

Dynasylan® 1411

N-(2-aminoethyl)-3-aminopropylmethyldimethoxysilane

Technical data

Properties and test methods	Value	Unit	Method
Density (20 °C/ 68 °F)	approx. 0.98	g/cm ³	DIN 51757
Refractive index n (20,D)	approx. 1.45	-	DIN 51423
Viscosity (20 °C/ 68 °F)	approx. 7 / 5.3-8.3	mPa·s / cSt	DIN 53015
Boiling point (1013 hPa / 760 Torr)	approx. 254-271 / 489-520	°C / °F	DIN 51751
Flash point	approx. 90 / 194	°C / °F	DIN 51758

Registrations

Dynasylan® 1411

EINECS/ELINCS (EU):	Yes
AICS (Australia):	Yes
DSL/NDSL (Canada):	Yes
PICCS (Philippines):	Yes
TSCA (USA):	Yes
IECS (P.R. China):	Yes
ENCS (Japan):	Yes
ECL (South Korea):	Yes

Dynasylan® 1411 is a bifunctional organosilane possessing reactive amino groups and hydrolyzable inorganic methoxysilyl groups.

The dual nature of its reactivity allows **Dynasylan® 1411** 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, surface modifier and as a reactant for product modification.

Dynasylan® 1411 is a clear yellow liquid with an amine-like odor. It is soluble in alcohols and aliphatic or aromatic hydrocarbons.

Safety and handling

Before considering the use of **Dynasylan®** and **Protectosil®** 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® 1411 is supplied in 25 kg pails or in 200 kg drums. In the unopened container **Dynasylan® 1411** has a shelf life of at least one year.

Properties and application

Dynasylan® 1411 can be used in many applications.

Examples are:

- additive for cold-curing phenolic and furan foundry resins to improve the flexural strength of the sand-resin composites while maintaining the shelf life of the resin over long periods
- starting material in the synthesis of amino-functional silicones
- additive to phenolic resin binders for mineral fiber insulating materials
- primer for additive to sealants and adhesives
- additive and/or primer for improving the adhesion of paints and coatings to the substrate

Important product effects that can be achieved through the use of **Dynasylan® 1411** include:

- improved mechanical properties, e.g. strength, impact strength and modulus of elasticity
- improved moisture and corrosion resistance
- improved electrical properties, e.g. dielectric constant, volume resistivity

Dynasylan® 1411 can also improve processing properties such as

- adhesion

Reactivity

In the presence of water, the methoxy groups of **Dynasylan® 1411** hydrolyze to form reactive silanol groups which can bond to a variety of inorganic substrates. The organophilic diamino group of **Dynasylan® 1411** can react with a suitable polymer.

The hydrolysis of **Dynasylan® 1411** takes place autocatalytically. The pH of the hydrolysate is about 10-11.

Dynasylan® 1411 may be used with such polymers as phenolic, furan resins and silicones.

Dynasylan® 1411 can undergo reactions with ketones or ester solvents. The silane or silanized substrates can react with carbon dioxide to form the corresponding carbonates or carbamates, respectively. Product modifications are possible through co-condensation with polysiloxanes (textile auxiliaries).

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