

Dynasylan® 1189

N-(n-Butyl)-3-aminopropyltrimethoxysilane

Technical data

Properties and test methods	Value	Unit	Method
Density (20 °C / 68 °F)	approx. 0.95	g/cm ³	DIN 51757
Boiling point (1013 hPa / 760 torr)	approx. 238 / 460	°C / °F	DIN 51751
Viscosity (20 °C / 68 °F)	approx. 2.5	mPa	DIN 53015

Registrations

Dynasylan® 1189

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

Dynasylan® 1189 is a bifunctional silane possessing a reactive secondary amine and hydrolyzable methoxysilyl groups.

The dual nature of its reactivity allows **Dynasylan® 1189** to bind chemically to both inorganic materials (e.g. glass, metals, fillers) and organic polymers (e.g. thermosets, thermoplastics and elastomers) thus functioning as an adhesion promoter or as a surface modifier and can be used for the chemical modification of substances.

Dynasylan® 1189 is a colorless to slight yellowish liquid with a light amine-like odor which is, for example, soluble in alcohols, and 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 or upon request from your local representative, customer service or from Evonik Industries AG, Product Safety Department, E-MAIL sds-im@evonik.com.

Packaging and storage

Dynasylan® 1189 is supplied in 25 kg pails, 190 kg drums and 800 kg containers. In the unopened container **Dynasylan® 1189** has a shelf life of at least 12 months.

Properties and application

Dynasylan[®] 1189 has many important applications.

Examples include:

- as a size constituent or finish for glass fiber/glass fabric composites
- as an additive to phenolic, furan and melamine resins used in foundry resins
- as a primer or additive and for the chemical modification of adhesives and sealants
- for pretreatment of fillers and pigments used in mineral-filled polymers
- as a primer and additive for improving the adhesion of paints and coatings to the substrate
- as a high flexible adhesion promoter in SMP-systems.

The most important product effects that can be achieved using **Dynasylan**[®] 1189 include:

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

Dynasylan[®] 1189 can also provide improvements in processing properties, such as

- adhesion
- filler dispersion
- rheological behavior: reduction in viscosity
- higher filler loading

Reactivity

In the presence of water, the methoxy groups of **Dynasylan**[®] 1189 hydrolyze to form reactive silanol groups which can bond to a variety of inorganic substrates. The organophilic n-butylamino group of **Dynasylan**[®] 1189 can react with a suitable polymer.

The hydrolysis of **Dynasylan**[®] 1189 in water takes place by acid catalysis (e.g. acetic acid at a pH of 3). To achieve solubility in organic solvents 2-4 wt.-% of water per wt.-% of **Dynasylan**[®] 1189 should be added. After stirring for 5 hours the solutions are ready for use.

Examples of suitable inorganic substrates are glass, glass fibres, glass wool, wollastonite and kaolin.

Dynasylan[®] 1189 may be used with such polymers as epoxy, polyurethanes, PA, PBT, EVA, modified PP and silicones.

In particular, **Dynasylan**[®] 1189 is a very effective coupling agent for thermoplastics. Superior mechanical properties can be achieved in reinforced MAA-modified PE or polypropylene matrices as well as polyamide. **Dynasylan**[®] 1189 especially leads to improvement of the impact strength of polyamide.

Dynasylan[®] 1189 treated fibers and fillers deliver superior performance over standard aminosilanes in challenging environments. **Dynasylan**[®] 1189 can be used as an endcapper for polyurethanes (isocyanatoprepolymer).

Processing

For substrate pretreatments (inorganic fibers and fillers)

Dynasylan[®] 1189 can be applied as a primer as a constituent of an aqueous size or solution, neat or added to the polymer as an additive. For substrate pretreatment a concentration of approx. 0.5-2 percent is recommended. Higher concentrations (1-5 wt.-%) achieve chemical modification by reaction with suitable functional monomers or polymers, for example those containing isocyanate groups.

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