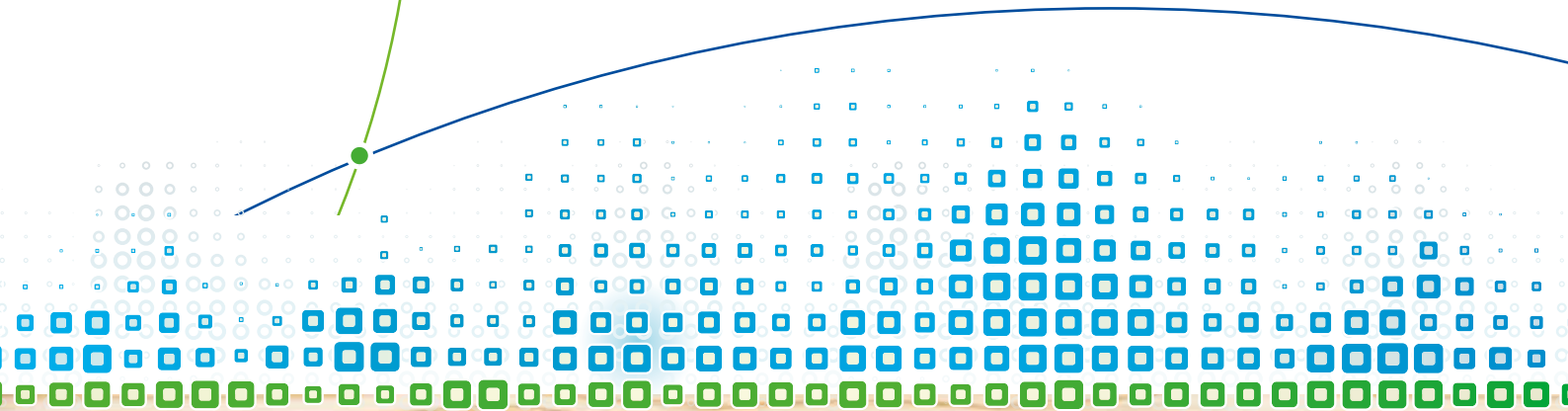




AW 43CX

SYNEXIL[®]

dispersion for professional
wood coatings



synthos
SPECIALTIES

AW 43CX

Synexil® AW 43CX is an acrylic self-crosslinking dispersion with complex morphology. The product has low VOC content, it does not contain any APEO emulsifiers or solvents.



Acrylic self-crosslinking dispersion

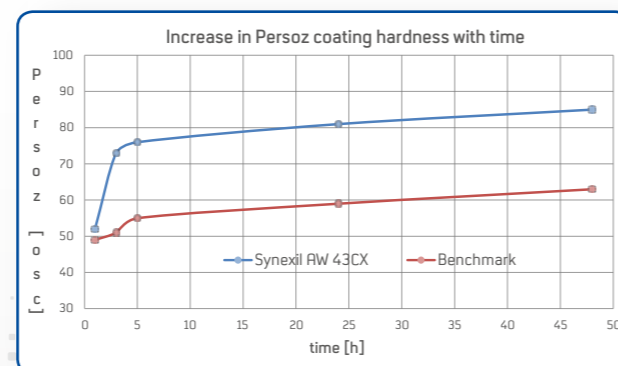
PHYSICO-CHEMICAL PARAMETERS

pH	8,3 - 9,0
Solids content, %	41 ± 1
Brookfield viscosity, mPa.s [1/60]	< 200
MFFT, °C	ca. 12
Mean particle size, nm	ca. 120
VOC,%	ca. 0,1

Favourable application parameters:

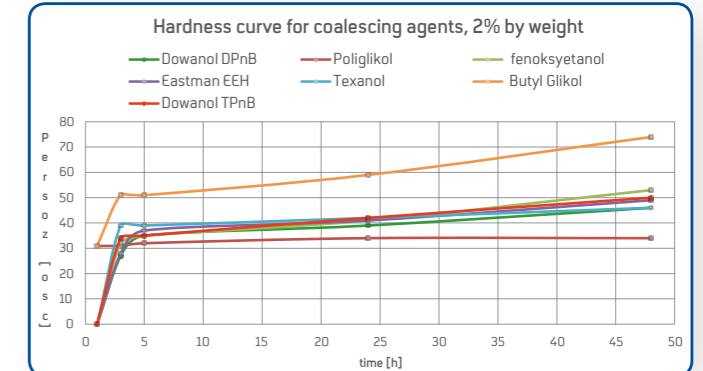
- ➔ Fast hardening
- ➔ Low water absorbability
- ➔ Very good anti-blocking
- ➔ Very good flexibility

Persoz hardness increase with time for Synexil® AW 43CX dispersion vs. competitor is shown in the diagram below.



Selection of the coalescing agent

A coalescing agent must be used to decrease MFFT to a level below 5 °C. Recommended coalescing agents for Synexil AW 43CX: Dowanol DPnB, Dowanol TPnB, Texanol, Eastman EEH, phenoxyethanol, polyethylene glycol, butyl glycol. The following substances are not recommended as coalescing agents for Synexil® AW 43CX: Dowanol PnB, Hexasol, butyl carbitol, dibutyl glycol. Adding 2 percent by weight of the coalescing agent to the dispersion will decrease MFFT to + 2.0 °C. Optimal coalescing agent was selected on the basis of the influence it exerts on the hardness of Synexil® AW 43CX coating. Butyl glycol proved to be the best and is the recommended coalescing agent.



Synexil® AW 43CX in coatings

Primers

Synexil® AW 43CX was tested in the starting application and compared with an equivalent commercially available product for the following wood coatings: primer, topcoat, and topcoat mixed with one-component polyurethane dispersion in 1:1 ratio by weight. Product formulations are given below:

A – the amount of thickener required to achieve the viscosity of 60-80 [s] on Ford cup

B – acrylic dispersion for simple wood coatings such as: wood stain, impregnation, primer

Material	Supplier	% by weight
Demineralised water	-	34,20
Butyl glycol	Overlack	1,20
BYK 3445	Byk Chemie	0,80
Benchmark	-	60,00
Nuosept 78	ISP	0,15
Suncare Concentrate	ISP	2,00
AF 0871	OMG Borchers	0,15
Borchigel 0625	OMG Borchers	1,30 ^A

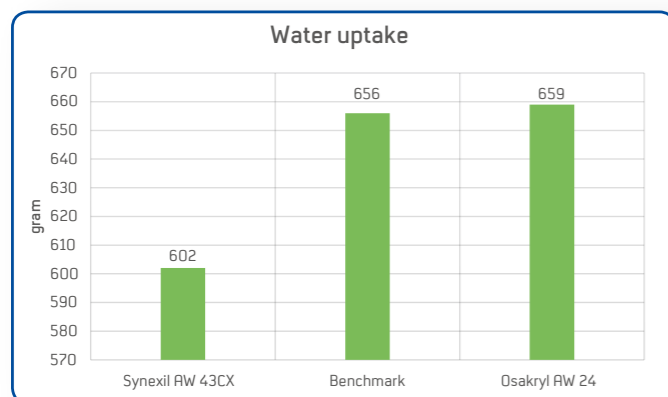
Material	Supplier	% by weight
Demineralised water	-	34,20
Butyl glycol	Overlack	1,20
BYK 3445	Byk Chemie	0,80
Synexil® AW 43CX	Synthos S.A.	60,00
Nuosept 78	ISP	0,15
Suncare Concentrate	ISP	2,00
AF 0871	OMG Borchers	0,15
Borchigel 0625	OMG Borchers	0,90 ^A

Material	Supplier	% by weight
Demineralised water	-	34,20
Butyl glycol	Overlack	1,20
BYK 3445	Byk Chemie	0,80
Osakryl® AW 24^B	Synthos S.A.	60,00
Nuosept 78	ISP	0,15
Suncare Concentrate	ISP	2,00
AF 0871	OMG Borchers	0,15
Borchigel 0625	OMG Borchers	0,90 ^A

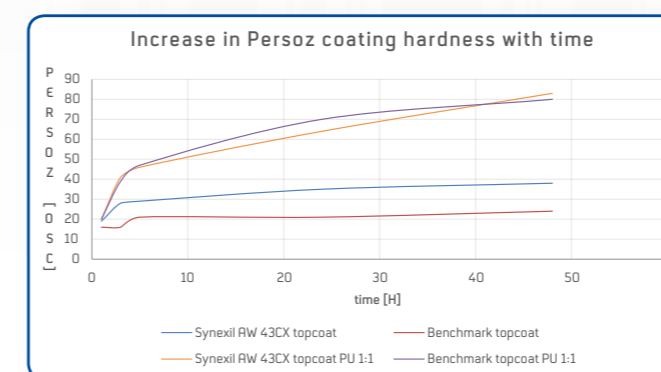


Primer water uptake

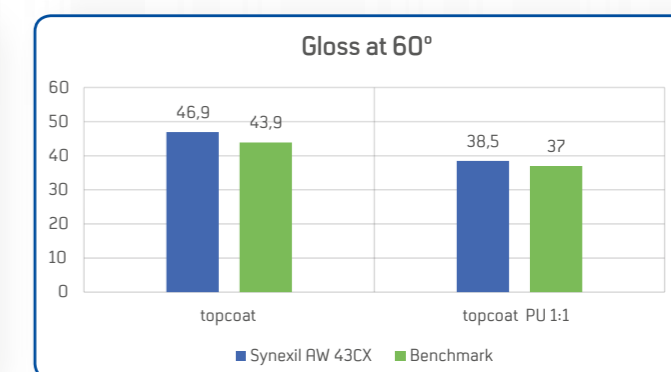
Water uptake is tested after 2 days of conditioning the samples at 15°C and 75% humidity. The coatings are sprayed onto spruce wood in two layers, 60 g/m² each. Then the samples are immersed in water for 3 days.



Hardness



Gloss



The test was carried out in accordance with ISO 2813

Topcoats

Material	Supplier	% by weight
Demineralised water	-	10,00
Butyl glycol	Overlack	1,60
BYK 3445	Byk Chemie	0,80
Synxil® AW 43CX	Synthos S.A.	80,00
Nuosept 78	ISP	0,15
Luba Print 164 G	Munzing	5,00
Suncare TOP	ISP	1,30
AF 0871	OMG Borchers	0,15
Borchigel 0625	OMG Borchers	0,50 ^A

Material	Supplier	% by weight
Demineralised water	-	10,00
Butyl glycol	Overlack	1,60
BYK 3445	Byk Chemie	0,80
Benchmark	-	80,00
Nuosept 78	ISP	0,15
Luba Print 164 G	Munzing	5,00
Suncare TOP	ISP	1,30
AF 0871	OMG Borchers	0,15
Borchigel 0625	OMG Borchers	0,80 ^A

Material	Supplier	% by weight
Demineralised water	-	10,00
Butyl glycol	Overlack	0,80
BYK 3445	Byk Chemie	0,80
Synxil® AW 43CX	Synthos S.A.	40,00
Esacote PU 147 (poliuretan)	Lamberti	40,00
Nuosept 78	ISP	0,15
Luba Print 164 G	Munzing	5,00
Suncare TOP	ISP	1,00
AF 0871	OMG Borchers	0,15
Borchigel 0625	OMG Borchers	0,67 ^A

Material	Supplier	% by weight
Demineralised water	-	10,00
Butyl glycol	Overlack	0,80
BYK 3445	Byk Chemie	0,80
Benchmark	-	40,00
Esacote PU 147 (poliuretan)	Lamberti	40,00
Nuosept 78	ISP	0,15
Luba Print 164 G	Munzing	5,00
Suncare TOP	ISP	1,00
AF 0871	OMG Borchers	0,15
Borchigel 0625	OMG Borchers	0,75 ^A

A – the amount of thickener required to achieve the viscosity of 60-80 [s] on Ford cup

Scratch resistance

Scratch resistance, pencil method

Coating	pencil type
Synxil® AW 43CX topcoat	6B
Benchmark topcoat	6B
Synxil® AW 43CX topcoat PU 1:1	3B
Benchmark topcoat PU 1:1	4B

The test was carried out in accordance with ISO 15184



Anti-blocking at higher temperature

Coating	results
Synxil® AW 43CX topcoat	2
Benchmark topcoat	2
Synxil® AW 43CX topcoat PU 1:1	1
Benchmark topcoat PU 1:1	1

- 1 – coating separation with small force, no damage
- 2 – coating separation with small force, minor damage to the coating

A coating 60 µm thick and 5x5 cm in size on a Leneta chart is dried for 24 hours under normal conditions. Two coatings are pressed together with a 5 kg weight for 5 hours at 50 °C.

Anti-blocking

A coating 60 um thick and 5x5 cm in size on beech wood is dried for 24 hours under normal conditions. Two coatings are pressed together with a 10 kg weight for 24 hours.

Coating	results
Synexil® AW 43CX topcoat	2
Benchmark topcoat	3
Synexil® AW 43CX topcoat PU 1:1	0
Benchmark topcoat PU 1:1	0

- 0 – coating separation without force, no damage
- 2 – coating separation with small force, minor damage to the coating
- 3 – coating separation with the use of force, damage to the coating



Coating systems primer / topcoat type

The following coating systems were tested:

AW24/AW 43CX topcoat: primer based on Synexil® AW 24, applied by spraying in two layers, 60 g/m² each, and topcoat based on Synexil® AW 43CX, applied by spraying in one layer, 120 g/m².

AW24/AW 43CX topcoat PU 1:1: primer based on Synexil® AW 24, applied by spraying in two layers, 60 g/m² each, and topcoat based on Synexil® AW 43CX and polyurethane applied by spraying in one layer, 120 g/m².

AW 43CX/AW 43CX topcoat: primer based on Synexil® AW 43CX, applied by spraying in two coats, 60 g/m² each, and topcoat based on Synexil® AW 43CX, applied by spraying in one layer, 120 g/m².

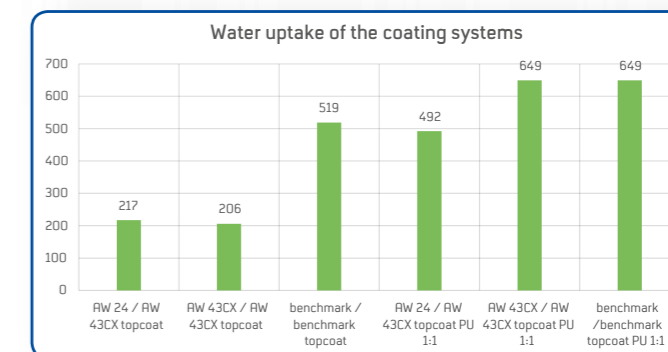
AW 43CX/AW 43CX topcoat PU 1:1: primer based on Synexil® AW 43CX, applied by spraying in two layers, 60 g/m² each, and topcoat based on Synexil® AW 43CX and polyurethane applied by spraying in one layer, 120 g/m².

Benchmark/Benchmark topcoat: primer based on benchmark, applied by spraying in two layers, 60 g/m² each, and topcoat based on benchmark, applied by spraying in one layer, 120 g/m².

Benchmark/Benchmark topcoat PU 1:1: primer based on benchmark, applied by spraying in two layers, 60 g/m² each, and topcoat based on benchmark, applied by spraying in one layer, 120 g/m².

Water uptake of the coating systems

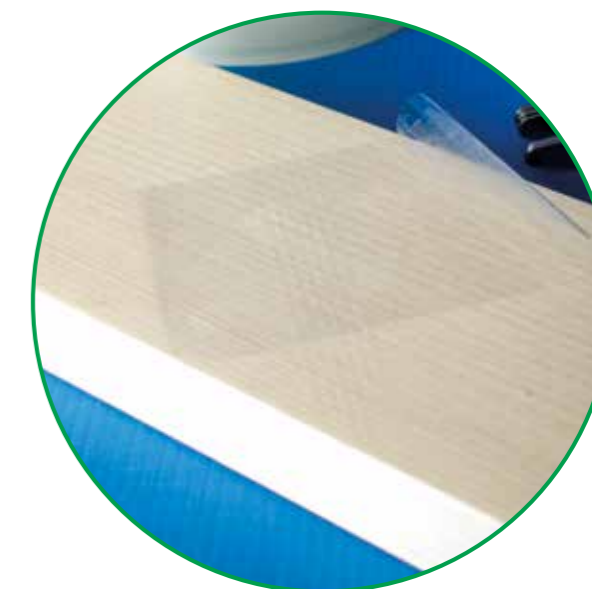
Water uptake is tested after 2 days of conditioning the samples at 15°C and 75% humidity. The coatings are sprayed onto spruce wood. Then the samples are immersed in water for 3 days.



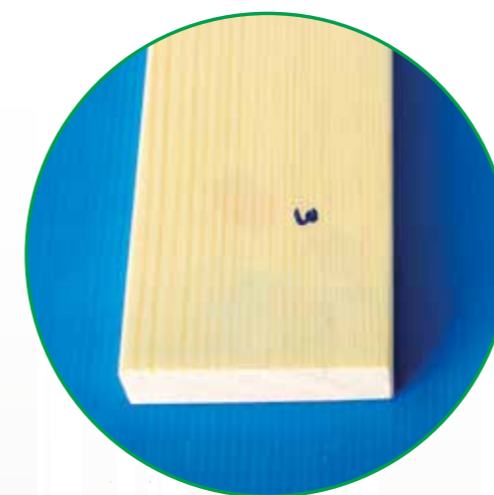
Wet adhesion

Coatings are applied by spraying and dried for 24 hours under normal conditions. The boards are then immersed in water for 1 hour, and then the coating adhesion is determined with the use of the incision method. The scale is from 0 to 5, where 0 is no damage, and 5 - coating completely torn off.

Coating	results
AW 24 / AW 43CX topcoat	0
AW 43CX / AW 43CX topcoat	0
benchmark / benchmark topcoat	0
AW 24 / AW 43CX topcoat PU 1:1	0
AW 43CX / AW 43CX topcoat PU 1:1	0
Benchmark / benchmark topcoat PU 1:1	0



Chemical resistance



Coatings are applied by spraying and dried for 24 hours under normal conditions. Contamination exposition time - 1 hour. The scale is from 0 to 5, where 0 means no mark, and 5 - a very clear mark.

Coating system	water	ink	cement mortar
AW 24 / AW 43CX topcoat	0	0	0
AW 43CX / AW 43CX topcoat	0	0	0
benchmark / benchmark topcoat	1	2	3
AW 24 / AW 43CX topcoat PU 1:1	0	1	1
AW 43CX / AW 43CX topcoat PU 1:1	0	0	0
Benchmark / benchmark topcoat PU 1:1	0	1	0



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