants, adhesives and coatings.

The use of GENIOSIL® DAPDM as an adhesion promoter in glass-fiber reinforced or filler-modified plastics increases filler dispersibility and improves numerous mechanical properties (e.g. flexural strength, tensile strength, modulus of elasticity) of the composites. Additionally, its use reduces the fillers' sedimentation tendency in the uncured polymer. The use of GENIOSIL® DAPDM in these materials also results in a markedly improved resistance to water (vapor) and corrosion. At the same time, the mechanical properties can be adjusted with even greater precision by means of the dialkoxy silyl group. Electrical properties, such as volume resistivity and the dielectric constant, are also positively influenced. As textile finishing agents, silicones modified with GENIOSIL® DAPDM result in amino-modified silicone fluids that are an ideal active ingredient in softener formulations for finishing fibers and textiles.

Technical data

General Characteristics

Property	Condition	Value	Method
Amine number	-	approx. 9.4 mmol/g	-
Density	25 °C	0.98 g/cm ³	-
Flash point	-	> 90 °C	-
Ignition temperature	-	280 °C	DIN 51794
Refractive index	25 °C	1.447	-

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

All the information provided is in accordance with the present state of our knowledge. Nonetheless, we disclaim any warranty or liability whatsoever and reserve the right, at any time, to effect technical alterations. The information provided, as well as the product's fitness for an intended application, should be checked by the buyer in preliminary trials. Contractual terms and conditions always take precedence. This disclaimer of warranty and liability also applies particularly in foreign countries with respect to third parties' rights.

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® DAPDM is highly miscible with standard organic solvents, such as ethers and hydrocarbons. Mixing with ketones results in imine formation, while mixing with alcohols other than methanol leads to an autocatalytic exchange of alkoxy groups until the system reaches thermodynamic equilibrium. GENIOSIL® DAPDM demonstrates typical amine behavior when exposed to acids, epoxides or isocyanates. GENIOSIL® DAPDM is highly soluble in neutral water and undergoes hydrolysis. Caution: Due to the enthalpy of solution, mixing GENIOSIL® DAPDM with water is exothermic. It is recommended that GENIOSIL® DAPDM be added to water, not vice versa, while stirring. A 2 % by weight solution of GENIOSIL® DAPDM in water has a pH of 10 – 11 and remains stable for several weeks. Due to the highly reactive nature of GENIOSIL® DAPDM, contact with moisture must be avoided during processing to prevent undesired hydrolysis.

2. GENIOSIL® DAPDM in glass-fiber reinforced or mineral-filled polymers

Fillers are treated either with pure GENIOSIL® DAPDM or a solution thereof. It may be necessary to pre-treat the substrate with water. The modified filler is preferably bonded to the organic material, e.g. an epoxy resin, by mixing it with a standard curing agent. GENIOSIL® DAPDM is added directly to the polymer – either before the organic material is compounded with the filler or at the same time. A prerequisite for the blending process is that GENIOSIL® DAPDM and the polymer are compatible and that the resin and GENIOSIL® DAPDM do not react prematurely.

3. GENIOSIL® DAPDM as a surface modifier

Used as a primer, GENIOSIL® DAPDM is applied as an aqueous or organic solution to an inorganic substrate (e.g. metal or glass surfaces). Once GENIOSIL® DAPDM has dried and bonded to the surface, an organic coating may be applied using a standard technique (e.g. spraying or knife coating). GENIOSIL® DAPDM can also be used as a constituent of sol-gel coatings by making it react with other alkoxy silanes in aqueous/organic media.

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® DAPDM



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

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