Product Information

Dynasylan® SIVO 110

SIVO SOL Technology for coating systems

PRODUCT DESCRIPTION

Dynasylan® SIVO 110 is a multifunctional, almost VOC-free, water-borne sol-gel system.

It is composed of organofunctional silanes and functionalized, nanoscale SiO2 particles. Dynasylan® SIVO 110 is an opaque to milky, colorless to slightly yellow, low viscous liquid. Dynasylan® SIVO 110 can be diluted in water and a variety of common organic solvents. Besides reactive silanol groups it also contains organic functionalities based on Si-bonded epoxy groups.

Typical Properties

Property	Unit	Value
Boiling Point, min. ASTM D-1120	°C	92
Chemical Name		water-borne organo-functional oligosiloxane
Density DIN 51757	g/cm³	~1.1-1.2
Flash Point, min. DIN EN ISO 2719	°C	90
pH Value DIN 19268 (20 °C)		~4-7
Pour Density DIN 51757	g/cm³	~1,1-1,2
Viscosity DIN 53015 (20 °C)	mPa·s	<500

The data represents typical values (no product specification)

TYPICAL APPLICATIONS

Dynasylan® SIVO 110 is suited as binder component in temperature crosslinking sol-gel coatings and sol-gel-based hybrid coatings. Dynasylan® SIVO 110 coatings are performing with:

- high hardness ("pencil hardness" up to 5H, depending on formulation)

- excellent scratch and mar resistance

- superior stability in boiling water (Gt0 upon 2 h treatment in water at 100 °C)

- very good adhesion on various substrates

- very good adhesion towards organic top coats (e.g. epoxies)

- sound flexibility ("mandrel bend test" according to DIN EN ISO 1519: 2 mm)

- very low thickness of formed layers (recommendation: dry layer of < 2 µm)

- excellent resistance against solvents and other chemicals

Recommended areas of application:

1. corrosion resistant primer systems

2. transparent sol-gel top coats which exhibit a temperature resistance of up to 220 °C

3. coatings comprising high hardness, which can be additionally improved by introduction of up to 20 wt.-% silica sol

4. transparent hydrophobic sol-gel - top coats upon adding Dynasylan® HYDROSIL 2909

Dynasylan® SIVO 110 containing formulations can be sprayed, dipped or applied with a doctor blade. It is recommended to orient towards a 0.2 - 2 µm thickness of the dry layer (approx. 4 µm of a wet layer equals approx. 1 µm of the respective dry layer). Hence the total quantity to be applied on smooth substrates will amount to approx. 5g / m^2. Generally for spray application an aqueous dilution should be used (e.g. 20 wt.-% Dynasylan® SIVO 110, 0.06 wt.-% processing agent (leveling or substrate wetting agents), 79.94 wt.-% water). Surfaces of treated substrates must be clean and free of grease and dust.

Product Composition		
Product Composition	**Unit**	**Value**
Solids Content 3 g/ 2 h 105 °C	%	35-35

The data represents typical values (no product specification)

BENEFITS & ADVANTAGES

Dynasylan® SIVO 110 is a water-borne sol-gel system which does not contain organic solvents. It does not release alcohols upon hydrolysis contrary to standard functional alkoxysilanes. Dynasylan® SIVO 110 contains a high concentration of active silanol functions. Consequently it can chemically bond to surfaces of suited substrates and achieves a high degree of crosslinking by formation of 2- and 3-dimensional siloxane networks. During curing functionalized SiO2 nanoparticles align into a densely packed structure and are covalently incorporated into the siloxane network. This causes the exceptional hardness and scratch resistance of Dynasylan® SIVO 110. Additionally a high degree of flexibility is obtained at a considerably low thickness fo the formed layers. Suited substrates: steel, stainless steel, Zn-galvanized steel, aluminum, glass. Complete crosslinking (including reaction of silanol groups) will be reached at temperatures between a minimum of 180 °C and, ideally, 200-220 °C.

DOSAGE

Dynasylan® SIVO 110 can be mixed with water at any proportion. Dilution in common organic solvents such as ethanol, isopropanol, butyl glycol or methoxy propanol is possible. Dynasylan® SIVO 110 can be formulated with a variety of water-thinnable binders and other auxiliary agents such as Tego® Wet 280. As of such e.g. a satisfactory compatibility with acrylate-based polymer dispersions has been achieved. Nevertheless, the final formulation must be checked towards possible incompatibilities such as phase separation or precipitation. Upon addition of acids and bases the pH value of Dynasylan® SIVO 110 can be varied between 4 and 9. These acid or alkaline additives must be selected with care as flocculation or gelation can occur in contact with certain substances. For acidification phosphoric acid may be used. For achievement of easy-to-clean properties Dynasylan® HYDROSIL 2909 is highly recommended. Dynasylan® SIVO 110 must be protected against freezing temperatures!

HANDLING & PROCESSING

Before considering the use of Dynasylan® 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 on our website https://silanes.evonik.com/en or upon request from your local representative, customer service or from Evonik Operations GmbH, Product Safety Department, E-MAIL sds-hu@evonik.com.

PACKAGING

Dynasylan® SIVO 110 is supplied in 25 kg PE drums, 200 kg PE-inlined steel drums and 1.000 kg IBC containers.

STORAGE

Due to its water content Dynasylan® SIVO 110 must be stored above freezing temperature. Storage temperatures must not exceed +40 °C.

SHELF LIFE

In original sealed containers Dynasylan® SIVO 110 has a shelf life of min. 12 months from delivery.

Registration Listings	
Registry	**Status**
Australia (AIIC)	No
Canada (DSL)	No
China (IECSC)	Information on Request
EU (EINECS/ELINCS)	Yes
Japan (ENCS)	Information on Request
South Korea (KECL)	No
Philippines (PICCS)	No
USA (TSCA)	Yes

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