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7P001688 B

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Testing of hydrophobic impregnation for the protection of concrete structures – Prevention of chloride ingress

(2 appendices)

1 Assignment

Testing of *BPS 7726* hydrophobic impregnation product on concrete with respect to prevention of chloride ingress and infrared analysis. The tests were carried out in accordance with the directions of NT BUILD 515, Edition 1, *Hydrophobic impregnations for Concrete – Prevention of chloride ingress – Filter effect*.

These test results have been published in report 6P00354 B 2016-10-28 for the same product, under another product name.

2 Test schedule

The test objects and scope of the test are shown in table 1. The tests were carried out between May and October 2016.

Tabel 1. Test schedule for treated and untreated concrete samples

Property	Method	Test object	
		Measurements Dimensions (mm)	Number
Prevention of chloride ingress – filter effect	NT BUILD 515	100x100x50	3 treated
			3 untreated

The concrete and the test specimens were produced and stored at RISE CBI Swedish Cement and Concrete Research Institute in Borås in accordance with the directions of EN 1766. Tests were carried out on “Type MC(0.45)”.

BPS 7726 batch nr KH 13145, which arrived at RISE CBI on 26 April 2016, was applied by RISE CBI in accordance with the manufacturer’s recommendations. An amount equivalent to approximately 130 g/m² was applied to the test surface of each test specimen (applied by dipping, 3 times for 5 min each with an interval of 15 min).

The amount of impregnation product applied was checked by weighing. RISE CBI has no other information relating to the substance and its sampling.

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3 Results

The chloride profiles of the test specimens was then determined as the Cl⁻ level in % of the weight of the concrete in six steps down to a depth of 25 mm in accordance with EN 14629:2007 *Products and systems for the protection and repair of concrete structures – Test methods – Determination of chloride content in hardened concrete*.

The results of the determination of the chloride profile is shown in diagram 1 as the mean of results from three specimens. The measurement data is reported in Appendix 1.

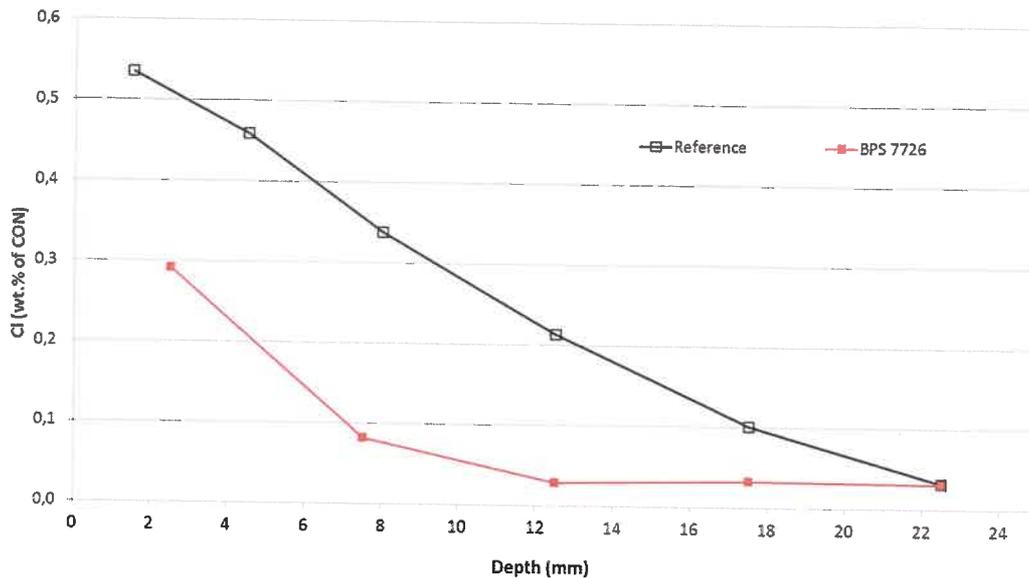


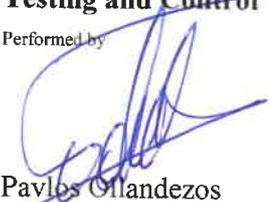
Diagram 1. Chloride content

4 Comments

The tested hydrophobic impregnation product, *BPS 7726*, meets the requirement of AMA Anläggning 17, LFB.311. The calculated filter effect (FE_{25}) is 0.71 which is higher than the requirement on minimum value, which is 0.60.

RISE CBI Swedish Cement and Concrete Research Institute Testing and Control

Performed by


Pavlos Glandezos

Examined by


Cathrine Ewertson

Appendices

1. Test schedule.
2. Test results of the determination of the chloride content.

Appendix 1

NT-Build 515			
MC(0,45) 100x100x100	Datum	Referens	BPS 7726 KH 13145
Tillverkning	2016-06-23	R	
Vattenlagring	2016-06-24		
20±2C			
Sågning, 100x100x50	2016-06-20	3	3
Vinkelrätt överytan			
inga håligheter ≥ Ø5 mm			
Försegling med epoxi	2016-06-20	R1 R2 R3	BS1 BS2 BS3
20±2C, 65±5 RF			
ca 2-3 h efter sågning			
2 st appliceringar			
Limning av gummiduk	2016-06-22		BS1 BS2 BS3
20±2C, 65±5 RF			
Applicering	2016-06-27		BS1 1111,31 1112,23 0,92 BS2 1192,00 1192,94 0,94 BS3 1112,73 1113,49 0,76
20±2C, 65±5 RF	10:15		
HP 200: 3 gånger			
5 min i vätskan			
15 min i luft			
	10:35		BS1 1112,24 1112,63 0,39 BS2 1192,96 1193,30 0,34 BS3 1113,52 1113,85 0,33
	10:55		BS1 1112,59 1112,66 0,07 BS2 1193,28 1193,35 0,07 BS3 1113,82 1113,91 0,09
Start exp i 15% NaCl-lösning	2016-07-25	R1 R2 R3	BS1 BS2 BS3
20±2C			
Separata behållare			
Kontroll efter 14 resp 28 dygn			
Avslut exponering	2016-09-19	R1 R2 R3	BS1 BS2 BS3
Provroppar torkas			
Placeras i plastpåsar			
Sedan i 5±2C			
Svarvning start tidigast	2016-09-19	R1	BS1
avslutas senast	2016-09-26	R2 R3	BS2 BS3
Dock inom max två dagar efter start			
Behöbeh svarvas parallellt			
Torkning	2016-09-19	R1 R2 R3	BS1 BS2 BS3
105±5C			
Förvaring av betongpulver		R1	BS1
skyddas mot CO2 och fukt		R2	BS2
fram till kloridanalys		R3	BS3

Appendix 2

			Reference										BPS 7726									
Max depth	Middle	Thickness	REF1	REF2	REF3	Avg	Avg-bg	Std	COV (%)	CI/step	Max depth	Middle	Thickness	BS1	BS2	BS3	Avg	Avg-bg	Std	COV (%)	CI/step	
step [mm]	[mm]	[mm]	(fig)							step [mm]	[mm]	[mm]	(fig)									
3	1,50	3,00	0,518	0,538	0,549	0,535	0,506	0,016	3	0,051	5	2,5	5	0,302	0,251	0,322	0,291	0,262	0,037	13	0,052	
6	4,50	3,00	0,439	0,466	0,472	0,459	0,430	0,018	4	0,052	10	7,5	5	0,070	0,095	0,081	0,082	0,052	0,012	15	0,008	
10	8,00	4,00	0,323	0,355	0,337	0,338	0,303	0,016	5	0,049	15	12,5	5	0,035	0,019	0,030	0,028	0,001	0,008	28	0,000	
15	12,50	5,00	0,208	0,205	0,227	0,213	0,184	0,022	6	0,037	20	17,5	5	0,028	0,022	0,046	0,032	0,003	0,013	39	0,001	
20	17,50	5,00	0,092	0,091	0,118	0,100	0,071	0,015	15	0,014	25	22,5	5	0,025	0,028	0,036	0,030	0,000	0,005	18	0,000	
25	22,50	5,00	0,020	0,033	0,039	0,031	0,001	0,010	32	0,000												
Total		25								0,213		25								0,061		
Filter effect (FE ₂₅)																						0,71