

Dynasytan® SIVO 214

Proprietary aminofunctional silane composition

Technical data

Properties and test methods	Value	Unit	Method
Boiling point (4 hPa)	> 68	°C	DIN 51356
Content Dynasytan AMEO	> = 80	wt.-%	SAA 0719
Content secondary AMINO-Silanes	< = 20	wt.-%	SAA 0719
Density (20 °C)	approx. 0.95	g/cm ³	DIN 51757
Flash point	98	°C	DIN EN ISO 2719
pH value (20 °C / 1:1 in H ₂ O)	11	-	-
Viscosity (20 °C)	2	mPa·s	DIN 53015

Registrations

Dynasytan® SIVO 214

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

Dynasytan® SIVO 214 is an aminofunctional silane composition with improved crosslinking activity which acts as an adhesion promoter between inorganic materials (for example glass, metals and fillers) and organic polymers (thermosets, thermoplastics and elastomers), as a surface modifier and for chemical modification of substances.

Dynasytan® SIVO 214 is a colorless to yellowish liquid with an amine-like odor which is, for example soluble in alcohols, aliphatic or aromatic hydrocarbons.

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 Operations GmbH, Product Safety Department, E-MAIL sds-hu@evonik.com.

Packaging, storage and shelf life

Dynasytan® SIVO 214 is supplied in 25 kg pails, 180 kg inner coated drums and 900 kg bulk containers.

In the originally closed drums Dynasytan® SIVO 214 has a shelf life of min. 12 months from delivery.

Properties and applications

Dynasylan® SIVO 214 is an important additive for many applications.

Examples are:

- glass fiber composites: as size constituent or finish
- metal primers
- mineral fiber insulating materials, abrasives: as additive to phenolic resin binders
- foundry resins: as additive to phenolic, furan and melamine resins
- sealants and adhesives: as primer or additive
- mineral-filled polymers (composites) or HFFR cables: for pretreatment of fillers and pigments
- paints and coatings: as additive and primer for improving adhesion to the substrate.

SIVO 214 can be used as pretreatment (e.g. by dipping, spraying or coating) or may be added directly to the resin matrix as additive. If SIVO 214 is used as additive, the compatibility with the resin matrix has to be tested before.

SIVO 214 may be used:

- as aqueous solutions (e.g. in glass fiber sizes) or
- neat (e.g. as additive in resins).
- SIVO 214 can be dissolved in water at pH 9 or pH 4-5 including an acid catalyst.

Hydrolysis in water can take place at pH 9 and pH 4-5.

For pH 9: 1.0 g SIVO 214 is stirred in 99.0 g 0.2 % acetic acid.
For pH 4-5: 1.0g SIVO 214 is stirred in 99.0 g 0.4 % acetic acid.

Upon stirring for 1 h, the clear hydrolysate is ready for use.

The most important effects which can be achieved using Dynasylan® SIVO 214 are:

- improvement in product properties,

such as

- flexural strength, tensile strength, impact strength and modulus of elasticity
- moisture and corrosion resistance
- electrical properties, for example dielectric constant, volume resistivity

- improvement in processing properties,

such as

- adhesion
- filler dispersion
- rheological behaviour: reduction in viscosity, Newtonian behaviour
- higher filler loading

Reactivity

Dynasylan® SIVO 214 contains primary and secondary aminoalkylethoxysilanes. The components are bifunctional organic compounds in which the silicon-functional ethoxy groups hydrolyze in the presence of water to give ethanol and the corresponding reactive silanols, which can be bonded to an inorganic substrate; the organophilic amino group can interact with a suitable polymer. The composition contains partly six hydrolyzable substituents in one molecule. Thus Dynasylan® SIVO 214 is exceptionally suitable to form highly crosslinked networks on and between substrates and in organic matrices.

Examples of suitable inorganic substrates are glass, glass fibres, glass wool, mineral wool, silicic acid, quartz, sand, cristobalite, wollastonite and mica; also suitable are aluminium hydroxide, kaolin, talc, other silicate fillers, metal oxides and metals.

Examples of suitable polymers are phenolic resins, furan resins, melamine resins, PA, PBT, PC, EVA, modified PP, PVB, PVAC, PVC.

The secondary amino group in Dynasylan® SIVO 214 provides high basicity at somewhat lower reactivity compared to the primary amino groups. This is of major advantage in e.g. HFFR cables where the silane is added to the polymer matrix: Homogeneous distribution and bonding/networking of Dynasylan® SIVO 214 to the inorganic filler can commence unless bonding to organic materials (e.g. polymers) will proceed. Excellent crosslinking properties make Dynasylan® SIVO 214 a preferred component in the silylation of inorganic filler surfaces and in corrosion-resistant primer systems for metal pretreatment. In foundry resins Dynasylan® SIVO 214 is suited as adhesion promoter between sand and resin. This is especially valid for phenolic resins cured by isocyanates.

Moreover, Dynasylan® SIVO 214 can be used as a component in aqueous PA- and PU-sizes for glass fibers.

Processing

For substrate pretreatments, for example as a primer (as an approximately 0.5-2 percent solution), Dynasylan® SIVO 214 can advantageously be employed in organic solvents, such as alcohols, as constituent of aqueous sizes or solutions, as pure substance or added to the polymer as an additive. In higher concentrations (1-5 wt.-%) chemical modification can be achieved by reaction with suitable functional monomers or polymers, for example those containing epoxy groups.

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