



# MFPA Leipzig GmbH

Testing, Inspection and Certification Authority for  
Construction Products and Construction Types

Leipzig Institute for Materials Research and Testing  
Business Division V - Geotechnics  
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Work Group 5.1 - Structural Sealing

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## Test Report No. PB 5.1/20-100-1- abridged version

24 June 2020

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**Object:** *Capsule Adhesive Anchor VZ -*  
Tightness test under the influence of water pressure of 7 bar

**Client:** MKT Metall-Kunststofftechnik GmbH & Co. KG  
Auf dem Immel 2  
67685 Weilerbach

**Sample receipt:** 04.05.2020 (Receipt numbers: 3361, 3361-1)

**Testing period:** May – June 2020

**Person responsible:** Göpel, M.Sc.

This document consists of 4 sheets.

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## 1 Scope of tasks

On behalf of *MKT Metall-Kunststofftechnik GmbH & Co. KG*, the watertightness of the *Capsule Adhesive Anchor VZ* installed in concrete with high water penetration resistance was to be tested subject to an external water pressure of 7 bar as part of an application-oriented test.

## 2 Object of the examinations

### 2.1 Fastener system

The *Capsule Adhesive Anchor VZ* being tested for water impermeability is an anchoring system consisting of the VZ-P glass capsule and the V-A anchor rod. Glass capsule filled with synthetic resin, hardener and additives are inserted into the corresponding drill hole in the appropriate size and the anchor rods are driven into them with a setting tool.

According to the client, the system is intended for the fastening of anchor rods in non-cracked and cracked concrete. The rotary, hammer-type driving-in of the anchor rods into the glass capsule means that the individual components are combined and then hardened in the drill hole.

To represent the different anchor rod diameters, the impermeability test is carried out using M8 anchor rods, as these have the lowest setting depths of all diameters, and therefore the lowest proportion of resin mixture. The tested system components have the designations MKT glass capsule VZ-P 8 and MKT anchor rods V-A 8-20/110 A4.

### 2.2 Specimens

For the test, three cuboids with the dimensions 300 x 300 x 150 [mm] made of concrete C 30/37, maximum grain size 16 mm with high water penetration resistance in accordance with DIN 1045 - 2<sup>1</sup> were produced at MFPA Leipzig GmbH. Following a setting period for the concrete of at least 28 days, the anchor rods were placed centrally into the concrete cuboid using the glass capsule in accordance with the client's specifications. After curing of the mortar, the excess material on the concrete surface was mechanically removed the following day.

After a hardening period of 4 days, a circumferential slot of 70 mm in depth was cut centrally into the bottom of all specimens using a drill bit with a diameter of 50 mm. Starting from this slot, the concrete was carefully removed up to the end of the anchor using a hand chisel. Thus the end of the borehole with the end of the anchor rod was available for the visual observation of a potential water penetration during the impingement with pressurized water.

<sup>1</sup> DIN 1045-2: Concrete, reinforced and prestressed concrete structures – Part 2: Concrete – Specification, properties, production and conformity – Application rules for DIN EN 206-1; 08/2008

### 3 Test execution

The test setup is shown in the following Figure 1.

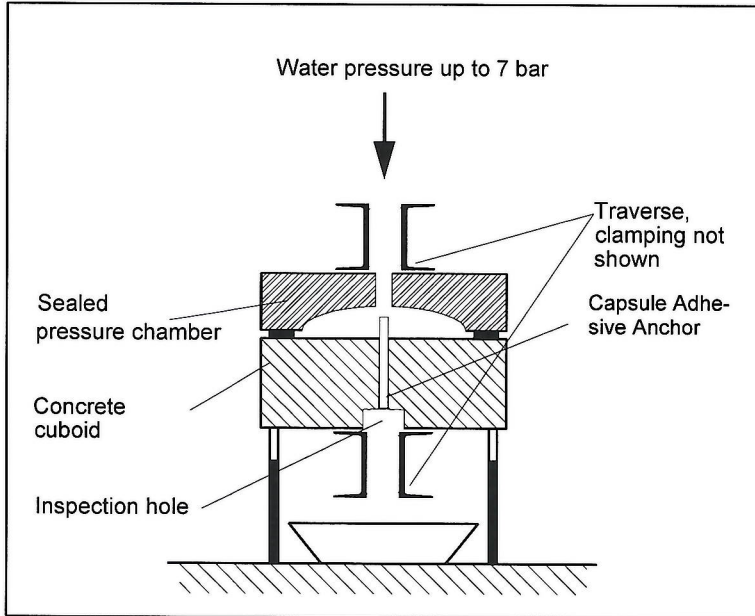


Figure 1: schematic diagram of the test rig

### 4 Results

The water pressure load on the test specimens (PK) with the *Capsule Adhesive Anchor VZ* was started 4 days after setting the anchors. Drinking water from the Leipzig pipeline network was used as the testing medium. The results of the examinations are summarised in Table 1.

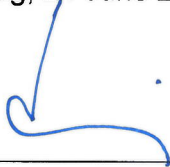
Table 1: Results of the impermeability test - *Capsule Adhesive Anchor VZ*

Testing pressure [bar]	Test duration [d]	Water flow rate [ml/h]			Remarks
		PK 1	PK 2	PK 3	
1,0	1	0	0	0	Start of impingement with pressurised water
2,0	6	0	0	0	PK 3: annular temporary moist spot, dried
3,0	1	0	0	0	impermeable
4,0	1	0	0	0	impermeable
5,0	1	0	0	0	impermeable
6,0	1	0	0	0	impermeable
7,0	14	0	0	0	impermeable

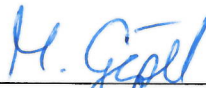
During the entire test duration of 25 days, no outflow of water from the inspection opening underneath the anchor was detected on any of the three specimens. In terms of its impermeability, the tested *Capsule Adhesive Anchor VZ* fulfils the requirements of service class A for exposure classes 1 and 2 in accordance with the WU Guideline<sup>2</sup> for use in concrete and reinforced concrete structures.

The results of the tests exclusively relate to the items tested. This document does not replace a certificate of conformity or suitability according to national and European building codes.

Leipzig, 24 June 2020



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<sup>2</sup> Directive of the German Committee for Reinforced Concrete (Deutscher Ausschuss für Stahlbeton – DAfStb) on water-impermeable concrete structures (WU Guideline), version December 2017