DANISH TECHNOLOGICAL INSTITUTE

Gregersensvej
DK-2630 Taastrup
Tel. +45 72 20 20 00
Fax +45 72 20 20 19

info@teknologisk.dk
www.teknologisk.dk

Teknos A/S
Industrivej 19
DK-6580 Vamdrup

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Initials	bkv/elm/hbs
Softwarever.	3.22/2012-10-19

Test Report

Material: The test specimens of Scotch pine, sapwood (*Pinus sylvestris* L.) were prepared according to EN 927-3:2012 by the Danish Technological Institute.
The test specimens were treated according to assignor's directions:
AQUATOP 2600 RAL 9010 (1/2 application rate), product code: 2600-82, spray application 185 g/m². Accept criteria 167-204 g/m²

Method: EN 927-3:2012. Paints and varnishes - Coating materials and coating systems for exterior wood - Part 3: Natural weathering test.

Period: The testing was carried out from 03-04-2014 to 28-05-2015.
The weathering took place in the 12 months from 29-04-2014 to 29-04-2015 at the test site at the Danish Technological Institute.

Result:

Property	Evaluation scale Test method	Results after 12 months	
		Tested system	Reference system
Change of gloss	EN ISO 2813	-1.9	7.6
Change in colour (ΔE^*_{ab})	ISO 7724-3	2.0	6.0
Blistering*	EN ISO 4628-2	0.0	0.0
Flaking*	EN ISO 4628-5	0.0	0.0
Cracking*	EN ISO 4628-4	0.7(S1)c	0.0
Chalking*	EN ISO 4628-6	0.5	0.0
Mould growth*[1, A]	EN ISO 4628-1	4.0/3.0	0.7/0.0
Adhesion**	EN 927-3, Annex B	1.0	0.2
General appearance*[1]	EN ISO 4628-1	4.0/3.0	1.7/1.7

*) 0 = None, 5 = Dense - **) 0 = Excellent, 5 = Poor - [1]) Before washing/after washing
A) The mould has penetrated the coating from the wood.

Assessment: According to EN 927-2:2014*," Paints and varnishes - Coating materials and coating systems for exterior wood -Part 2: Performance specification*", the exposure conditions are rated as "Medium" and the system under test can be categorized as "Stable" concerning the properties: Blistering, flaking, cracking and adhesion. The system under test is considered as "Not mould resistant".

Storage: The samples will be destroyed after 6 months, if nothing else has been agreed in writing.

Terms: The test has been performed according to the attached conditions, which are according to the guidelines laid down by DANAK (The Danish Accreditation). The testing is only valid for the tested specimen. The test report may only be extracted, if the laboratory has approved the extract.

29-05-2015, Danish Technological Institute, Wood Technology, Taastrup

Berit Lindegaard
Direkte tlf.: +45 72 20 23 14
E-mail: berit.lindegaard@teknologisk.dk

Test responsible

Elisabeth Morsing
Ph. Direct: +45 72 20 23 35
E-mail: elisabeth.morsing@teknologisk.dk

Co-reader

Appendix 1. Surface treatment and results

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EN 927-3:2006. Paints and varnishes - Coating materials and coating systems for exterior wood - Part 3: Natural weathering test.

Substrate: Scotch pine, sapwood (*Pinus sylvestris* L.).

Weathering: Danish Technological Institute, Taastrup. Oriented 45° to the south, min. 1.5 m above terrain.

Tested system:

System:

Coat	Trade name	Type/ Density (g/mL)	Application method and date	Recommended amount
1	AQUATOP 2600 RAL 9010	Topcoat 1.204	Spray application	167-204 g/m²

Results:

		Exposed specimens			Unexposed specimen
Specimen no.		302	303	304	301
Application data					
Coat 1 (g/m²)		202	191	194	202
Inspection before exposure					
Film thickness (µm)[1]					51
Gloss		17	15	16	15
Colour	L*	92.9	92.9	92.9	92.9
	a*	-1.4	-1.4	-1.4	-1.4
	b*	4.8	4.8	4.8	4.9
Initial defects		0	0	0	0
Inspection after exposure					
Blistering		0	0	0	-
General appearance		4	4	4	-
Flaking		0	0	0	-
Cracking		1(S1)c	1(S1)c	0	-
Chalking		0.5	0.5	0.5	-
Mould growth		4	4	4	-
Inspection after exposure and washing					
Gloss		15	14	13	16
Change of gloss		-2.3	-1.0	-2.5	1.0
Colour	L*	91.4	90.7	91.0	92.6
	a*	-0.9	-0.7	-0.8	-1.0
	b*	5.0	5.2	5.1	5.2
Change of colour		1.6	2.3	2.0	0.6
General appearance		3	3	3	-
Mould growth		3	3	3	-
Adhesion		0.5	1	1.5	-

Appendix 1. Surface treatment and results

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Reference system: Internal Comparison Product (ICP)

System:

Coat	Trade name	Application method and dates	Recommended amount in total
1-3	ICP	Brush application 30-12-1899 30-12-1899 30-12-1899	150 ± 30 g/m²

Results:

		Exposed specimens			Unexposed specimen
Specimen no.		901	902	904	903
Application data					
Coat 1 (g/m²)		49	55	52	61
Coat 2 (g/m²)		50	49	41	39
Coat 3 (g/m²)		54	48	49	40
Total amount (g/m²)		153	152	142	141
Inspection before exposure					
Film thickness (µm)[1]					40
Gloss		76	74	0	77
Colour	L*	28.0	28.1	0.0	30.3
	a*	41.4	41.0	0.0	42.4
	b*	38.7	38.7	0.0	42.1
Initial defects		0	0	0	0
Inspection after exposure					
Blistering		0	0	0	-
General appearance		2	2	1	-
Flaking		0	0	0	-
Cracking		0	0	0	-
Chalking		0	0	0	-
Mould growth		1	1	0	-
Inspection after exposure and washing					
Gloss		87	79	86	76
Change of gloss		10.5	5.7	85.8	-1.2
Colour	L*	28.3	0.0	29.8	29.8
	a*	38.8	0.0	41.8	41.8
	b*	33.4	0.0	40.6	40.6
Change in colour		6.0	6.2	63.5	1.7
General appearance		2	2	1	-
Mould growth		0	0	0	-
Adhesion		0	0	0.5	-

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The general conditions pertaining to assignments accepted by Danish Technological Institute shall apply in full to the technical testing and calibration at Danish Technological Institute and to the completion of test reports and calibration certificates within the relevant
field.

Danish Accreditation (DANAK)

DANAK was established in 1991 in pursuance of the Danish Act No. 394 of 13 June 1990 on the promotion of Trade and Industry.

The requirements to be met by accredited laboratories are laid down in the "Danish Agency for Trade and Industry's ("Erhvervsfremme Styrelsens") Statutory Order on accreditation of laboratories to perform testing etc. and GLP inspection. The statutory order refers to other documents, where the criteria for accreditation are specified further.

The standards DS/EN ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories" and DS/EN 45002 "General criteria for the assessment of testing laboratories" describe fundamental criteria for accreditation. DANAK uses guidance documents to clarify the requirements in the standards, where this is considered to be necessary. These will mainly be drawn up by the "European co-operation of Accreditation (EA)" or the "International Laboratory Accreditation Co-operation (ILAC)" with the purpose of obtaining uniform criteria for accreditation. In addition, DANAK draws up Technical Regulations with specific requirements for accreditation that are not contained in the standards.

In order for a laboratory to be accredited it is, among other things, required:

- that the laboratory and its personnel are not subject to any commercial, financial or other pressures, which might influence their technical judgement
- that the laboratory operates a documented quality system
- that the laboratory has at its disposal all items of equipment, facilities and premises required for correct performance of the service that it is accredited to perform
- that the laboratory management and personnel have technical competence and practical experience in performing the service that they are accredited to perform
- that the laboratory has procedures for traceability and uncertainty calculations
- that accredited testing or calibration is performed in accordance with fully validated and documented methods
- that the laboratory keeps records, which contain sufficient information to permit repetition of the accredited test or calibration
- that the laboratory is subject to surveillance by DANAK on a regular basis
- that the laboratory shall take out an insurance, which covers liability in connection with the performance of accredited services

Reports carrying DANAK's logo are used, when reporting accredited services and show that these have been performed in accordance with the rules for accreditation.

November 2013