

## Test Report

- Translation -

Document number: (1201/402/16a) – Pan of 15/05/2017

Customer: Schomburg GmbH & Co. KG  
Aquafinstraße 2-8  
32760 Detmold, Germany

Order date: 02/09/2016

Subject of the order: Test of the characteristic performance values on the  
"ASODUR-EV 200"  
anchoring product.

Test basis: DIN EN 1504-6:2006 with the test standards contained  
therein

Samples received: 06/09/2016

Sampling: By the customer

Duration of test: December 2016 to April 2017

This test report consists of 2 pages, including the cover sheet, and 3 annexes.



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## 1 Order

Schomburg GmbH & Co. KG commissioned the Braunschweig Civil Engineering Materials Testing Institute (MPA) to test the characteristic performance values of an epoxy resin based 3-component anchoring product with the designation "ASODUR-EV 200".

The order comprised the tests specified in Table 3 (performance requirements for anchoring products) of DIN EN 1504-6.

## 2 Tests and results

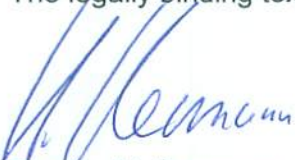
The ASODUR-EV 200 anchoring product consists of a resin component (comp. A) which is mixed with a hardener component (comp. B) and a filler (comp. C). On 06/09/2016, Schomburg GmbH & Co. KG sent a 30 kg unit (batch number 081600037 (comp. A+B) and 081600083 (comp. C)) to MPA for carrying out the tests.

The mixtures used in the tests were prepared with the mixing ratio A : B : C = 5.04 : 1.66 : 23.3 parts per weight. For production, the components were combined and homogeneously mixed with a stirrer in accordance with the manufacturer's instructions. The contents of the mixed containers were placed into different containers and mixed again.

The results of the test, together with details of the test conditions, are summarised in the following table and compared to the existing requirements.

Characteristic performance values	Test procedure	Results	Requirement
Pull-out resistance	EN 1881	Displacement at 75 kN 0.23 mm (dry concrete) 0.31 mm (wet concrete) Annex 1	Displacement $\leq$ 0.6 mm at a load of 75 kN
Chloride ion content	EN 1015-17 (comp. C)	0.004 %	$\leq$ 0.05 %
Glass transition temperature	EN 12614	55.5 °C	$\geq$ 45 °C or 20 °C above the maximum ambient temperature of the structure during use, whereby the larger value is binding
Creep behaviour under tensile load	EN 1544	0.26 mm Annex 1	Displacement $\leq$ 0.6 mm after 3 months of uninterrupted load with 50 kN

This document is the translated version of Test Report no. 1201/402/16a – Pan – dated 15/05/2017.  
The legally binding text is the aforementioned German Test Report.

  
Dr.-Ing. K. Herrmann  
Head of Testing Laboratory



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M. Pankalla  
Engineer/Official in Charge



## Pull-out resistance and creep behaviour

The concrete base bodies with the dimensions (400 x 400 x 250) mm, which were required for testing the pull-out resistance and creep behaviour under tensile load, were produced and prepared for the tests by MPA in accordance with DIN EN 1881 and DIN EN 1544. The 150 mm deep holes were produced using a hammer drill. The drill hole diameter was 22 mm. In addition, ribbed reinforcement bars (type B500B, diameter 16 mm) were sandblasted to prepare them for testing.

The drill holes were first cleaned with a bottle brush and then by blowing them out with an air pump.

The anchoring product was produced in the mixing ratio specified in Section 2 in accordance with the technical data sheet and the drill holes were filled with it directly after mixing. Afterwards, the reinforcement bars were inserted into the drill holes and fixed in place (horizontally). The material which was pressed out during this process was removed immediately. Prior to the tests, the test specimens were stored for 28 days in an atmosphere of  $(21 \pm 2) ^\circ\text{C}$  and  $(60 \pm 10) \% \text{ r. h.}$

### Test result pull-out resistance and creep behaviour under sustained tensile load

The pull-out resistance was determined in accordance with DIN EN 1881. The test was carried out on three test specimens where the reinforcement bars were bonded into concrete blocks which had been pre-stored in dry conditions and three test specimens where the reinforcement bars were bonded into concrete blocks which had been pre-stored in wet conditions. The test results are illustrated in the diagrams in Annexes 2 and 3 and summarised in the following table.

Pre-storage	Sample	max. load [kN]	Travel at 75 kN [mm]		Type of failure
			Individual values	Mean value	
dry	1	112	0.20	0.23	Concrete body cracked
	2	121	0.24		
	3	117	0.24		
wet	4	115	0.29	0.31	
	5	100	0.36		
	6	116	0.28		

In accordance with DIN EN 1544, the determination of the creep behaviour under sustained tensile load was carried out on three samples which were stored in an atmosphere of  $(21 \pm 2) ^\circ\text{C}$  and  $(60 \pm 10) \% \text{ r. h.}$  for 28 days after the reinforcement steels had been bonded into the concrete blocks. Subsequently, the creep load of 50 kN was applied and maintained for 3 months. The test was also carried out in an atmosphere of  $(21 \pm 2) ^\circ\text{C}$  and  $(60 \pm 10) \% \text{ r. h.}$  The results of the test are summarised in the following table.

Initial displacement [mm]	Creep displacement [m]	Total displacement [mm]	
		Individual values	Mean value
0.11	0.04	0.15	0.14
0.10	0.04	0.14	
0.11	0.03	0.14	

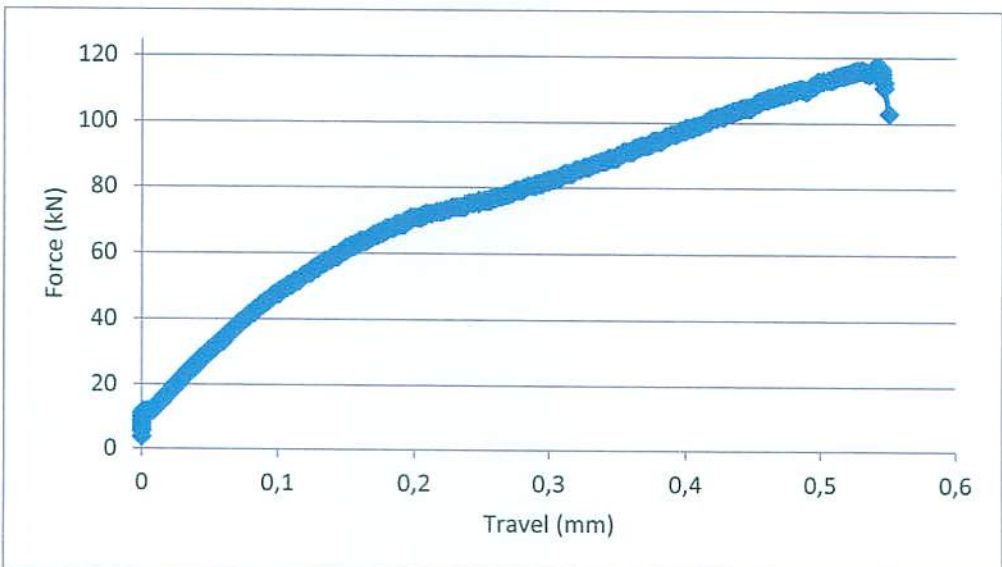
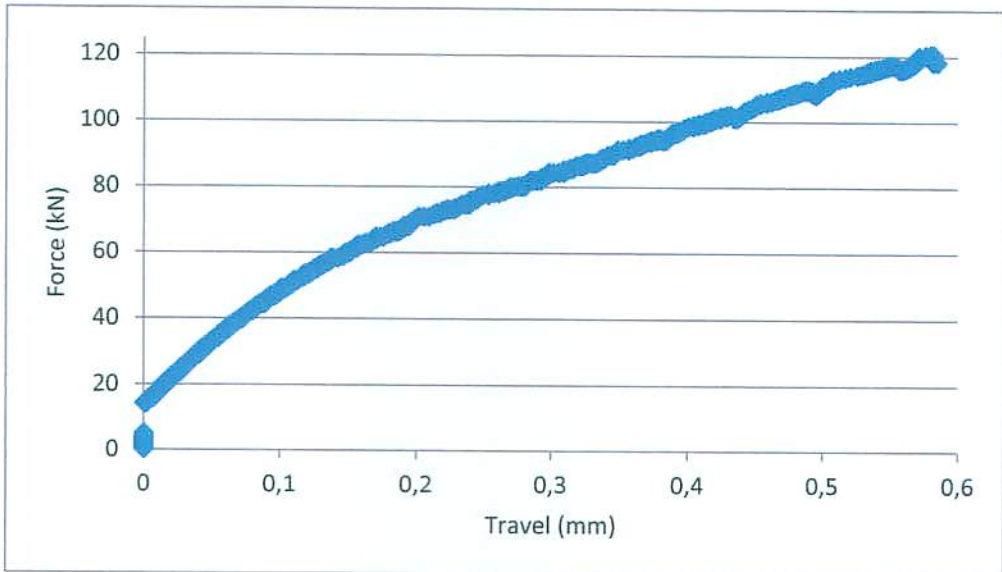
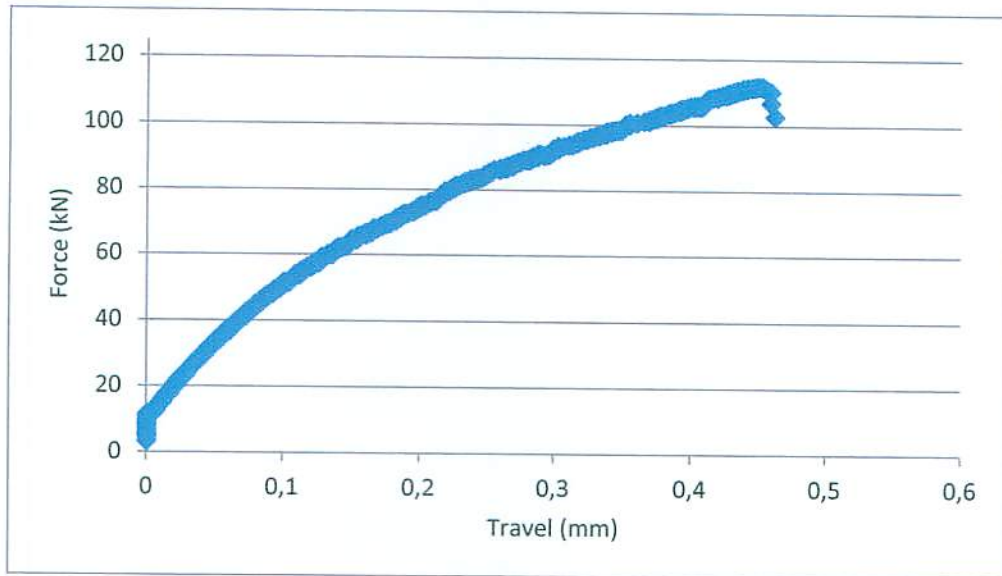


Image A1 to A3: Results of pull-out test from dry concrete (samples 1 to 3)

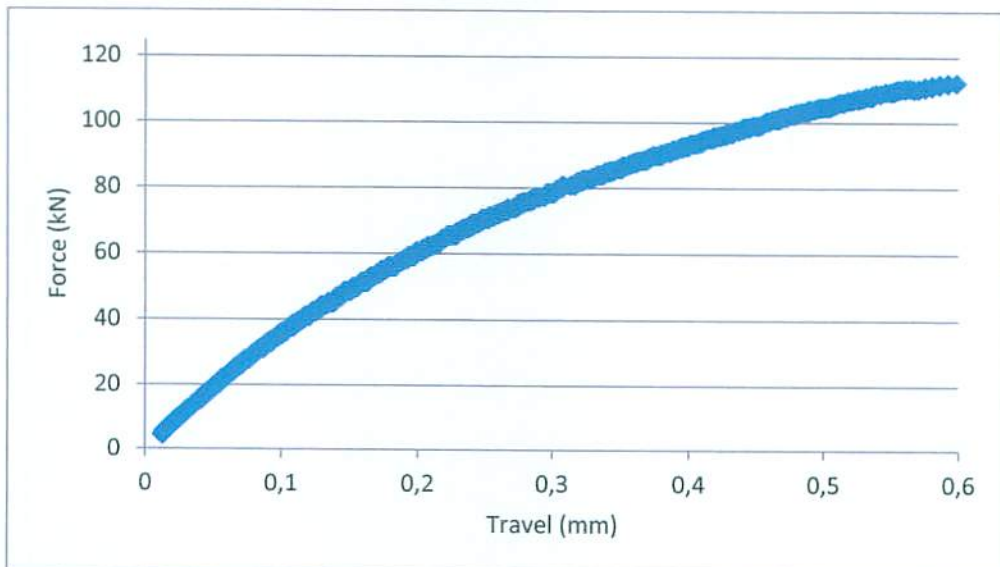
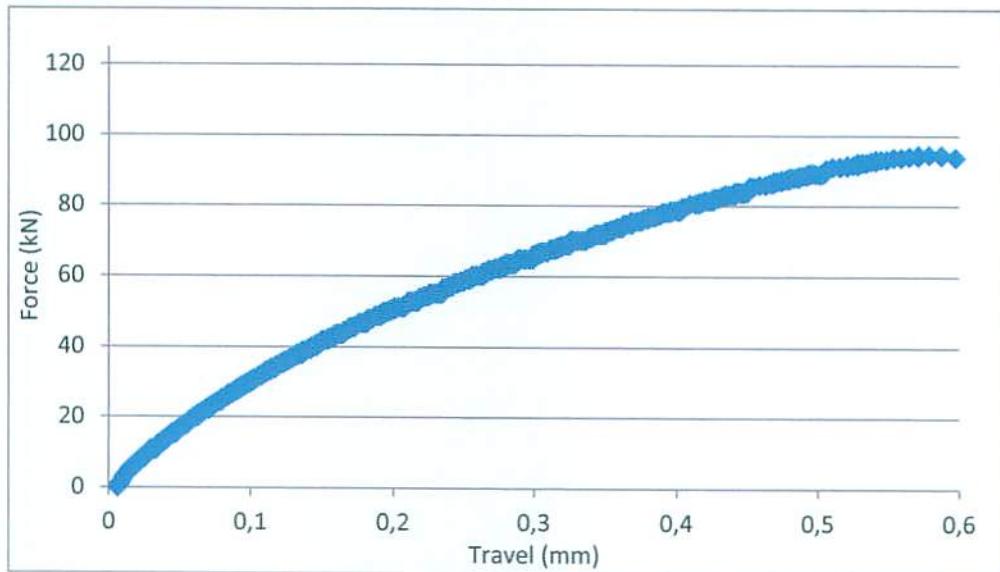
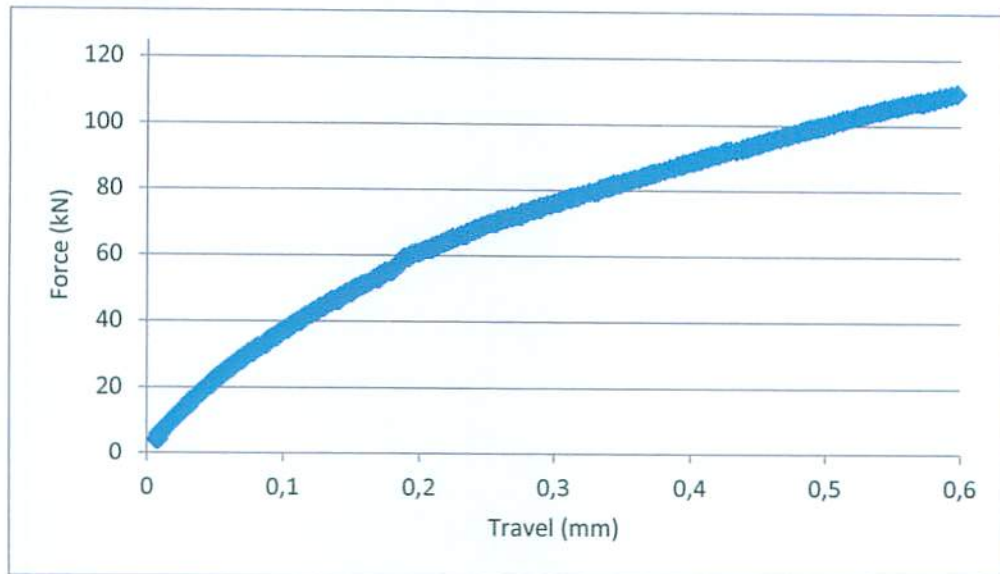


Image A4 to A6: Results of pull-out test from wet concrete (samples 4 to 6)