Product information

Dynasylan® VTMO

Vinyltrimethoxysilane

Technical data

Properties and test methods	Value	Unit	Method
Viscosity (20 °C/ 68 °F)	approx. 1/ 1	mPa·s / cSt	DIN 53015
Flash point	approx. 22/ 72	°C/ °F	DIN 51755
Density (20 °C/ 68 °F)	approx. 0.97	g/cm^3	DIN 51757
Refractive index n(20, D)	approx. 1.390	-	DIN 51423
Boiling point (1013 hPa / 760 Torr)	approx. 123/ 253	°C/ °F	DIN 51751

Registrations

Dynasylan® VTMO

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® VTMO is a bifunctional organosilane possessing a reactive vinyl group and a hydrolyzable inorganic trimethoxysilyl group.

The dual nature of its reactivity allows **Dynasylan®** VTMO to bind chemically to both inorganic materials (e.g. glass, metals, fillers) and organic polymers (e.g. thermosets, thermoplastics, elastomers), thus functioning as a crosslinking agent, adhesion promoter and/or surface modifier. **Dynasylan®** VTMO is a colorless, low-viscosity liquid with a typical aromatic odor.

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® VTMO is supplied in 25 kg or 195 kg drums or 900 kg containers. The containers must remain tightly sealed during storage and kept in a cool, well aired place. The product should be protected against humidity. In the unopened container the shelf life of **Dynasylan®** VTMO is one year.

Properties and application

1. Moisture curing of polymers
Dynasylan® VTMO is suitable for the preparation of moisture-curing polymers, e.g. polyethylene. The characteristic feature of this process is peroxide-initiated grafting of the vinylsilane to the polymer during extrusion. After grafting, the polymer can still be processed as a thermoplast. Only upon treatment with moisture (in a 80-100 °C waterbath, steambath, or even at ambient conditions), the polymer chains are linked together; thereby forming a crosslinked polymer. This reaction can be accelerated by using a catalyst. Silane crosslinked polyethylene is widely used as cable isolation, and sheathing mainly in low voltage applications as well as for hot water/sanitary pipes and underfloor heating. Heat resistance is the main reason for the crosslinking of polymers for cable applications, but crosslinking can also improve the following properties: tear- and crack resistance, chemical resistance, abrasion resistance, memory effect. **Dynasylan®** VTMO may also be used as a co-monomer for the preparation of different polymers such as polyethylene or acrylics. Those polymers show an improved adhesion to inorganic surfaces and they can also be crosslinked with moisture as described above.

2. Adhesion promotion and surface modification

Because of its ability to react with inorganic fillers as well as with organic polymers (activated by e.g. peroxides or radiation), **Dynasylan®** VTMO acts as an efficient adhesion promoter for various mineral-filled polymers, improving mechanical and electrical properties especially after exposure to moisture. Once bonded to an inorganic filler, **Dynasylan®** VTMO hydrophobates the filler surface, improving the compatibility of fillers with polymers, leading to a better dispersibility, reduced melt viscosity and easier processing of filled plastics. The pretreatment of glass, metals, or ceramic surfaces with **Dynasylan®** VTMO improves the adhesion of coatings on these surfaces and can thus improve the corrosion resistance.

3. Dynasylan® VTMO as co-monomer for polymer dispersions

Polymer dispersions (e.g. styrene acrylics), modified with **Dynasylan®** VTMO show improved adhesion strenght in wet conditions and wet scrub resistance.

4. Dynasylan® VTMO as moisture scavenger
Dynasylan® VTMO reacts rapidly with water. Even traces of water can be removed with **Dynasylan®** VTMO. This effect is used widely in sealants.

5. Other applications of Dynasylan® VTMO
Dynasylan® VTMO can easily bond to OH-groups. Hydroxyl containing polymers e.g. functionalized silicones, may be modified with **Dynasylan®** VTMO, thereby introducing reactive vinyl groups into the polymer chains. The vinyl group of **Dynasylan®** VTMO is activated by its proximity to silicon, which makes it an attractive molecule for different organic syntheses.

Reactivity

In the presence of moisture the methoxy (Si-OCH3) groups of **Dynasylan®** VTMO hydrolyze to produce methanol and reactive silanol (Si-OH) groups which can bond to a variety of inorganic substrates or react with each other to form siloxane bonds (Si-O-Si). The organophilic vinyl end of **Dynasylan®** VTMO can also react with a suitable polymer initiated by a peroxide.

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