Lamberti

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
- From fossil to bio based case study

Product range

DECOSPHAERA®

ESACOTE BIO®

VISCOLAM®

BIOBASED WOOD COATING

ESACOTE® BIO 118	2K systems top coats/ very high gloss & hardness
ESACOTE® BIO 148	2K systems top coats / excellent flowing / hardness & clarity
ESACOTE® BIO 2249	1K – self crosslinking / good sandabiltiy / good substrate wetting
ESACOTE® BIO 4900	2K systems top coats / excellent flexibiltiy
ESACOTE® BIO 9001	Solvent free / low gloss & high clarity / silky touch
DECOSPHAERA® BIO 8 TR	Matting & texturizing agent / antiscratch
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® 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 148

- Anionic UAD
- High gloss & color retention
- Good hardness development
- Mechanical & chemical resistances
- Excellent flow & levelling

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

Sustainability features

ESACOTE® BIO 148 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

Visual Appearance at 25 °C:	opalescent liquid
pH at 25°C (on supplied product, ASTM E 70):	7.0-9.0
Viscosity (cPs) (on supplied product, Brookfield RVT @ 25 °C, 50 rpm spindle 1):	< 200
Solid content, %:	34.0-36.0

Product properties

Solvent content, %:	4.5% (DPGDME)
Density, g/ml	~1.03
Minimal film forming temperature, °C:	~15
Film aspect	tough, transparent and glossy
Koenig Hardness (s)	~100

2K GLOSSY FORMULATION FOR WOOD FLOORING

		Trade name	ESACOTE® PU 148 F3W51-2021	ESACOTE® BIO 148 F4W51-2021
A1	Binder	**Binder**	85.0	85.0
B1	Coalescent (DOW)	BUTYL CARBITOL	2.0	2.0
B2	Water	DEMI WATER	2.0	2.0
C1	Wetting agent (Munzing)	EDAPLAN 451	0.5	0.5
D1	Defoamer (BYK)	BYK 025	1.0	1.0
E1	Surface additive (BYK)	BYK 333	0.1	0.1
F1	Rheology modifier	**VISCOLAM® BIO PS 202 AIR**	0.54	1.39
G1	Water	DEMI WATER	8.86	8.01
H1	NCO crosslinker	**CROSSLINKER 08 LM**	10.0	10.0
	Total		110.0	110.0
	Biobased content on solid		0	**23.7%**

The formulations were applied on veneered Italian walnut and on solid beech/mahogany with following cycle:

- two layers (second coat after 2 hours)
- 5 mils wet and dry at room temperature
- sanding the day after, with abrasive paper 320
- two layers of top coat
- 5 mils wet and dry at room temperature
- the panels were conditioned for fifteen days at 23°C and 50% HR

2K GLOSSY FORMULATION FOR WOOD FLOORING

Formulation applied on veneered walnut 2K Chemical and stain resistance EN 12720	NH_3 10% - 1h	Ethanol 48% - 1h	Acetic Acid 10%- 1h	Acetone 10 min	MEK 10 min
F3W51-2021 – ESACOTE® PU 148	5	5	5	5	5
F4W51-2021 – ESACOTE® BIO 148	5	5	5	5	5

Formulation applied on veneered walnut 2K Chemical and stain resistance EN 12720	Coffee 1h	Ketchup 1h	Mustard 1h	Shoe polish 1h	Water 1/6/16 h
F3W51-2021 – ESACOTE® PU 148	4	5	4-5	2	5/5/5
F4W51-2021 – ESACOTE® BIO 148	4	5	4-5	2	5/5/5

Formulation applied on solid beech 2K Chemical and stain resistance EN 12720	NH_3 10% - 1h	Ethanol 48% - 1h	Acetic Acid 10%- 1h	Acetone 10 min	MEK 10 min
F3W51-2021 – ESACOTE® PU 148	4	5	5	5	5
F4W51-2021 – ESACOTE® BIO 148	5	5	5	5	5

Formulation applied on solid beech 2K Chemical and stain resistance EN 12720	Coffee (40g/L) 1h	Ketchup 1h	Mustard 1h	Shoe polish 1h	Water 1/6/16h
F3W51-2021 – ESACOTE® PU 148	4	5	4-5	2	5/5/5
F4W51-2021 – ESACOTE® BIO 148	4	5	4-5	2	5/5/5

Formulation applied	Gloss (60°)	Pencil Hardness	Taber test weight loss on solid Mahogany (CS10 - 1kg -1000 cycles)
F3W51-2021 – ESACOTE® PU 148	42	HB	0.035
F4W51-2021 – ESACOTE® BIO 148	51	HB	0.029

ESACOTE® BIO 2249

- Anionic self X-linking urethane acrylic
- Low VOC
- Good hardness development
- Good stain and chemical resistance in 1K/2K formulations

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

Sustainability features

ESACOTE® BIO 2249 is made with raw materials from vegetal sources, obtained from plant-derived substances.

Biobased Content calculated on product anhydrous according to EN 16785:2 : **17%**

Typical values

Visual Appearance at 25 °C:	opalescent liquid
pH at 25°C (on supplied product, ASTM E 70):	7.0-9.0
Viscosity (cPs) (on supplied product, Brookfield RVT @ 25 °C, 50 rpm spindle 2):	< 500
Solid content, %:	34.0-36.0

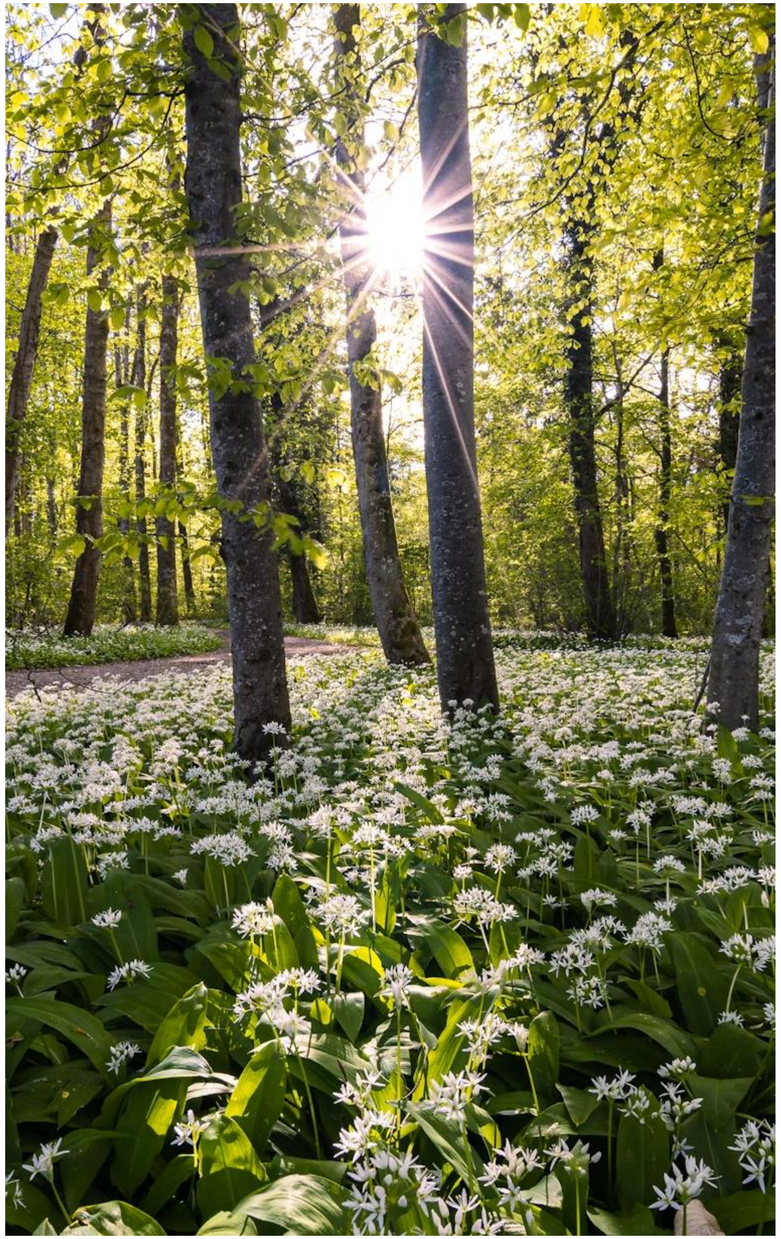
Product properties

Solvent content, %:	<0.35 (MEK)
Density, g/ml	1.01 - 1.05
Minimal film forming temperature, °C:	~50°C
Film aspect	tough, transparent and glossy
Koenig Hardness (s)	~140

1K BIOBASED TRANSPARENT SEALER

		Trade name	% w/w
A1	Binder	**ESACOTE® BIO 2249**	75.0
B1	Sanding agent	**LAMKOTE RO**	4.0
B2	Coalescent (DOW)	BUTYL CARBITOL	5.0
C1	Water	DEMI WATER	5.0
D1	Wetting agent (Munzing)	EDAPLAN 451	0.5
E1	Defoamer (BYK)	BYK 028	0.5
G1	Rheology modifier	**VISCOLAM® BIO PS 202 AIR**	6.0
I1	Rheology modifier	**VISCOLAM® BIO PS 170 AIR** (diluted 20%)	4.0
	Total		100.0
	Biobased content on solid		**15.8**

Solid Content ≈ 30%
Ford cup 4 Vx = 1’



1K BIOBASED GLOSSY TOP COAT

		Trade name	% w/w
A1	Binder	**ESACOTE® BIO 2249**	80.0
B1	Wax dispersion	**ADIWAX H 30 F**	2.0
C1	Coalescent (DOW)	BUTYL CARBITOL	5.0
D1	Water	DEMI WATER	7.3
E1	Wetting agent (BYK)	BYK 349	0.5
F1	Surface additive (BYK)	BYK 333	0.2
G1	Defoamer (Evonik)	TEGO AIREX 902 W	0.5
H1	Defoamer (BYK)	BYK 028	0.5
I1	Rheology modifier	**VISCOLAM® BIO PS 202 AIR**	3.0
J1	Rheology modifier	**VISCOLAM® BIO PS 170 AIR** (diluted 20%)	1.0
	Total		100.0
	Biobased content on solid		**16.5**

Solid Content ≈ 30%
Ford cup 4 Vx = 90”

Gloss	20°	60°	85°
F13W03-2023 1K	44	73	81

Chemical and stain resistance EN 12720 – 1K							
Formulation	NH_3 10% - 1h	Ethanol 48% - 1h	Acetic Acid 10% 1h	Ketchup 1h	Coffee 1h (40g/L)	Coffee 6h (40g/L) 6	Coffee 16h (40g/L)
F13W03-2023 1K	2	4-5	5	5	5	3	3

Formulation	Mustard 1h	Sun cream 1h	Ethanol 96% - 1h	Water 1h	Water 8h	Water 16h
F13W03-2023 1K	5	4-5	4	5	5	5

1K BIOBASED MATT TOP COAT

		Trade name	% w/w
A1	Binder	**ESACOTE® BIO 2249**	75,0
B1	Microbeads	**DECOSPHAERA® BIO 8 TR**	2.0
C1	Wax dispersion	**ADIWAX H 30 F**	2.0
D1	Coalescent (DOW)	BUTYL CARBITOL	5.0
E1	Water	DEMI WATER	11.3
F1	Wetting agent (BYK)	BYK 349	0.5
G1	Surface additive (BYK)	BYK 333	0.2
H1	Slip/mar agent(DOW)	DOWSIL 56 (50% dikuted)	0.5
I1	Defoamer (BYK)	BYK 028	0.5
J1	Rheology modifier	**VISCOLAM® BIO PS 202 AIR**	2.0
K1	Rheology modifier	**VISCOLAM® BIO PS 170 AIR** (diluted 20%)	1.0
	Total		100.0
	Biobased content on solid		**17.8**

Solid Content ≈ 32%
Ford cup 4 Vx = 90″

Gloss	20°	60°	85°
F14W09-2023 1K	60	30	43

Chemical and stain resistance EN 12720 – 1K							
Formulation	NH_3 10% - 1h	Ethanol 48% - 1h	Acetic Acid 10% 1h	Ketchup 1h	Coffee 1h (40g/L)	Coffee 6h (40g/L) 6	Coffee 16h (40g/L)
F14W03-2023 1K	2	4-5	5	5	5	3	3

Formulation	Mustard 1h	Sun cream 1h	Ethanol 96% - 1h	Water 1h	Water 8h	Water 16h
F14W03-2023 1K	5	5	4	5	5	5

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

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**

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.

2K MATT BIOBASED WOOD FLOORING

		Trade name	% w/w
A1	Binder	**ESACOTE® BIO 4900**	45.5
B1	Binder	**ESACOTE® PU 77**	24.5
C1	Inherently matt Binder	**ESACOTE® BIO 9001**	15.0
D1	Microbeads	**DECOSPHAERA® BIO 8 TR**	4.0
E1	Coalescent (DOW)	BUTYL CARBITOL	2.0
E2	Water	DEMI WATER	5.3
F1	Surface additive (BYK)	BYK 333	0.2
G1	Wetting agent (Münzing)	EDAPLAN 451	0.5
H1	Defoamer (Evonik)	TEGO 825	0.5
I1	Defoamer (BYK)	BYK 025	0.5
L1	Rheology modifier	**VISCOLAM® BIO PS 202 AIR**	2.0
M1	NCO crosslinker	**CROSSLINKER 08 LM**	10.0
	Total		110.0
	Biobased content on solid		**30.9**

The formulation was applied on veneered Italian walnut and on solid beech/mohogany with following cycle:

- two layers of transparent sealer
- 120 microns wet
- sanding the day after
- one layers of top coat by roller

2K MATT BIOBASED WOOD FLOORING

Gloss	20°	60°	85°
F04W19-2021 2K	10	10	28

Chemical and stain resistance EN 13442 – 2K							
Formulation	NH_3 10% 2 min	NH_3 10% 1h	Ethanol 48% - 1h	Acetic Acid 10%- 1h	Coffee (40g/L) 2 min	Coffee (40g/L) 1h	Paraffin Oil - 1h
F04W19-2021 2K	5	4	4	5	5	5	5
Formulation	Detergent 1h	Detergent 16h	Paraffin oil	Water 1h	Water 8h	Water 16h	
F04W19-2021 2K	5	4	5	5	5	4	

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

DECOSPHAERA® BIO 8 TR

- Crosslinked PU
- Spherical shape
- Gaussian distribution
- Deep matt effect
- Natural look & no haziness
- Excellent scratch & stain resistance
- Soft & elastic touch

- Solvent free manufacturing process
- Suitable for WB, SB, UV and moisture curable formulations

Typical values

Appearance at 20 °C: White powder
Dry content: 99 ± 1 %
pH (10% dispersion): 6 – 9
Oil absorption: 60 – 110 %
Granulometry D(50): 5 – 8 (µm)
Bulk density: 300 – 500 (g/l)

Sustainability features

DECOSPHAERA® BIO 8 TR is made with raw materials from renewable vegetal sources, obtained from plant-derived substances that, at the best of our knowledge, are not in competition with food production.

Biobased Carbon content C^{14}/C^{total} according to ASTM D6866: **52% ± 3**

VISCOLAM® BIO PS range

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

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 (Provisional)

- 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 FORMULATIONS FOR WOOD FLOORING

	Trade name	Formulation 1	Formulation 2	Formulation 3	Formulation 4
Binder	**ESACOTE® PU 77**	70.0	70.0	70.0	24.5
Binder	**ESACOTE® BIO 4900**	-	-	-	45.5
Inherently matt binder	**ESACOTE® PU 980**	15.0	-	-	-
Inherently matt binder	**ESACOTE® BIO 9001**	-	15.0	15.0	15.0
Microbeads	**DECOSPHAERA® 8/20**	4.0	4.0	-	-
Microbeads	**DECOSPHAERA® BIO 8 TR**	-	-	4.0	4.0
Wetting agent (Munzing)	EDAPLAN 451	0.5	0.5	0.5	0.5
Defoamer (BYK)	BYK 025	0.5	0.5	0.5	0.5
Defoamer (Evonik)	TEGO 825	0.5	0.5	0.5	0.5
Surface additive (BYK)	BYK 333	0.2	0.2	0.2	0.2
Coalescent (DOW)	BUTYL CARBITOL	4.0	4.0	4.0	4.0
Water	DEMI WATER	3.3	3.3	3.3	3.3
Rheology modifier	**VISCOLAM® BIO PS 170 AIR** (20% diluted)	2.0	2.0	2.0	2.0
NCO crosslinker	**CROSSLINKER 08 LM**	10	10	10	10
TOTAL		110	110	110	110
Biobased content on solid		**0%**	**6.8%**	**10.9%**	**29.3%**

Solid Content ≈ 37,5%
Ford cup 4 Vx = 25-30”

2K MATT FORMULATIONS FOR WOOD FLOORING

	Transparency	Gloss @60°	Gloss@85°	Pencil hardness	Hardness scratch pen – DIN 55656	Taber test ASTM D4090 – CS17
Formulation 1	good	12	21	HB	3,5	0,169
Formulation 2	good	12	22	HB	3,0	0,132
Formulation 3	good	12	23	HB	3,0	0,139
Formulation 4	good	12	27	HB	3,0	0,131

Chemical resistances UNI 13442	H_2O		Coffee 40 g/L		NH_3 (10%)			Alcohol (48%)		Acetone	Detergent		Acetic acid 5%		Paraffin oil
	6h	16h	2'	1h	2'	10'	1h	2'	1h	10"	1h	16h	2'	1h	1h
Formulation 1	5	4	5	5	5	4	4	4	3	3	5	4	5	5	5
Formulation 2	4	4	5	5	5	4	4	4	3	3	5	4	5	4	5
Formulation 3	4	4	5	5	5	4	4	4	3	3	5	4	5	5	5
Formulation 4	5	4	5	5	5	4	4	5	4	4	5	4	5	5	5

With formulation n°4 it is possible to obtain the high frequentation class as per UNI 11622-1 – appendix D.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