TÜV Rheinland LGA Bautechnik GmbH
Construction Materials and Concrete Technology

TÜVRheinland®
LGA
Genau. Richtig.

Test laboratories DAP-PL1524.13 accredited by DAP German Accrediting System Testing Ltd.

Certification according to DIN EN ISO 9001/14001.

TEST REPORT

No. 94615431-003 **23rd August 2013**

Client:	PERI GmbH Schalung und Gerüste Rudolf-Diesel-Straße 89264 Weißenhorn
Date of Order:	E-mail dated 5th August 2013
Subject of Order:	Testing sealed tie holes for water impermeability
Test Material:	3 test cubes 150 mm nominal dimension, water-impermeable concrete Specifications provided by client - prepared with PERI anchor MX 15 - 30 - sealed with Screw Plug MX 15-75 MF-S, tightened to a torque of 10 Nm
Date of Sample Delivery:	7th August 2013, by forwarding agent
Expert:	Johannes Knörler
Phone No.:	+49 911 655-5347
Fax No.:	+49 911 655-5360
E-mail:	johannes.knoerler@de.tuv.com

The rest report comprises 3 written pages and 1appendix.

All results pertain to test material handled in this report exclusively.

TÜV Rheinland
LGA Bautechnik GmbH
Construction Materials and
Concrete Technology
Tillystraße 2
90431 Nürnberg

Phone: +49 1803 252535-1500
Fax +49 1803 252535-1599
E-mail bautechnik@de.tuv.com

Executive Board

Eckhard Lippold

Nürnberg HRB 20586
Tax-No. 241/115/90733
VAT No. DE813835574

Web www.tuv.com

TÜV Rheinland LGA Bautechnik GmbH
Construction Materials and Concrete Technology

1. Order and Test Programme

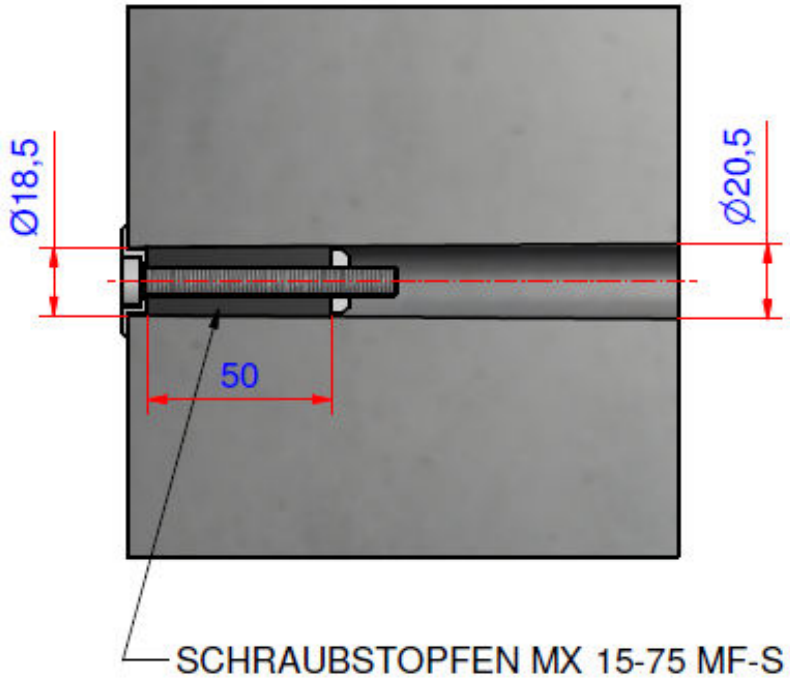
PERI GmbH Weißenhorn sent an e-mail order on 2013-08-05 to TÜV Rheinland LGA Bautechnik GmbH, to test water impermeability of concrete test cubes, tie holes made with MAXIMO MX 15-30, sealed by Screw Plugs MX 15-75 MF-S.

The test cubes had been prepared by TBR Technologiezentrum GmbH & Co. KG of the Schwenk Zement KG, in Allmendingen, Germany. Up to the date of testing (>28 days) the cubes were placed under water. The anchor point was sealed by PERI.

Testing of the samples was carried out according to DIN EN 12390-8 (5 bar water pressure, duration of test period: 72 h).

Screw rod fitting is illustrated in drawing No. 1.

Drawing No. 1: Fitting the screw rods



TÜV Rheinland LGA Bautechnik GmbH
Construction Materials and Concrete Technology

TÜVRheinland®
LGA
Genau. Richtig.

Test Report No. 94615431-003 dated 23rd August 2013

2. Determining Water Penetration

Beginning of test: 2013-08-09
End of test: 2013-08-12

Table No. 1: Determining Water Penetration

Test Cube No.	Appearance after Load		max. Penetration	Fig. No.
--	top	lateral	[mm]	--
S 4	dry	dry	37	1-3
S 5	dry	dry	27	4-6
S 6	dry	dry	39	7-9

3. Evaluation

Samples tested according to DIN 12390-8, such as

- concrete samples, nominal dimension 150 mm, water-impermeable concrete
- anchor point prepared with PERI MAXIMO anchor MX 15/30
- sealed with Screw Plug MX 15-75 MF-S

can be classified as construction component highly resistant to water penetration, depth of penetration ≤ 50 mm, in accordance with Section 5.5.3 of DIN EN 206-1 / DIN 1045-2.

Note:
On sample S5 water penetration was measured adjacent to the screw rod. Increasing depths of water penetration on the sides of the sample resulted from disturbance in the structure of the concrete. It has nothing to do with the sealing system itself.

Sealing of MAXIMO anchor points, as presented in the description, qualifies for use in construction components or structures load class 1 and for utilization class A, according to DAfStb-directives „Water-impermeable Concrete Structures“, edition: November 2003.

LGA Bautechnik GmbH
Construction Materials and Concrete Technology

Dipl.-Ing. (FH) Hermann Lechner
Head of Expert Center

Expert:

Johannes Knörler

TÜV Rheinland LGA Bautechnik GmbH
Construction Materials and Concrete Technology

TÜVRheinland®
LGA
Genau. Richtig.

Test Report No. 94615431-003 dated 23rd August 2013

Attachment:

Fig No. 1 Sample S4 Lateral view

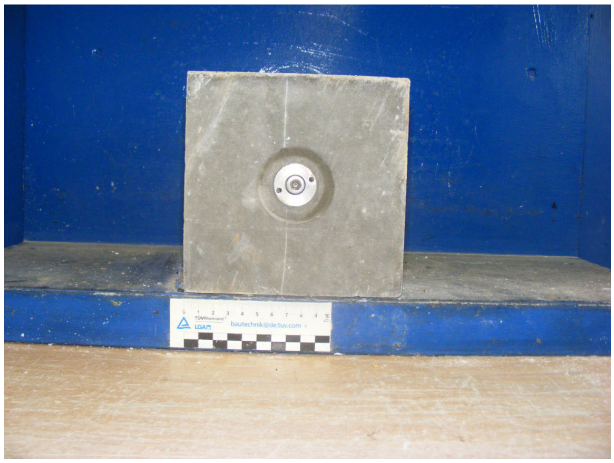


Fig. No. 2 Sample S4 View from below

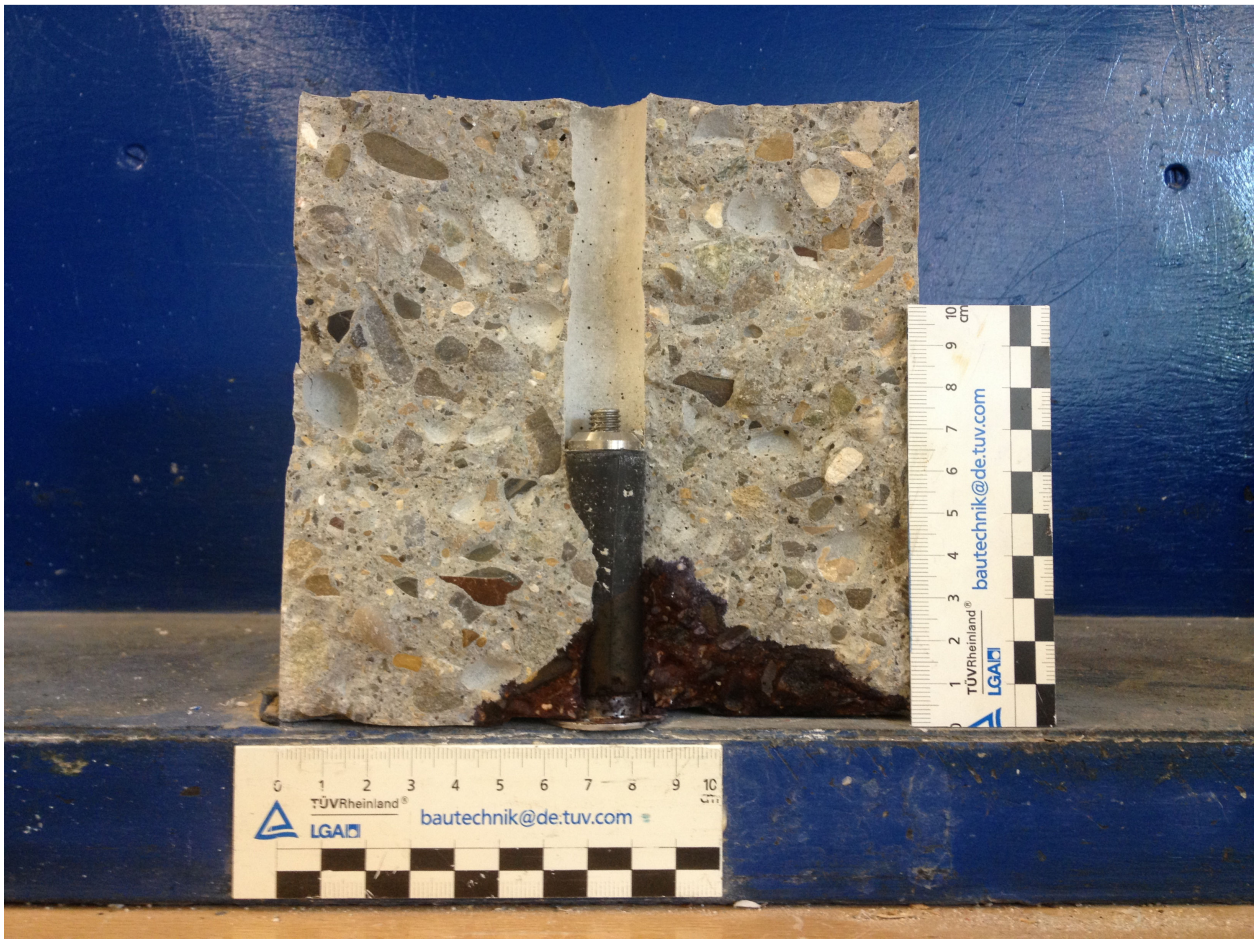


Fig No. 3 Sample S4 Water penetration

TÜV Rheinland LGA Bautechnik GmbH
Construction Materials and Concrete Technology

Fig. No. 4 Sample S5 Lateral view

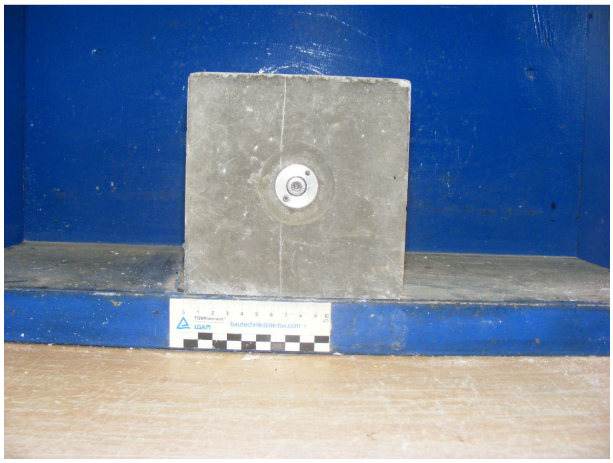


Fig. No. 5 Sample S5 View from below

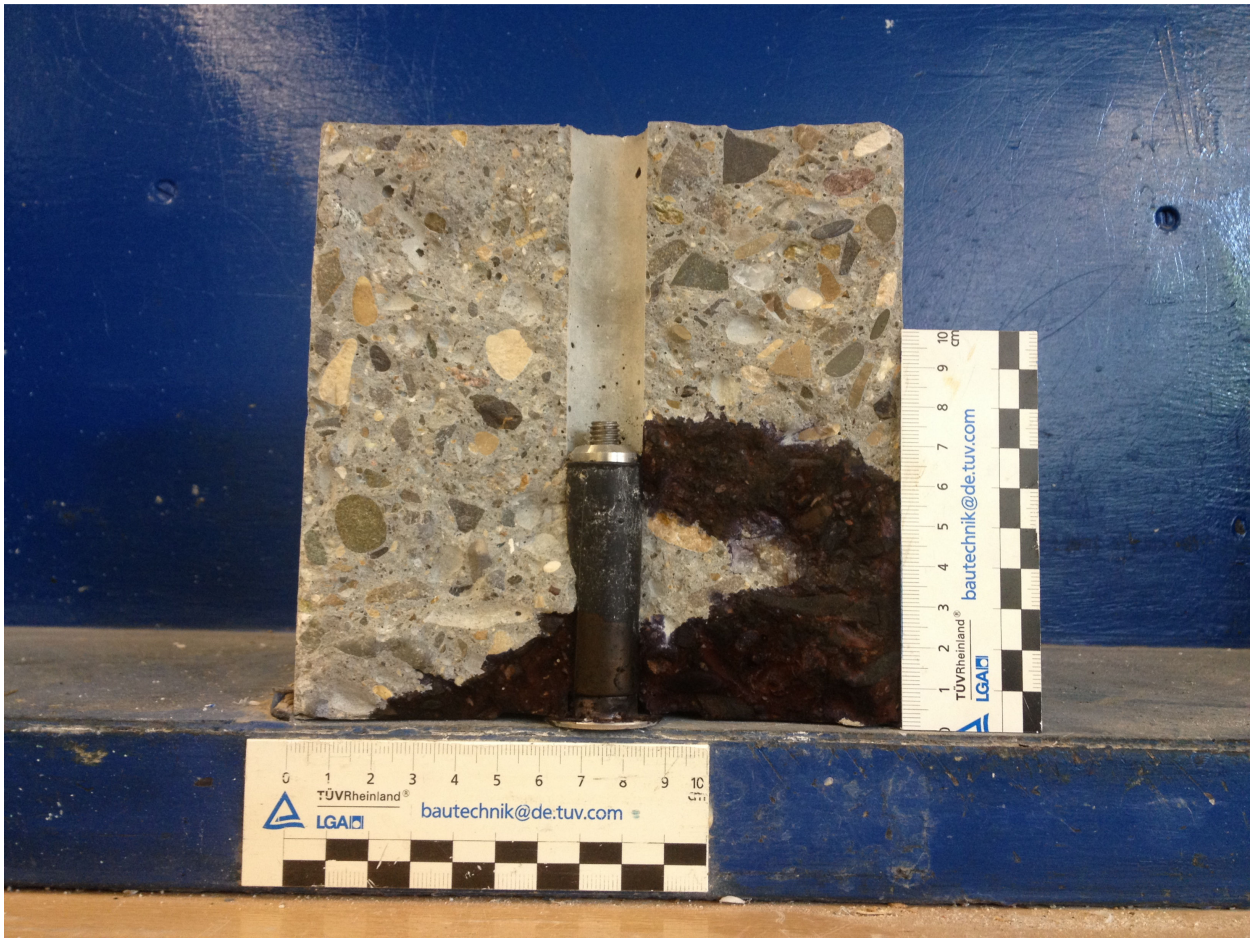


Fig. No. 6 Sample S5 Water penetration

TÜV Rheinland LGA Bautechnik GmbH
Construction Materials and Concrete Technology

Fig. No. 7 Sample S6 Lateral view

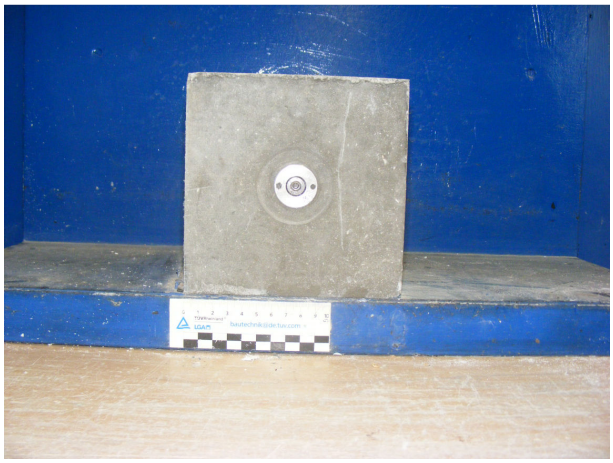


Fig. No. 8 Sample S6 View from below

Fig. No. 9 Sample S6 Water penetration