

Dynasytan® A SQ

Tetraethyl orthosilicate, high purity

Technical data

Properties and test methods	Value	Unit	Method
Purity (GC-FID)	> 99.9	%	AN-SAA 1506
Density (20 °C)	approx. 0.94	g/cm ³	DIN 51757
Viscosity (20 °C)	approx. 0.75	mPa.s	DIN 53015
SiO ₂ content	28.3 - 29.1	wt.-%	AN-SAA 0851
Initial boiling point	approx. 167	°C	DIN 51751
Flash point	approx. 45	°C	DIN 51755

Registrations

Dynasytan® A SQ

EINECS/ELINCS (EU):	Yes
AICS (Australia):	Yes
DSL/NDL (Canada):	Yes
PICCS (Philippines):	Yes
TSCA (USA):	Yes
IECS (P.R. China):	Yes
ENCS (Japan):	Yes
ECL (South Korea):	Yes
REACH (Europe)	Registered

Dynasytan® A SQ represents a special quality of Dynasytan® A, the ethyl ester of orthosilicic acid.

With a specified purity of 99.9 % (GC-FID) and a low level of impurities like chloride and trace metals Dynasytan® A SQ stands for reliable product quality. Tetraethyl orthosilicate is the most industrially important of the tetraalkyl silicates. It is frequently also referred to as TEOS or tetraethoxysilane in the literature. Dynasytan® A SQ is a colourless, low-viscosity liquid with an SiO₂ content of 28.5%.

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® A SQ must be stored under exclusion of moisture. In a sealed container, the product has a shelf-life of 6 months with no loss of quality.

Dynasytan® A SQ is supplied ready to use in 180 kg and 190 kg drums.

Properties and applications

Dynasylan® A SQ can replace Dynasylan® A in every application where higher purity is required. In the application of silic acid esters, use is often made of the option of preparing silicic acid by hydrolysis or thermally treatment. The resulting silicic acid bonds well to many inorganic substrates and can be deposited in situ in a controlled manner. The surfaces of glass, metals, pigments, fillers and synthetic fibres can be coated with a very thin SiO₂ layer in order to improve chemical and thermal stability and mechanical properties. Other applications are:

- Dynasylan® A SQ is a suitable base material for the production of ultra high purity tetraethoxysilane (UHP TEOS) used in the electronic industry
- crosslinkers in silicone rubbers for electronic potting systems
- drying agents in sealing compositions for electronic applications.

Dynasylan® A SQ is an important starting material for sol-gel processes, Hydrolysis leads to silanol groups which, in a subsequent condensation reaction, form very stable siloxane bonds (-Si-O-Si-). Condensation starts before hydrolysis is complete and, during storage of these hydrolysates, continues until a network is formed, where the rate depends on the degree of hydrolysis. Additional use of alkylalkoxysilanes (e. g. Dynasylan® MTES) can give the siloxane network a somewhat organic character as a result of the incorporation of alkyl groups.

It is also possible to construct an inorganic/organic network by adding silanes containing organofunctional groups (e.g. aminopropyl groups) and polymerizing with organic precursors. This principle makes it possible to obtain highly scratch- and abrasion-resistant coatings.

Dynasylan® A SQ is immiscible with water, so hydrolysis requires the use of a cosolvent as solubilizer. Suitable catalysts are acids or bases like mineral acids or ammonia, or even acetic acid and amines.

Partial hydrolysis gives hydrolysates of Dynasylan® A SQ whose shelf life depends on the amount of water and solvent used. The amount of water determines the activity of the hydrolysate. Activity and shelf life are inversely proportional. The correct choice of the amount of water can give hydrolysates which have a shelf life of up to a year.

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