

Dynasylan® SIVO 121

Surface Impregnation of Wood



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OUTLINE



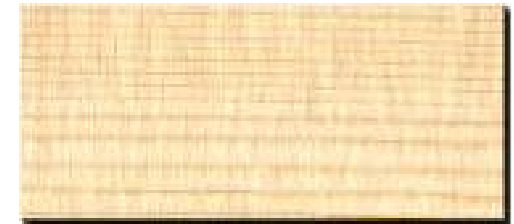
- **Dynasylan® SIVO 121 for Wood Surface Impregnation**
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- **Summary**

Dynasytan® SIVO 121 for Wood Surface Impregnation



Dynasytan® SIVO 121 is a novel impregnation system for wooden surfaces which renders outstanding properties:

- Soil- and water-repellent
- Substrate remains vapor-permeable / breathable
- Extremely weather-proof
- Almost invisible due to the formation of a nanoscale layer
- Water-borne, VOC-free
- Not harmful according to the German Chemicals Law (ChemG)

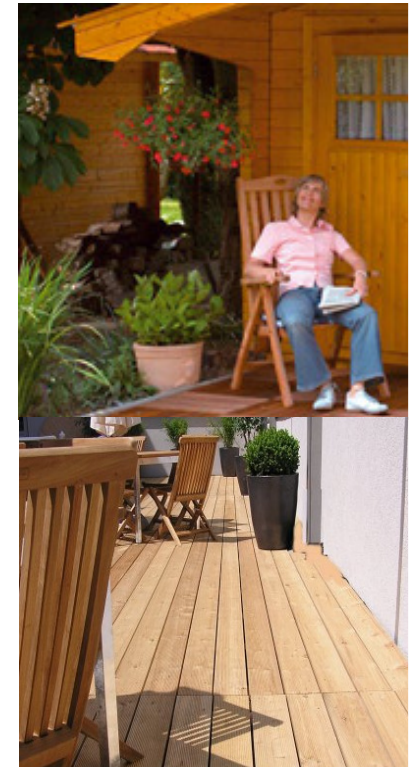


Dynasytan® SIVO 121 for Wood Surface Impregnation



Dynasytan® SIVO 121 convinces with a lot of unique advantages:

- Lasting protection against moisture penetration
- Lasting protection against adhesion of dirt
- Lasting protection from environmental influences
- Easy to apply
- Stays permanently active for approximately 1 - 3 years (depending on dosage)
- Due to less water/humidity on the surface reduced contamination with microorganisms occurs



Dynasytan® SIVO 121 for Wood Surface Impregnation



Dynasytan® SIVO 121 has been developed predominantly for timber surfaces exhibiting the following special characteristics:

- Untreated and impregnated lumbers
- Weathered surfaces of originally waxed and varnished lumbers (sanding recommendable)
- No influence on the swelling- and shrinking properties of lumbers. Consequently Dynasytan® SIVO 121 can be used on lumbers for outside applications as long as contact to the ground is avoided



Technical Performance

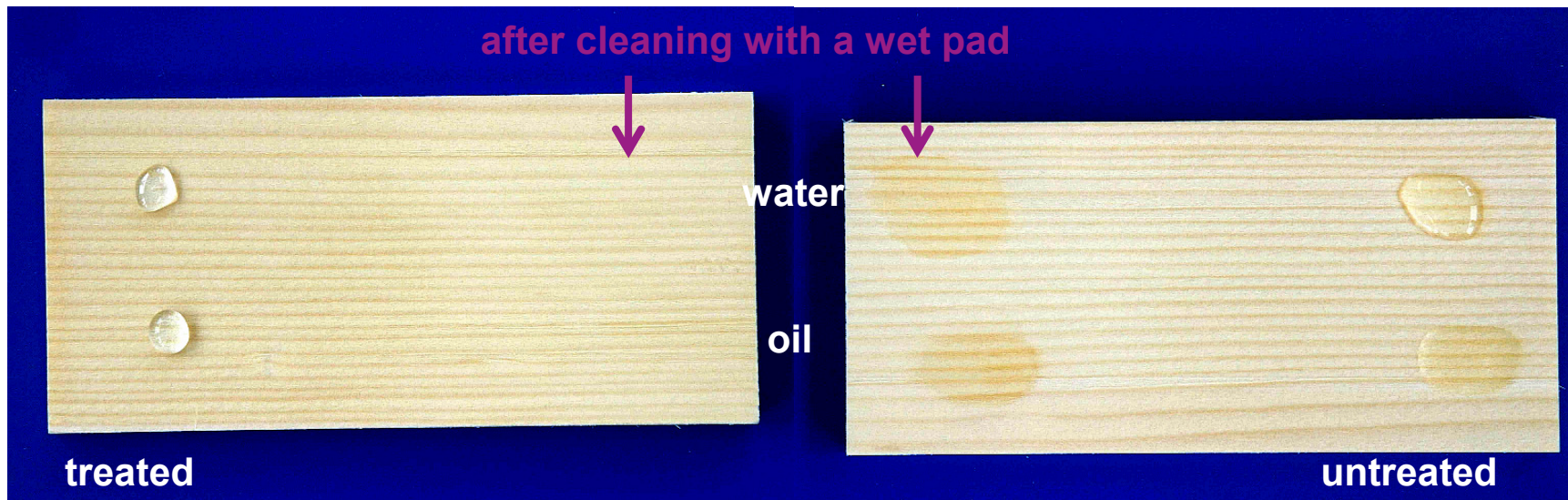


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Dynasytan[®] SIVO 121 Exhibits Excellent Soil- and Water-Repellency



An outstanding **hydrophobic** and **oleophobic** effect is rendered on untreated timber surfaces and on weathered wood painted with a transparent varnish (sanding recommendable before SIVO 121 application):

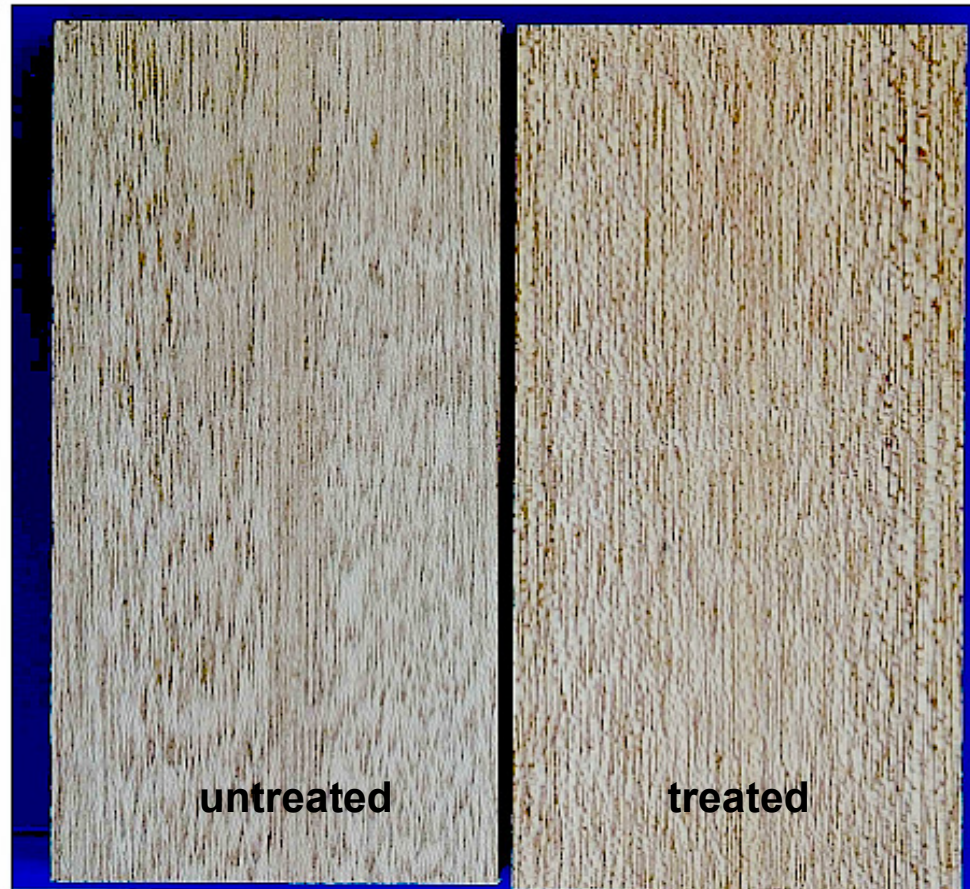


Water and oil drops on pine wood

The Protection – Almost indiscernible... The Effect - Highly Visible!



Dynasylan® SIVO 121
on tropical wood (meranti):



The Protection - Almost Indiscernible... The Effect - Highly Visible!



Dynasylan® SIVO 121 on pine wood:

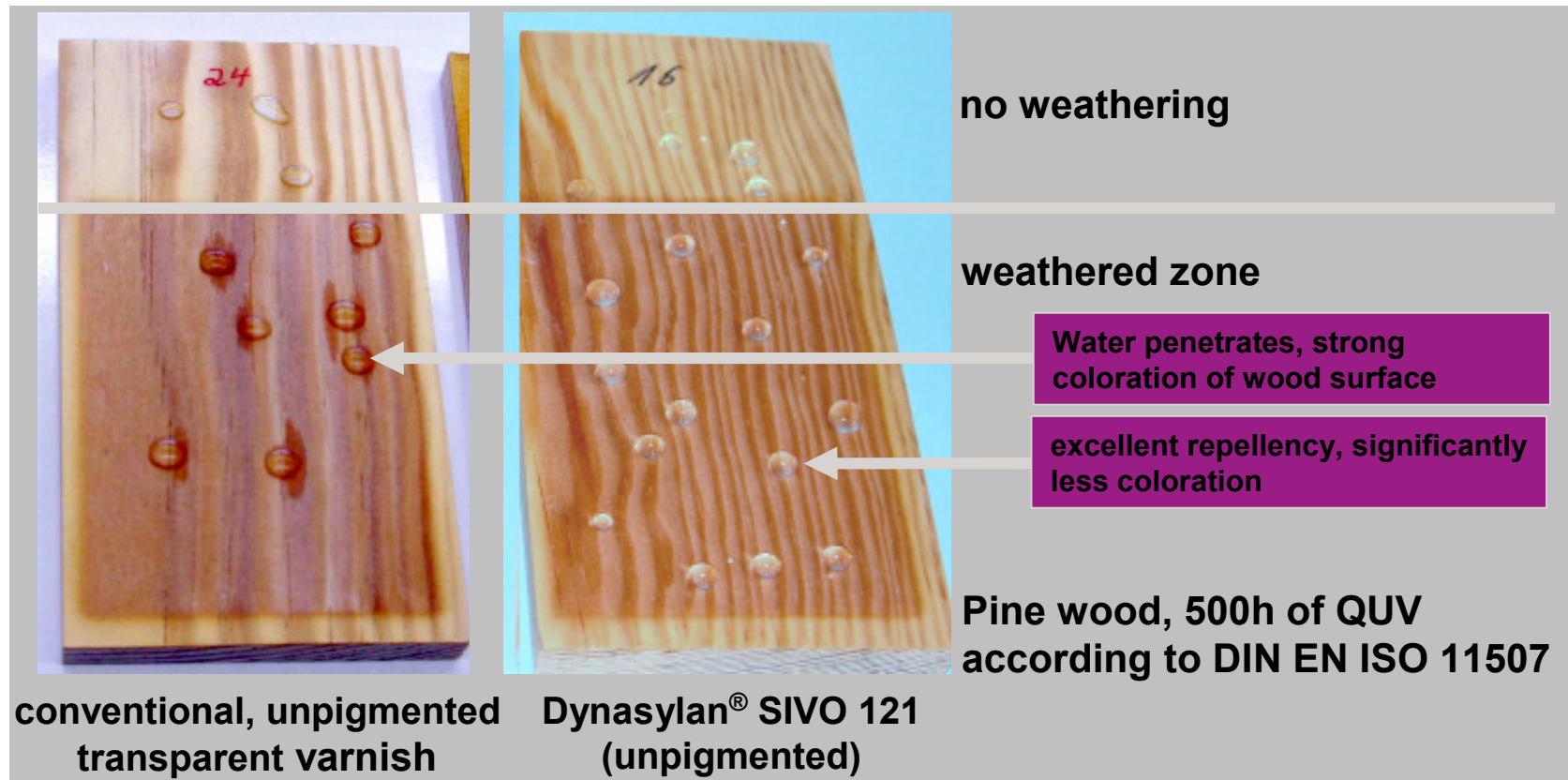


On very bright lumbers a slightly yellowish color can appear due to the system. This effect disappears in comparison to untreated lumber during outside weathering.

Dynasylan® SIVO 121 Demonstrates Its Enormous Resistance Against Weathering



Comparative example against a state-of-the-art, transparent, solvent-based coating:



Due to the Hydro-/Oleophobicity of the Treated Surface Staining with Dirt and Microorganisms is reduced

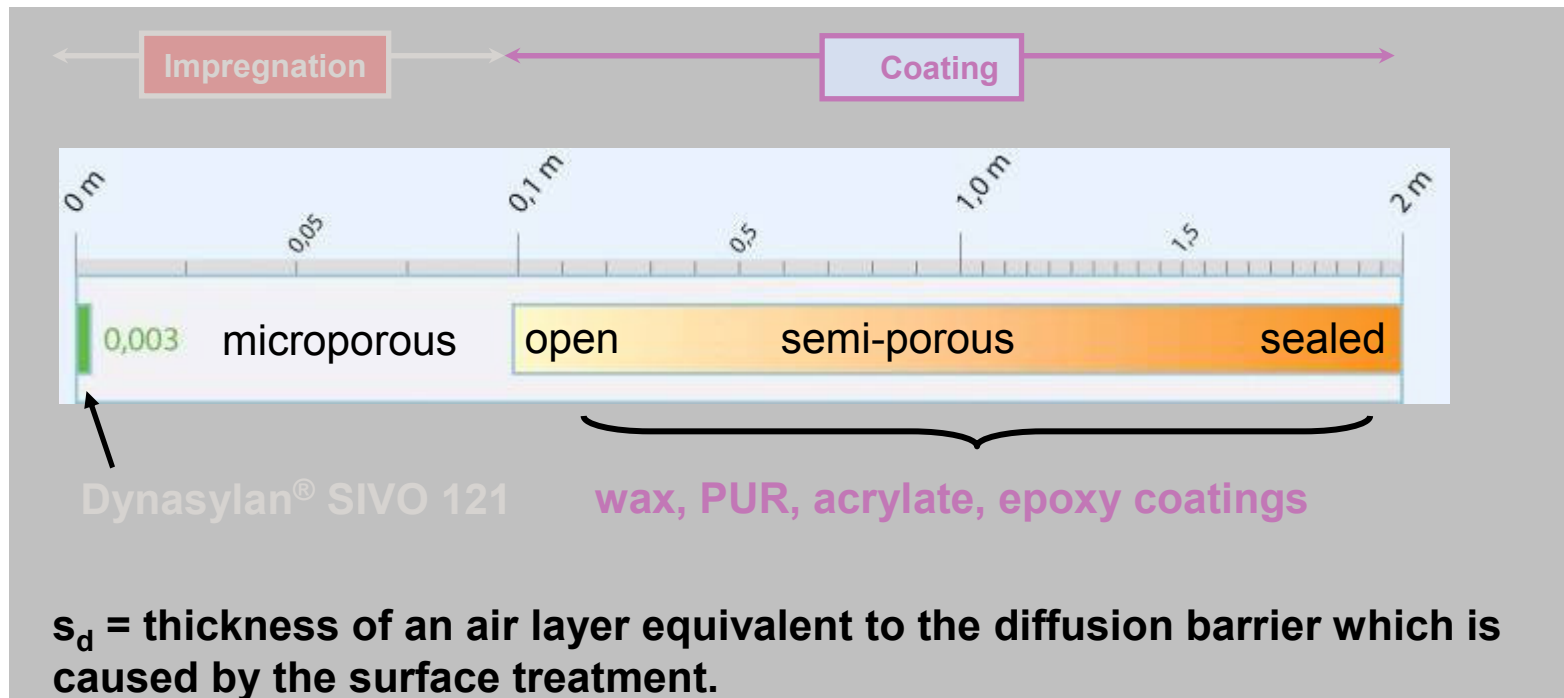


Microorganisms and dirt on spruce after one year of outside weathering under humid conditions



Dynasylan® SIVO 121 treated spruce (same weathering conditions)

Dynasytan® SIVO 121 Maintains the Gas-Permeability / Breathability of Wood



The smaller the s_d -value the higher the water vapor permeability is!

Application Examples, Formulation Examples and Methods of Application



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Two Prime Areas of Application

Garden furniture



- **Common deficiencies:**
- Stains: e.g. red wine, grease
- Weathering: Ingress of water

Wooden decks



- **Common deficiencies:**
- Deterioration: Moss, mildew, fungi
- Tedious cleaning

The Answer: Dynasylan® SIVO 121

Methods of Application

Rolling



Painting



Spraying



Suggested Quantity for Treatment of Garden Furniture



Table: 2.5 m²
Chairs: 2 x 1.8 m²

approx. 6 m²

consumption: 0.1 l / m²

→ 0.6 liter of preparation

recommendation: 1:1 dilution in water

= 0.3 liter of Dynasylan[®] SIVO 121



Table: 5 m²
Chairs: 4 x 1.8 m²

approx. 12 m²

consumption: 0.1 l / m²

→ 1.2 liter of preparation

recommendation: 1:1 dilution in water

= 0.6 liter of Dynasylan[®] SIVO 121

Suggested Quantity for Treatment of Decks



Average standard area: approx. 20 m²

Recommendation:

Use pure product for long-term protection. Depends on mechanical stress up to 3 years.

→ 2 liters of Dynasylan® SIVO 121

Dynasytan[®] SIVO 121 - Information on Application



- **Recommended concentration:** Neat or 1:1 with water
- **Dosage / Consumption / Durability:**
 - Depends on sort of timber and grade of dilution
 - 1:1 dilution: 70 - 150 ml/m² of preparation, seasonal (approx. 1 year)
 - undiluted: 70 – 150 ml/m², up to 3 years
 - undiluted: up to 300 ml/m², > 3 years
- **Application:** Painting, rolling, spraying (avoid generation of fine aerosols)
- **Working temperature:** 5 - 50 °C (temperature of substrate)
- **Humidity of substrate:** < 18 %
- **Respective product information contains additional information**

Dynasytan[®] SIVO 121 - Information on Formulation



- **Solvents:** Water; alcohols and ketones can be added
 - Recomendation for better wetting on resin rich wood like teak:
 - SiVO 121 + 7% Ethanol + 3% i-Propannol
 - SIVO 121 + 7% Ethanol + 3% i-Propanol + 2% Butylglycol

- **Binder systems:**

A formulation with other binder systems, e.g. acrylates, is not recommendable. The strong surface repellency effect would dissappear, the binder would cover the repellency effect of SIVO 121.

- **Pigments**

Pigmentation of SIVO 121 is not recommendable. SIVO 121 is not able to fix the pigments on the wood surface.

Dynasytan® SIVO 121 - Information on Formulation



- **Biocides:** Quaternary ammonium compounds are compatible with SIVO 121:

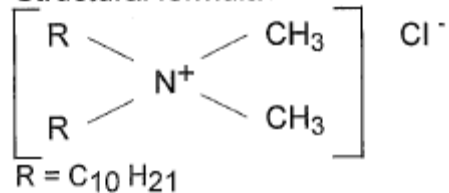
Examples (Lonza): an addition of up to 2% is possible

Bardac 2240

Active matter

N,N-Didecyl-N,N-dimethylammoniumchloride

Structural formula

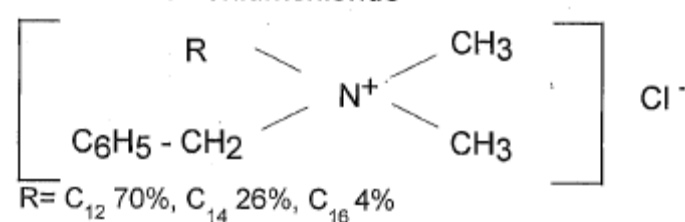


Barquat DM-50

Active matter

Alkyl Dimethyl Benzyl Ammonium Chloride

INN: Benzalkoniumchloride



SIVO 121 is not a protection against fouling of wood from inside due to wood destructive fungi like blight, white rot or blue stain.

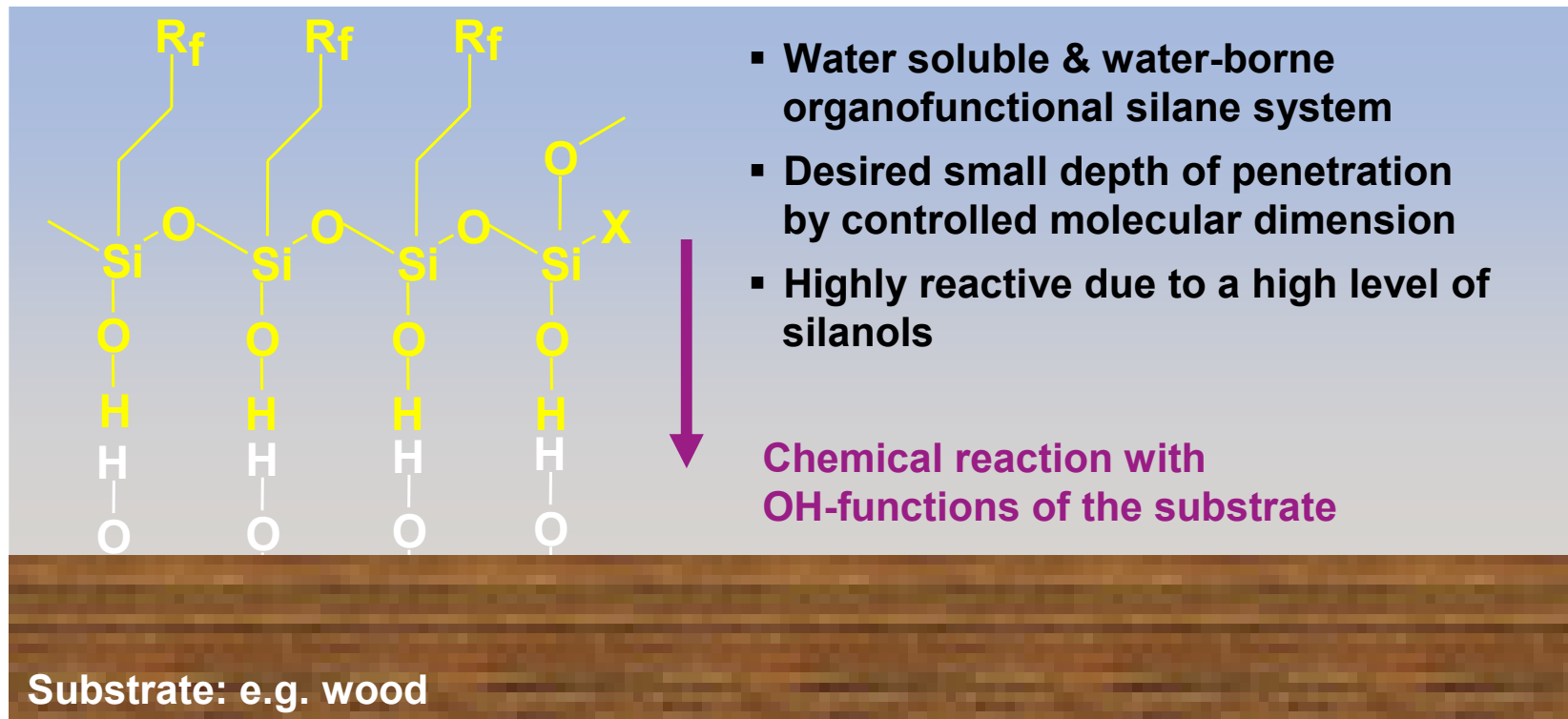
The Chemistry of Dynasylan[®] SIVO 121



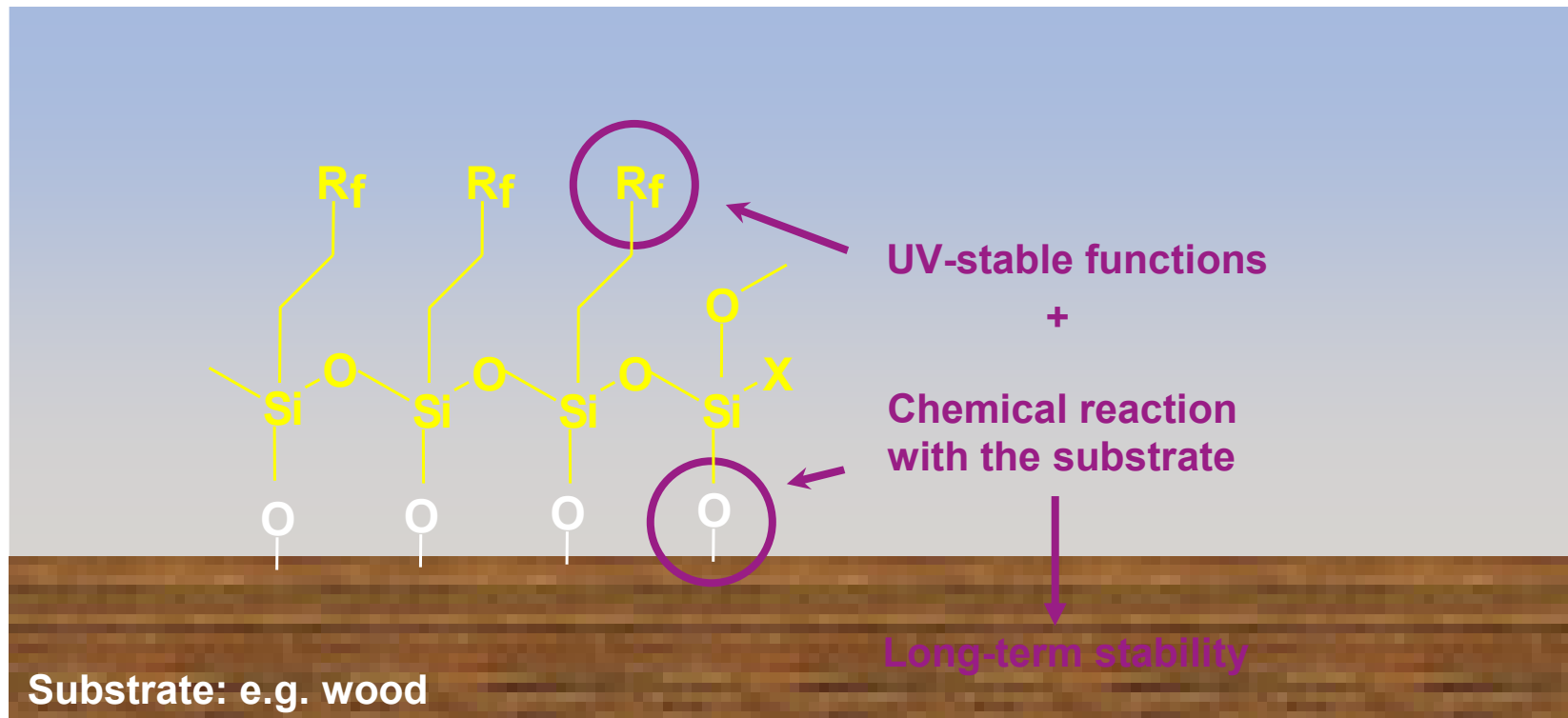
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SIVO® SOL Technology

Reaction with the Substrate



Evonik Degussa's SIVO® SOL Technology: Enabling A Novel Dimension of Wood Surface Impregnation



Summary



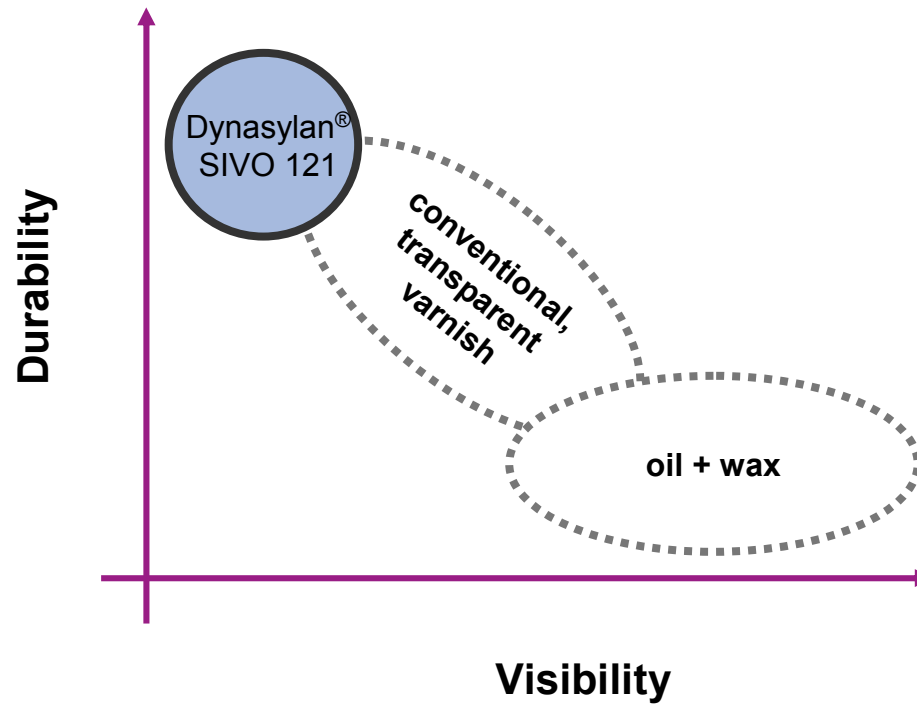
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Usual Transparent Varnishes for Wood Pose Disadvantages...

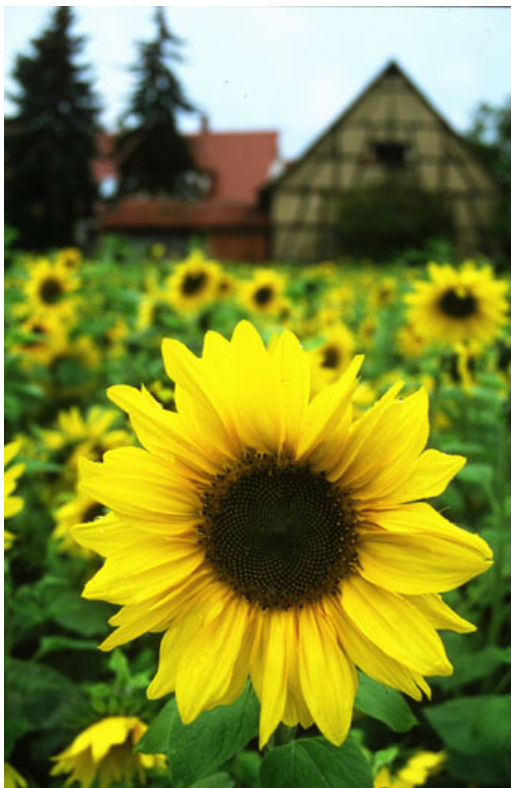


- **Insufficient weather resistance**
- **Performance products contain biocides and are solvent-borne**
- **Visible**
- **Change of surface texture**

Technical Position of Dynasylan® SIVO 121



Dynasylan® SIVO 121 is not Only Solvent-Free...



...it also boasts of being...

- water-borne
- without odor
- no biocide
- not toxic
- not influential towards the tactile sense of the surface
- not harmful according to the German Chemicals Law (ChemG)



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