

Dynasytan® 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. 25/ 77	°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

Dynasytan® 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
REACH (Europe)	Registered

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

The dual nature of its reactivity allows Dynasytan® 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. Dynasytan® VTMO is a colorless, low-viscosity liquid with a typical aromatic odor.

Safety and handling

Before considering the use of Dynasytan® products please read its Safety Data sheet (SDS) thoroughly for safety and toxicological data as well as for information on proper transportation, storage and use. The Safety Data Sheet is available after registration on our website www.dynasytan.com or upon request from your local representative, customer service or from Evonik Resource Efficiency GmbH, Product Safety Department, E-MAIL sds-hu@evonik.com.

Packaging, storage and shelf life

Dynasytan® 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 Dynasytan® VTMO is min. 12 months from delivery.

Properties and applications

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 strength 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.

This information and any recommendations, technical or otherwise, are presented in good faith and believed to be correct as of the date prepared. Recipients of this information and recommendations must make their own determination as to its suitability for their purposes. In no event shall Evonik assume liability for damages or losses of any kind or nature that result from the use of or reliance upon this information and recommendations. EVONIK EXPRESSLY DISCLAIMS ANY REPRESENTATIONS AND WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, AS TO THE ACCURACY, COMPLETENESS, NON-INFRINGEMENT, MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE) WITH RESPECT TO ANY INFORMATION AND RECOMMENDATIONS PROVIDED. Reference to any trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used. Evonik reserves the right to make any changes to the information and/or recommendations at any time, without prior or subsequent notice.

Europe/Middle-East/Africa/RoW
Evonik Resource Efficiency GmbH

Business Line Silanes
Rodenbacher Chaussee 4
63457 Hanau-Wolfgang
Germany
PHONE +49 6181 59 13636
FAX +49 6181 59 713915
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik (SEA) Pte. Ltd.

Business Line Silanes
3 Internatioanl Business Park
#07-18, Nordic European Centre
Singapore 609927
PHONE +65 6809 6576
FAX +65 6809 6699
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Japan Co. Ltd

Business Line Silanes
12th Floor Monolith Building
2-3-1, Nishi-Shinjuku-ku
Tokyo 163-0912
Japan
PHONE +81 353 23 7446
FAX +81 353 23 7397
dynasytan@evonik.com
www.dynasytan.com

North America

Evonik Corporation

Business Line Silanes
299 Jefferson Road
Parsippany, NJ 07054-0677
USA
PHONE (TOLL FREE) +1 800 237 67 45
PHONE +1 973 929 8513
FAX +1 973 929 8503
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Specialty

Chemicals (Shanghai) Co. Ltd.

Business Line Silanes
55, Chungdong Road
Xinzhuang Industry Park
Shanghai 201108
P.R. China
PHONE +86 21 61191-399
FAX +86 21 61191-648
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik India Pvt. Ltd.

Business Line Silanes
Krislon House
Saki Vihar Road, Anderi (E)
Mumbai - 400 072
India
PHONE +91 226 7238 809
FAX +91 226 7238 811
dynasytan@evonik.com
www.dynasytan.com

North America

Silbond Corporation

9901 Sand Creek Highway
Weston, MI 49289
USA
PHONE +1 517 436 9316
FAX +1 517 436 3148
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Korea Ltd.

Business Line Silanes
94, Galsan 1-dong
Bupyeong-gu
Incheon, 403-081
Korea
PHONE +82 2320 4773
FAX +82 2783 2520
dynasytan@evonik.com
www.dynasytan.com

Latin America

Evonik Brasil Ltda.

Business Line Silanes
Alameda Campinas, 579
01404-000 São Paulo-SP
Brazil
PHONE +55 11 3146 4123
FAX +55 11 3146 4148
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Taiwan Ltd.

Business Line Silanes
Artist Construction Bldg.
9F, No. 133
Min Sheng East Road, Sec 3
Taipei, 105 Taiwan, R.O.C.
Taiwan 10596
PHONE +886 227 17 1242
FAX +886 227 17 2106
dynasytan@evonik.com
www.dynasytan.com