Creating Additive Value

Innovative and sustainable additives in the coatings industry: high-performance solutions without compromise

Tina Leyh

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Sustainable additives for a wide range of applications

Creating sustainable products and technologies to support the following global efforts:

- Reducing of energy and emissions
- Minimizing of the use of resources

Increasing the amount of products in our portfolio which have:

- Have renewable raw materials and/or
- Are biodegradable acc. to OECD
- Are microplastic free and PTFE free

We are doing research to enlarge the recycled inputs on the MÜNZING products

Reduce CO_2 footprint

MÜNZING Goals: 2030: 80% CO_2 neutral, 2040: 100% CO_2 neutral, 2050: 100% CO_2 free

We help our customers in CREATING SUSTAINABLE VALUE!

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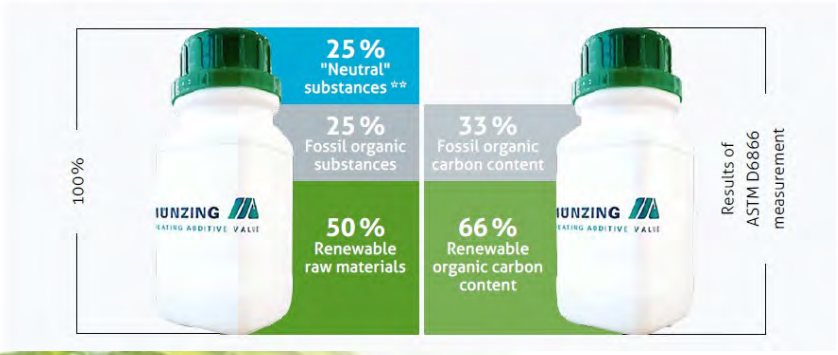
Our key points for sustainable additive development

1. RENEWABLE CONTENT

- ASTM D6866: Renewable carbon content
- Schematic composition



2. BIODEGRADABILITY

- Measured in our lab acc. to OECD 301 F

→ Readily biodegradable if > 60% removal of COD within 28 days testing period

3. MICROPLASTIC FREE

4. VOC FREE

5. PTFE FREE

6. CREATING SUSTAINABLE VALUE

Our additives improve the properties of your formulations → increase the lifespan of the coatings

Our sustainability strategy is inspired by our guiding principle "Creating Additive Value". We create sustainable products and technologies to support global efforts to reduce energy consumption, minimize emissions and usage of resources to help our customers CREATING SUSTAINABLE VALUE!

7. BROAD COMPLIANCE WITH DIFFERENT REGULATORIES AND INVENTORIES

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GREEN PRODUCTS Brochure with our sustainable additives

DEFOAMER

DISPERSING AGENTS

WETTING AGENTS

POWDER ADDITIVES

RHEOLOGY MODIFIERS

MICRONIZED WAXES

OPEN TIME ADDITIVES

WAX DISPERSIONS

Product	Chemistry	"Neutral" substances / Fossil substances / Renewable substances	Renewable organic carbon content in % according to ASTM D6866*	Readily biodegradable according to OECD 301	Adhesives & Heatseal	Architectural Coatings	Building & Construction (Products)	Energy & Oilfield	Industrial Coatings	Laminates	Paper	Printing Inks	Water treatment & Process Water	Wood Coatings	Wood Panels	Properties
DEFOAMER																
AGITAN® **271**	Vegetable oil, polyoxalkylene		45–55	no	•	•		•	•		•					Excellent stability, high efficiency, alkali and acid resistant, pH-range between 3 and 12.
AGITAN® **301**	Vegetable oil, few silicone		85–95	yes	•						•		•			Nonionic structure, excellent compatibility with binders, easy to incorporate, suitable for food contact applications.
AGITAN® **352**	Vegetable oil, polyoxalkylene		50–60	yes	•	•			•		•	•		•		Excellent stability, high efficiency, alkali and acid resistant, pH-range between 3 and 12.

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Test Results

Defoamer for high PVC indoor Wall Paint based on Vinyl Acetate

90g coating + 0,4% defoamer	IKA stirring test [%] foam	Appearance after 24 h	Film defoaming (roller application)		Storage for 4 weeks at 40°C	De-aeration [% foam]	Appearance after 24 h	Film defoaming (roller application)	
			wet	dry				wet	dry
without defoamer	43.2	very foamy	2	3		37.3	very foamy	2	3
Reference	8.2	homogeneous	3	5		9.5	slightly foamy	3-4	4
AGITAN® 105	4.4	homogeneous	3-4	6		8.2	slightly foamy	3-4	4
AGITAN® 109	4.1	homogeneous	4	6		4.7	slightly foamy	5	7
AGITAN® 271	**0.4**	**homogeneous**	**5**	**7**		**3.1**	**slightly foamy**	**6**	**6**
AGITAN® 351	0.3	homogeneous	5	8		2.7	slightly foamy	7	8
AGITAN® 352	**1.6**	**homogeneous**	**4**	**7**		**3.0**	**slightly foamy**	**5**	**6**

Defoamer evaluation from 1 to 10 : 1 – worst / 10 – excellent

- **AGITAN® 105 shows good initial defoaming efficiency (small decreases after storage but still better than the reference)**
- **AGITAN® 109; 271; 351 and 352 achieve good defoaming results at all and very good persistence after storage**

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Test Results
Defoamer for Elastomeric Roof Seal Paint

Roof seal paint + 0.2% defoamer	IKA-stirring test [% air]	Appearance after 24 h	Roller application on customer substrate		Leveling on glass 1000µm	
			wet	dry	overall	film defoaming dry
without defoamer	18.24	homogeneous	1	2	10	1
Reference 1	11.95	homogeneous	1	1	10	2
Reference 2	6.52	homogeneous	3	3	10	4
AGITAN® 271	6.86	homogeneous	7	7	10	6
AGITAN® 351	4.09	homogeneous	7	7	10	7
AGITAN® 352	5.44	homogeneous	6	7	10	6

Defoamer evaluation from 1 to 10 : 1 – worst / 10 – excellent

- **With regard of both Reference defoamers all mentioned AGITAN® types show very high defoaming efficiency on both substrates**

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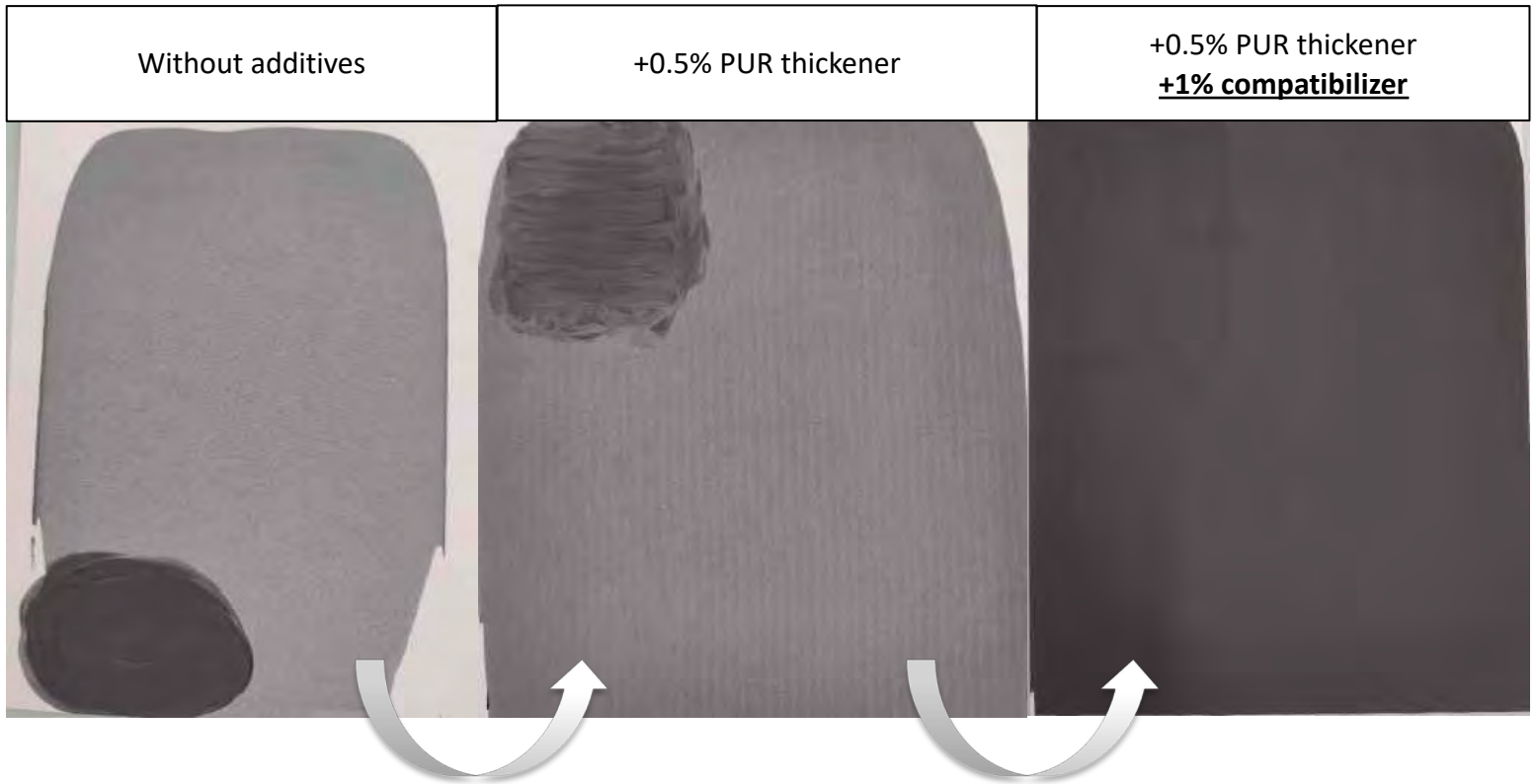
METOLAT® 367 R and METOLAT® 388 R

Highly Efficient & Renewable Compatibilizer

Rub-out test in architectural coating



✓ Rheology

✓ Rheology
✓ Color acceptance
✓ Color development
✓ Rub-out elimination

METOLAT® 367 R

~100% renewable

METOLAT® 388 R

~100% renewable

- *Type:* Polyglycol esters, non-ionic
- Active content: **100% (liquid)**
- Broad applicability & compliances
- Post-additives especially for:
  - Enhanced color development
  - Eliminating/reducing rub-out effects

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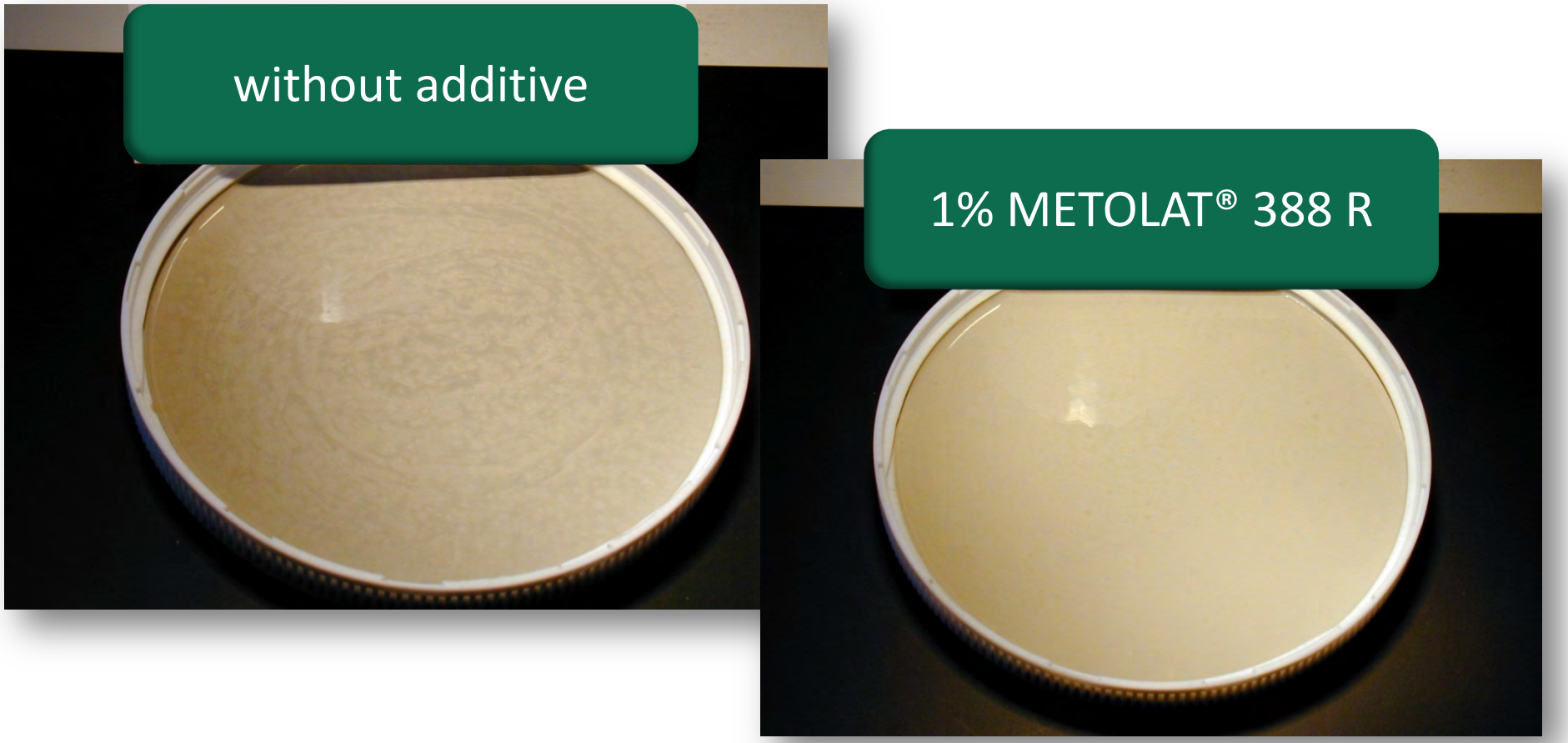
Applications
Compatibility – Silicone-free, nonionic

Pigmented amine component of a 2K-EP flooring



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Applications
METOLAT® 368 – Wetting of a PSA on PVC

Without wetting agent

2% METOLAT® 368

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EDAPLAN® 397 R
High-Performer for Phthalocyanines, Great for Organic Pigments

		Pigment Green PG 7	Pigment Blue PB 15:3	Pigment Red PR 254	Pigment Yellow PY 154
Water		49.70	47.30	53.60	63.10
AGITAN® 760		**0.50**	**0.50**	**0.50**	**0.50**
Acticide MBS		0.10	0.10	0.10	0.10
EDAPLAN® 397 R		**9.60**	**12.00**	**10.50**	**6.00**
Ammonia (25%)		0.10	0.10	0.30	0.30
Pigment		40.00	40.00	35.00	30.00
TOTAL		**100.00**	**100.00**	**100.00**	**100.00**
%-Dispersant calculated on pigment		*24%*	*30%*	*30%*	*20%*
Stability of paste after 24h		No settling Low viscous	No settling Medium viscos	No settling Low viscous	No settling Low viscous
	Color strength (integrated)	111.22	114.84	174.01	17.90
Acrylic based	**Gloss 20°**	101	93	93	90
Clear Coat	**Haze 20°**	69	55	34	104
	Flocculation/ specks	0	0	0	0
White	**Color strength (integrated)**	1.46	2.78	3.06	0.64
DIY Paint	**Rub-Out (ΔE)**	0.19	0.35	0.98	1.00

Color Strength	Higher = better*
Gloss	Higher = better
Haze	Lower = better
Flocculation	Lower = better
Rub-Out (ΔE)	Lower = better

**possible values depending on color shade*

In the case of EDAPLAN® 397 R, excess dispersant leads to considerable foam formation
→ start testing at low dosages!

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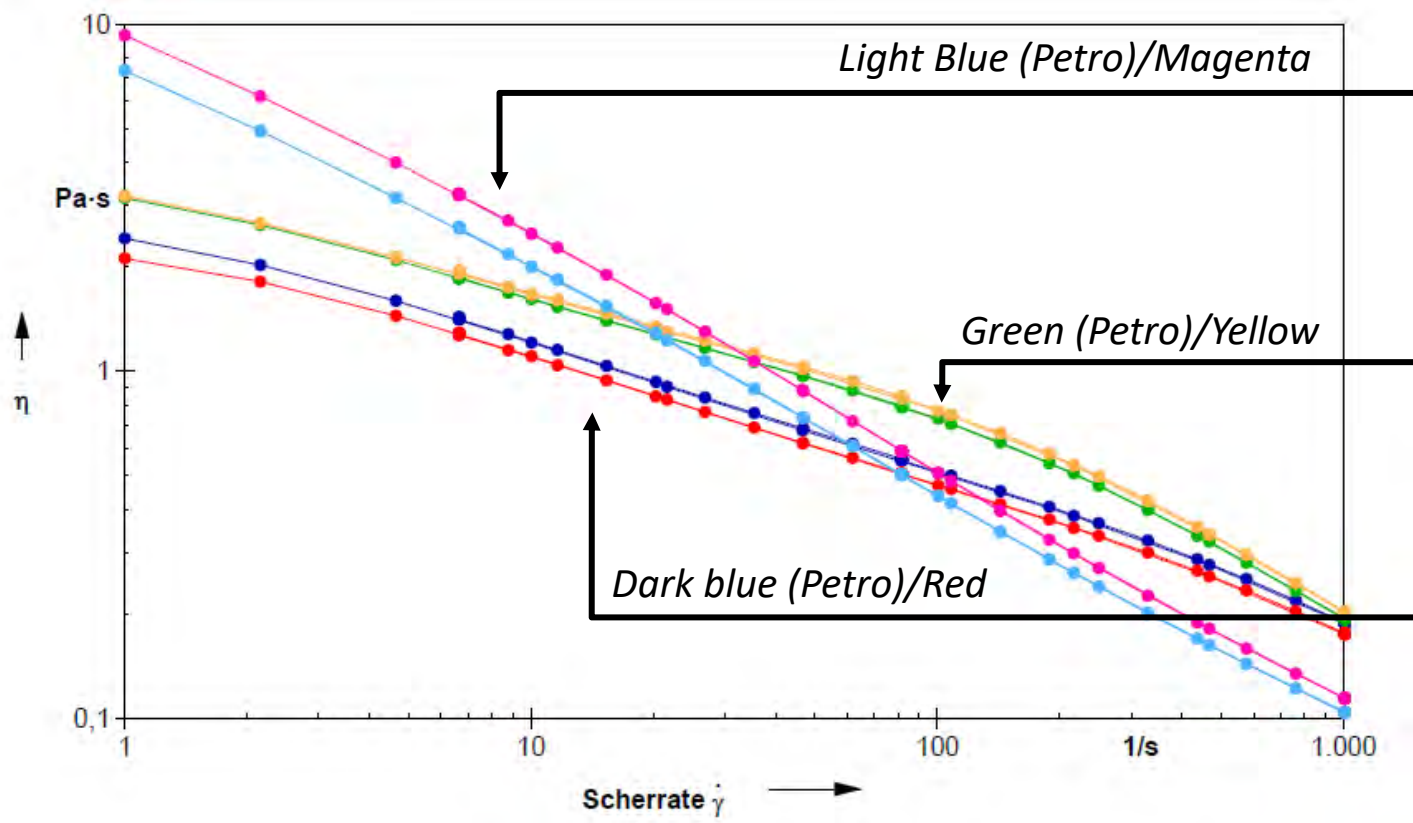
TAFIGEL® PUR „R-Series“

New Renewable PUR Thickeners as Direct Drop-Ins to Standard Versions

- Renewable „Drop-Ins“ exhibit the same performance as the standard petro-based PURs
- Test System/Binder: Acrylic copolymer dispersion



TAFIGEL® PUR 64 R
~90% Renewable

Strong pseudoplastic

TAFIGEL® PUR 54 R
~88% Renewable

Moderate pseudoplastic

TAFIGEL® PUR 82 R
~89% Renewable

Newtonian

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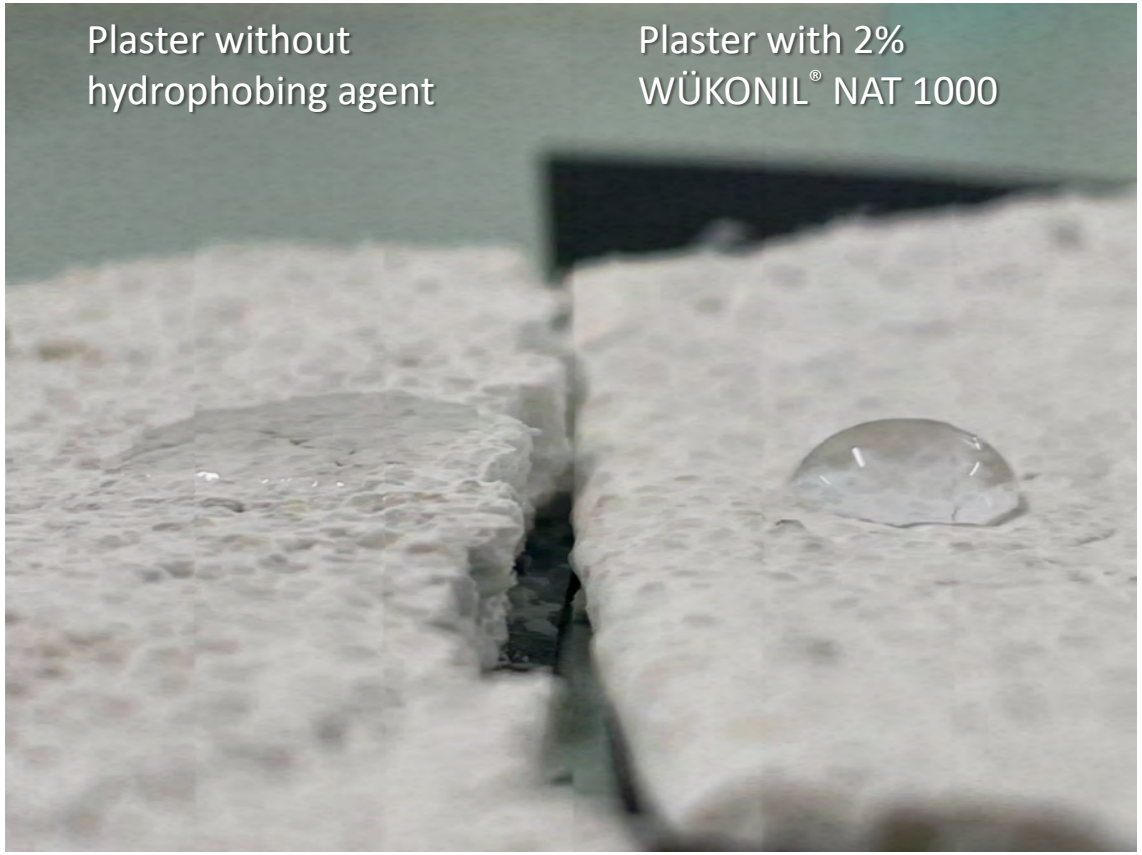
Renewable hydrophobing agent WÜKONIL® NAT 1000 – Plaster



	Reference	WÜKONIL® PW	SÜDRANOL® 340eco	WÜKONIL® NAT 1000
L*	90.75	92.78	93.57	93.22
a*	-0.4	-0.38	-0.42	-0.43
b*	3.61	3.88	3.78	3.44
ΔE	-	2.05	2.82	2.47

→ Low influence on color with WÜKONIL® NAT 1000.
Comparable to standard grades.

Drying: 7 days at room temperature
Wax Dosage: 2% calculated on solid content (6% delivery form)

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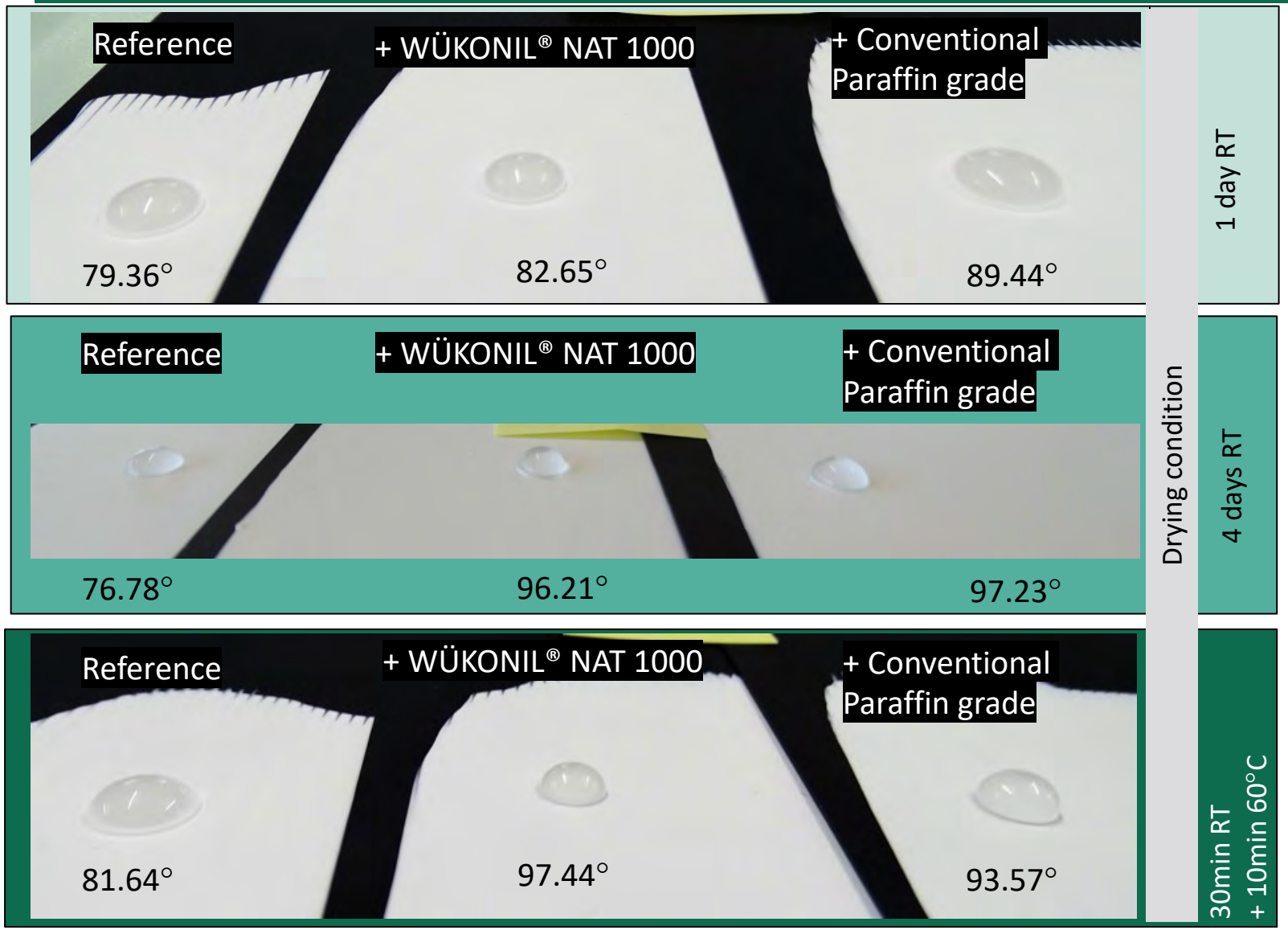
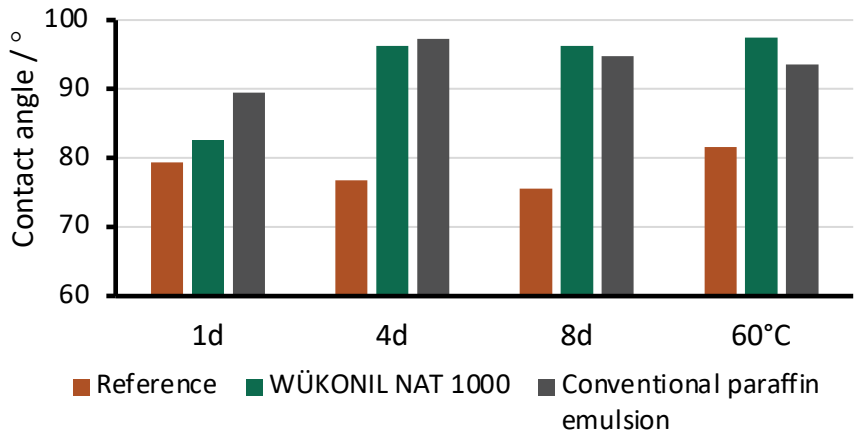
Renewable hydrophobing agent
WÜKONIL® NAT 1000 – Paint - Hydrophobicity



Application: 150 µm wet on Leneta card
Wax Dosage: 3% solid wax
Pictures taken 1min after placing the water drop
Contact angle measured with KRÜSS Easy Drop

Improvement of hydrophobic effect for all samples but especially for WÜKONIL® NAT 1000 with

- **Higher temperature**
- **Longer drying time**



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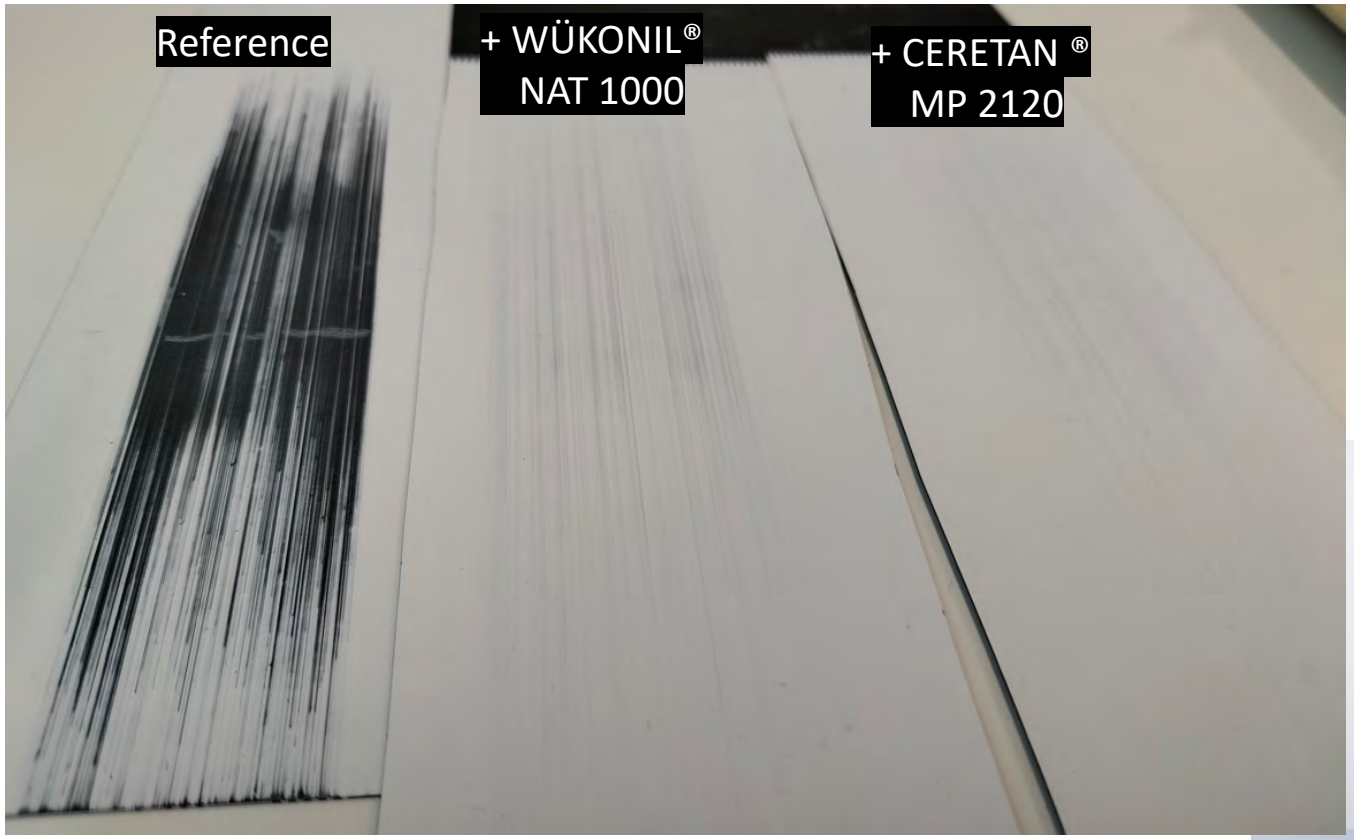
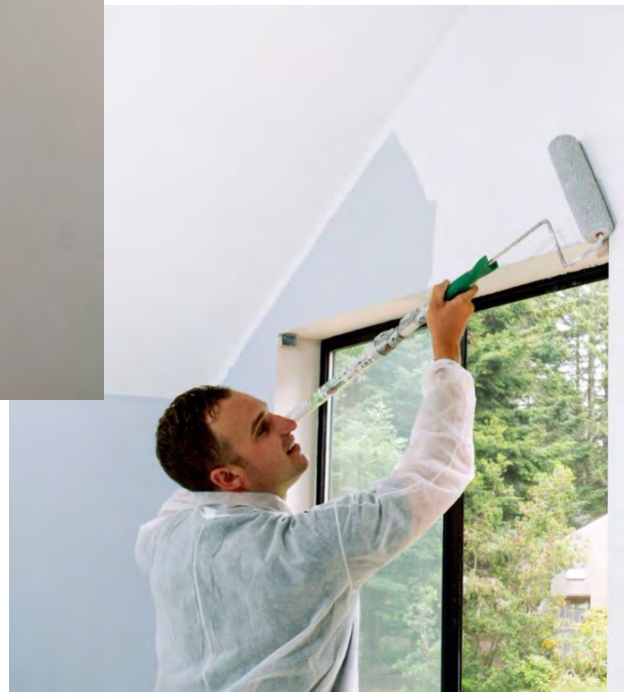
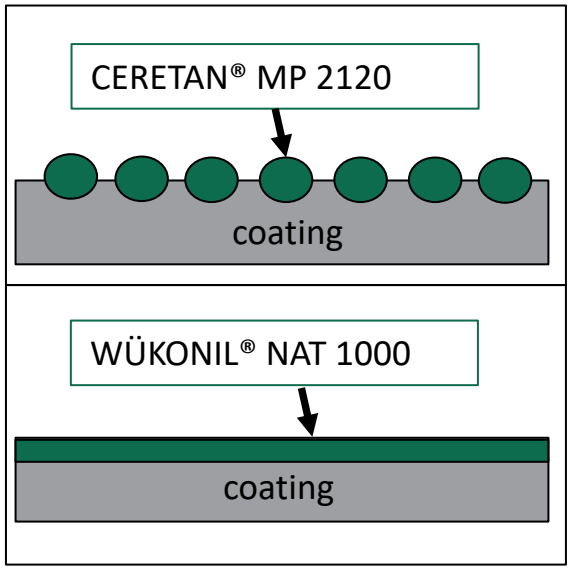
Renewable hydrophobing agent
WÜKONIL® NAT 1000 – Paint – Wet scrub resistance



Application: 150 µm wet on Leneta card
Drying: 7 days at room temperature
Wax Dosage: 3% solid wax

Improvement of wet scrub resistance with micronized wax CERETAN® MP 2120 and WÜKONIL® NAT 1000





Zehnter abrasion measurement ZAA 2600 based on DIN EN ISO 11998
Washing solution: 0.25% Marlon A 350 solution
Parameters: 350 cycles

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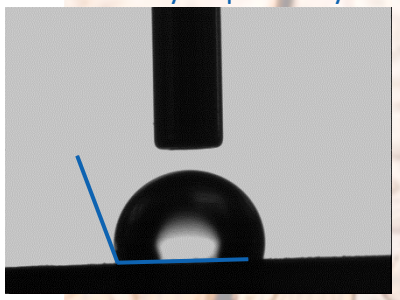
Hydrophobing agent– WÜKONIL® NAT 1000 – Wood Coating

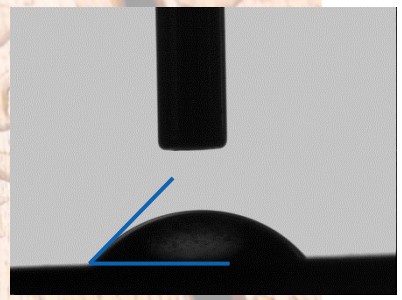
Test in water based clear wood coating
Dosage: 2 % (solid wax)
Wet film thickness: 100 µm
Curing conditions: 10 min at 60 °C after short drying at room temperature
→ Drying at 60 °C further improves hydrophobicity

	Contact angle
Blank sample	53.4° poor
WÜKONIL® NAT 1000	101.4° very good
Conventional paraffin dispersion	100.5° very good

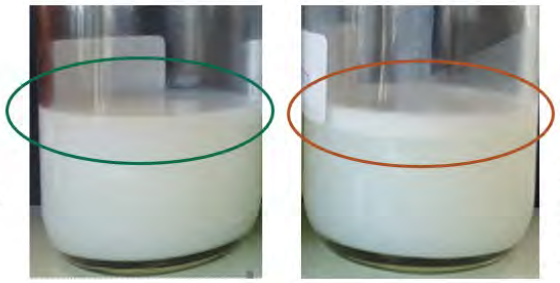
High contact angle
= Good hydrophobicity



Low contact angle
= Poor hydrophobicity



Storage stability of the samples after 3 days



WÜKONIL® NAT 1000
In wood coating.
No separation visible

Conventional paraffin
Dispersion in wood
coating.
Separation clearly visible

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Slip and matting in wood coatings

SLIP

Test in water based, white pigmented wood coating
Dosage: 2 % (solid wax)
Wet film thickness: 200 µm
Drying at 60 °C in a stove

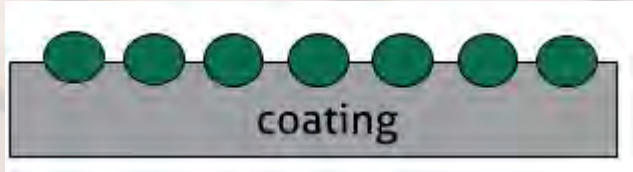
	Reference	WÜKONIL® NAT 1000	Conventional paraffin dispersion
COF µD	0.30	0.18	0.19

Depending on the wax type the COF can be either increased or decreased.

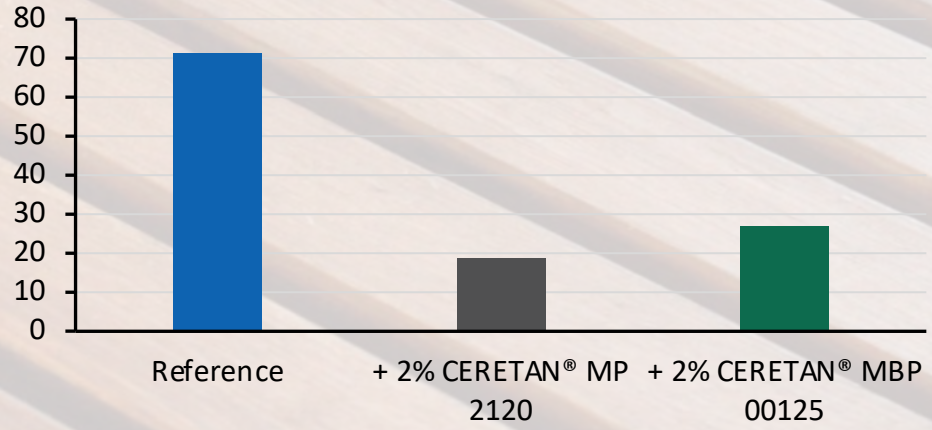
- CERETAN® MBP 00125 doesn´t change the COF or can be used as anti-slip additive
- WÜKONIL® NAT 1000 gives slip properties

MATTING

Matting effect depends on the particle size of the wax → diffuse light scattering on wax particles sticking out of the surface



Gloss 60° Standard wood coating formulation, 30 µm dry film thickness



Same gloss reduction and no effect on slip like PP wax

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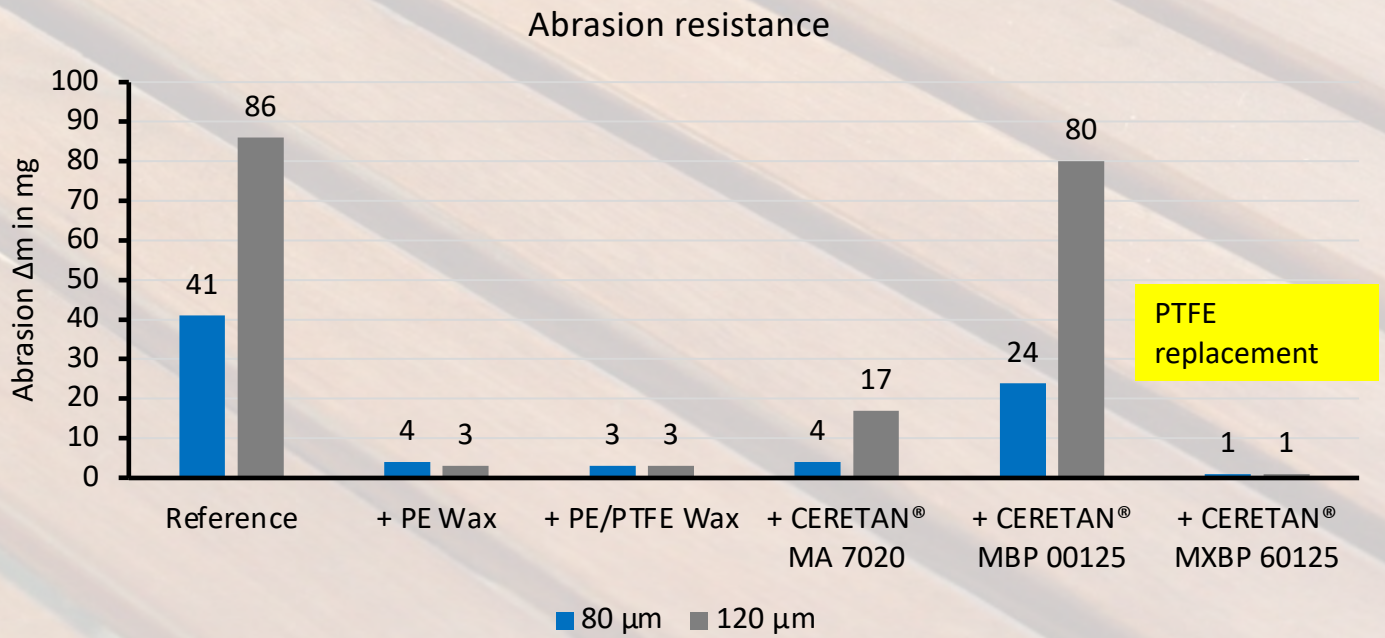
Abrasion resistance and sandability in wood coatings

ABRASION RESISTANCE

Acrylic clear wood coating
Dosage: 3%
Application on Leneta card
Taber Abraser 200 cycles



SANDABILITY

CERETAN® MBP 00125	Polyolefin wax
	

Pictures: Sanding paper after
20 rubs on acrylic wood coating with sanding paper

CERETAN® MBP 00125 is a biopolymer with a decomposition temperature > 200°C
→ Good thermal resistance

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Printing ink – water based

Water-based printing ink, 200 rub cycles

	Sample without additive	1% CERETAN® MBP 20220	1% CERETAN® MX 9820	1% CERETAN® MT 9119	1% LUBA-print® WBP 2700	1% LUBA-print® W 5700
						
COF µD	0.54	0.17	0.11	0.17	0.33	0.23

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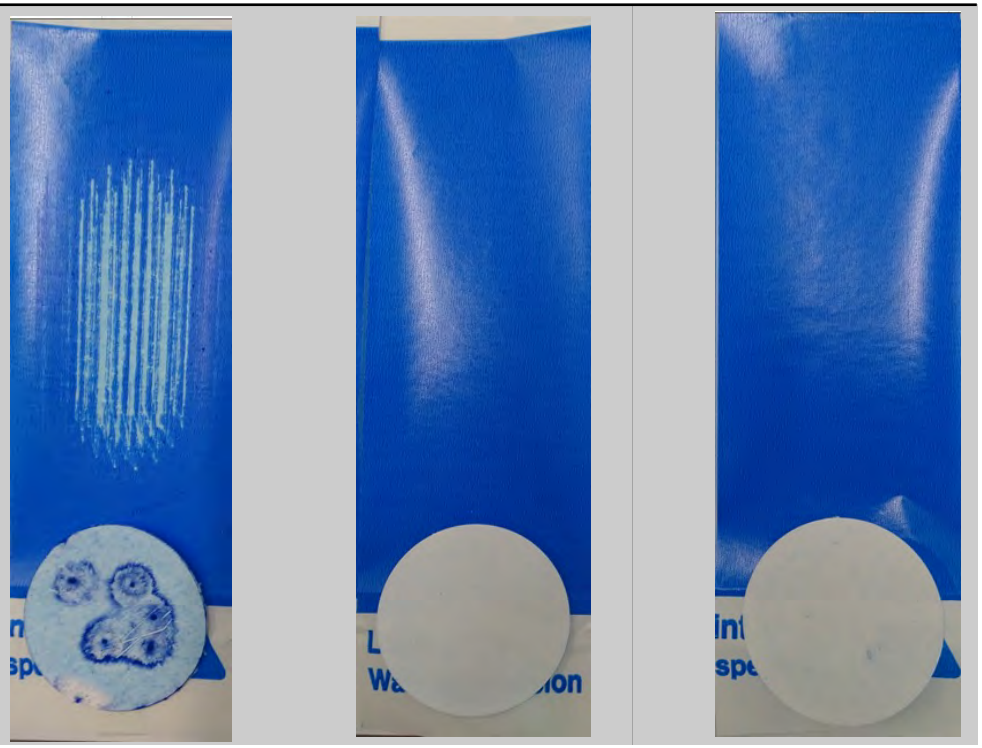
Printing ink – water based

Water-based printing ink, 200 rub cycles

	Sample without additive	1% CERETAN® MBE 30720	1% CERETAN® MX 9820
			
COF µD	0.64	0.23	0.21

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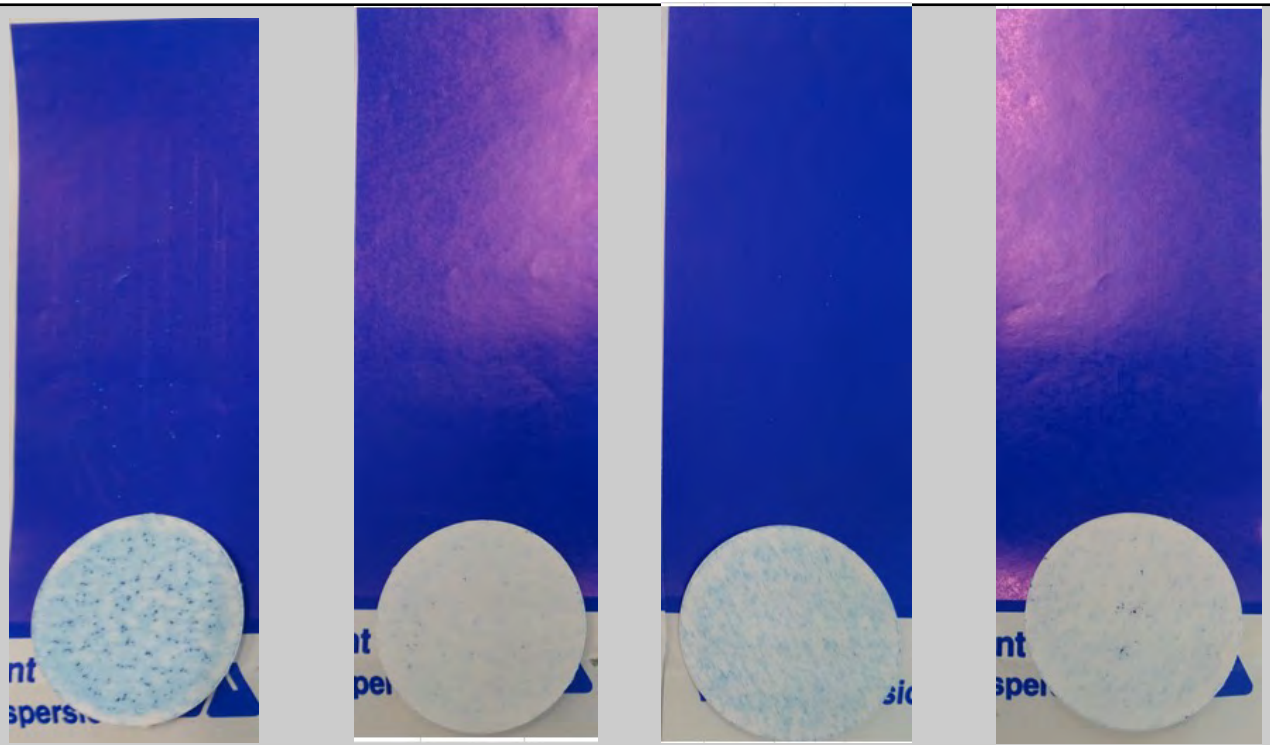
Printing ink – solvent based

Solvent-based printing ink, 200 rub cycles

	Sample without additive	1% CERETAN® MBE 30720	1% CERETAN® MBP 20220	1% CERETAN® MX 9820
				
COF µD	0.39	0.27	0.36	0.27

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Thank you

Vielen Dank

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