Water-based coatings delivering performance & lower carbon footprint, from impregnation to film formation, with bio-based binders

Dr Julia CALLOT
Technical Sales Engineer
October 28th 2026



ecoat
RESPECT THE FUTURE

SUSTAINABLE & PERFORMING

octima
organizzazione per la chimica e per la tecnologia innovativa dei materiali avanzati
organization for chemistry and innovation technology of advanced materials

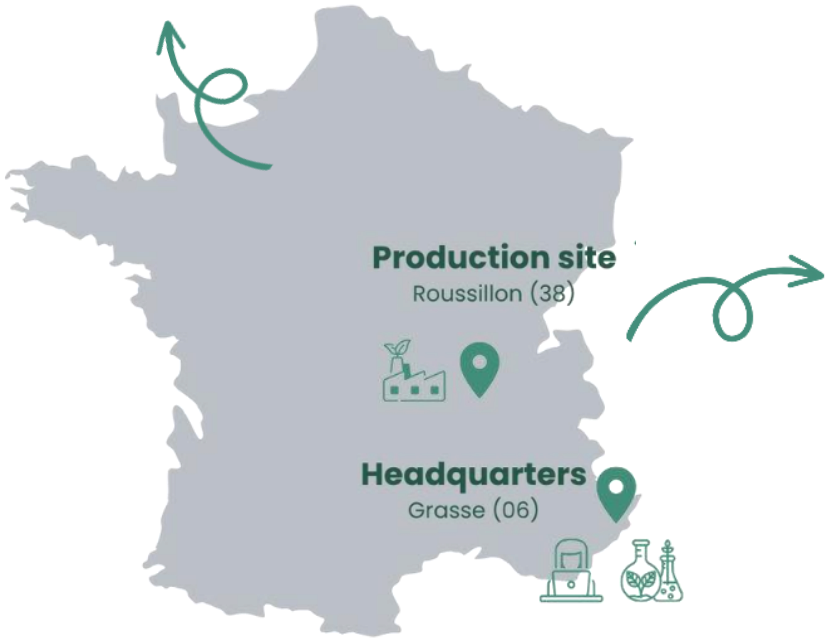


Ecoat, a French industrial scale-up

- Founded in 2011 & focusing on green chemistry
- **Designing**, **producing** and **marketing** water based & bio-based polymers for coatings
- **ESG-focused** and committed to **Responsible Care®**

BRONZE | Top 35% ecovadis Sustainability Rating NOV 2025

Responsible Care® OUR COMMITMENT TO SUSTAINABILITY



- On **OSIRIS, 1st French chemical platform**

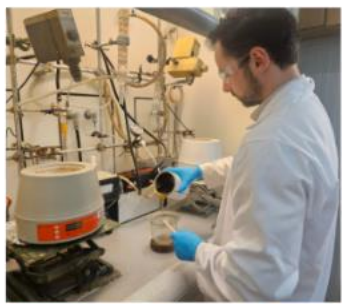
  (shared with many actors like BASF, Sequens, Elkem, etc.)
- 3000 m² ECOAT own building
- 10 000 MT capacity 2026, with future expansion plans













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Worldwide available





Serving customers worldwide

- with Ecoat's own sales force through **global key account management**
- and a strong network of **local distributors.**

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Low CF binders for three main application fields



Architectural



Wood



Metal

SECOIA®

From 89 to 98 %
Bio-based content*

INOKEM®

From 47 to 66 %
Bio-based content*

3 main application fields

A recognized expertise in decarbonization

A specific know-how regarding bio-based binders, eco-designed paint formulations & LCA

*based on C content according to EN 16640

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SECOIA® 4487

Decking oil

©Ecoat 2026

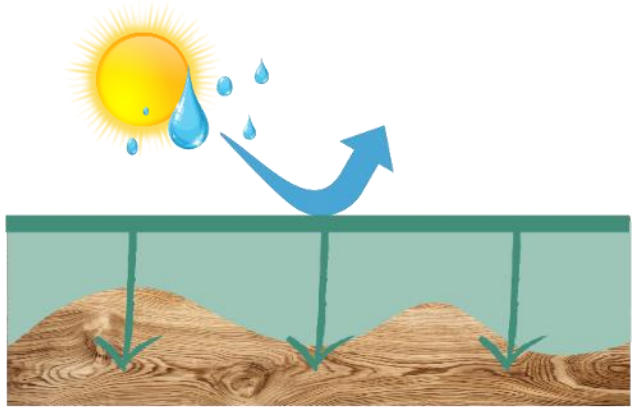
SECOIA® 4487 for wood impregnation & protection



USDA CERTIFIED BIOBASED PRODUCT
PRODUCT 97%
FP

WOOD IMPREGNATION

- Designed for non-film forming wood coating
- Procures natural wood aspect
- Outstanding water repellency performances
- Surfactant-free technology



✓ Deck, cladding, etc.
✓ Pine, exotic wood, oak, etc.

Deep penetration helps protect wood from weathering degradation

**Based on C content measured according to EN 16640*

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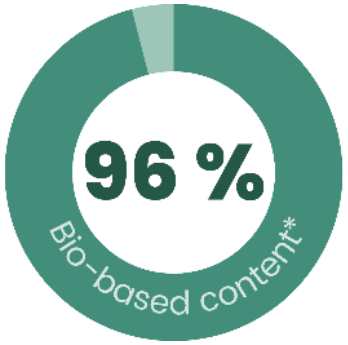
SECOIA® 4487 : surfactant-free technology



SECOIA® 4487

Water-based
biosourced alkyd

*Based on C content according to EN 16640

The current coatings for wooden deck application tend to peel after ageing

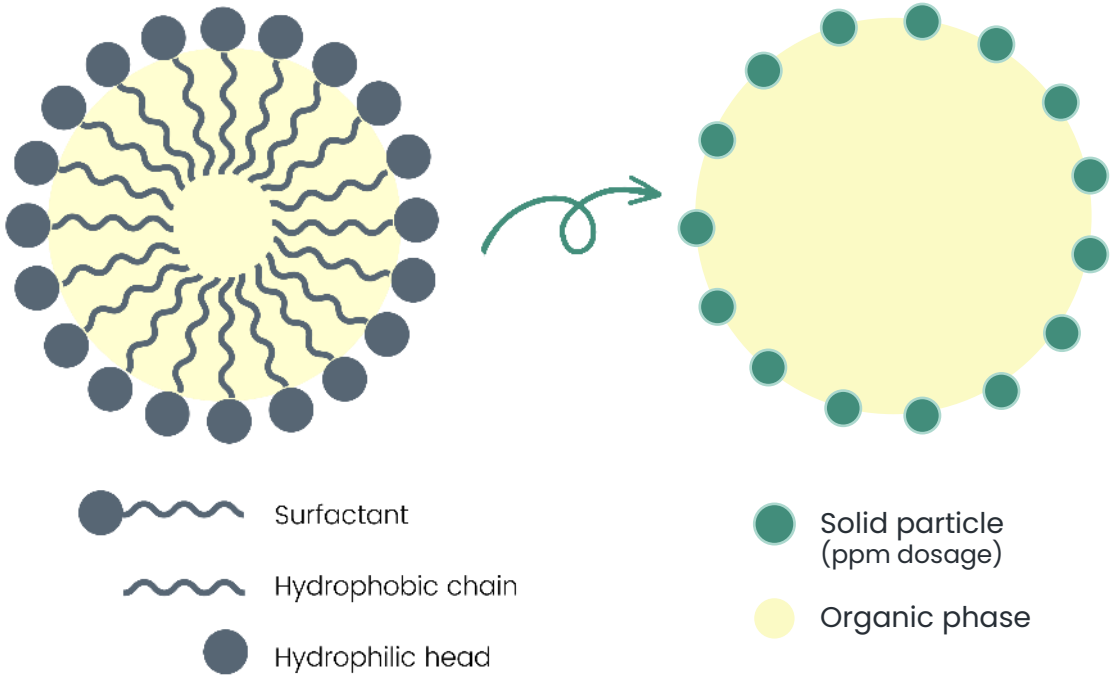
Secoia® 4487 technology allows to have a natural ageing by gradual degradation



Distilled water on Secoia® 4487 based decking oil applied on exotic wood

The Pickering patented technology

A clever alternative **using solid particles irreversibly adsorbed at the water/oily phase** interface to **stabilize the dispersion**



SECOIA® 4487 : efficient protection of wood



SECOIA® 4487

ACRYLIC BINDER



Pine wood – Brush application - 2 layers - 21 days of drying before immersion
Pictures : after 4 days of immersion in distilled water.

Both formula (Secoia® 4487 and acrylic) contains the same solid binder content. A rate of 0.3% of iron-based drier was added to Secoia® 4487 formula. Edges and backs of the samples were protected with solventborne white paint.

Secoia® 4487 : a good WB alternative to **fine particle acrylic & high oil length SB alkyd**

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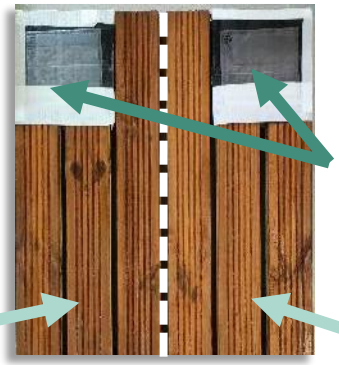
SECOIA® 4487 : outdoor exposure of decking oil

	Pine wood	Exotic wood
Substrates	Autoclave-treated scots pine wood.	Ipe wood exposed 2 months outside beforehand, without any treatement.
Preparation of the substrate	Smoothing and cleaning with wet cloth and drying	
Decking oils applied	• WB Decking oil based on SECOIA® 4487 (Teak tint) • WB Decking oil based on biobased alkyd emulsion from the market (teak tint) • WB Decking oil based on acrylic emulsion from the market (teak tint) • SB Decking oil based on high oil length alkyd (Teak tint)	
Application of decking oil	WB : Application with a roll - no wiping - 2 layers - 4h of drying between layers SB : 3 layers (until saturation) + wiping	
Exposure time and location	12 months - GRASSE (06), France	



DECKING OIL FORMULA	
Solid content	17 %
Binder rate	26 %





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SECOIA® 4487 : effective protection of knots

Knots on pine wood with decking oil based on **Secoia® 4487** and bio-based acrylic after 1 year of natural weathering.



SECOIA® 4487	Bio-based acrylic

Protection of knots is difficult and weak impregnation leads to prematurely peeling.

Thanks to deep impregnation of **SECOIA® 4487, knots are protected and preserved, even several months after application**.

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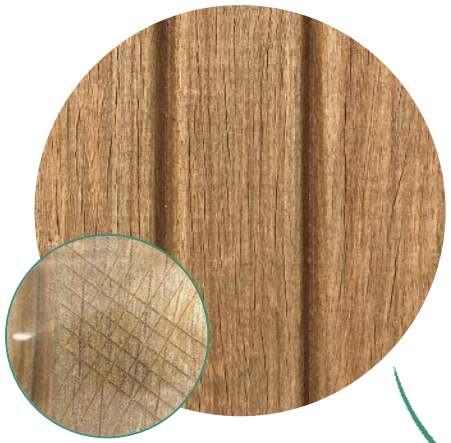
SECOIA® 4487 : solution for easy renovation

Secoia® 4487

Secoia® 4487 leads to gradual degradation.

This facilitates restoration after 1 or 2 years of exposure.



After 1 year of exposure, before restoration

Restoration

(1 layer)

Adhesion check, cross-cut test (ISO 2409) 3 days after restoration



12 months of exposure + 1 layer of restoration

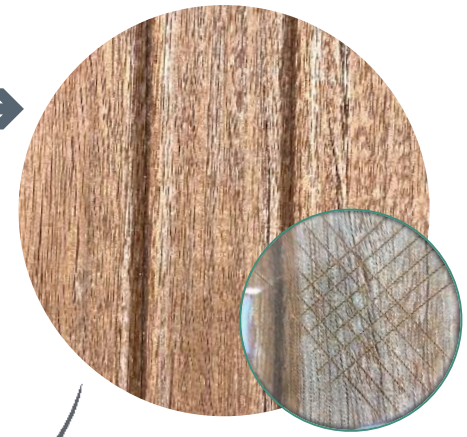


Adhesive from cross-cut test (ISO 2407)

Acrylic based coating

Restoration can be difficult because of lack of adhesion after ageing.

After 1 year of exposure, before restoration



Restoration

(1 layer)

Adhesion check, cross-cut test (ISO 2409), 3 days after restoration



Adhesive from cross-cut test (ISO 2407)



12 months of exposure + 1 layer of restoration

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SECOIA® 4487 : stronger protection than SB

Exotic wood - 7 months of natural exposure

Non-exposed area (black square)

Non-exposed area (black square)



Secoia® 4487

Application :
2 layers with a roll, 4h of drying between layers.

Solventborne decking oil

Application :
3 layers with a brush (until saturation).

No coating

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SECOIA® 4487 decking oil : strong CF reduction



Functional unit: 1 kg of decking oil.

Comparative LCA carried out with **Simapro v9.5/ IPCC 2021 method GWP100**, **taking into account the CO_2 storage effect of biogenic carbon at the gate.**

Cradle to gate study – manufacturing supposed in Grasse - product without packaging.

Production process data based on Decorative Paint PEFCR scenario.

Secoia® 4487: binder modelized cradle to ECOAT's gate without the packaging using Ecoinvent database v3.8 cut-off and supplier specific data (June 2024 Assessment).

Solvent based alkyd: binder modelized cradle to ECOAT's gate without the packaging using Ecoinvent database v3.8 cut-off (August 2024 Assessment).

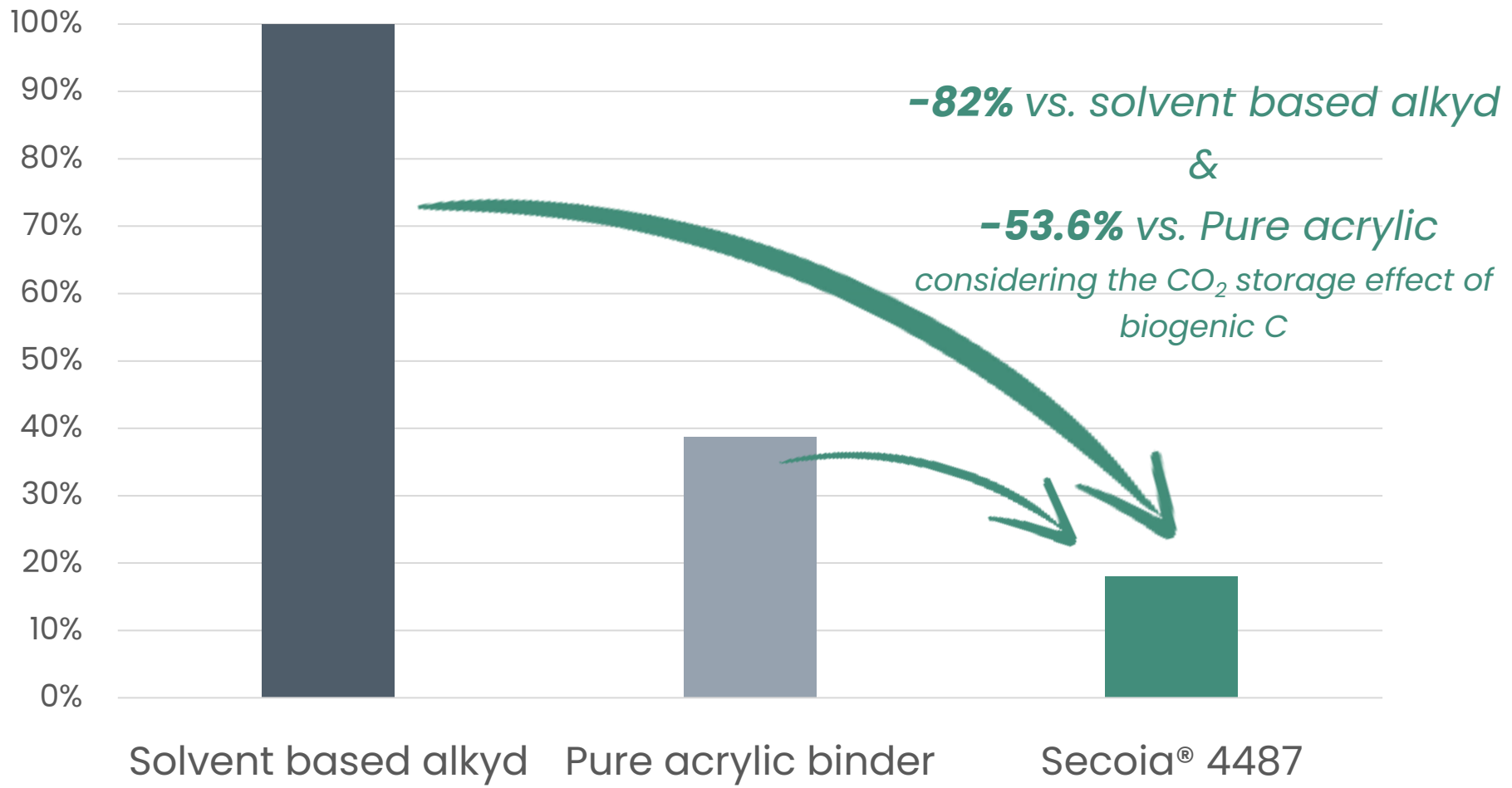
Pure Acrylic binder: model from EPDLA LCA study (European Polymer Dispersion & Latex Association).

Paint raw materials: models from Ecoinvent database v3.8 cut-off and CEPE database (European Council of the Paint, Printing Ink, and Artist's Colours Industry).

Please consult us for more information

Climate change impact of clear decking oils
Secoia® 4487 vs. references

Cradle to gate - IPCC 2021 GWP100 method + CO_2 storage effect of biogenic carbon



***-82%** vs. solvent based alkyd*

&

***-53.6%** vs. Pure acrylic*

considering the CO_2 storage effect of biogenic C

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INOKEM® UR 3301

Trim paints

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INOKEM® UR 3301 : versatile binder



* % biobased calculated according to EN 16640

VERSATILE WATER-BASED PU-ALKYD

- Good chemical resistance and good leveling
- Good scratch resistance
- Good balance flexibility / hardness
- Designed for a wide range of gloss level including high glossy paints
- Adhesion on multi-substrates (wood, steel, laminate, old glycerophtalic paint, …)
- Compatible with acrylic, SA, vinylic and PUD
- Lower CO_2 footprint versus PUD and acrylics

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INOKEM® UR 3301 : High leveling

TRIM PAINT FORMULA	
Solid content	52 %
PVC	31 %
Gloss (60°/85°)	8/12

- **INOKEM® UR 3301**
- **STYRENE ACRYLIC**

+

- **MARKET PAINT 1 : WB Acrylic - PU**
- **MARKET PAINT 2 : WB Acrylic PU alkyd**
- **MARKET PAINT 3 : SB Glycerophtalic**

Leveling on pine wood plates

Good leveling for Inokem® UR 3301



Brush marks for Styrene acrylic paint





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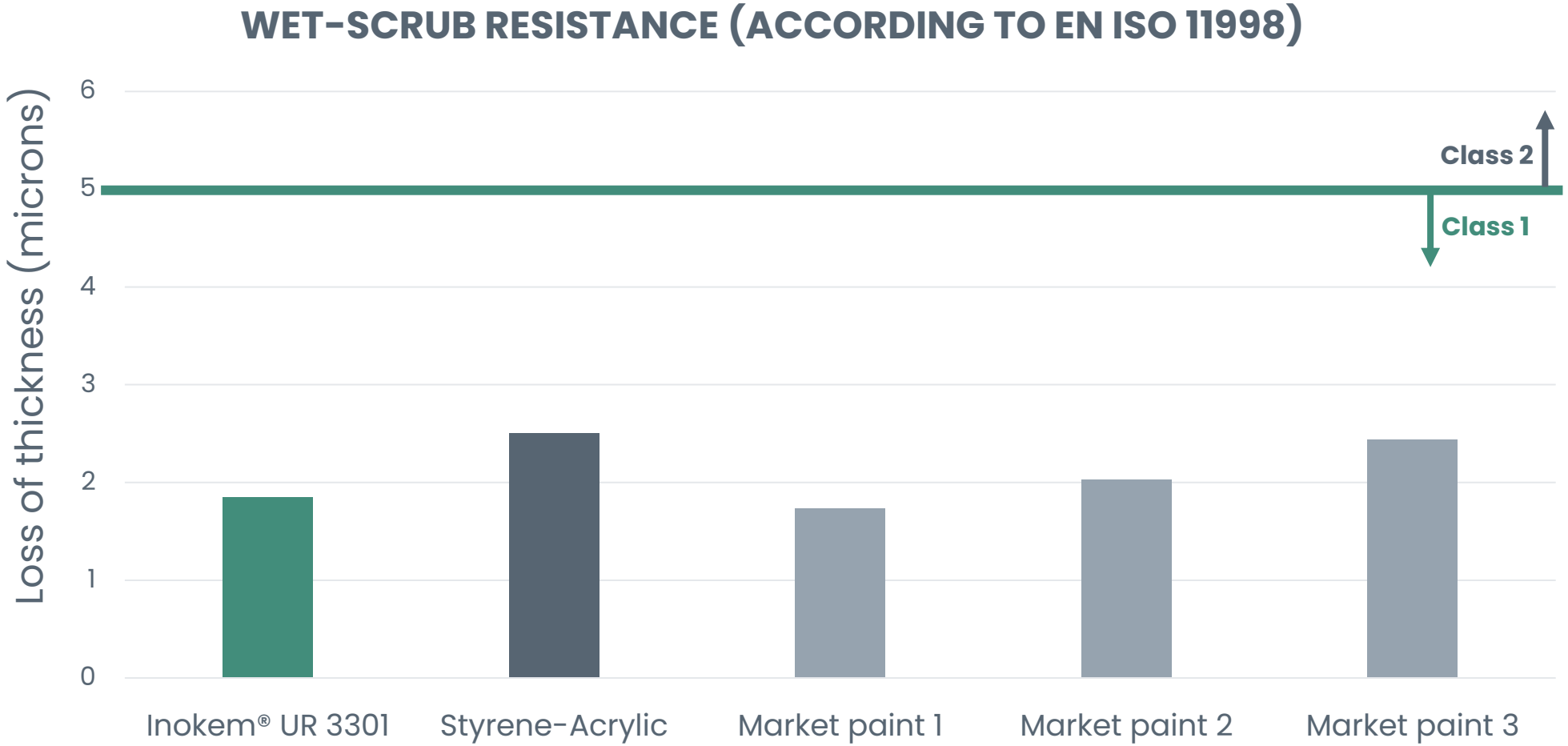
INOKEM® UR 3301 : class 1 scrub resistance



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INOKEM® UR 3301 : high stain resistance

Procedure:

- Plasterboard
- Roller application of a constant weight
- 20 days of drying time
- A few seconds, 1 hour and 1 day of exposure

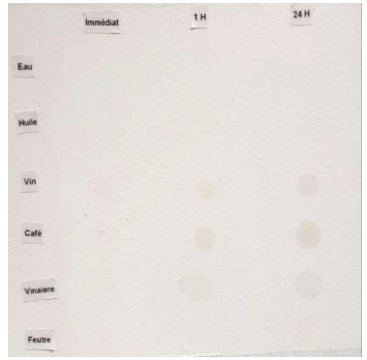
Tested products:

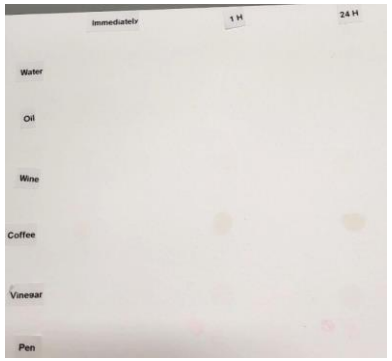
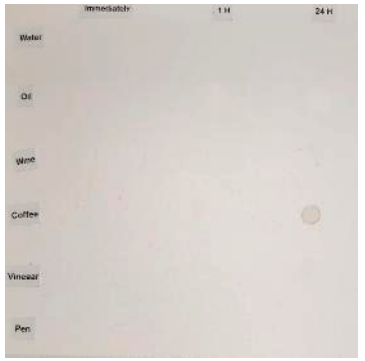
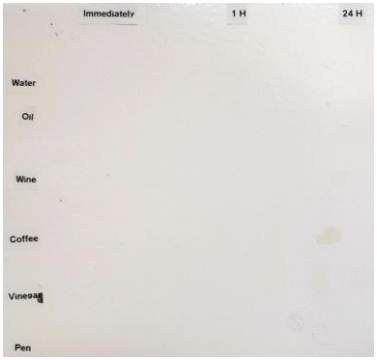
- Tap water
- Sunflower Oil
- Red Wine (example of application below)
- Coffee
- Vinegar
- Velvet pen

	Immediate	1 hour	24 hours
Red Wine			



Inokem® UR 3301 shows very good results on this test

Inokem®UR 3301	Styrene Acrylic
	
Rating : **14**	Rating : **28**

Market paint 1 **WB Acrylic - PU**	Market paint 2 **WB Acrylic PU alkyd**	Market paint 3 **SB Glycerophtalic**
		
Rating : **16**	Rating : **12**	Rating : **13**

Rating :
0 ➔ 90 : Very high resistance ➔ No resistance

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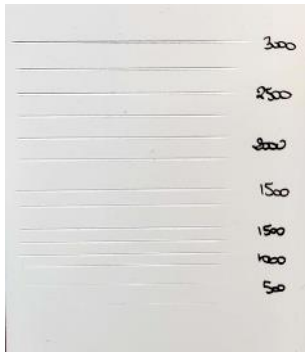
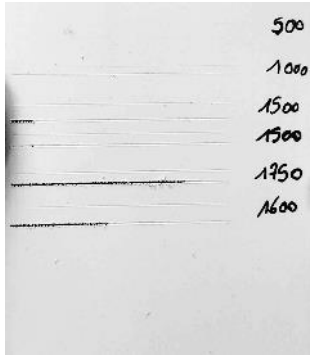
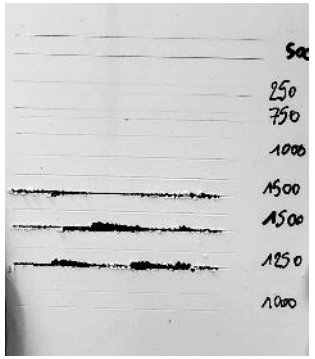
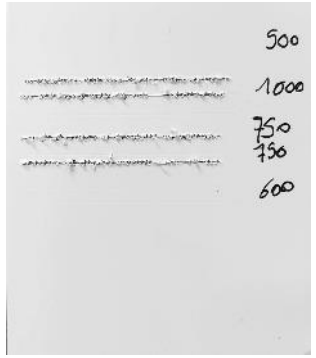
INOKEM® UR 3301 : good scratch resistance

Procedure (ISO 1518-1):

- ✓ One layer of 200 µm wet paint is applied on a Q-panel plate (QD-36)
- ✓ 14 days of drying time
- ✓ A scratch tester (sliding weight model) is then used to measure **the maximum weight that the film can support without scratching** (right table)



Inokem®UR 3301	Styrene Acrylic
	
✓ 1800 g	600 g

Market paint 1 WB Acrylic - PU	Market paint 2 WB Acrylic PU alkyd	Market paint 3 SB Glycerophtalic
		
✓ 1500 g	1000 g	600 g

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INOKEM® UR 3301 : good adhesion on multi-substrates



ISO 2409	Inokem®UR 3301	Styrene Acrylic	Market paint 1 WB Acrylic - PU	Market paint 2 WB Acrylic PU alkyd	Market paint 3 SB Glycerophtalic
Pine wood 	0	0	0	0	0
Sanded aged glycerophtalic paint 	1	5	1	1	2
Sanded PVC 	0	0	0	0	3
Sanded Laminate 	0	NA	1	0	3

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INOKEM® UR 3301 trim paint : CF reduction



Functional unit: *1 kg of paint.*

Comparative LCA carried out with ***Simapro v9.5/ IPCC 2021 GWP100 method, taking into account the CO_2 storage effect of biogenic carbon at the gate.***

Cradle to gate study *– manufacturing supposed in Grasse - product without packaging.*

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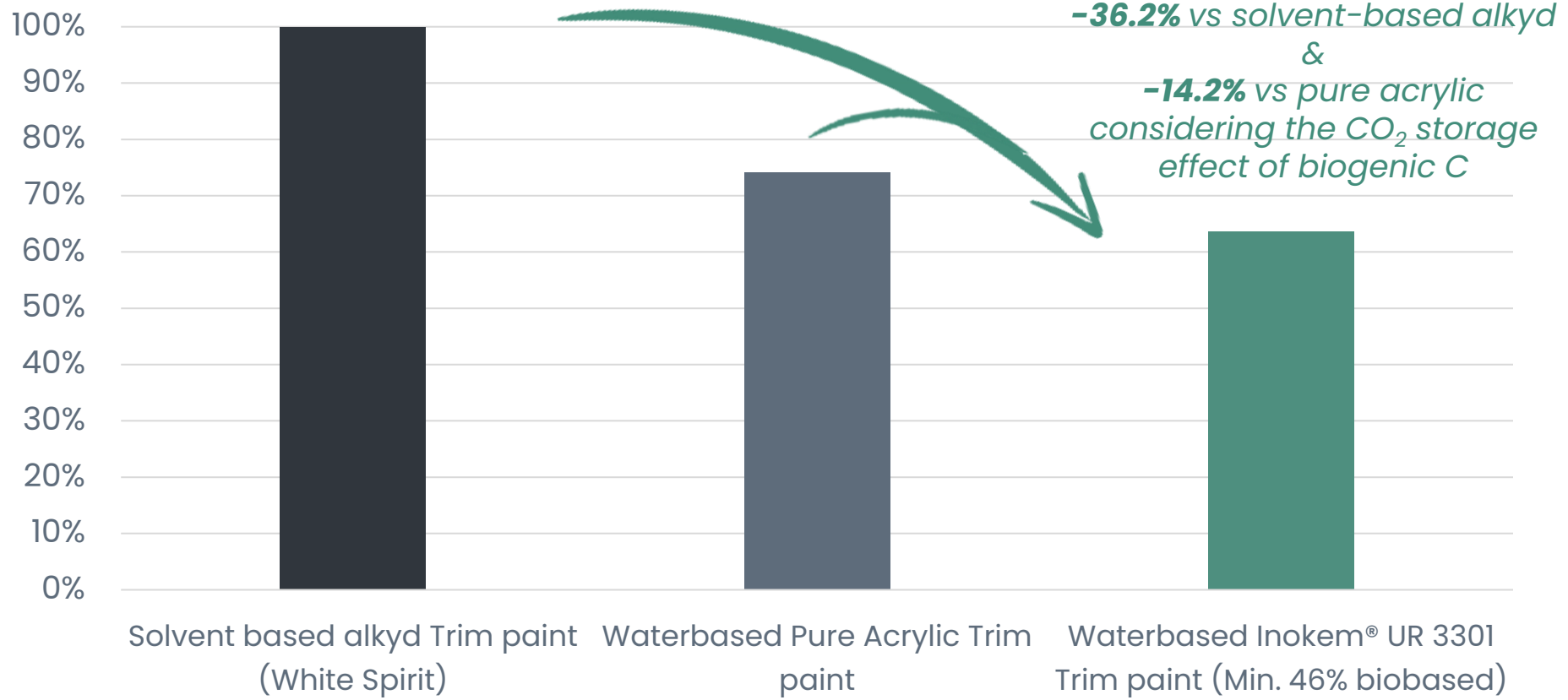
CLIMATE CHANGE IMPACT OF TRIM PAINTS

Inokem® UR 3301 vs references

Cradle to gate - IPCC 2021 method GWP100 + CO2 storage effect of biogenic carbon



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INOKEM® UR 3301 : can achieve very high gloss



Paint properties:

- Very high gloss
- Low VOC rate
- Gloss retention over time
- Scrub resistance
- Drying time
- Stain resistance
- Water uptake

INOKEM® UR 3301 formula applied on pine wood :



GLOSS :
89 GU (60°)
52 GU (20°)

A technical presentation with all data and guideline formula is available

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ECOAT binders for wood



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