

**Evidence of Performance**  
**Determination of fire resistance**

Test report 14-001094-PR05 (PB-C04-01-en-01)



Client  
**PERI GmbH**  
**Schalung und Gerüste**  
**Rudolf-Diesel-Straße**  
**89264 Weißenhorn**

**Basis**

DIN EN 1363-1:2012  
 Fire resistance tests - Part 1:  
 General requirements

Test report 14-001094-PR05  
 (PB-C04-01-de-01)  
 dated 30.06.2014

**Representation**



Manufacturer /  
 Supplier **PERI GmbH**

Product **Sealing cone**

Designation **Screw plug "Schraubstopfen MX 15-50 OF-LS"**

Dimensions (d X L) **17.5 mm x 50 mm**

Field of application **Sealing of remaining tie holes in concrete and reinforced concrete elements.**

Special features **--**

**Instructions for use**

This test report serves to demonstrate fire resistance.

This test report does not provide any evidence of specified use/ verification of applicability as set out by the relevant Building Supervisory Authorities.

**Validity**

The data and results given relate solely to the tested and described specimen. Testing the fire resistance does not allow any statement to be made on any further characteristics regarding performance and quality of the product submitted.

**Notes on publication**

The ift Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies.

The cover sheet can be used as an abstract.

**Contents**

The report comprises a total of 11 pages.

- 1 Object
- 2 Procedure
- 3 Detailed results Annexes



**Fire resistance**

Criteria	Test results
<b>E - integrity</b>	<b>95 minutes</b>
<b>I - insulation</b>	<b>95 minutes</b>
<b>Abortion of test</b>	<b>in the 96th minute</b>

ift Rosenheim  
 28.07.2014 23.07.2014

*Gerhard Wackerbauer* *Jan Schimpl*

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 Head of Testing Department  
 Fire safety

Jan Schimpl  
 Deputy Head of Laboratory  
 Fire safety



## 1 Object

### 1.1 Description of test specimen<sup>1</sup>

Test specimen- concrete	For the test client provided a test specimen made of reinforced concrete featuring 2 tie points.
Dimensions (W x H x s)	500 mm x 500 mm x 120 mm
Material	Normal weight concrete C20/25 to DIN 1045 or DIN EN 206-1.
Tie points in test specimen	The tie points were produced using the tie "MAXIMO MX Anker 20-30". The remaining tie holes are conical, on one side d = 18.5 mm, on the other side d = 20.0 mm.
Procedure	The ties were introduced to accommodate the pressure of fresh concrete on the two formwork sides. After the concrete had hardened the ties were removed from the concrete. The tie holes were filled on both sides with the test specimen screw plugs "Schraubstopfen MX 15-50 OF-LS" and each screw plug was tightened applying a torque of 10 Nm.
Test specimen	Screw plug "Schraubstopfen MX 15-50 OF-LS"
Item No.:	--
Dimensions (d X L)	17.5 mm x 50 mm
Material	V2A steel, sealing body made of polyurethane, PU
Manufacturer	Möschl, Weissenhorn

### 1.2 Representation of test specimen

The drawings and data on the construction/design of the test specimen were prepared by the client and made available to the testing body prior to testing.

Conformity of the drawings with the tested specimen was checked.

## 2 Procedure

The company PERI GmbH commissioned the ift Rosenheim, to evaluate the fire resistance of reinforced concrete walls featuring formwork tie holes sealed with screw plugs "Schraubstopfen MX 15-50 OF-LS" on the basis of DIN EN 1363-1.

A total of 5 test specimens were subjected to fire resistance testing, representing the main basis of testing.

<sup>1</sup> as specified by client and manufacturer



## 2.1 Sampling

The test specimen (sealing cone) was selected by the client.

Client did not submit a sampling report to the **ift**.

Number	1
Sampling	Concrete products sampled by PERI in July 2013, sealing cones sampled from the PERI inventory in March 2014.
Delivered on	7 April 2014 by client
Test specimen No.	36883-001
Installation of test specimen:	by client
Date of test:	15 April 2014
Location of test:	<b>ift</b> Rosenheim Brandschutzzentrum Nürnberg (Centre for Fire Testing) Tillystraße 2 D-90431 Nuremberg

## 2.2 Method/s

EN 1363-1:2012	Fire resistance tests - Part 1: General requirements
Boundary conditions	as per standard specifications
Deviation	There were no deviations from the test method and test conditions, respectively.
Conditioning phere mass.	The test specimens were conditioned at standard atmosphere for a period of more than 6 weeks until achieving constant mass.
Pressure in furnace	The furnace pressure was set to 10 Pa positive pressure at test specimen level.



Measurement of surface temperatures.

The surface temperatures on the unexposed face of the test specimen were measured as per DIN EN 1363-1.

Layout of measurement points

Glueline at top	Measurement point No. 25
Centre sealing cone at top	Measurement point No. 26
Wall surface	Measurement point No. 22
Glueline at bottom	Measurement point No. 23
Centre sealing cone at bottom	Measurement point No. 24

(see Annex 3, layout of measurement points)

**2.3 Test equipment**

Test furnace Device number 22912

**2.4 Testing personnel**

Test engineer 1 Mr Schimpl Test engineer 2 Mr Uhl

**3 Results**

**3.1 Evaluation of results**

Table 1

<b>Temperature rises (measured values see Table 2)</b>
After 95 minutes exposure to fire, the maximum temperature rises measured were 84 K.
The values measured at the connecting joints - tie wall / wall sealing cone- were somewhat lower (81 K and 83 K) than those measured on the remaining regular wall surface (84 K).
The values measured at the measurement points located at the sealing cone centres were somewhat lower (74 K and 82 K) than those measured on the remaining regular wall surface (84 K).
<b>Appearance of test specimens after fire test (photos, see Annex 2)</b>
Exposed face: concrete of test specimens thermally affected to a depth of approx. 5 to 6 mm.
The sealing cones continued to be tightly fixed on the unexposed face, but had become loose on the exposed face.

**Table 2** Temperature rises (K) on the unexposed face of the test specimen / sample

Test duration (min)	Temperature rise (K) at the measurement points <sup>2</sup>				
	22	23	24	25	26
0	0	0	0	0	0
5	0	0	0	0	0
10	0	0	0	0	0
15	1	1	1	1	1
20	3	3	8	4	7
25	7	10	23	10	16
30	15	19	25	19	26
35	26	28	28	28	33
40	36	37	33	36	40
45	45	45	38	43	44
50	53	52	41	48	48
55	60	57	43	53	52
60	65	62	46	57	55
65	69	65	51	61	61
70	73	69	56	65	72
71	74	69	57	66	75
72	74	70	60	67	78
73	75	71	61	68	79
74	76	71	61	69	79
75	76	72	62	70	80
76	77	72	63	71	80
77	77	73	64	71	80
78	78	74	65	72	80
79	79	74	65	73	80
80	79	75	66	74	80
81	80	75	67	75	80
82	80	76	67	76	80
83	81	76	68	77	80
84	81	77	68	78	80
85	82	77	69	78	81
86	82	78	70	79	81
87	82	78	70	79	81
88	82	78	71	80	81
89	82	79	71	80	81
90	83	79	72	81	81
91	83	80	72	81	82
92	83	80	73	82	82
93	84	81	73	82	82
94	84	81	74	82	82
95	84	81	74	83	82

<sup>2</sup> For layout of measurement points, see Annex 3



### **3.2 Summary and evaluation of test results**

The construction product screw plug "Schraubstopfen MX 15-50 OF-LS" was tested in the built-condition, inserted in 120 mm thick test specimens made of normal weight concrete, with one face exposed to fire based on the STC (standard temperature curve) as set out by DIN EN 1363-1.

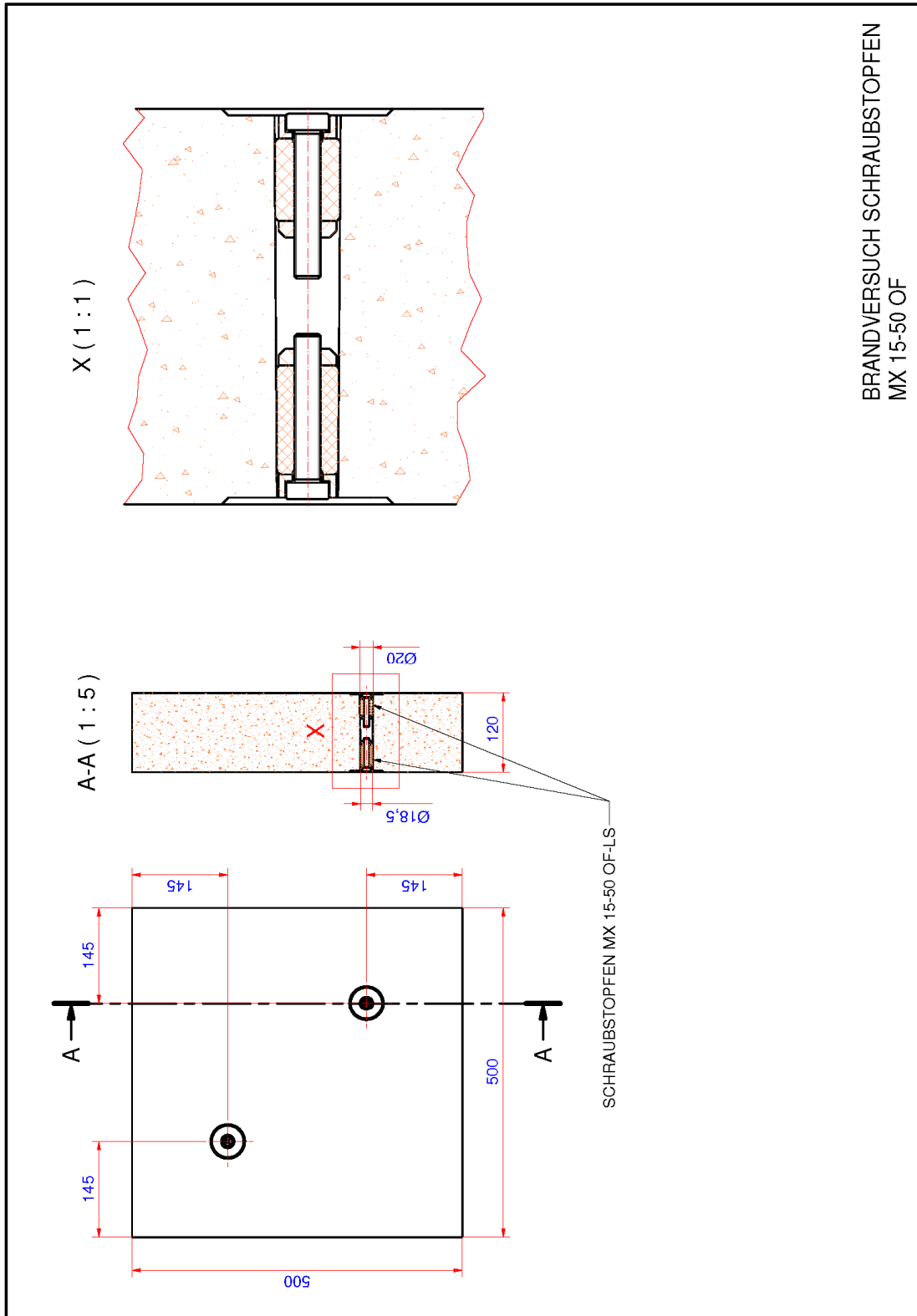
Based on the results obtained in testing, it can be confirmed that the above screw plugs Schraubstopfen MX 15-50 OF-LS" qualify for insertion in loadbearing and non-loadbearing concrete walls and reinforced concrete walls made of normal weight concrete as per DIN 1045-2 and DIN EN 206-1, and, provided that the walls are dimensioned in accordance with the requirements for fire resistance, the rated fire resistance - fire retardant (F 30 as per DIN 4102-2), high-performance fire retardant (F 60 as per DIN 4102-2) or fire resistant (F 90 as per DIN 4102-2) of the walls will not be impaired as a result.

### **3.3 Validity of test results and test report**

This test report describes in detail the installation procedure, the test conditions and the results obtained for the specific construction product described here, after testing them to EN 1363-1. Any major deviation referring to size, design details, loads, stress, boundary conditions is not covered by this test report.

Due to the specific nature of fire resistance testing and the resulting problems in quantifying measurement inaccuracies when determining fire resistance it is not possible to provide a stated degree of measurement accuracy of the results.

Annex 1: Structure and dimensions of tie hole sealing cones



Annex 2: Appearance / photos of test specimens

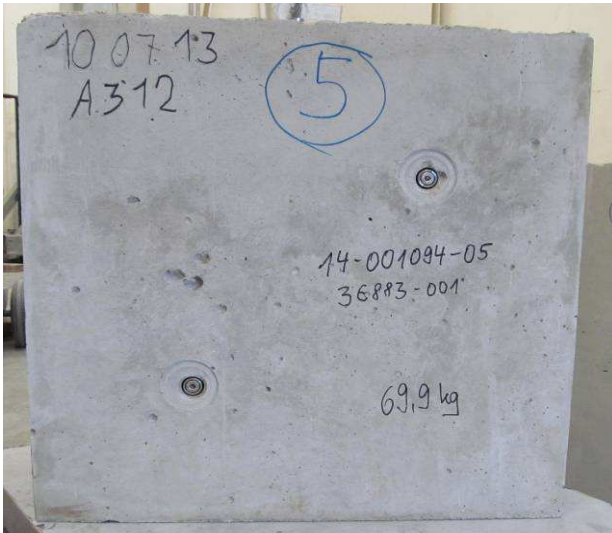


Photo 1 Unexposed face before fire test



Photo 2 Screw plug "Schraubstopfen MX 15-50 OF-LS" Unexposed face before fire test



Photo 3 Exposed face before fire test



Determination of fire resistance

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Screw plug "Schraubstopfen MX 15-50 OF-LS"

Photo 4 Exposed face



Unexposed face after fire test

Photo 5



Screw plug "Schraubstopfen MX 15-50 OF-LS"

Unexposed face after fire test

Photo 6



Photo 7 Exposed face after fire test



Photo 8 Screw plug "Schraubstopfen MX 15-50 OF-LS"  
Exposed face after fire test

### Annex 3: Layout of measurement points

