

# Dynasytan® SILBOND® 50

## Ethyl polysilicates

### Technical Data

Properties and test methods	Unit	Value
Form	-	Clear Liquid
Density (20 °C)	g/cm <sup>3</sup>	1.095-1.150
Viscosity (20 °C)	mPa·s / cSt	5.0
Flash Point	°C / °F	27 / 81
Boiling Point	°C / °F	160 / 320
Silica Content (as SiO <sub>2</sub> )	% by wt	45.0 - 47.0

Dynasytan® SILBOND® 50 is a clear, low-viscosity liquid that is one of the most concentrated forms of available silica, ranging from 45.0% to 47.0% (the Si content of Dynasytan® SILBOND® 50 is calculated as SiO<sub>2</sub>).

Dynasytan® SILBOND® 50 is an ethyl polysilicate that is the partially hydrolyzed product of tetraethyl orthosilicate (TEOS). The partial hydrolysis of TEOS (Si[OEt]<sub>4</sub>) results in the conversion of ethoxy groups to hydroxyl groups forming silanols. Subsequent condensation of silanols will form siloxane bonds (-Si-O-Si-O-) and eventually cause the material to gel.

Dynasytan® SILBOND® 50 is often used as an intermediate, which is further hydrolyzed to produce a binder that can be used for many applications. This binder is used for inorganic zinc-rich primers, investment casting molds, cores and ceramic shapes, and coatings.

### Safety and handling

Before considering the use of Dynasytan® SILBOND® 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](http://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](mailto:sds-hu@evonik.com).

### Packaging, storage and shelf life

Dynasytan® SILBOND® 50 could be available in pails, drums, totes, and tanker quantities.

In the unopened container Dynasytan® SILBOND® 50 has a shelf life of min. 12 months from date of manufacture.

Please ask us for further details.

## Properties and applications

Similar to Dynasylan® SILBOND® Condensed and Dynasylan® SILBOND® 40, Dynasylan® SILBOND® 50 is used to deposit silicic acid formed as a result of complete hydrolysis. The resulting silicic acid bonds well to many inorganic substrates, such as glass, ceramic, metal, fillers, pigments, and synthetic fibers. The deposition of a thin SiO<sub>2</sub> layer improves the chemical and thermal stability and mechanical properties.

Other applications are:

- binder, especially for inorganic zinc-rich coatings or precision investment castings
- encapsulant for hydroxyl poor fillers to enhance adhesion with functional silanes
- crosslinker component in cold-curing silicone rubber systems
- coupling agent/adhesion promoter between organic polymers and inorganic substrates (fillers, pigments, glass, metals surfaces, etc.)

Dynasylan® SILBOND® 50 can also be used as starting material for sol-gel processes. It is usually used in conjunction with alkylsilanes (e.g. Dynasylan® MTES) organofunctional silanes and/or organic precursors (e.g. organic resins) to form siloxane networks. This makes it possible to obtain highly scratch-, abrasion-, and chemical-resistant coatings.

Dynasylan® SILBOND® 50 is immiscible with water, therefore hydrolysis requires a cosolvent as a solubilizer. Mineral acids and ammonia are suitable as catalysts.

Dynasylan® SILBOND® 50 or its hydrolysates are also the binder component for 1- and 2-pack inorganic zinc-rich coatings, for corrosion protection on steel, and for slurries used in precision investment castings.

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**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