

Biobased solutions for wood coating

Shaping tomorrow wood coating today: sustainable coatings, lasting impacts

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Outline

- Product range
- Biobased solutions for wood coating
- Wood flooring case study



Product range

Adiwax®

ESACOTE BIO®

VISCOLAM®

BIOBASED WOOD COATING

ESACOTE® AC 126	1K systesm / compatible with ZnO
ESACOTE® BIO 118	2K systems top coats/ very high gloss & hardness / warming effect
ESACOTE® BIO 4900	2K systems top coats / excellent flexibiltiy / Fast water release
ESACOTE® BIO 9001	Solvent free / low gloss & high clarity / silky touch
ESACOTE® LX BIO 6430	Radiation Curable / Solvent free / Primers & top coat / Fast water release / Antiblocking
ADIWAX H 30 F	Carnauba based / anti scratch / anti blocking
VISCOLAM® BIO PS range	Broad range of rheological effects





Biobased solutions for wood coating

Starting formulations

ESACOTE® AC 126

- Anionic acrylic emulsion
- Solvent and APEO free
- Suitable for clear and pigmented formulations

- Suitable for spray, brush and roller applications
- Suitable for DIY, professional and OEM applications

Sustainability features

ESACOTE® AC 126 is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Content calculated on product anhydrous according to EN 16785:2: **26%**

Typical values

Appearance at 25 °C:	milky liquid
pH: (at 25°C on supplied product, ASTM E 70):	4.0-6.0
Viscosity (mPa.s): (Brookfield RVT @ 25 °C, 20 rpm spindle 1)	<200
Solid content, %:	39.0-41.0

Product properties

Solvent content, %:	0%
Minimal film forming temperature, °C:	~19
Density @ 25°C, g/ml	1.01-1.05
Koenig hardness (sec):	~80
Film aspect:	transparent and glossy

ANTISTAIN PIGMENTED PRIMER

	F2W3-2020	Trade name	% w/w
A1	Dispersant	**FLUIJET® 1725**	8.0
B1	Demi water	WATER	16.4
C1	Titanium dioxide (Kronos)	KRONOS 2310	75.0
D1	Wetting agent (BYK)	BYK 349	0.3
E1	Defoamer (BYK)	BYK 024	0.3
Total			100.0

	F33W61-2021	Trade name	% w/w
A1	Binder	**ESACOTE® AC 126**	42.5
B1	Titanium dioxide slurry	White paste F2W3-2020	20.0
C1	Filler (Imerys)	KAOLIN POLESTAR 200	23.5
D1	ZnO pigment (Eurochemicals)	ZnO pigment	1.5
E1	Wetting agent (BYK)	BYK 349	0.5
F1	Defoamer (BYK)	BYK 024	0.5
G1	Demi water	WATER	2.5
H1	Coalescent (DOW)	DOWANOL DPM	5.0
I1	Rheology modifier	**VISCOLAM® PS 202 AIR**	2.0
Total			100.0

Solid Content ≈ 57.8%.
Brookfield RVT Vx 20rpm - Spindle 3 - 20 °C ≈ 500 cps





Primer applied on solid oak	ΔL* (360h -40°C)	**Δb*(360h -40°C)**
Top coat + Primer white STD	-0.54	1.28
Top coat + F33W61-2021	-0.11	0.21

ESACOTE® BIO 118

- Anionic PUD modified with fatty acids
- Good adhesion on many different substrates
- High gloss
- Good hardness development
- Mechanical & chemical resistances

- Suitable for spray, brush and roller applications
- Suitable for DIY, professional and OEM applications

Sustainability features

ESACOTE® BIO 118 is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Carbon content C^{14}/C_{total} according to ASTM D6866: **33%± 3**

Typical values

Appearance at 25 °C:	yellow liquid
pH: (at 25°C on supplied product, ASTM E 70):	7.5-8.5
Viscosity (cPs) (Brookfield RVT @ 25 °C, 50 rpm spindle 2)	< 600
Solid content, %:	31.0-33.0

Product properties

Solvent content, % :	8% (DPGDME)
Density, @ 25°C g/ml:	~1.05
Minimal film forming temperature, °C:	~43
Koenig hardness (s)	~150
Film aspect:	tough, transparent and glossy

Please contact our sales representatives for test methods details.

2K GLOSSY FORMULATION FOR WOOD FLOORING

		Trade name	% w/w
A1	Binder	**ESACOTE® BIO 118**	80.0
B1	Coalescent (DOW)	BUTYL CARBITOL	5.0
B2	Water	DEMI WATER	5.0
C1	Levelling agent (Synthron)	MODAREX PW 688	2.0
D1	Defoamer (Unichem GmbH)	UNIQ FORAM LP 2507	0.5
E1	Water	DEMI WATER	2.5
F1	Rheology modifier	**VISCOLAM® BIO PS 170 AIR (20% diluted)**	5.0
H1	NCO crosslinker	**CROSSLINKER 08 LM**	10.0
	Total		110.0
	Biobased content on solid		**22.4**

Gloss	20°	60°	85°
F10W37-2024 2K	85	92	97

Formulation	NH_3 10% 1h	Ethanol 48% 1h	Acetic Acid 10% 1 h	Ethanol 96% 1h	Nivea Cream 1h	Sun Cream 1h	Olive Oil 1 h
F01W37-2024 2K	5	5	5	4	5	3	5

Formulation	Water 1h	Water 6h	Water 16h
F01W37-2024 2K	5	5	5

120 microns wet on White melamine panel 2K (10% Crosslinker C08LM)							
Formulation	Coffee 1h	Coffee 6h	Coffee 16h	Ketchup 1h	Mustard 1h	Shoe Polish 1h	Betadine 1h
F01W37-2024 2K	4,5	4	3	5	5	5	2

ESACOTE® BIO 4900

- Anionic WB polyurethane dispersion
- Excellent flexibility
- Mechanical & chemical resistances

- Suitable for 2K formulations
- Suitable for spray, brush and roller applications
- Suitable for DIY, professional and OEM applications

Typical values

Appearance at 25 °C:	opalescent liquid
pH at 25°C (on supplied product, ASTM E 70):	7.0-9.0
Viscosity (cPs) (Brookfield RVT @ 25 °C, 50 rpm spindle 2)	< 600
Solid content, %:	34.0-36.0

Product properties

Solvent content, %:	<1 (MEK)
Density, g/ml	1.00 - 1.03
Minimal film forming temperature, °C:	~15
Film aspect	tough, transparent and glossy
Koenig Hardness (s)	~88

Please contact our sales representatives for test methods details.

Sustainability features

ESACOTE® BIO 4900 is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Carbon content C^{14}/C_{total} according to ASTM D6866: **62 % ± 3**

ESACOTE® LX BIO 6430

- Anionic rad curable PUD
- Solvent free
- Low MFFT
- **Biobased content**
- High abrasion resistance
- High stain & chemical resistances
- Good balance of elasticity & hardness

- Tack free before curing
- Suitable for spray, brush, roller and curtain applications
- Fast water release, suitable for high speed drying
- Suitable for professional and OEM applications
- Suitable for traditional Hg lamps and LED curing

Sustainability features

ESACOTE® LX BIO 6430 is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Content calculated on product anhydrous according to UNI EN 16785-2 : **30%± 3**

Product properties

Appearance at 25 °C:	yellow liquid
pH: (at 25°C on supplied product, ASTM E 70):	7.0-9.0
Viscosity (cPs) (Brookfield RVT @ 25 °C, 50 rpm spindle 2)	< 500
Solid content, %:	37-39

Typical values*

Solvent content, % :	0
Density, @ 25°C g/ml:	~1.05
Minimal film forming temperature, °C:	~0
Koenig hardness (s)	~140
Film aspect:	tough, transparent and glossy

**These values provide general information and are not part of the product specification*

ESACOTE® BIO 9001

- Inherently matt anionic PUD
- Matt appearance
- Silky feeling
- High clarity on dark substrates
- MFFT reducer
- Tack free

- Suitable for 2K formulations
- Suitable for spray, brush and roller applications
- Suitable for DIY, professional and OEM applications

Sustainability features

ESACOTE® BIO 9001 is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Carbon content C^{14}/C_{total} according to ASTM D6866: **66 % ± 3**

Typical values

Appearance at 25 °C:	milky liquid
pH: (at 25°C on supplied product, ASTM E 70):	8.0-9.0
Viscosity (cPs) (Brookfield RVT @ 25 °C, 50 rpm spindle 3)	600- 1000
Solid content, %:	31.0-33.0
Gloss unit, 60°:	<1

Product properties

Solvent content, % :	0
Density, @ 25°C g/ml:	1.01 – 1.05
Minimal film forming temperature, °C:	~0
Film aspect:	matt, silky touch, tack free

VISCOLAM® BIO PS range (Development products)

VISCOLAM® BIO PS 010 AIR

- Solvent free HEUR thickener
- Shear thinning
- High thickening efficiency
- High pigment compatibility
- Sag resistance
- Settling resistance
- Suitable for spray applications

Sustainability features

VISCOLAM® BIO PS 010 AIR is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Content calculated on product anhydrous according to EN 16785:2 : **64%**

VISCOLAM® BIO PS 170 AIR

- Solvent free HEUR thickener
- Medium-shear
- Good balance between thickening, levelling and gloss
- Anti-spattering properties

Sustainability features

VISCOLAM® BIO PS 170 AIR is made with raw materials from vegetal sources, obtained from plant-derived substances.

Bio-based carbon content calculated C^{14}/C^{total}: **62%**

VISCOLAM® BIO PS range (Development products)

VISCOLAM® BIO PS 202 AIR

- Solvent free HEUR thickener
- Excellent film build
- Excellent flow and levelling
- High gloss
- Broad pH range

Sustainability features

Origin: is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Content calculated on product anhydrous according to EN 16785:2 : **94%**

VISCOLAM® BIO PS 222

- Solvent free HEUR thickener
- Strongly newtonian
- Suitable for gloss and semi-gloss paints
- Broad pH range

Sustainability features

Origin: is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Content calculated on product anhydrous according to EN 16785:2 : **94%**



From fossil to biobased

Case study

2K MATT WOOD FLOORING FORMULATIONS

Function of use	Trade name	F01W29-2025	F02W29-2025	F03W29-2025	F10W29-2025
Main binder	**ESACOTE® PU 6535**	70.0	-	-	-
Main binder	**ESACOTE® PU 77**		24.5	24.5	24.5
Bio main binder	**ESACOTE® BIO 4900**	-	**45.5**	**45.5**	**45.5**
Inherently matt binder	**ESACOTE® PU 980**	15.0	15.0	-	-
Bio inherently matt binder	**ESACOTE® BIO 9001**	-	-	**15.0**	**15.0**
Polymeric matting agent	**DECOSPHAERA® 8/20**	4.0	4.0	4.0	4.0
Cosolvent	DPM*	2.0	2.0	2.0	2.0
Water	WATER	5.7	5.7	5.7	5.7
Wetting agent	EDAPLAN 451*	0.5	0.5	0.5	0.5
Defoaming agent	BYK 025*	0.5	0.5	0.5	0.5
Defoaming agent	TEGO FOAMEX 825*	0.5	0.5	0.5	0.5
Levelling agent	BYK 333*	0.2	0.2	0.2	0.2
Rheology modifier	**VISCOLAM® PS 202 AIR**	1.5	1.5	1.5	-
Bio rheology modifier	**VISCOLAM® BIO PS 202 AIR**	-	-	-	**1.5**
Rheology modifier	**VISCOLAM® PS 170 AIR**	0.1	0.1	0.1	-
Bio rheology modifier	**VISCOLAM® BIO PS 170 AIR**				**0.1**
Crosslinker	**CROSSLINKER 08 LM**	10.0	10.0	10.0	10.0
TOTAL		110.0	110.0	110.0	110.0
Solid content		37.0	37.0	37.0	37.0
Biobased content UNI 16785/2 (%)		**0**	**22.7**	**30.8**	**32.0**
Biobased content ASTM 6866 (%)		**0**	**25.7**	**34.7**	**36.0**
Product Carbon Footprint (Kg CO_2 eq)		**~4.1**	**~3.8**	**~3.6**	**~3.6**
Product Carbon Footprint variation		**-**	**-7.3%**	**-12.2%**	**-12.2%**

* Not included in PCF calculations

2K MATT WOOD FLOORING FORMULATIONS

Substrate	Test	F01W29-2025	F02W29-2025	F03W29-2025	F10W29-2025
Veneered beech 3 x 30 gsm DFT RT drying	Gloss @20° [GU]	1.7	2.7	2.1	1.8
	Gloss @60° [GU]	**12.6**	**18.9**	**14.9**	**12.6**
	Gloss @85° [GU]	27.1	37.5	33.7	21.0
Cherry melamine 2 x 30 gsm DFT RT drying	Taber test CS-10 [mg] 1000 cycles	**28**	**30**	**34**	**23**
Veneered beech 3 x 30 gsm DFT RT drying	NH_3 (10%) 10'	5	5	5	4.5
	Acetic acid (10%) 1h	5	5	5	5
	EtOH (48%) 1h	5	5	5	5
	H_20 1h – 6h – 16h	5 – 5 - 5	5 – 5 - 5	5 – 5 - 5	5 – 5 - 5
	Cleaner 1h – 16h	5 – 5	5 – 5	5 – 5	5 – 5
	Mineral oil 1h	5	5	5	5
	Coffee 1h – 6h – 16h	3 – 2.5 - 2	3.5 – 3 - 2	4 – 3 – 2	4.5 – 3.5 – 2.5
	Ketchup 1h	5	5	5	5
	Mustard 1h	5	5	5	5
	Shoe polish 1h	2	2	2	2
	Betadine 1h	2.5	2	2	2.5
	Wine 1h	5	5	5	5
	Tea 1h	5	5	5	5
Biobased content UNI 16785/2 (%)		**0**	**22.7**	**30.8**	**32.0**
Biobased content ASTM 6866 (%)		**0**	**25.7**	**34.7**	**36.0**
Total performance index		**77**	**77.5**	**78**	**79.5**
Product Carbon Footprint (Kg CO_2 eq)		~4.1	~3.8	~3.6	~3.6
Product Carbon Footprint variation		-	-7.3%	-12.2%	-12.2%

UV CURABLE MATT WOOD FLOORING FORMULATIONS

Function of use	Trade name	F06W29-2025	F11W29-2025
Main binder	**ESACOTE® LX 5010**	65.0	-
Inherently matt binder	**ESACOTE® PU 980**	10.0	-
Bio main binder	**ESACOTE® LX BIO 6430**	-	**79.0**
Photoinitiator	OMNIRAD 1173*	1.6	1.6
Polymeric matting agent	**DECOSPHAERA® 8/20**	7.0	7.0
Silica	ACEMATT 3600*	1.5	-
Levelling agent	BYK 333*	0.1	0.2
Wetting agent	BYK 349*	0.3	0.3
Defoaming agent	BYK 025*	0.5	0.5
Water	WATER	12.0	9.3
Rheology modifier	**VISCOLAM® PS 202 AIR**	1.0	-
Bio rheology modifier	**VISCOLAM® BIO PS 202 AIR**	-	**1.0**
Rheology modifier	**VISCOLAM® PS 170 AIR**	0.1	-
Bio rheology modifier	**VISCOLAM® BIO PS 170 AIR**		**0.1**
TOTAL		100	100
Solid content		40.0	37.0
Biobased content UNI 16785/2 (%)		**0**	**24.7**
Biobased content ASTM 6866 (%)		**0**	**Not available**
Product Carbon Footprint (Kg CO_2 eq)		**~2.9**	**~2.6**
Product Carbon Footprint variation		**-**	**-10.0%**

PCF reduction becomes about **-36% compared to a traditional 2K fossil based formulation** like F01W29-2025 (4.1 kg CO_2 eq)

* Not included in PCF calculations

UV CURABLE MATT WOOD FLOORING FORMULATIONS

Substrate	Test	F06W29-2025	F11W29-2025
Veneered beech 3 x 30 gsm DFT 15' 50 °C drying Hg lamp 160 W/cm	Gloss @20° [GU]	0.8	0.8
	Gloss @60° [GU]	**4.4**	**4.5**
	Gloss @85° [GU]	8.7	4.3
Cherry melammine 2 x 30 gsm DFT 15' 50 °C drying Hg lamp 160 W/cm	Taber test CS-10 [mg] 1000 cycles	**14**	**35**
Veneered beech 2 x 30 gsm DFT 30' 50 °C drying Hg lamp 160 W/cm	NH_3 (10%) 10'	5	5
	Acetic acid (10%) 1h	5	5
	EtOH (48%) 1h	5	5
	H_20 1h – 6h – 16h	5 – 5 – 5	5 – 5 – 5
	Cleaner 1h – 16h	5 – 5	5 – 5
	Mineral oil 1h	5	5
	Coffee 1h – 6h – 16h	5 – 5 – 5	5 – 5 – 5
	Ketchup 1h	5	5
	Mustard 1h	5	5
	Shoe polish 1h	2	2
	Betadine 1h	4	3.5
	Wine 1h	5	5
	Tea 1h	5	5
Biobased content UNI 16785/2 (%)		**0**	**24.7**
Biobased content ASTM 6866 (%)		**0**	**Not available**
Total performance index		**86**	**85.5**


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