

Dynasytan® 1189

N-(n-Butyl)-3-aminopropyltrimethoxysilane

Technical data

Properties and test methods	Value	Unit	Method
Density (20 °C / 68 °F)	approx. 0.95	g/cm ³	DIN 51757
pH (20 °C / 68 °F), 1:1 in H ₂ O	approx. 11	-	-
Viscosity (20 °C / 68 °F)	approx. 2.5 / 2.6	mPa / cSt	DIN 53015
Boiling point (1013 hPa / 760 torr)	approx. 238 / 460	°C / °F	DIN 51751
Flash point	approx. 110 / 230	°C / °F	DIN 51755

Registrations

Dynasytan® 1189

EINECS/ELINCS (EU):	Yes
AICS (Australia):	No
DSL/NDSL (Canada):	NDSL
PICCS (Philippines):	No
TSCA (USA):	Yes
IECS (P.R. China):	Yes
ENCS (Japan):	*
ECL (South Korea):	Yes
* = available on request	

Dynasytan® 1189 is a bifunctional silane possessing a reactive secondary amine and hydrolyzable methoxysilyl groups.

The dual nature of its reactivity allows **Dynasytan® 1189** 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 or as a surface modifier.

Dynasytan® 1189 is a colorless to slight yellowish liquid with a light amine-like odor which soluble in alcohols, and aliphatic or aromatic hydrocarbons.

Safety and handling

Before considering the use of Dynasytan® 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.dynasytan.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

Dynasytan® 1189 is supplied in 25 kg pails and 190 kg drums. In the unopened container **Dynasytan® 1189** has a shelf life of at least one year.

Properties and application

Dynasylan[®] 1189 has many important applications. Examples include:

- as a size constituent or finish for glass fiber/glass fabric composites
- as an additive to phenolic, furan and melamine resins used in foundry resins
- as a primer or additive and for the chemical modification of sealants and adhesives
- for pretreatment of fillers and pigments used in mineral-filled polymers
- as a primer and additive for improving the adhesion of paints and coatings to the substrate.

The most important product effects that can be achieved using **Dynasylan**[®] 1189 include:

- flexural strength, tensile strength, impact strength and modulus of elasticity
- improved moisture and corrosion resistance

Dynasylan[®] 1189 can also provide improvements in processing properties, such as

- adhesion
- filler dispersion
- rheological behavior: reduction in viscosity
- higher filler loading

Processing

For substrate pretreatments (inorganic fibers and fillers)

Dynasylan[®] 1189 can be applied as a primer as a constituent of an aqueous size or solution, neat or added to the polymer as an additive. For substrate pretreatment a concentration of approx. 0.5-2 percent is recommended. Higher concentrations (1-5 wt.-%) achieve chemical modification by reaction with suitable functional monomers or polymers, for example those containing isocyanate groups.

Reactivity

In the presence of water, the methoxy groups of **Dynasylan**[®] 1189 hydrolyze to form reactive silanol groups which can bond to a variety of inorganic substrates. The organophilic n-butylamino group of **Dynasylan**[®] 1189 can react with a suitable polymer.

The hydrolysis of **Dynasylan**[®] 1189 in water takes place by acid catalysis (e.g. acetic acid at a pH of 3). To achieve solubility in organic solvents 2-4 wt.-% of water per wt.-% of **Dynasylan**[®] 1189 should be added. After stirring for 5 hours the solutions are ready for use.

Examples of suitable inorganic substrates are glass, glass fibres, glass wool, wollastonite and kaolin.

Dynasylan[®] 1189 may be used with such polymers as epoxy, polyurethanes, PA, PBT, EVA, modified PP and silicones.

In particular, **Dynasylan**[®] 1189 is a very effective coupling agent for thermoplastics. Superior mechanical properties can be achieved in reinforced MAA-modified PE or polypropylene matrices as well as polyamide. **Dynasylan**[®] 1189 especially leads to improvement of the impact strength of polyamide.

Dynasylan[®] 1189 treated fibers and fillers deliver superior performance over standard aminosilanes in challenging environments. **Dynasylan**[®] 1189 can be used as an endcapper for polyurethanes.

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Europe/Middle-East/Africa/RoW

Evonik Industries AG

Inorganic Materials
Rodenbacher Chaussee 4
63457 Hanau-Wolfgang
Germany
PHONE +49 6181 59 13636
FAX +49 6181 59 13737
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Degussa (SEA) Pte. Ltd.

Inorganic Materials
3 Internatioanl Business Park
#07-18, Nordic European Centre
Singapore 609927
PHONE +65 6809 6830
FAX +65 6809 6630
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Taiwan Ltd.

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

North America

Evonik Degussa Corporation

Inorganic Materials
P.O. Box 677
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 Degussa (Shanghai) Co. Ltd.

Inorganic Materials
55, Chungdong Road
Shanghai 201108
P.R. China
PHONE +86 21 6119 1053
FAX +86 21 6119 1075
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Japan Co. Ltd

Inorganic Materials
12th Floor Monolith Building
2-3-1, Nishi-Shinjuku-ku
Tokyo 163-0912
Japan
PHONE +81 353 23 7300
FAX +81 353 23 7399
dynasytan@evonik.com
www.dynasytan.com

Latin America

Evonik Brasil Ltda.

Inorganic Materials
Alameda Campinas, 579
01404-000 São Paulo-SP
Brazil
PHONE +55 11 3146 4123
FAX +55 11 3146 4109
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik Korea Ltd.

Inorganic Materials
94, Galsan 1-dong
Bupyeong-gu
Incheon, 403-081
Korea
PHONE +82 32 510 2433
FAX +82 32 505 2510
dynasytan@evonik.com
www.dynasytan.com

Asia / Pacific

Evonik India Pvt. Ltd.

Inorganic Materials
Krislon House
Saki Vihar Road, Anderi (E)
Mumbai - 400 072
India
PHONE +91 226 7238 800
FAX +91 226 7238 811
dynasytan@evonik.com
www.dynasytan.com