



Valires[®] HA
Self-stabilized
Micro Alkyd Emulsion

Valires HA 040.01 and Valires HA 040.15 Self-stabilized micro alkyd emulsion

VALIRES HA 040 IS A SELF-STABILIZED MICRO ALKYD EMULSION AT 40% SOLIDS. THE SPECIAL PRODUCTION TECHNIQUE OFFERS THE ADVANTAGE OF A PH NEUTRAL RESIN. VALIRES HA 040 DRIES OXIDATIVELY, CATALYZED BY A COMPATIBLE DRIER SUCH AS ECOS ND[®]15 AQUA.

Technical properties and specifications

This urethanized waterborne resin can be used for primers, top-coats, wood stains, stoving finishes, anti-corrosion coatings, deco paints, varnishes....

Average particle size (nm)	60 - 80
Solvent	demineralized water
Solids content % (0,5 g - 30 min - 150°C)	40
Viscosity s (20°C - DIN cup 4)	15 - 60
Acid value (mg KOH/g)	20 - 30
pH	6,5 - 7,5

Advantages - Compatibility - Driers

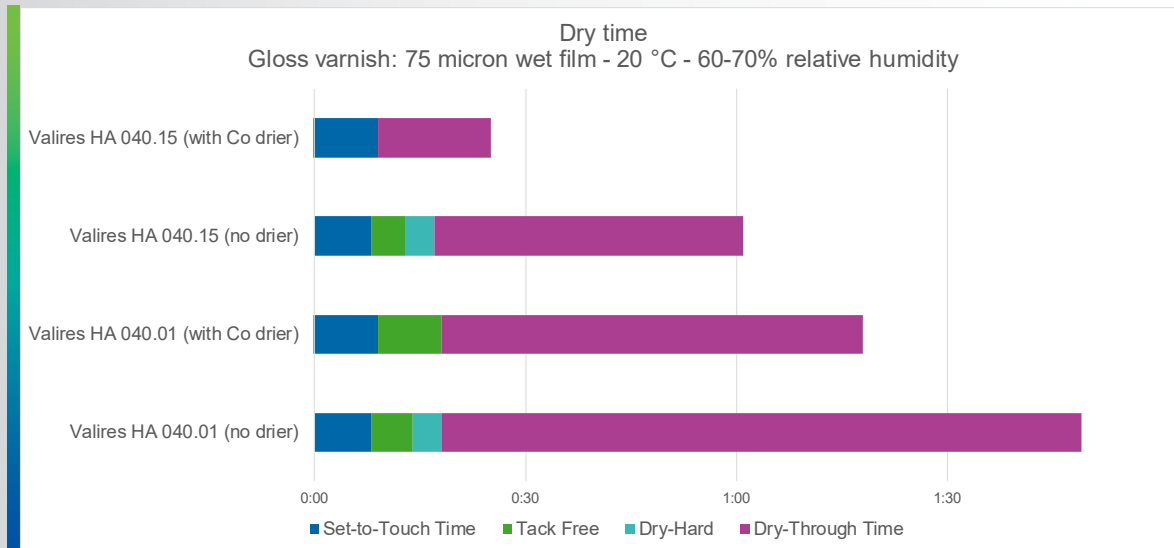
The Valires HA 040 has good mechanical and low yellowing properties, high stability, rapid initial drying and good through drying, high brushability and wet edge, good adhesion, neutral pH and low odour. No neutralisation is required. This resin is compatible with many acrylic emulsions and water dispersible melamine resins.

USMB recommends ECOS ND[®]15 Aqua as drier. You can use up to 0,1% of cobalt on the resin solids.

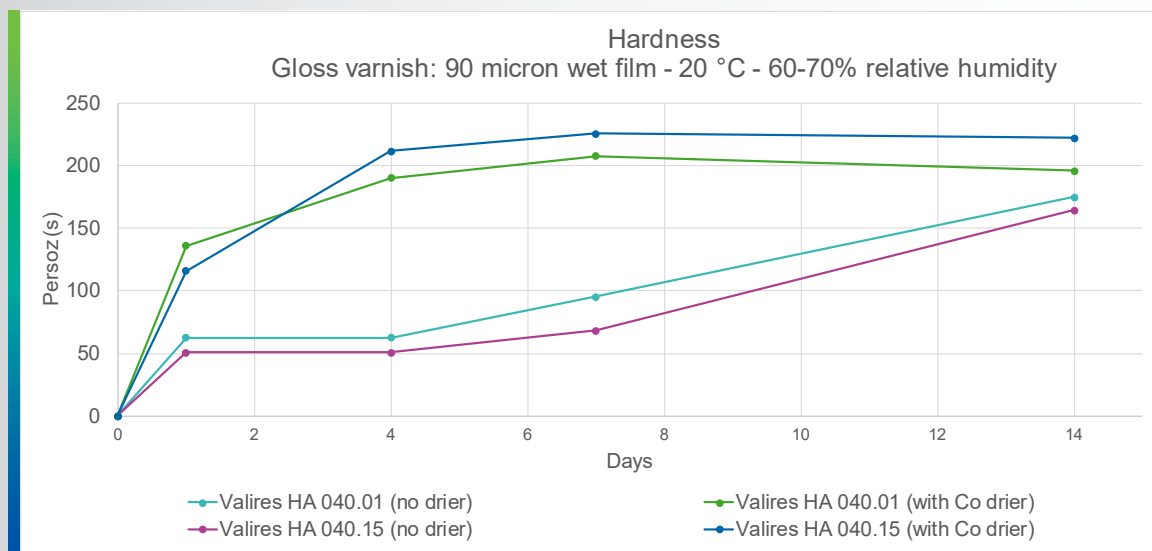
Stability

Valires HA 040 shows an exceptional stability, allowing the paint formulator to grind in pigments and fillers with attritors, pearl mills, dissolvers and rotor-stator dispersers. Rollmills will not affect the stability of the resin but are less suitable.

Low temperature film formation without co-solvent Fast drying



Quick hardness build-up and good final hardness



Environmental tendencies

Coatings are following the trend of ever increasing concern on human health and the preservation of the environment.

The different behaviour and application procedures of these new paints often leave the user, be it a professional or an amateur, surprised if not disappointed with the final results. Generally unacceptable through drying, final hardness and wear resistance is found with the high solids systems, whereas the flow and gloss of the water based systems leave much to desire.

In general, build and resulting mechanical properties of both classes are inferior to classical solvent based paint films. **Using our Valires HA 040 will prove you the contrary.**



Formulation

Valires HA 040 can be used as sole binder to make decorative paints and varnishes at various gloss levels: high gloss, satin or matt. These finishes will show rapid surface drying and good through drying. The traditional formulation techniques for alkyds and urethane alkyds need only minor adjustments. Appropriate thickeners will give a satisfactory rheology.

Coatings with Valires HA 040 have good adhesion, brushability and open time. Water based coatings dry very quickly on porous surfaces like wood or stone. To overcome application problems, several techniques can be used : the application of a special sealant or the use of a primer with high loading of fillers and thickeners.

Combinations with other binder types

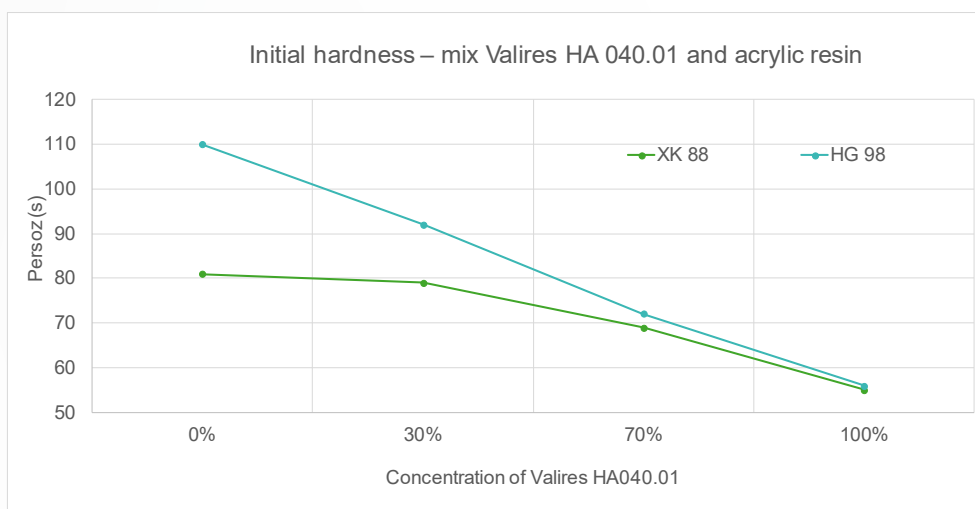
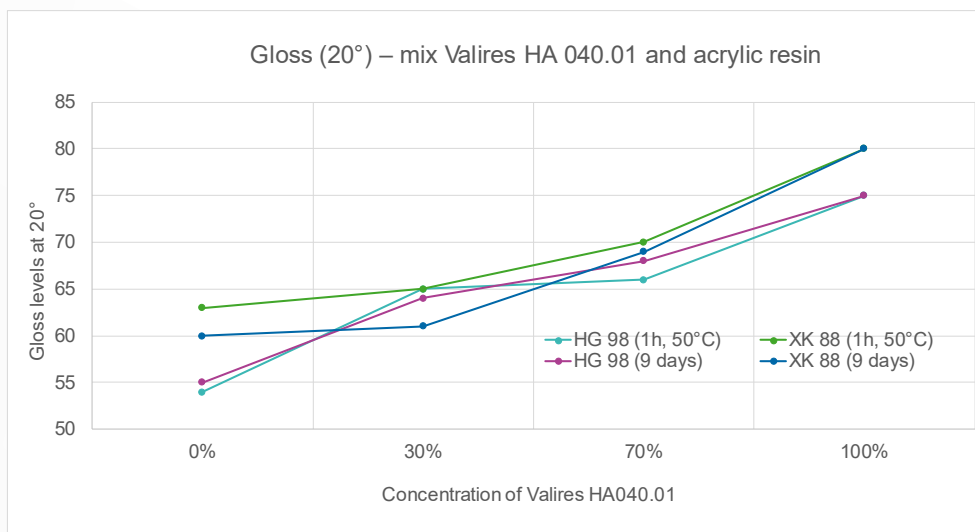
Valires HA 040 will give a good initial film hardness. For applications like parquet varnishes and floor coatings, Valires HA 040 can be combined with compatible hard acrylic resins. A typical mixture contains more or less 50 % of each binder, based on resin solids. Valires HA 040 does not require co-solvents to dry.

Milling and dispersing can be done in Valires HA 040, adding the acrylic resin in the final stage of the paint making. Valires HA 040 can be combined with suitable water-based melamine resins to make oven drying coatings.

A mix of Valires HA 040.01 and acrylic resins

The properties of the Valires HA 040.01 are excellent but sometimes more initial hardness is needed. This can be obtained by the addition of an acrylic resin, at the same time retaining the brushability, gloss and sanding properties.

The following graphs show the evolution of the gloss and the initial hardness of a varnish based on Valires HA 040.01 and two acrylics : HG 98 (Rohm & Haas), XK 88 (NeoResins).



It is a dream to be able to combine the best of several worlds. Valires HA 040.01 make this happen. This resin gives the formulator :

- * Ease of use: high stability, shear resistance
- * Compatibility with a broad range of other resins like acrylics, vinylics, ...
- * Enhanced flow, leveling, open time
- * High gloss, even in full colours
- * Small particle size, excellent penetration in substrate
- * Good outdoor resistance
- * Emulsifier free
- * Low yellowing
- * Low additive demand
- * Good adhesion on many different substrates
- * Excellent wetting, deep intense colours
- * Neutral pH
- * Low odor

Valires HA 040.03

Improved initial hardness development and drying performance with Valires HA 040.03

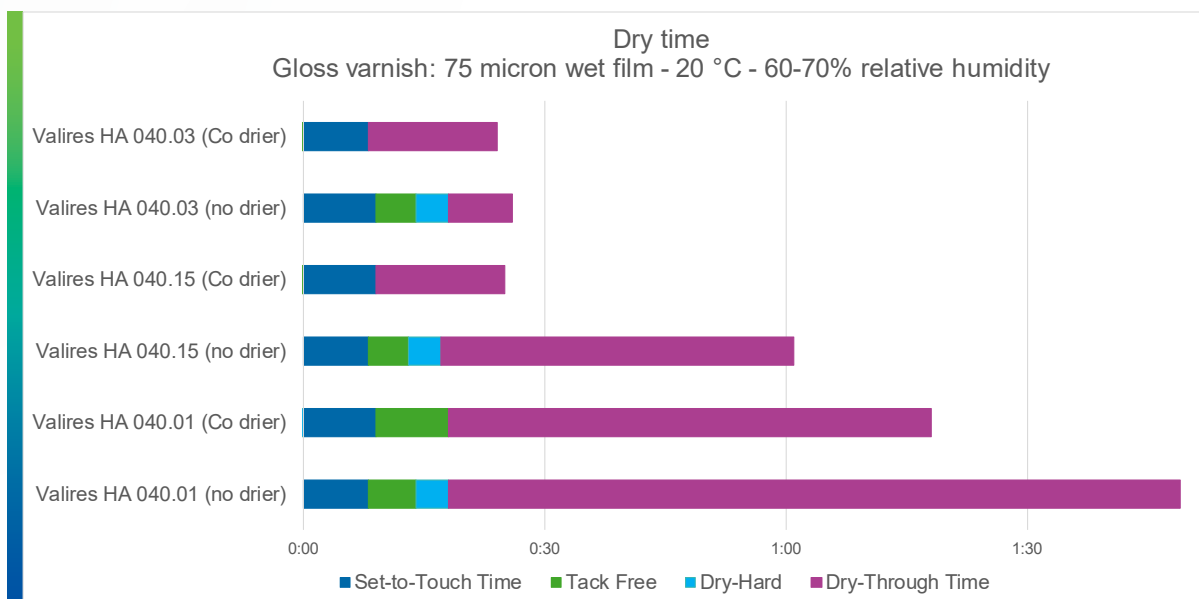
In some applications a faster hardness development is needed, with or without the use of a cobalt drier. Valires HA040.03 proves to dry faster and build up hardness quicker. It appears to have a better compatibility with anti-corrosion pigments, cfr. guide formulation p. 17.

Application test

Drying time

The drying performance was measured with a ball linear time recorder at 20°C and 60 to 70 % relative humidity with a velocity of 3 cm/h and a ball loading of 10 grams. The drier containing paint formulations were applied on the recorder after 3 days storage.

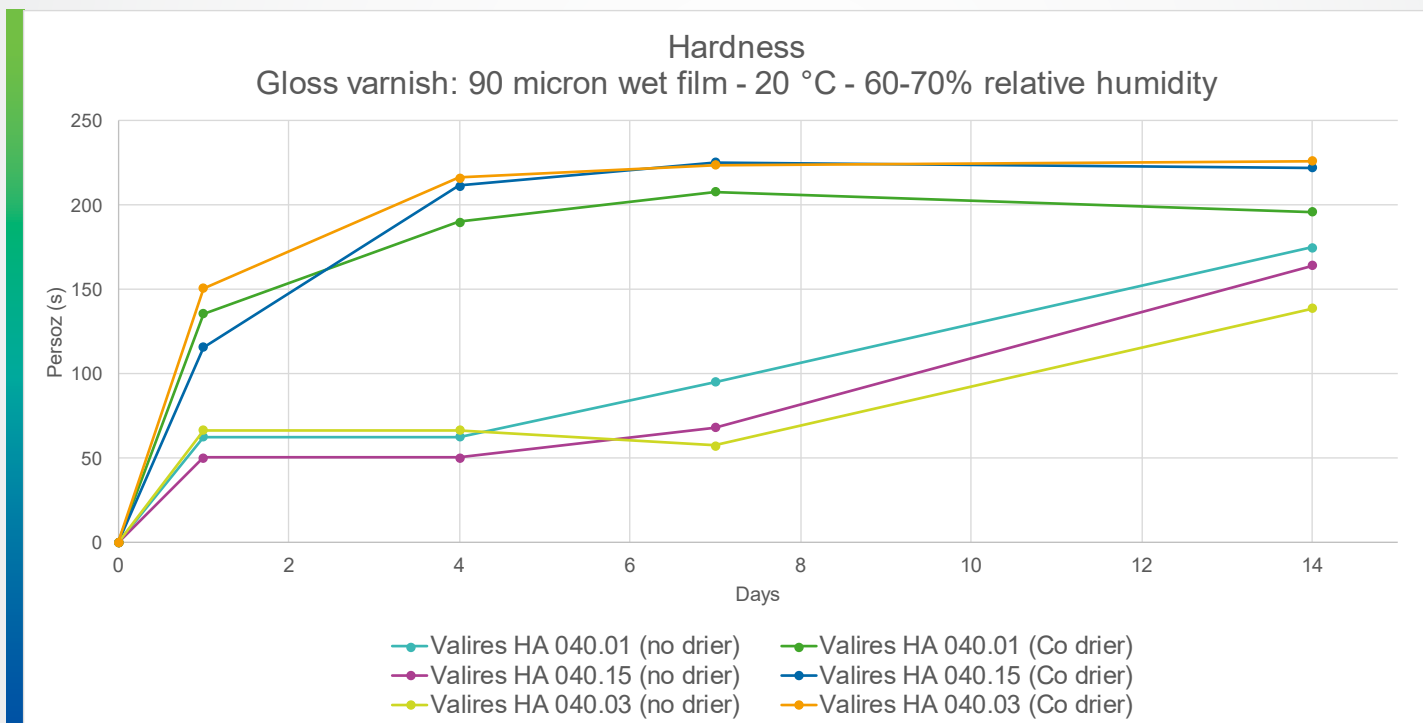
We notice that the HA040.03 dries significantly faster than the HA040.01 as well with or without a cobalt drier. When a longer drying time is acceptable, one can work without the addition of a drier.



Hardness development

The hardness has been measured with a Persoz pendulum. The hardness was evaluated after several days and measured in a conditioned room at 20°C and 60 to 70 % relative humidity.

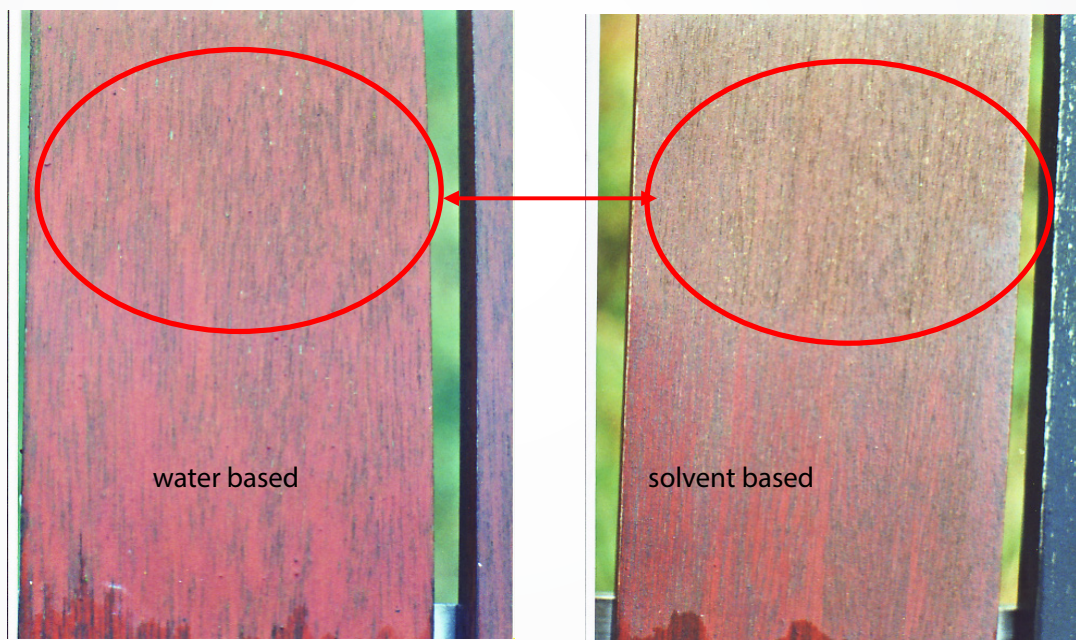
The interesting point is that the hardness increases faster in the early stage of drying with the HA040.03.



Comparison between a water based and a solvent based woodstain

Application methods

Application on wooden board in red Meranti (25cm x 9cm x 1,5cm).
 First sanding with sand paper grain size 180, afterwards with grain size 240.
 Apply first layer of +/- 40 μ .
 Let dry during 3 days.
 Sanding with grain size 240.
 Apply second layer of +/- 60 μ .
 Preservative pre-treatment: none.
 Observation period : 36 months.



Specifications

Concentration binder %

Binder

Concentration pigment %

Transparant pigment

Total solids %

Water based

27,80

Valires HA 040.01

2,70

iron oxide

32,40

Solvent based

28,20

50 % long oil alkyd resin
 50 % urethane resin

2,70

iron oxide

31,80

Guide formulations

Primer based on Valires HA 040.01

	Ingredients	%	Function	Supplier
1	Valires HA 040.01	20,00	binder	USMB
	Water	5,88	solvent	
	Coatex P90	0,40	dispersing	Coatex
	Tafigel 45	0,82	thickening	Münzing Chemie GmbH
	Tego foamex 830	0,20	antifoam	Evonik
2	Kronos 2160	20,08	pigment	Kronos
	Westmin D30 E	4,02	extender	Mondo minerals BV
	Westmin 8E	2,01	extender	Mondo minerals BV
	Omyacarb 2AV	2,26	extender	OMYA GmbH
	Water	0,67	solvent	
3	Valires HA 040.01	30,19	binder	USMB
	Tego Airex 902 W	0,20	antifoam	Evonik
	ECOS ND®15 Aqua	0,64	drier	USMB
4	Tafigel 45	0,31	thickening	Münzing Chemie GmbH
	Acrysol RM 8 W	0,38	thickening	Dow Chemicals
	Water	11,95	solvent	
		100,00		

Method

- 1/ Mix phase 1 under moderate stirring.
- 2/ Disperse phase 2 into phase 1 until desired dispersion is obtained.
- 3/ Add the binder and the additives under moderate stirring.
- 4/ Adjust viscosity.

Specifications

Viscosity P, 10.000s ⁻¹ , 25°C	2,8
PVC	29
Density g/cm ³	1,25
Solids %	49,4
VOC g/l	< 20

White gloss paint based on Valires HA 040.01

	Ingredients	%	Function	Supplier
Phase 1	Valires HA 040.01	20,17	binder	USMB
	Water	3,80	solvent	
	Acrysol RM 8W	0,25	thickener	Dow Chemical
	Acrysol RM 2020	1,49	thickener	Dow Chemical
	Tego dispers 750W	2,69	dispersing additive	Evonik
	Tego foamex 830	0,20	antifoam additive	Evonik
Phase 2	Kronos 2160	23,93	pigment	Kronos
Phase 3	Valires HA 040.01	46,77	binder	USMB
	Tego airex 902W	0,20	deaerator	Evonik
	Tego wet 280	0,50	wetting agent	Evonik
	Total	100,00		

Method

- 1/ Mix phase 1 under moderate stirring
- 2/ Disperse phase 2 into phase 1 until desired dispersion is obtained
- 3/ Add phase 3 and mix until homogeneous
- 4/ Add drier
 - o ECOS Mix 353 Neo Aqua: 1,07%
 - o ECOS Mix 265 Neo Aqua: 0,86%

Specifications

Viscosity @ 25 °C

@ 7000s-1: 2,3 P

PVC: 19 %

VOC: < 20 g/l

Wet film 90 micron

Gloss 20 ° (7 days):

Gloss 60 ° (7 days):

ECOS Mix 353 Neo Aqua

49

79

ECOS Mix 265 Neo Aqua

51

80

Color (7 days)

L*:

a*:

b*:

ECOS Mix 353 Neo Aqua

92,99

-0,91

-1,24

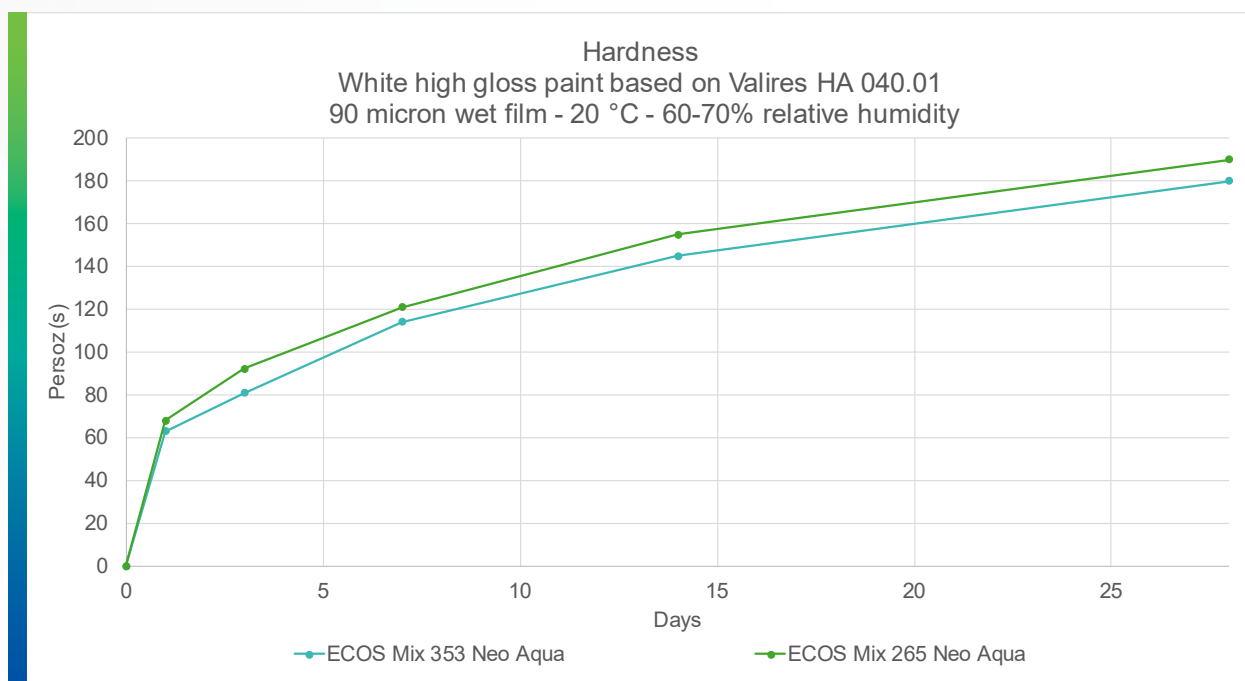
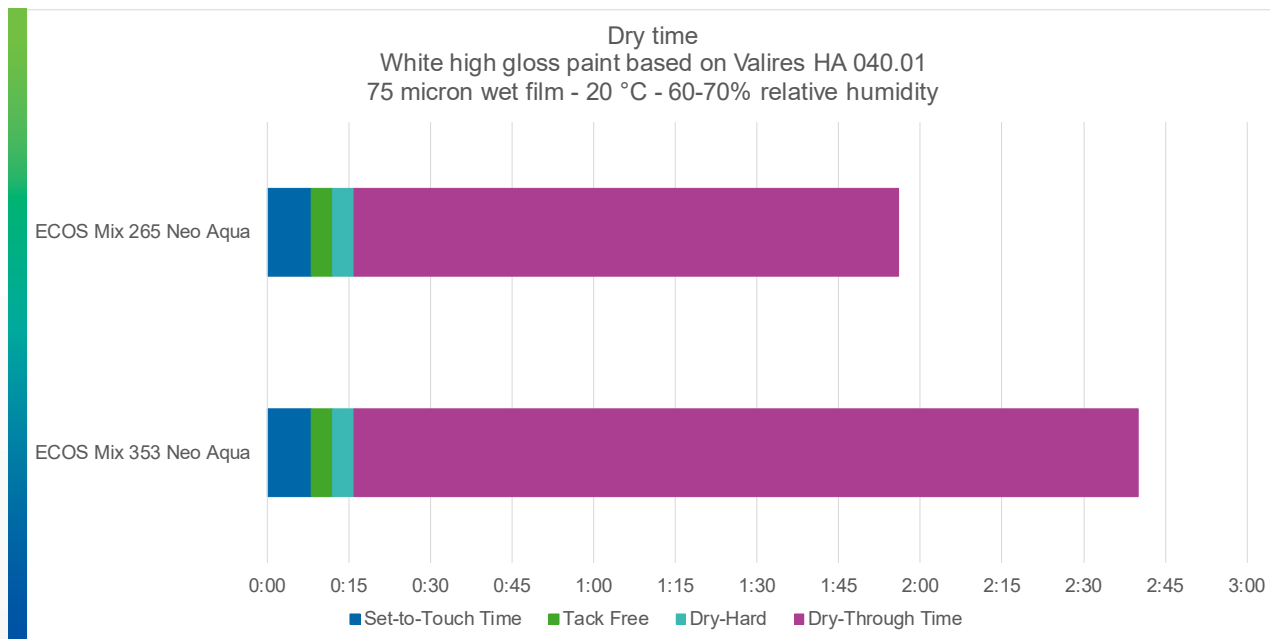
ECOS Mix 265 Neo Aqua

92,41

-0,95

-1,55

Graphics Drytime and hardness : on the next page



White satin paint based on Valires HA 040.15

	Ingredients	%	Function	Supplier
Phase 1	Water	13,48	solvent	
	Tego dispers 750W	3,45	dispersing additive	Evonik
	Acrysol RM 8W	0,25	thickener	Dow Chemical
	Acrysol RM 2020	1,26	thickener	Dow Chemical
	Tego foamex 830	0,2	antifoam additive	Evonik
Phase 2	Kronos 2160	27,26	pigment	Kronos
	Acemat OK 500	1,69	matting agent	Arkema
Phase 3	Valires HA 040.15	51,71	binder	USMB
Phase 4	Tego airex 902W	0,2	deaerator	Evonik
	Tego wet 280	0,5	wetting agent	Evonik
	Total	100,00		

Method

- 1/ Mix phase 1 under moderate stirring
- 2/ Disperse phase 2 into phase 1 until desired dispersion is obtained
- 3/ Add phase 3 and mix until homogeneous
- 4/ Add drier
 - o ECOS ND 15 Aqua: 0.46%
 - o ECOS Mix 353 Neo Aqua: 0.80%
 - o ECOS Mix 265 Neo Aqua: 0.66%

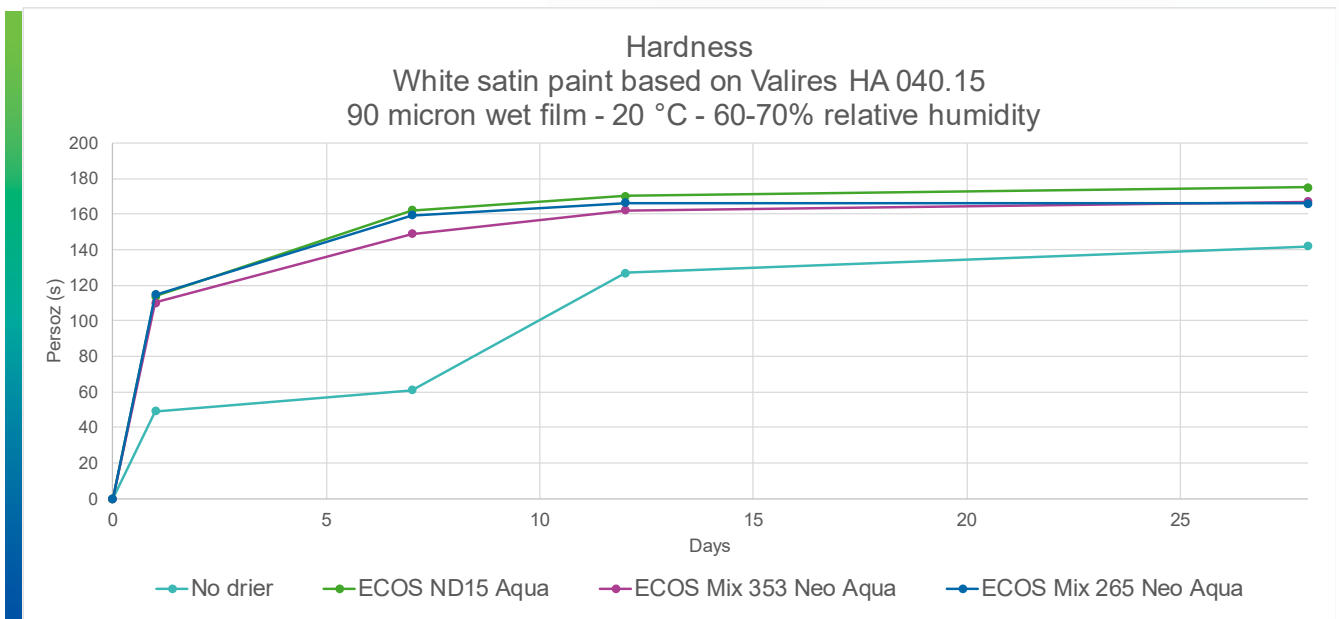
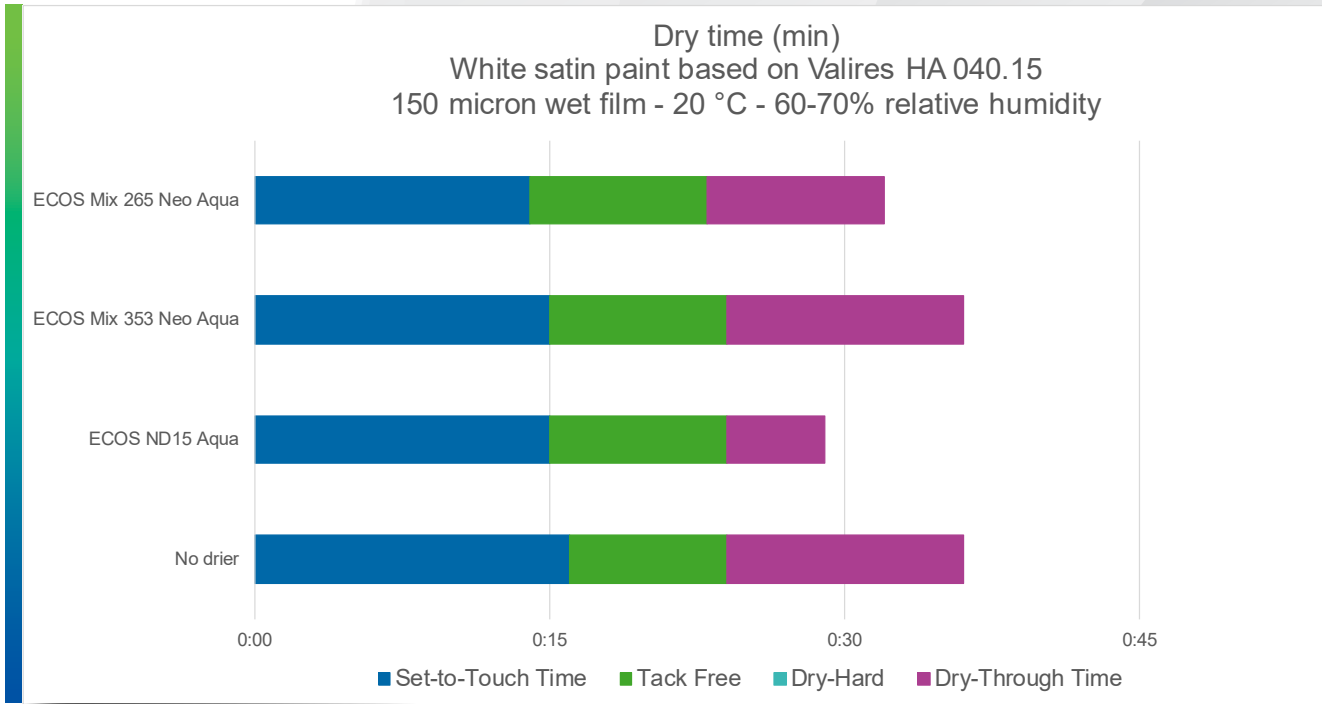
Specifications

Viscosity @ 25 °C
 @ 10s-1: 16,4 P
 @ 7000s-1: 1,9 P

PVC: 26,4 %

VOC: < 20 g/l

Graphics Drytime and hardness : on the next page



Blue gloss paint based on Valires HA 040.15

	Ingredients	w%	Function	Supplier
Phase 1	Valires HA 040.15	84,57	binder	USMB
	Tego foamax 830	0,20	antifoam additive	Evonik
	Acrysol RM 2020	1,27	thickener	Dow Chemical
Phase 2	Luconyl blue 7080	9,96	pigment	BASF
	White high gloss paint based on Valires HA 040.15	3,32		USMB
	Luconyl black 0060	0,17	pigment	BASF
Phase 3	Tego Wet 280	0,51	wetting agent	Evonik
	Total	100.00		

Method

- 1/ Mix phase 1 under moderate stirring
- 2/ Add the coloring pastes and mix until desired dispersion is obtained
- 3/ Add the wetting agent
- 4/ Add drier
 - o ECOS Mix 353 Neo Aqua: 1.50%
 - o ECOS Mix 265 Neo Aqua: 1.10%

Specifications

Viscosity @ 25 °C
 @ 10s-1: 13,2 P
 @ 7000s-1: 1,5 P

Wet film 90 micron

Gloss 20 ° (7 days):
 Gloss 60 °(7 days):

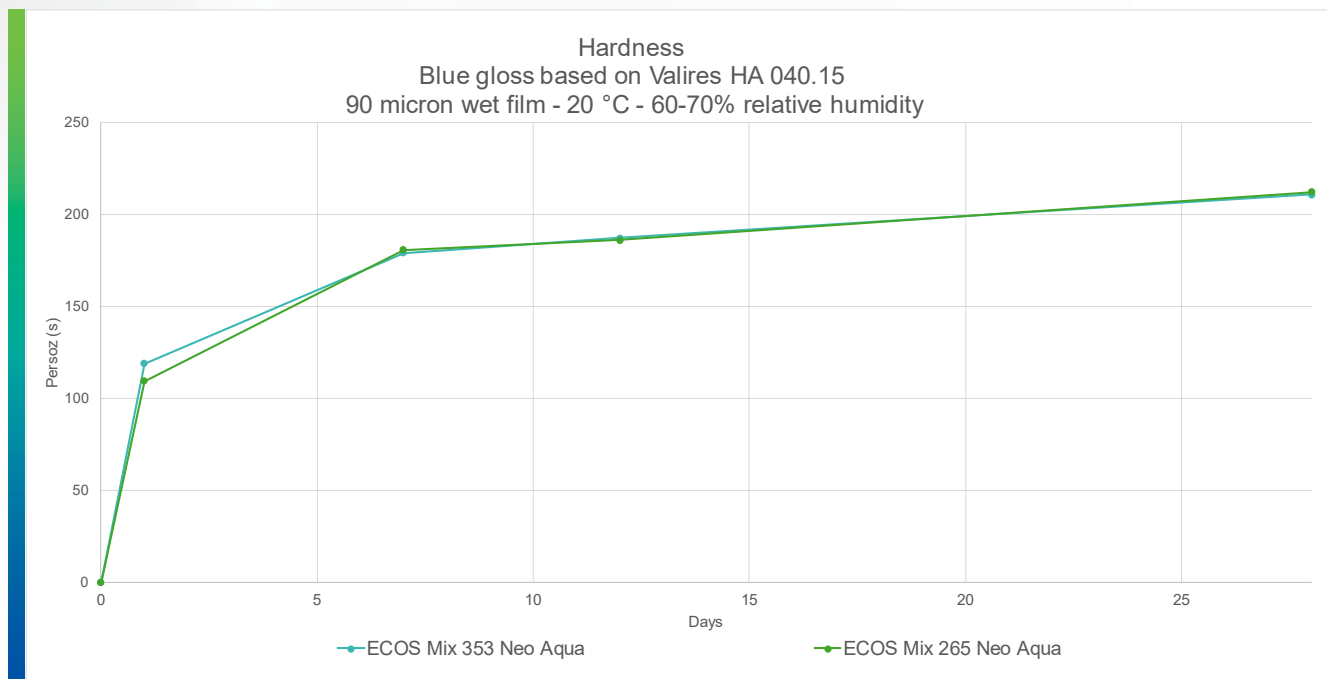
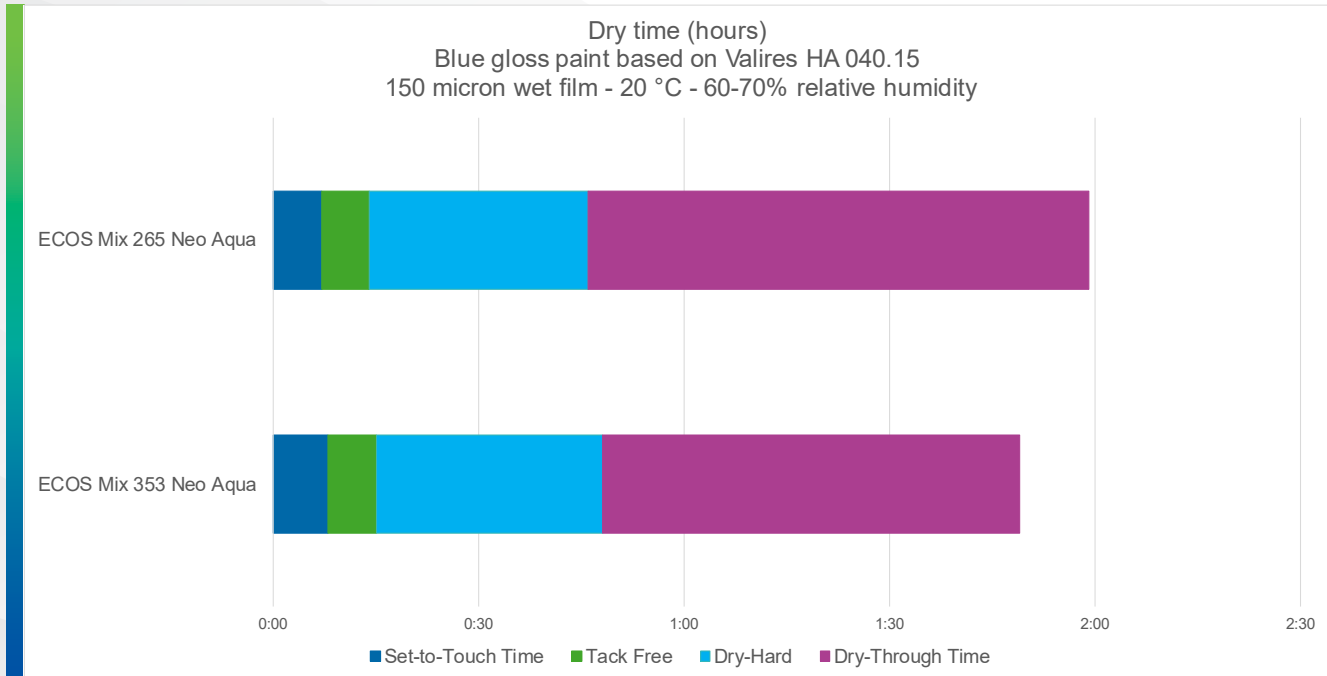
ECOS Mix 353 Neo Aqua

79
 89

ECOS Mix 265 Neo Aqua

78
 89

Graphics Drytime and hardness : on the next page



Gloss varnish based on Valires HA 040.01

	Component	%	Function	Supplier
Phase 1	Valires HA 040.01	95,45	binder	USMB
	Water	2,95	solvent	
	Tego Foamex 830	0,20	anti-foam	Evonik
	Tego Wet 280	0,50	rheology modifier	Evonik
Phase 2	Proxel BC	0,10	biocide	Lonza
	Acrysol RM-8W	0,50	rheology modifier	Dow Chemical
	Valirex Co 9% Aqua	0,30	drier	USMB
	Total	100,00		

Method

- 1/ Mix the compounds.
- 2/ Adjust the viscosity with Acrysol.

Specifications

Viscosity @ 25 °C (7.000s-1): 2,0 P
 Solids: 40%
 VOC: < 20 g/l

Teak woodstain based on Valires HA 040.01

	Ingredients	%	Function	Supplier
Phase 1	Valires HA 040.01	67,43	binder	USMB
	Yellow paste transp 30%	6,56	paste	
	Red paste transp 35%	3,27	paste	
	Ablack paste 35%	0,06	paste	
	Water	19,41		
Phase 2	Wax pc 500	0,8	wax	
Phase 3	Tego foamex 805	0,5	antifoam additive	Evonik
	Tego wet KL 245	0,5	wetting	Evonik
	ECOS ND15 Aqua	0,77	drier	USMB
	Acticide BX	0,15	biocide	Thor
Phase 4	DSX 3116	0,55	tickening	BASF
	Total	100,00		

Method

- 1/ Mix the resin with the pastes and water
- 2/ Add the wax and dispers
- 3/ Add the additives under moderate stirring
- 4/ Adjust viscosity

Specifications

Density: 1,05 g/cm³
 Solids: 32%
 Gloss @ 60°: 30

Anti-corrosion metal coating with Valires HA 040.03

	Ingredients	w%	Function	Supplier
Phase 1	Water	8,67	solvent	
	Edaplan 490	1,20	dispersing additive	Münzing Chemie GmbH
	Byk 012	0,10	antifoam	Byk
	Kronos 2160	17,34	pigment	Kronos
	Omyacoat 850 OG	2,00	CaCO ₃ filler	Omya
	Luzenac Har T84	5,18	talcum filler	Imerys
	Heucophos ZCP Plus	1	anticorrosion pigment	Heubach
Phase 2	Asconium-114	3	anticorrosion additive	Ascotec
Phase 3	Valires HA 040.03	51,9	binder	USMB
	Byk 024	0,10	antifoam	Byk
	Water	7,38	solvent	
	Coapur 3025	1,6	thickener	Coatex
	Ascotran-H10	0,20	antiflash-rust additive	Ascotec
	ECOS Mix 353 Neo Aqua	0,33	drier	USMB
	Total		100,00	

Method

- 1/ Phase 1: add in order with good agitation
- 2/ Phase 2: disperse with high shear rate for 10-15 min
- 3/ Phase 3: Add in order with continuous stirring

Paint data

- PVC : approx. 26%
PVC/CPVC : approx. 0,57

Salt-spray performances: cold-rolled steel (700 h / 2 layers / DFT 65-70 mm)

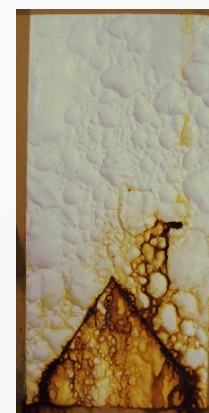
With Asconium-114



without Asconium-114



with 4 %
anticorrosion pigment



blank

Bio content Valires HA 040.01



Beta Analytic Inc
 4985 SW 74 Court
 Miami, Florida 33155
 Tel: 305-667-5167
 Fax: 305-663-0964
info@betalabservices.com

ISO/IEC 17025:2005-Accredited Testing Laboratory

Summary of Results - % Biobased Carbon Content
 ASTM D6866-18 Method B (AMS)

Certificate Number: 40409151685998540

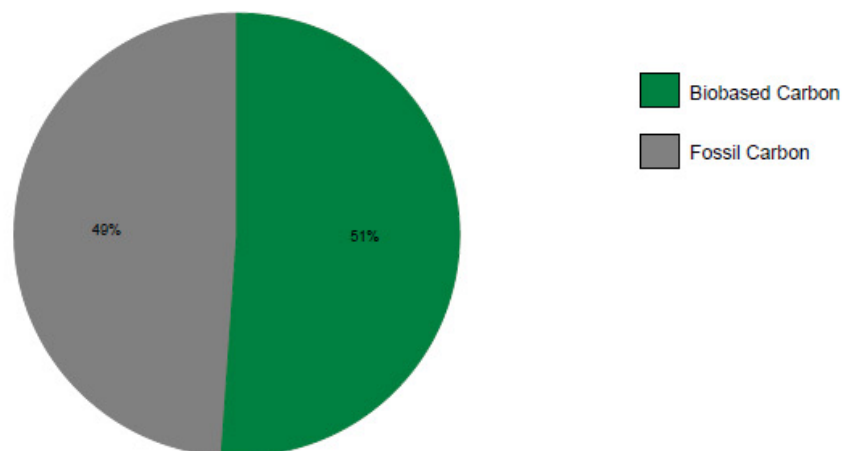
Validation:

Chris Patrick
Signature of Chris Patrick

Company	Umicore Specialty Material Brugge
Date Received	January 25, 2019
Date Reported	January 29, 2019
Submitter Label	Valires HA 040.01

RESULT: 51 % Biobased Carbon Content (as a fraction of total organic carbon)

Laboratory Number	Beta-516859
Percent modern carbon (pMC)	50.88 +/- 0.14 pMC
Atmospheric adjustment factor (REF)	100.0; = pMC/1.000



Precision on the RESULT is cited as +/- 3% (absolute). The cited precision on the analytical measure (pMC) is 1 sigma (1 relative standard deviation). The reported result only applies to the analyzed material. The accuracy of the RESULT relies on the measured carbon in the analyzed material having been in recent equilibrium with CO₂ in the air and/or from fossil carbon (from living more than 40,000 years ago such as petroleum or coal). The RESULT only applies to relative carbon content, not to relative mass content. The RESULT is calculated by adjusting pMC by the applicable "Atmospheric adjustment factor (REF)" cited in this report.

For inquiries and
additional information
please contact us.

Umicore Specialty Materials Brugge NV

Kleine Pathoekeweg 82
8000 Brugge, Belgium

Tel.: +32 50 320 720
Info.USMB@eu.umicore.com
www.csm.umicore.com



www.csm.umicore.com


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