

**Test certificate no.**

**220011095-15-01-01-e**

**Customer**

BAG Bauartikel GmbH  
Zotzenheimer Straße 64a

55576 Sprendlingen

**Date of commission:** 12.2.2015

**Date sample received:** 12.2.2015

**MPA NRW no.:** 58/15

**Commission**

Testing on “**Quality level 1 (Q1)**” spacers.

**Type of samples**

“**Quality level 1 (Q1)**” spacers

**Number of samples**

30 pcs.

**Description of the tests and/or the applied regulations**

Testing according to the January 2011 version of the “Abstandhalter” [Spacers] code of practice from the German Society for Concrete and Construction Technology (DBV).

According to the requirements of the respective annexes:

A 2.1 Installation dimension

A 2.2 Load-bearing capacity in the short-term static test

A 2.3 Tipping resistance

A 3.2 Freeze/thaw test (CF method)

- Section 2

- Section 3

A 3.3 Water penetration depth

A 3.4 Thermal cycling

The results of the tests relate exclusively to the sample(s)/test object(s) described above.

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This test certificate has 6 pages.

## 1 Sampling

The “**Quality level 1 (Q1)**” spacers were delivered to the MPA NRW Dortmund by a representative of the customer on 12.02.2015.

## 2 Test results

### 2.1 Installation dimension

Two spacers were fastened to a smooth steel rod at a spacing of 100 mm. A measurement was taken of the smallest spacing between the contact area and the bottom edge of the steel rod.

#### 2.1.1 Results:

Sample no.	Fastening system	Installation dimension $c_v$ [mm]	Installation dimension $c_v$ [mm]
1	Binding wire	49.6 50.4	0.8
2		49.9 49.2	0.7
3		49.6 49.5	0.1
4		49.6 50.6	1.0
5		49.2 49.4	0.2
Required value		> 40	± 2
Requirement met		Yes	Yes

### 2.2 Load-bearing capacity in the short-term static test

Each spacer was held in a forked testing device with a steel rod (diameter: 16 mm) and subjected to a force-controlled loading test (deformation-resistant spacer) in which the deformation was recorded.

#### 2.2.1 Results:

Sample no.	Fastening system	Load application	Test load in [N]	Deformation in [mm]
1	Wire	Pressure from above	2000	0
2			2000	0
3			2000	0
4			2000	0
5			2000	0
6			2000	0
7			2000	0
8			2000	0
9			2000	0
10			2000	0
11			2000	0
12			2000	0
Mean			2000	0
Required value for performance class L2			≥ 1000	≤ 2
Requirement met			Yes	Yes

## 2.3 Tipping resistance

Each spacer was held in a forked testing device with a steel rod (diameter: 16 mm) and subjected to a force-controlled loading test in which the deformation was recorded. The testing device is formed in such a way that the steel rod reached a gradient of 1:5. The spacer was tested with a load of 500 N.

### 2.3.1 Results:

Sample no.	Fastening system	Load application	Test load in N	Deformation in mm
1	Wire	Pressure from above	500	0.48
2			500	0.29
3			500	0.33
4			500	0.28
5			500	0.28
6			500	0.38
7			500	0.36
8			500	0.38
9			500	0.44
10			500	0.32
11			500	0.70
12			500	0.34
Mean			500	0.46
Required value for performance class L2			500	≤ 2
Requirement met			Yes	Yes

## 2.4 Freeze/thaw test

The “**Quality level 1 (Q1)**” spacers were set in concrete and stored in accordance with section 3.1. After 28 days, the freeze/thaw test was carried out with 56 cycles at temperatures of between +20 °C and -20 °C according to the specifications in section A 3.2 (2) of the code of practice.

Once the 56 freeze/thaw cycles were completed, a visual inspection was made of the area immediately surrounding the spacer set into the concrete.

### 2.4.1 Results:

No cracking, flaking or chipping was observed.

**Figure 1: Picture of the “Quality level 1 (Q1)” spacer**



## 2.5 Determination of the water penetration depth in the area of the spacer

The “**Quality level 1 (Q1)**” spacers set into the concrete according to section A 3.1 were stored under water for 28 days up to the day of testing. Following this, a test was carried out to determine the water penetration depth (3 days at 5 bar).

During the test, the behaviour of the side faces was observed.

After the test was completed, the test specimens were split down the middle in order to determine the water penetration depth.

### 2.5.1 Results

Sample no.	Observations during test	Water penetration depth [mm]
1	Wet on testing side	10
2		10
3		7
Required value		≤ 50

**Figure 2: Picture of the water penetration depth**



## **2.6 Thermal cycling**

The “**Quality level 1 (Q1)**” spacers were set in concrete and stored in accordance with section 3.1. After 28 days, the samples were subjected to 10 thermal cycles at temperatures of between +60 °C and -10 °C. For this purpose, the relevant face of the cube was heated to a temperature of +60 °C by radiant heat for 8 hours. The cubes were then stored at a temperature of -10 °C in a freezer for approx. 16 hours.

After 10 temperature cycles, a visual inspection was made of the cube’s face. In this inspection, special attention was paid to the section immediately surrounding the spacer set into the concrete.

### **2.6.1 Results:**

No flaking or cracking was observed.

### 3 Summary

The “**Quality level 1 (Q1)**” spacer meets the requirements with regard to the freeze/thaw test, water penetration depth and thermal cycling in accordance with the January 2011 version of the “Abstandhalter” [Spacers] code of practice from the German Society for Concrete and Construction Technology (DBV).

This test report written in English language is issued additionally to the report written in German language with the same report number. In case of doubt the German version is solely valid.

As a result of the above findings the submitted spacer is to be designated as follows in accordance with the DBV Spacers leaflet:

**DBV-50-L2/F/T/A**

Dortmund, 29.01.2016

By order



**E. Lipinski**  
Inspector