

Report Bond Strength

ZTV-SIB 90, EN 1542 (99), SIA 281/3, ASTM C 1583

Report-N° 201314483A.en **Project-N°** 50 L10313 0001
Client BASF Construction Chemicals Europe AG, Frank Clement, Im Tiergarten 7, 8055 Zürich
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Object	Testing for Masterseal 345
Part	

Underground

Material	Shotcrete
Production Date	
Length of drilling	86 mm
Pretreatment	
Further Remarks	

System

	Layer 1	Layer 2	Layer 3
Material	Masterseal 345		
Production Date			
Thickness	4 mm		
Further Remarks			

Specimen

Number of Test Areas	1 Piece	Specimens per Area	5 Pieces
Form	Drilling core(s) Ø 50 mm	Length of drilling core	90 mm
Preparation at	24.09.13	By	VSH, U. Honegger

Description of the Examination

The method is used to determine the bond strength of single- or multi-layer specimens. Metal Stamps are glued at the end of the faces of the specimen. The specimen are uniaxially loaded till the breaking. The bond strength is calculated from the maximum force on the fracture surface.

Test according EN 1542 (99)

Details to the testing device

Testing device	Bond-Strength device 30 kN Typ HZM 30 (PM-Nr. 02 004)
Stamp	Ø 50 mm, H = 30 mm
Rate of loading	0.15 N/mm ² /s
Glue	X 60
Preparation of the specimens	cut, glued Stamp

Results (for details see appendix)

Prüfdatum: 26.09.13

Test Area	temperature [°C]	length [mm]	Quantity	Bond-Strength [N/mm ²]			
				Average	St.de.	minimum	maximum
1	22.2	90.0	5	1.45	0.22	1.15	1.62
Average of Test Areas				1.45			
Standard Deviation of Test Areas							

Remarks

Measurement uncertainty

On inquiry we will gladly inform you about the measuring uncertainty of the test result and on which basis it was determined.

Hagerbach Test Gallery Ltd.

Flums, 17.10.13

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(01.028_Labor-02.11f)

Report Bond Strength

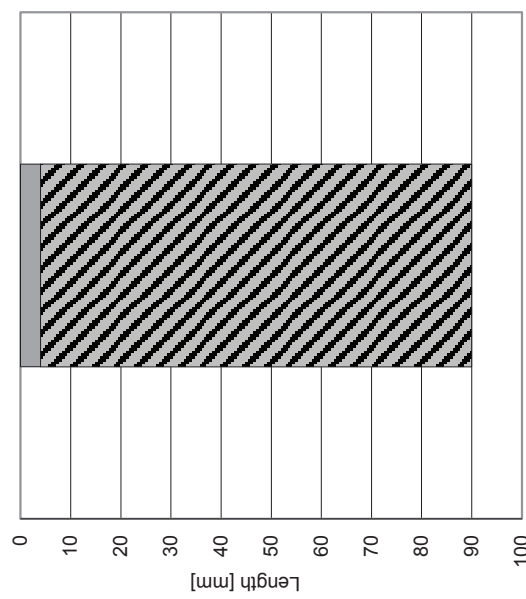
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Project-N° 50 L10313 0001

Client BASF Construction Chemicals Europe AG, Frank Clement, Im Tiergarten 7, 8055 Zürich

Object **Testing for Masterseal 345**
 Part

Test Area 1 Specimens Client	VSH	Dimensions			Temp- erature [°C]	Length [mm]	Force F [kN]	Bond-Strength $\beta_{Z_{bzw.}, \beta_{HZ}}$ [N/mm ²]	Remarks (Point of Breaking, etc)	Age of Specimens
		Ø [mm]	s ₁ [mm]	s ₂ [mm]						
	3185/1	48.8			22.2	90	3.02	1.62	Break at the crossover Shotcrete / Masterseal	
	3185/2	48.8			22.2	90	2.37	1.27	Break at the crossover Shotcrete / Masterseal	
	3185/3	48.8			22.2	90	2.99	1.60	Break at the crossover Shotcrete / Masterseal	
	3185/4	48.8			22.2	90	2.16	1.15	Break at the crossover Shotcrete / Masterseal	
	3185/5	48.8			22.2	90	3.00	1.61	Break at the crossover Shotcrete / Masterseal	
Average Series					22.2	90.0	2.71	1.45		
Standard Deviation Serie					0.0	0.0	0.41	0.22		



System (Average or Data of the Client)

Position	Material	Strength	Remarks
Layer 3			
Layer 2			
Layer 1	Masterseal 345	4 mm	
Underground	Shotcrete	86 mm	

Remarks

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Flums, 17.10.13

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Report Bond Strength

ZTV-SIB 90, EN 1542 (99), SIA 281/3, ASTM C 1583

Report-N° 201313728A.en **Project-N°** 50 L10313 0001
Client BASF Construction Chemicals Europe AG, Frank Clement, Im Tiergarten 7, 8055 Zürich
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Object	Testing for Masterseal 345
Part	

Underground

Material	Shotcrete
Production Date	
Length of drilling	60 mm
Pretreatment	
Further Remarks	

System

	Layer 1	Layer 2	Layer 3
Material	Masterseal 345	Shotcrete	
Production Date			
Thickness	4 mm	76 mm	
Further Remarks			

Specimen

Number of Test Areas	1 Piece	Specimens per Area	5 Pieces
Form	Drilling core(s) Ø 50 mm	Length of drilling core	140 mm
Preparation at	25.07.13	By	VSH, R. Schwarzkopf

Description of the Examination

The method is used to determine the bond strength of single- or multi-layer specimens. Metal Stamps are glued at the end of the faces of the specimen. The specimen are uniaxially loaded till the breaking. The bond strength is calculated from the maximum force on the fracture surface.

Test according to ASTM C 1583

Details to the testing device

Testing device	Bond-Strength device 30 kN Typ HZM 30 (PM-Nr. 02 004)
Stamp	Ø 50 mm, H = 30 mm
Rate of loading	0.15 N/mm ² /s
Glue	Scotch-Weld DP 100
Preparation of the specimens	cut, glued Stamp

Results (for details see appendix)

Date 25.07.13

Test Area	temperature [°C]	length [mm]	Quantity	Bond-Strength [N/mm ²]			
				Average	St.de.	minimum	maximum
1	22.6	140.0	5	1.11	0.09	0.96	1.19
Average of Test Areas				1.11			
Standard Deviation of Test Areas							

Remarks

Measurement uncertainty

On inquiry we will gladly inform you about the measuring uncertainty of the test result and on which basis it was determined.

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Client BASF Construction Chemicals Europe AG, Frank Clement, Im Tiergarten 7, 8055 Zürich

Object **Testing for Masterseal 345**
 Part

Results	Date	25.07.13	Examiner	R. Schwarzkopf	Age of Specimens
Test Area 1					
Specimens					
Client	VSH				
	2028/1	50.0	140	2.25	1.14
	2028/2	50.0	140	1.88	0.96
	2028/3	50.0	140	2.22	1.13
	2028/4	50.0	140	2.22	1.13
	2028/5	50.0	140	2.34	1.19
Average Series			140.0	2.18	1.11
Standard Deviation Serie			0.0	0.17	0.09

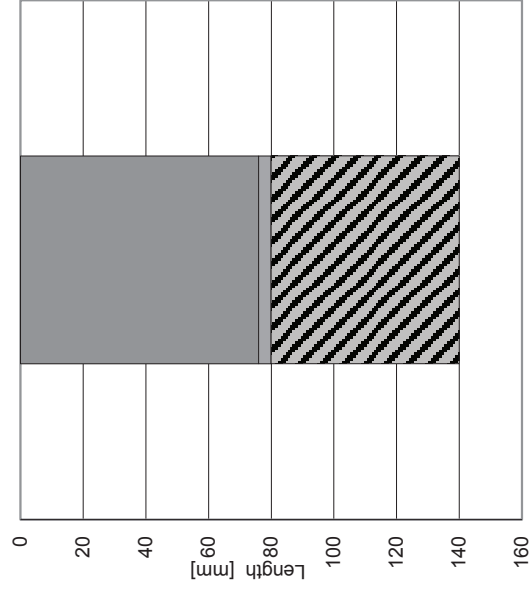
System (Average or Data of the Client)

Position	Material	Strength	Remarks
Layer 3			
Layer 2	Shotcrete	76 mm	
Layer 1	Masterseal 345	4 mm	
Underground	Shotcrete	60 mm	

Remarks

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Specimen



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