

Dynasytan® SIVO 121

Wood Surface Impregnation Agent

Technical data

Properties and test methods	Value	Unit	Method
Density (20 °C)	1,01	g/cm ³	DIN 51757
Flash point	> 90	°C	DIN 51755
Viscosity (20 °C)	approx. 1	mPa.s	DIN 53015
Appearance	yellowish, slightly turbid liquid	-	-
pH-value at 20 °C, 1:1 in water	4	-	ASTM D-1120

Registrations

Dynasytan® SIVO 121

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

Dynasytan® SIVO 121 is a multifunctional, nearly VOC-free, water-borne silane system.

It can act most prominently as a hydrophobizing or olephobizing agent for plain wood surfaces or weathered, originally scumble paint treated wood surfaces.

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® SIVO 121 is supplied in 25,2 kg pails and 201,2 kg drums.

Being a water-borne system, Dynasytan® SIVO 121 must be stored above 0° C. Moreover, storage temperature should stay below 40° C.

In originally, unopened containers Dynasytan® SIVO 121 has a shelf life of min. 12 months after delivery.

Properties and applications

Dynasylan® SIVO 121 - containing wood preservation agents can be painted, rolled or sprayed. In a spray application it is mandatory to minimize the generation of Aerosol emissions by suited procedures (e.g. application of HPLV spray processes, air driven low pressure spray processes. Consecutive application steps should be carried out wet-in-wet as a dried coat of Dynasylan® SIVO 121 will almost immediately exhibit a strong repelling effect. Consequently a second application step would therefore be much less effective.

Recommended dosage during application: For a full range effectiveness and durability (up to 1500 h of QUV-stability in transparent systems) 300 g/m² of undiluted Dynasylan® SIVO 121 are necessary. That amount can be applied by either one-step or multi-step procedures, depending on the absorptiveness of the wood substrate.

In a quantity of 70 - 150 g/m² Dynasylan® SIVO 121 will exhibit a QUV-stability of 300 - 900 h with regard to hydro- and oleophobic surface activity (corresponding to approx. 1 - 3 years of exterior weathering in an average European climate). As a minimum concentration we recommend a preparation of 1 part Dynasylan® SIVO 121 and 1 part of dilution agent (= organic solvent water additive).

Temperature of treated substrates should stay in the range of 5 - 50 °C. Dynasylan® SIVO 121 is sensitive to freezing temperatures. Frozen material can flocculate upon defrosting and may in part lose its beneficial properties. Dynasylan® SIVO 121 - containing wood preservation agents should not be applied on wet wood surfaces (humidity < 18% recommended). Crosslinking on wet substrates will be incomplete and thus full efficiency may not be achieved.

To a certain degree Dynasylan® SIVO 121 will impart yellowing on bright wood surfaces. This will by no means influence the hydro-/oleophobic performance of the products. However, the issue must be taken into consideration once a certain optical appearance is of importance during the formulation of transparent, colorless wood preservation agents.

As a fully crosslinked impregnating coating, Dynasylan® SIVO 121 is extremely resistant against all kinds of atmospheric exposure (UV-irradiation, rainfall, temperature changes) but imparts only a relatively weak UV-absorbing strength. Decomposition of lignin by UV light will be delayed but not prevented. Typical greying of wood under the influence of UV light may thus be delayed by Dynasylan® SIVO 121 but will not be inhibited. If a strong UV-protection is desired in the final formulation, additional UV absorbers need to be introduced. With this regard the addition of pigments (e.g. most prominently iron oxides) can be recommended.

Reactivity

Dynasylan® SIVO 121 does not contain solvents and, contrary to functional alkoxy-silanes, does not release alcohols upon hydrolysis when applied. Dynasylan® SIVO 121 boasts of a high proportion of already active silanol functions. Consequently a chemical coupling to the wood substrate as well as high crosslinking density due to the formation of two- and three-dimensional networks is obtained. Fluoroalkyl-functional groups contained in Dynasylan® SIVO 121 provide strong hydro- and oleophobic surface properties (low energy surfaces).

Processing

Dynasylan® SIVO 121 is suited for hydro- and oleophobic surface modification of wood surfaces. It can also be used in formulations of translucent scumble paints with outstanding properties. Once wood surfaces are treated accordingly, formation of low energy surfaces leads to a prominent repelling effect towards almost all kinds of liquids. This strongly hydro- and oleophobic treatment reduces the pick-up of dirt significantly. As of such affection of wood surfaces by microorganisms (e.g. mildew) is reduced. Dynasylan® SIVO 121 exhibits its beneficial properties solely on the surface of the substrate. It may thus be appropriate to add biocides to the final formulation, e.g. agents against bluestain. This will actively prevent fouling caused by microorganisms. This surface modification is extremely resistant against weathering. Main reason is a severe stability of the fluoroalkylsilyl function as well as the chemical reaction of the silanols with the surface and the generation of a highly crosslinked siloxane network. These features make Dynasylan® SIVO 121 superior to any other standard fluorocarbon - based additive.

Dynasylan® SIVO 121 enables the formulation of translucent scumble paints, which can withstand many years of exterior weathering once applied to a suited wooden surface. QUV-testing according to DIN EN ISO 11507 (irradiation cycles by UVA-lamps (UVA-340) at 55° C, condensation cycles at 45° C plus intermittent rinsing with water) did show a permanent repelling effect of more than 800 h (corresponding to an approx. 2 years exterior weathering) when applying approx 100 g/m² in non-pigmented, transparent formulations. Elevated consumptions of up to 300 g/m² can further increase the durability of the treatment.

Wood which is treated with Dynasylan® SIVO 121 stays completely air-permeable despite its strongly hydro- and oleophobic surface. Permeability of water vapour is only marginally influenced by Dynasylan® SIVO 121, much less than by most of the standard binder systems in the paint and coating industry.

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