Product information

Dynasylan® VTEO

Vinyltriethoxysilane

Technical data

Properties and test methods	Value	Unit	Method
Density (20 °C/ 68 °F)	approx. 0.90	g/cm³	DIN 51757
Refractive index n (20,D)	approx. 1.397	-	DIN 51423
Boiling point (1013 hPa / 760 torr)	approx. 158/ 316	°C/ °F	DIN 51751
Flash point	approx. 38/ 100	°C/ °F	DIN 51755
Viscosity (20 °C/ 68 °F), dynamic	approx. 0.7/0.7	mPa·s / cSt	DIN 53015

Registrations

Dynasylan® VTEO

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® VTEO is a bifunctional organosilane possessing a reactive vinyl group and a hydrolyzable inorganic triethoxysilyl group.

The dual nature of its reactvity allows **Dynasylan®** VTEO 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® VTEO is a colorless, low-viscosity liquid with a typical aromatic odor.

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® VTEO is supplied in 25, 180 kg, 800 kg drums/ containers. In the unopened container the shelf life of **Dynasylan®** VTEO is at least one year.

Properties and application

1. Moisture curing of polymers
Dynasylan® VTEO is suitable for the preparation of moisture-curing polymers, e.g. polethylene. 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 an 80-100°C waterbath, steambath, or even at ambient conditions), are the polymer chains linked together via the formation of siloxane bonds, 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®** VTEO may also be used as a comonomer 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®** VTEO acts as an adhesion promoter for various mineral-filled polymers, improving mechanical and electrical properties especially after exposure to moisture. Once bonded to an inorganic filler, **Dynasylan®** VTEO hydrophobizes the filler surface, improving the compatibility of fillers with polymers, leading to a better dispersibility, reduced melt viscosity and easier processing of filled plastics. Surface coating of glass, metal or ceramics with **Dynasylan®** VTEO will improve not just adhesion, especially of acrylic systems, but also corrosion or scratch resistance.

3. Dynasylan® VTEO as co-monomer for polymer dispersions
Polymer dispersions (e.g. styrene acrylics), modified with **Dynasylan®** VTEO show improved adhesion strenght in wet conditions and wet scrub resistance.

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

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

Reactivity

In the presentce of moisture the ethoxy (Si-OCH_2CH_5) groups of **Dynasylan®** VTEO hydrolyze to produce ethanol 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®** VTEO can also react with a suitable polymer initiated by a peroxide.

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