

# Dynasylan® 1122

## Bis(3-triethoxysilylpropyl)amine

### Technical data

Properties and test methods	Value	Unit	Method
Density (20 °C)	approx. 0.97	g/cm <sup>3</sup>	DIN 51757
Boiling point (1013 hPa)	> 300	°C	ASTM D-1120
Viscosity (20 °C)	approx. 5.5	mPa·s	DIN 53015

### Registrations

#### Dynasylan® 1122

EINECS/ELINCS (EU):	Yes
AICS (Australia):	No
DSL/NDSL (Canada):	*
PICCS (Philippines):	Yes
TSCA (USA):	Yes
IECSC (P.R. China):	Yes
ENCS (Japan):	*
ECL (South Korea):	Yes
* = available on request	

**Dynasylan® 1122** is a secondary aminofunctional ethoxysilane possessing two symmetric silicone atoms. **Dynasylan® 1122** acts as an adhesion promoter between inorganic materials (for example glass, metals and fillers) and organic polymers (thermosets, thermoplastics and elastomers), as a surface modifier and can be used for the chemical modification of substances.

**Dynasylan® 1122** is a colourless to yellow liquid with an amine-like odor which is, for example, soluble in alcohols, aliphatic or aromatic hydrocarbons.

### Safety and handling

Before considering the use of **Dynasylan®** products please read its Material Safety Data sheet (MSDS) thoroughly for safety and toxicological data as well as for information on proper transportation, storage and use. The Material Safety Data Sheet is available after registration on our website [www.dynasylan.com](http://www.dynasylan.com) or upon request from your local representative, customer service or from Evonik Industries AG, Product Safety Department, E-MAIL [sds-im@evonik.com](mailto:sds-im@evonik.com).

### Packaging and storage

**Dynasylan® 1122** is supplied in convenient small sized package (25 kg) and in 180 kg drums. In the originally closed drums **Dynasylan® 1122** has a shelf life of at least of 12 months.

## Properties and application

**Dynasylan**<sup>®</sup> 1122 is an important additive in many applications. Examples are:

- glass fiber/glass fabric composites: as size constituent or finish
- metal primers
- mineral fiber insulating materials, abrasives: as additive to phenolic resin binders
- foundry resins: as additive to phenolic, furane and melamine resins
- adhesives and sealants: as primer or additive
- mineral-filled polymers (composites) or HFFR cables: for pretreatment of fillers and pigments
- paints and coatings: as additive and primer for improving adhesion to the substrate

The most important effects which can be achieved using **Dynasylan**<sup>®</sup> 1122 are:

improvement in product properties, such as

- flexural strength, tensile strength, impact strength and modulus of elasticity
- moisture and corrosion resistance

improvement in processing properties, such as

- adhesion
- filler dispersion
- rheological behaviour: reduction in viscosity, Newtonian behaviour
- higher degree of filling

## Reactivity

**Dynasylan**<sup>®</sup> 1122 is a bifunctional organic compound in which the silicon-functional ethoxy-groups hydrolyze in the presence of water to form reactive silanols, which can be bonded to an inorganic substrate; the organophilic amino group can interact with a suitable polymer. Due to 6 hydrolyzable substituents present in one molecule, **Dynasylan**<sup>®</sup> 1122 is exceptionally suitable to form highly crosslinked networks on and between substrates and in organic matrices.

The hydrolysis of **Dynasylan**<sup>®</sup> 1122 in water takes place by acidic catalysis (e.g. formic or acetic acid at a pH of 2-3). In order to achieve solubility in organic solvents simply add 2-4 wt.-% of water per wt.-% of **Dynasylan**<sup>®</sup> 1122. Upon stirring for 5h the solutions are ready for use.

Examples of suitable inorganic substrates are glass, glass fibres, glass wool, mineral wool, silicic acid, quartz, sand, cristobalite, wollastonite and mica; also suitable are aluminium hydroxide, kaolin, talc, other silicate fillers, metal oxides and metals. Examples of suitable polymers are epoxy resins, polyurethanes, phenolic resins, furan resins, melamine resins, PA, PBT, PC, EVA, modified PP, PVB, PVAC, PVC, acrylates and silicones.

The secondary amino group in **Dynasylan**<sup>®</sup> 1122 provides high basicity at somewhat lower reactivity compared to primary amino groups. This is of major advantage in e.g. adhesives and sealants where the silane is added to the polymer matrix: Homogeneous distribution and bonding/networking of **Dynasylan**<sup>®</sup> 1122 to the inorganic filler can commence unless bonding to organic materials (e.g. polymers) will proceed. Moreover, **Dynasylan**<sup>®</sup> 1122 has been successfully used as a component in aqueous PA- and PU-sizes for glass fibers.

## Processing

**Dynasylan**<sup>®</sup> 1122 can advantageously be employed in organic solvents, as constituent of aqueous sizes, as pure substance or added to the polymer as an additive. In higher concentrations (1-5 wt.-%) chemical modification can be achieved by reaction with suitable functional monomers or polymers, for example those containing epoxy groups.

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