

Dynasylan® AMMO

3-Aminopropyltrimethoxysilane

Technical data

Properties and test methods	Value	Unit	Method
Density (20 °C/ 68 °F)	approx. 1.02	g/cm ³	DIN 51757
Refractive index n(20,D)	approx. 1.425	-	DIN 51423
Viscosity (20 °C/ 68 °F)	approx. 2/1.95	mPa·s / cSt	DIN 53015
Boiling point (1013 hPa/ 760 Torr)	approx. 194/381	°C/ °F	DIN 51751
Flash point	approx. 90/194	°C/ °F	DIN 51758

Registrations

Dynasylan® AMMO

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

Dynasylan® AMMO is a bifunctional organosilane possessing a reactive primary amine and hydrolyzable inorganic methoxysilyl groups.

The dual nature of its reactivity allows **Dynasylan® AMMO** 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 and a surface modifier. **Dynasylan® AMMO** is a clear, colorless liquid having an amine-like odor which is soluble in alcohols and aliphatic and 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® AMMO is supplied in 25 and 200 kg drums. In the unopened container **Dynasylan® AMMO** has a shelf life of at least one year.

Properties and application

Dynasylan[®] AMMO is an important additive in many applications.

Examples include:

- glass fiber/glass fabric composites: as a size ingredient or finish
- glass and metal primers
- foundry resins: as an additive to cold-curing phenolic and furan resins
- sealants and adhesives: as a primer or additive and for chemical modification
- mineral-filled composites: for pretreatment of fillers and pigments
- paints and coatings: as an additive and primer for improving adhesion to the substrate.

Important product effects which can be achieved using

Dynasylan[®] AMMO are:

- improved mechanical properties, for example flexural strength, tensile strength, impact strength and modulus of elasticity
- improved moisture and corrosion resistance
- improved electrical properties, for example dielectric constant, volume resistivity

Dynasylan[®] AMMO can also improve processing properties such as

- adhesion
- filler dispersion
- rheological behavior: reduction in viscosity, Newtonian behavior
- increased filler loading

Reactivity

In the presence of water, the methoxy groups of **Dynasylan**[®] AMMO hydrolyze form reactive silanol groups which can bond to a variety of inorganic substrates. The organophilic amino group of **Dynasylan**[®] AMMO can react with a suitable polymer. Hydrolysis of **Dynasylan**[®] AMMO takes place autocatalytically. The pH of the hydrolysate is about 10-11.

Examples of suitable inorganic substrates are glass, glass fibers, glass wool, mineral wool, silicic acid, quartz, sand, cristobalite, wollastonite and mica as well as aluminum hydroxide, kaolin, talc, other silicate fillers, metal oxides and metals.

Dynasylan[®] AMMO may be used with such polymers as epoxy, phenolic, furan and melamine resins, polyurethanes, PA, PBT, PC, EVA, modified PP, PVB, PVAC, PVC, acrylics and silicones.

Dynasylan[®] AMMO can undergo reactions with ketone or ester solvents. The silanes or silanized substrates can react with carbon dioxide to form the corresponding carbonates or carbamates, respectively. Product modifications are possible through addition reactions with suitable monomeric or polymeric compounds (for example isocyanates, epoxides).

Processing

Dynasylan[®] AMMO can be used as an approx. 0.5-10 wt.% solution in an organic solvent or as a constituent of an aqueous size. It may also be used neat or can be added to the polymer as an additive. Chemical modification can be achieved by reaction of **Dynasylan**[®] AMMO with suitable functional monomers or polymers, for example those containing isocyanate or epoxy groups.

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