REPORT

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Reference
8F005898 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 *BCS Lives* hydrophobic impregnation product on concrete with respect to prevention of chlordie 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)”.

BCS Lives 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.

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.

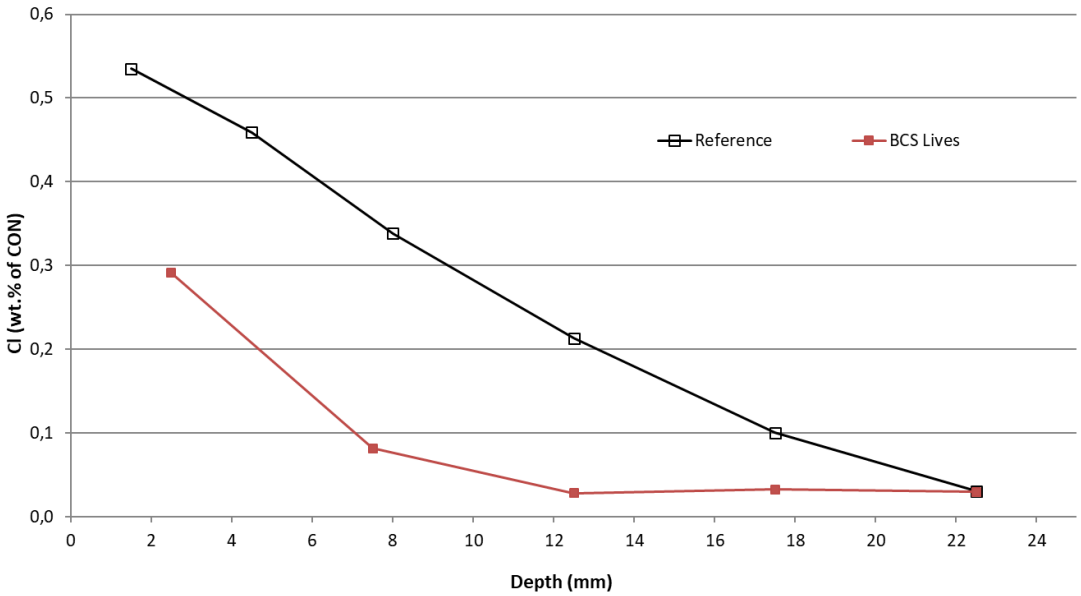

Diagram 1. Chloride content

4 Comments

The tested hydrophobic impregnation product, *BCS Lives*, 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.

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Performed by

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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		*BCS Lives*	
Tillverkning	2016-05-23	R		*KH 13145*	
Vattenlagring	2016-05-24				
20±2C					
Sågning, 100x100x50	2016-06-20	**3**		**3**	
Vinkelrätt överytan					
inga håligheter ≥ Ø5 mm					
Försegling med epoxi	2016-06-20	*R1*		*BS1*	
20±2C, 65±5 RF		*R2*		*BS2*	
ca 2-3 h efter sågning		*R3*		*BS3*	
2 st appliceringar					
Limning av gummiduk	2016-06-22			*BS1*	
20±2C, 65±5 RF				*BS2*	
				BS3	
Applicering	2016-06-27			*BS1*	1111,31
20±2C, 65±5 RF	10:15				1112,23
					0,92
				BS2	1192,00
HP 200: 3 gånger					1192,94
5 min i vätskan					*0,94*
15 min i luft				*BS3*	1112,73
					1113,49
					0,76
	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*		*BS1*	
20±2C		*R2*		*BS2*	
Separata behållare		*R3*		*BS3*	
Kontroll efter 14 resp 28 dygn					
Avslut exponering	2016-09-19	*R1*		*BS1*	
Provkroppar torkas		*R2*		*BS2*	
Placeras i plastpåsar		*R3*		*BS3*	
Sedan i 5±2C					
Svarvning start tidigast	2016-09-19	*R1*		*BS1*	
avslutas senast	2016-09-26	*R2*		*BS2*	
Dock inom max två dagar efter start		*R3*		*BS3*	
Beh/obeh svarvas parallellt					
Torkning	*2016-09-19*	*R1*		*BS1*	
105±5C		*R2*		*BS2*	
		R3		*BS3*	
Förvaring av betongpulver		*R1*		*BS1*	
skyddas mot CO2 och fukt		*R2*		*BS2*	
fram till kloridanalys		*R3*		*BS3*	

Appendix 2

			Reference								BCS Lives							
Max depth	Middle	Thickness	REF1	REF2	REF3	Avg	Avg-bg	Std	COV (%)	Cl/step	BS1	BS2	BS3	Avg	Avg-bg	Std	COV (%)	Cl/step
step [mm]	[mm]	[mm]				(fig)								(fig)				
3	**1,50**	3,00	0,518	0,538	0,549	*0,535*	*0,506*	*0,016*	*3*	*0,061*								
6	**4,50**	3,00	0,439	0,466	0,472	*0,459*	*0,430*	*0,018*	*4*	*0,052*	0,302	0,251	0,322	*0,291*	*0,262*	*0,037*	*13*	*0,052*
10	**8,00**	4,00	0,323	0,355	0,337	*0,338*	*0,309*	*0,016*	*5*	*0,049*	0,070	0,095	0,081	*0,082*	*0,052*	*0,012*	*15*	*0,008*
15	**12,50**	5,00	0,208	0,205	0,227	*0,213*	*0,184*	*0,012*	*6*	*0,037*	0,035	0,019	0,030	*0,028*	*-0,001*	*0,008*	*28*	*0,000*
20	**17,50**	5,00	0,092	0,091	0,118	*0,100*	*0,071*	*0,015*	*15*	*0,014*	0,028	0,022	0,046	*0,032*	*0,003*	*0,013*	*39*	*0,001*
25	**22,50**	5,00	0,020	0,033	0,039	*0,031*	*0,001*	*0,010*	*32*	*0,000*	0,025	0,028	0,036	*0,030*	*0,000*	*0,005*	*18*	*0,000*
Total		**25**								**0,213**								**0,061**
Filter effect (FE_{25})																		**0,71**