

Dynasylan® Product Range




Dynasylan®

 **EVONIK**
POWER TO CREATE



Dynasylan®. Experience. Knowledge. Future

For more than 50 years, the brand Dynasylan® has been synonymous with the investigation, production and application of silanes. Since 1934, the year which saw the first patent for silanes being granted, Evonik and its predecessors have applied for and received more than 400 patents.



Such innovative energy and long-term thinking clearly pay off. Today Dynasylan® products are used successfully throughout the world in paints and coatings, adhesives and sealants, plastics, fiber glass, cables and pharmaceuticals.

On the one hand, our position as one of the world's leading manufacturers of functional silanes is down to the uncompromising quality and purity of our products. But no less important is the broad spectrum of different silane types belonging to the brand Dynasylan®. Under the brand name Dynasylan®, Evonik offers a huge range of different silane product groups. These include, for example, products which have been well-known for decades, such as the aminosilanes, technologically sophisticated and patented systems such as Dynasylan® HYDROSIL or the multifunctional silanes. The aim of this publication is to provide you with an overview of the Dynasylan® products currently available. New product developments can be found on www.dynasylan.com.

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The Future of Silane Technology is Multifunctionality

With the development of the first multifunctional silanes, the brand Dynasylan® has been able to make important steps toward improving product performance and efficiency of our customers' production processes.

However, the combination of several functionalities in one Dynasylan® product must not be mistaken for a simple "two-in-one" effect. The chemical and technical combination of two or more functions in one silane affords Dynasylan® new effects or product properties that until now have not been possible. The concept of the new Dynasylan® SIVO® products combines this functional advantage with a decisive competitive factor: speed. Dynasylan® SIVO®

products represent a constantly growing group of multifunctional silanes. Following on from Dynasylan® SIVO® CLEAR and Dynasylan® SIVO® 210 - two products which have already enjoyed considerable success - are products both for new applications, such as wood preservation and aqueous sol-gel coatings and for more typical applications such as adhesives and solvents, colors and coatings.

You will obtain multifunctional silanes of the brand Dynasylan® from the product groups HYDROSIL, SILFIN and SIVO, as monomers or oligomers to achieve special effects. Tables on pages 6 and 7 display all multifunctional Dynasylan® products currently available.



Oligomers of the brand Dynasylan®

Oligomers are multifunctional silanes which possess, for example, different vinyl, alkyl and amino functional groups, and are characterized by a significantly reduced alcohol release (low VOC). Due to their higher flash point, they offer obvious advantages for handling, storage and production. Furthermore, compared to monomeric silanes, the technical capability of customer systems is, in many cases, surpassed.

Dynasylan® HYDROSIL

Products from this group of multifunctional silanes are, as the name suggests, water-based, and are produced in a process. They are non-flammable, water-borne and release no solvents during production or in the end product (low VOC).

Dynasylan® SILFIN

Products from the SILFIN group are silanes which have a particularly wide range of potential uses due to the combination of a silane molecule with different additives (initiator, catalyst, etc.). They are produced specially for use in the plastic, cable and pipe industries.

Dynasylan® SIVO® and beyond...

Dynasylan® and Dynasylan® SIVO® products use the possibilities provided by silane technology to create products that are application specific. These products have been tailored to specific requirements and go beyond mere molecules.

Multifunctional Silane Systems

Typical Application

Chemical Functionality	Additional Functionality	Product Name	Description	Adh. Promoter/ Coupling Agent	Reagent for Chem. Synthesis	Cobinder/ Comonomer	Crosslinking Agent	Water Scavenger	Surface Modifier
Oligomers									
amino/alkyl	methoxy	Dynasylan® 1146	functional oligosiloxane	●					●
vinyl	oligomeric	Dynasylan® 6490	functional oligosiloxane	●			●	●	●
vinyl	oligomeric	Dynasylan® 6498	functional oligosiloxane	●			●	●	●
vinyl/alkyl	oligomeric	Dynasylan® 6598	functional oligosiloxane	●			●	●	●
alkyl	oligomeric	Dynasylan® 9896	alkylsiloxane						●
amino	methoxy	Dynasylan® SIVO® 202	multifunctional aminosilane system	●			●		●
HYDROSIL									
amino	water-borne	Dynasylan® HYDROSIL 1151	aqueous siloxane, low VOC	●			●		●
amino/alkyl	water-borne	Dynasylan® HYDROSIL 2627	aqueous siloxane, low VOC	●			●		●
diamino	water-borne	Dynasylan® HYDROSIL 2776	aqueous siloxane, low VOC	●			●		●
amino/vinyl	water-borne	Dynasylan® HYDROSIL 2907	aqueous silane, low VOC	●			●		●
amino/alkyl	water-borne	Dynasylan® HYDROSIL 2909	aqueous siloxane, low VOC	●			●		●
hydroxy/epoxy	water-borne	Dynasylan® HYDROSIL 2926	aqueous siloxane, low VOC	●		●	●		●
SILFIN									
vinyl	ready-to-use	Dynasylan® SILFIN 06	product for 1-step process (PE crosslinking)				●		
vinyl	ready-to-use	Dynasylan® SILFIN 13	product for 2-step process (PE crosslinking)				●		
vinyl	ready-to-use	Dynasylan® SILFIN 22	product for 2-step process (PE crosslinking)				●		
vinyl	ready-to-use	Dynasylan® SILFIN 25	product for 2-step process for pipes, allows higher throughput				●		
vinyl	ready-to-use	Dynasylan® SILFIN 50	product for 1-step process for pipes				●		
vinyl	ready-to-use	Dynasylan® SILFIN 53	product for 1-step process (PE crosslinking)				●		
vinyl	ready-to-use	Dynasylan® SILFIN 63	high performance product for 1-step process (PE crosslinking) at ambient conditions				●		
vinyl	ready-to-use	Dynasylan® SILFIN 70	tailor-made product for the 1-step process for EVA-based HFFR compounds				●		
vinyl	ready-to-use	Dynasylan® SILFIN 71	tailor-made product for the 1-step process for PE-based HFFR compounds				●		
vinyl	ready-to-use	Dynasylan® SILFIN 75	high performance product for 1-step process (PE crosslinking), improved handling and storage				●		
vinyl	ready-to-use	Dynasylan® SILFIN 100	product for 1-step process (PE crosslinking), alternative catalyst				●		

Multifunctional Silane Systems

Chemical Functionality	Additional Functionality	Product Name	Description	Typical Application												
				Adh. Promoter/ Coupling Agent	Reagent for Chem. Synthesis	Co-binder/ Comonomer	Crosslinking Agent	Water Scavenger	Surface Modifier							
Easy-to-clean																
fluoroalkyl	easy-to-clean	Dynasylan® F 8261	tridecafluorooctyltriethoxysilane													●
fluoroalkyl	ready-to-use/easy-to-clean	Dynasylan® F 8263	hydro-/oleophobic treatment in alcohol													●
fluoroalkyl	water-borne/easy-to-clean	Dynasylan® F 8815	hydro-/oleophobic treatment													●
fluoroalkyl	water-borne/easy-to-clean	Dynasylan® SIVO® 121	hydro-/oleophobic treatment for wood treatment													●
fluoroalkyl	ready-to-use/easy-to-clean	Dynasylan® SIVO® CLEAR	hydro-/oleophobic treatment, 2-component, in alcohol													●
fluoroalkyl	ready-to-use/easy-to-clean	Dynasylan® SIVO® CLEAR EC	hydro-/oleophobic treatment, 1-component, in alcohol													●
Others																
amino/alkyl	methoxy	Dynasylan® 1189	N-(n-butyl)-3-amino-propyltrimethoxysilane	●	●			●								●
amino	methoxy	Dynasylan® SIVO® 202	multifunctional aminosilane system	●				●								●
amino	ethoxy	Dynasylan® SIVO® 210	proprietary aminosilane composition	●	●			●								●
amino	ethoxy	Dynasylan® SIVO® 214	proprietary aminosilane composition	●				●								●
sol-gel	binder	Dynasylan® SIVO® 110	water-borne temperature cured sol-gel binder	●												●
sol-gel	water-borne	Dynasylan® SIVO® 112	hydro-/oleophobic modifier for sol-gel system													●
sol-gel	water-borne	Dynasylan® SIVO® 113	hydrophobic modifier for sol-gel system	●				●								●
sol-gel	binder	Dynasylan® SIVO® 140	water-borne room temperature cured binder for zinc dust paints													
amino	binder	Dynasylan® SIVO® 160	corrosion protection primer	●												●
alkyl		Dynasylan® BTSE	bis (triethoxysilyl) ethan												●	●

Please note that not every product may be available in every region!



Dynasytan®. Creating Possibilities beyond Imagination

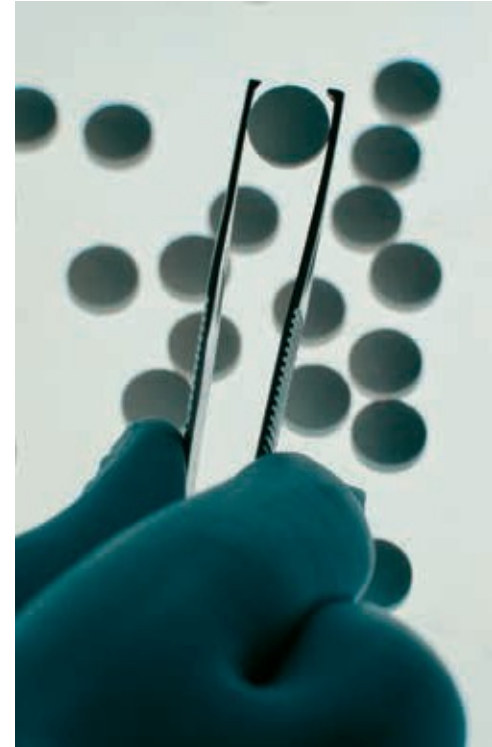
The chemical structure of silanes allows them to link with both organic and inorganic molecules. This special structure has made silanes indispensable to all kinds of markets and applications. Today, there are some processes or products which cannot be imagined without silanes.

During the last few decades, organofunctional silanes of the brand Dynasytan® have mainly been used as additives to improve adhesion or crosslinking, or to modify surfaces. However, silanes are being used more and more as vital components for innovative processes, for example in the case of sol-gel coatings. Further examples for areas of application are:

- Adhesion promoter (e.g., in paints and coatings, adhesives and sealants)
- Crosslinking agent (e.g., in polyolefins for cables and pipes)
- Surface modifier (e.g., in fillers and pigments to improve dispersion or hydrophobicity)
- Water scavenger (e.g., for moisture-sensitive adhesives and sealants)
- Cobinder/Comonomer (e.g., for polymer dispersions, zinc-rich paints or sol-gel systems)
- Reagent (e.g., for chemical and pharmaceutical synthesis)

Dynasylan® SILBOND®

In early 2014 Evonik acquired Silbond Corp., a leading supplier of silicic acid esters. The brand SILBOND® is strongly recognized in the silanes market for its high purity products and consistent quality. As perfect addition to our portfolio we now are able to offer more than 15 grades of TEOS-based products under the name of Dynasylan® SILBOND®. These products are used for corrosion-resistant coatings, zinc-rich primers, precision investment castings, industrial chemicals and electronic applications.



Dynasylan®. One Brand. Many Markets

Today there are myriads of possibilities for benefiting from the use of Dynasylan. New areas of application have constantly been discovered by ongoing research and development along with close contacts to our customers. And we have just entered a novel chapter in Dynasylan® technology – innovative Multifunctional Silane Systems. So, whether you are thinking about an advanced Dynasylan® product for well-established applications or for the next cutting-edge idea, industry's broadest and most innovative range of organosilanes may offer just the right solution for you.

Here is a selection of products in which silanes play an important role:

- Fiber glass and mineral wool
- Polyolefin compounds for, among other uses, cables, synthetic pipes
- Adhesives and sealants
- Paints and coatings
- Sol-gel systems
- Fillers and pigments
- Foundry and foundry resins
- Silicones
- Pharmaceutically active agents
- Co-catalysts for chemical syntheses (e. g., PP)
- Electronics

Product Overview

Typical Application

Chemical Functionality	Additional Functionality	Product Name	Description	Adh. Promoter/ Coupling Agent	Reagent for Chem. Synthesis	Cobinder/ Comonomer	Crosslinking Agent	Water Scavenger	Surface Modifier
SILBOND®									
silicic acid ester		Dynasylan® SILBOND® Condensed	tetraethoxysilane			•	•		
silicic acid ester		Dynasylan® SILBOND® 40	ethyl polysilicate			•	•		
silicic acid ester		Dynasylan® SILBOND® 40 HF	ethyl polysilicate			•	•		
silicic acid ester		Dynasylan® SILBOND® 50	ethyl polysilicate			•	•		
silicic acid ester		Dynasylan® SILBOND® Pure	tetraethoxysilane			•	•		
silicic acid ester	solvent-borne	Dynasylan® SILBOND® H-4	ethyl polysilicate binder			•			
silicic acid ester	solvent-borne	Dynasylan® SILBOND® H-5	ethyl polysilicate binder			•			
silicic acid ester	solvent-borne	Dynasylan® SILBOND® H-6C	ethyl polysilicate binder			•			
silicic acid ester	solvent-borne	Dynasylan® SILBOND® H-181C	ethyl polysilicate binder			•			
silicic acid ester	solvent-borne	Dynasylan® SILBOND® H-25	ethyl polysilicate binder			•			
silicic acid ester	solvent-borne	Dynasylan® SILBOND® HT-30	ethyl polysilicate hybrid binder			•			
silicic acid ester	semiconductor grade	Dynasylan® SILBOND® UHPT	tetraethoxysilane						•
silicic acid ester	low boron electronic grade	Dynasylan® SILBOND® LBEG	tetraethoxysilane						•
silicic acid ester	electronic grade	Dynasylan® SILBOND® EG	tetraethoxysilane						•
silicic acid ester	solvent-borne	Dynasylan® SILBOND® HT-33	ethyl polysilicate hybrid binder			•			
silicic acid ester	low VOC	Dynasylan® SILBOND® HT-28A	ethyl polysilicate hybrid binder			•			
silicic acid ester		Dynasylan® SILBOND® ESP-E	ethyl polysilicate			•			
Other Products									
acetoxyl		Dynasylan® BDAC	di-tert-butoxydiacet-oxysilane	•		•			
alkyl		Dynasylan® 9116	hexadecyltrimethoxysilane					•	•
alkyl		Dynasylan® IBTEO	isobutyltriethoxysilane						•
alkyl		Dynasylan® IBTMO	isobutyltrimethoxysilane						•
alkyl		Dynasylan® MTES	methyltriethoxysilane						•
alkyl		Dynasylan® MTMS	methyltrimethoxysilane			•			•
alkyl		Dynasylan® OCTCS	octyltrichlorosilane						•
alkyl		Dynasylan® OCTEO	octyltriethoxysilane						•
alkyl		Dynasylan® OCTMO	octyltrimethoxysilane						•
alkyl		Dynasylan® PTEO	propyltriethoxysilane						•
alkyl		Dynasylan® PTMO	propyltrimethoxysilane						•
alkyl		Dynasylan® BTSE	Bis (triethoxysilyl) ethan			•			•

Product Overview

Typical Application

Chemical Functionality	Additional Functionality	Product Name	Description	Adh. Promoter / Coupling Agent	Reagent for Chem. Synthesis	Cobinder / Comonomer	Crosslinking Agent	Water Scavenger	Surface Modifier
amino		Dynasylan® 1122	bis(3-triethoxysilylpropyl) amine	•	•		•		•
amino		Dynasylan® 1124	bis(3-trimethoxysilylpropyl) amine	•	•		•		•
amino		Dynasylan® 1505	3-aminopropylmethyldiethoxysilane	•					•
amino		Dynasylan® AMEO	3-aminopropyltrieth-oxysilane	•		•	•		•
amino	adjusted reactivity	Dynasylan® AMEO-T	proprietary aminosilane composition	•		•	•		•
amino		Dynasylan® AMMO	3-aminopropyltrimethoxysilane	•			•		•
amino	ethoxy	Dynasylan® SIVO® 210	proprietary aminosilane composition	•	•		•		•
amino	ethoxy	Dynasylan® SIVO® 214	proprietary aminosilane composition	•	•		•		•
amino		Dynasylan® TRIAMO	triamino-functional propyltrimethoxysilane	•					
amino/alkyl	methoxy	Dynasylan® 1189	N-(n-butyl)-3-amino-propyltrimethoxysilane	•	•				•
amino/alkyl	methoxy	Dynasylan® SIVO® 203	functional oligosiloxane	•			•		•
aryl		Dynasylan® 9165	phenyltrimethoxysilane	•		•			•
aryl		Dynasylan® 9265	phenyltriethoxysilane	•		•			•
diamino	methoxy	Dynasylan® 1411	2-aminoethyl-3-aminopropylmethyldimethoxysilane	•			•		•
diamino		Dynasylan® DAMO	2-aminoethyl-3-amino-propyltrimethoxysilane	•			•		•

Product Overview

Typical Application

Chemical Functionality	Additional Functionality	Product Name	Description	Adh. Promoter / Coupling Agent	Reagent for Chem. Synthesis	Cobinder / Comonomer	Crosslinking Agent	Water Scavenger	Surface Modifier
diamino	adjusted reactivity	Dynasylan® DAMO-T	proprietary aminosilane composition	•			•		•
epoxy		Dynasylan® GLYEO	3-glycidyloxypropyltriethoxysilane	•		•	•		
epoxy		Dynasylan® GLYMO	3-glycidyloxypropyltrimethoxysilane	•		•	•		
fluoroalkyl	easy-to-clean	Dynasylan® F 8261	tridecafluorooctyltriethoxysilane						•
fluoroalkyl	ready-to-use/easy-to-clean	Dynasylan® F 8263	hydro-/oleophobic treatment in alcohol						•
fluoroalkyl	water-borne/easy-to-clean	Dynasylan® F 8815	hydro-/oleophobic treatment						•
fluoroalkyl	water-borne/sol-gel system	Dynasylan® SIVO® 112	hydro- oleophobic modifier for sol-gel system						•
fluoroalkyl	water-borne/easy-to-clean	Dynasylan® SIVO® 121	hydro-/oleophobic wood treatment						•
fluoroalkyl	ready-to-use/easy-to-clean	Dynasylan® SIVO® CLEAR	hydro-/oleophobic treatment, 2-component, in alcohol						•
fluoroalkyl	ready-to-use/easy-to-clean	Dynasylan® SIVO® CLEAR EC	hydro-/oleophobic treatment, 1-component, in alcohol						•
glycol		Dynasylan® 4148	polyether-functional trimethoxysilane						•
glycol		Dynasylan® 4150	polyether-functional trimethoxysilane						•
mercapto		Dynasylan® MTMO	3-mercaptopropyltri-methoxysilane	•			•		•

Product Overview

Typical Application

Chemical Functionality	Additional Functionality	Product Name	Description	Adh. Promoter / Coupling Agent	Reagent for Chem. Synthesis	Cobinder / Comonomer	Crosslinking Agent	Water Scavenger	Surface Modifier
methacryl		Dynasylan® MEMO	3-methacryloxypropyltrimethoxysilane	•		•	•		
silicic acid ester		Dynasylan® 40	ethyl polysilicate			•	•		
silicic acid ester		Dynasylan® A	tetraethoxysilane			•	•		
silicic acid ester		Dynasylan® AR	ethyl polysilicate/silica hybrid binder			•			
silicic acid ester		Dynasylan® M	tetramethyl orthosilicate			•	•		
silicic acid ester		Dynasylan® MKS	ethyl polysilicate/silica hybrid binder			•			
silicic acid ester		Dynasylan® P	tetra-n-propyl orthosilicate			•	•		
silicic acid ester		Dynasylan® XAR	ethyl polysilicate/silica hybrid binder			•			
silicic acid ester	electronic grade	Dynasylan® A-SQ	tetraethoxysilane						•
silyl		Dynasylan® BSA	N, O-bis (trimethylsilyl) acetamide		•				
silyl		Dynasylan® HMDS	hexamethyldisilazane		•				•
ureido		Dynasylan® 2201 EQ	3-ureidopropyltriethoxysilane, 50% in methanol, ethylcarbamate-free	•			•		•
vinyl		Dynasylan® VTC	vinyltrichlorosilane				•		
vinyl		Dynasylan® VTEO	vinyltriethoxysilane	•			•	•	•
vinyl		Dynasylan® VTMO	vinyltrimethoxysilane	•		•	•	•	•
vinyl		Dynasylan® VTMOEO	vinyltris (2-methoxy-ethoxy) silane	•			•	•	•
vinyl/benzyl	oligomeric	Dynasylan® 1175	cationic vinylbenzyl-amino-functional silane hydrochloride, 40% in methanol	•					•



Dynasylan® on the Web

Information, addresses, contacts.

The website **www.dynasylan.com** provides you with a well-structured information platform, where you will find everything you need to know on products, procedures and chemical processes. Via a Solution Finder, you can also download product information and safety data sheets as well as informative brochures or presentations.

The worldwide database with Evonik contact persons and traders allows you at any time comfortable and easy access to important contact data.

www.dynasylan.com

www.evonik.com



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