

**Mfpa Leipzig GmbH**  
Testing, inspection and certification body for  
building materials, building products and building systems

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## **Advisory opinion no. GS 3.2/17-091-2**

10<sup>th</sup> January 2018  
1st copy

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**Subject matter:** Insulation anchor ISOMET  
Summarising evaluation of the test results for the Insulation anchor ISOMET

**Client:** ITW CONSTRUCTION EUROPE  
SOCIETE DE PROSPECTION ET D'INVENTIONS TECHNIQUES (SPIT)  
150 Avenue de Lyon  
26500 BOURG LES VALENCE  
FRANCE

**Date of order:** 26<sup>th</sup> October 2017

**Person in charge:** Dipl.-Ing. S. Bauer

**Validity:** 09<sup>th</sup> January 2023

This document consists of 3 text pages and 2 enclosures.

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## 1 Objective and request

On 26<sup>th</sup> October 2017, MFPA Leipzig GmbH was commissioned by SPIT with the assessment of the resistance to fire of the Insulation anchor ISOMET with fire exposure from one side and anchored to a reinforced concrete base in order to determine the characteristic parameters for a load under tensile stress.

## 2 Description of the tested structure

The Insulation anchor ISOMET is an anchor made of 1 mm galvanized steel. In the lower area, two spikes are punched out for the anchorage into the ground. In the upper area, a plate (head) with a diameter of 35 mm is fixed by bending the shaft material (see Picture A1.1 in Annex 1). The ISOMET is fixed in place by the expansion of the spikes in the concrete base by impact on the anchor and can be used in cracked and uncracked reinforced concrete. The anchor may be anchored under static and quasi-static load in reinforced and unreinforced normal concrete with a stability class between C 20/25 and C 50/60 in accordance with DIN EN 206:2014-07 [1].

The present test of the Insulation anchor ISOMET was performed for size 8. The galvanized version with a length of 200 mm and an anchoring depth of 50 mm for an insulation thickness of 150 mm, was tested. The test set-up and the results are shown in test report PB 3.2/17-091-1 [2].

## 3 Test analysis and evaluation

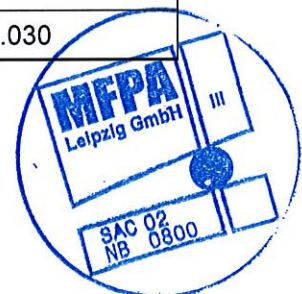
The test evaluation for steel failure was conducted in accordance with TR 020:2004-05 [3]. A graphical analysis of the test results can be found in enclosure 2. In order to determine the characteristic tensile stresses, the values were evaluated on the basis of the test results.

The following characteristic parameters for the load under central tension can be quoted for the Insulation anchor ISOMET on this basis (table 1). The characteristic steel stress at normal temperature also has to be taken into account for the assessment; the smaller stress value is decisive in each case.

The determination of the characteristic parameters for other failure types (e.g. "pulling out", or "concrete break-out" was not the subject of the tests; they can be determined according to the simplified verification procedure described in TR 020:2004-05 [3], or experimentally according to the method described in TR 048:2016-08 [4].

Table 1 Characteristic tension resistance for the Insulation anchor ISOMET

Nominal diameter of drill bit	$d_0$	[mm]	8
Effective anchoring depth	$h_{ef}$	[mm]	$\geq 50$
30 min	$N_{Rk,s,fi(30)}$	[kN]	0.063
60 min	$N_{Rk,s,fi(60)}$	[kN]	0.052
90 min	$N_{Rk,s,fi(90)}$	[kN]	0.041
120 min	$N_{Rk,s,fi(120)}$	[kN]	0.036
180 min	$N_{Rk,s,fi(180)}$	[kN]	0.030



#### 4 Special notes

The evaluation above only applies to Insulation anchor ISOMET which is installed in compliance with the installation regulations of SPIT or a general building inspectorate approval or an European Technical Approval.

The evaluation still only applies in uncracked and cracked reinforced concrete with the corresponding anchoring depth and only to fixings with multiple anchors.

The results of the tests can be transferred to anchors with a higher anchoring depth.

The results of the tests can be transferred to anchors with a smaller length, but with a minimal anchorage depth of 50 mm.

The results of the tests for anchors made of galvanized steel may also be transferred to anchors made of stainless steel A4 with at least the same anchoring depth.

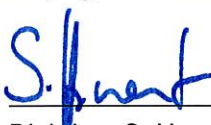
The assessment applies in general to a one-sided fire exposure of the structural elements. In the event of a fire load on several sides, the verification procedure can only be applied if the distance to the outer edge of the nail anchor is  $c \geq 300$  mm and  $\geq 2$  hef.

Based on this, the specified loads also apply to lateral tension and/or diagonal tension.

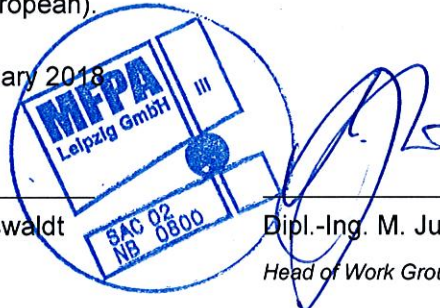
The assessment only applies in conjunction with reinforced concrete ceilings of strength class  $\geq C 20/25$  and  $\leq C 50/60$  acc. to DIN EN 206:2014-07 [1] that have at least the same fire resistance rating as the fire-resistance period of the anchors. In addition, the notes contained in DIN EN 1992-1-2:2010-12 [5] (see section 4.5) on the avoidance of concrete spalling apply. This means that the moisture content must be less than three % by weight (or four according to the National Annex).

This document does not replace any certificate of conformity or usability as defined by the building regulations (national/European).

Leipzig, 10<sup>th</sup> January 2018



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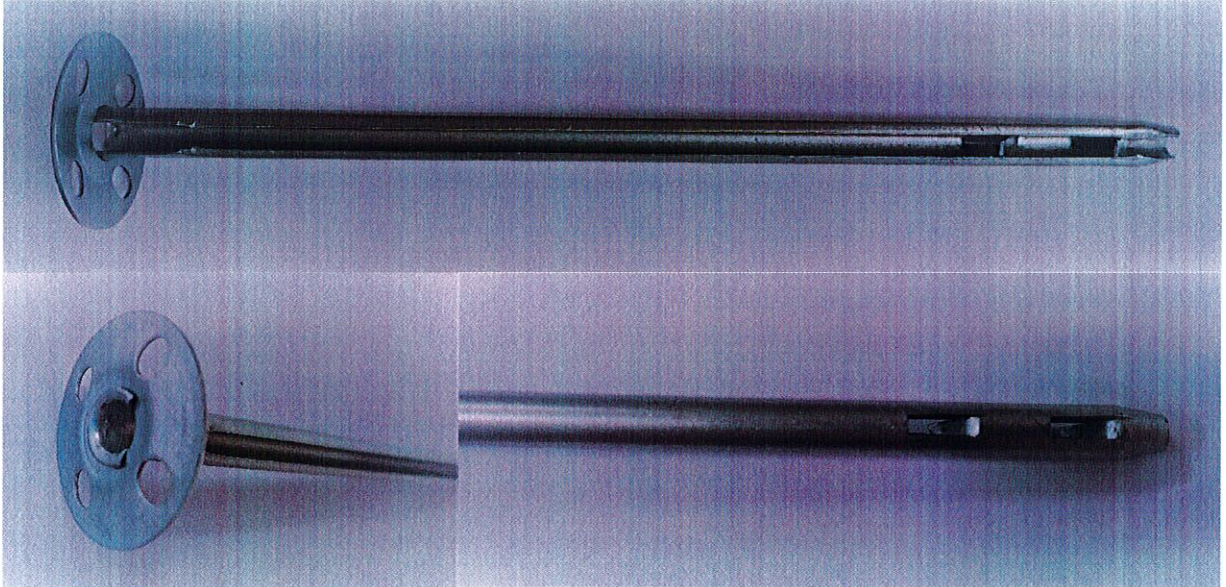
#### List of enclosures

- Annex 1 Installation parameters of the Insulation anchor ISOMET  
Annex 2 Graphical evaluation of the test results according to TR 020: 2004-05 [3]

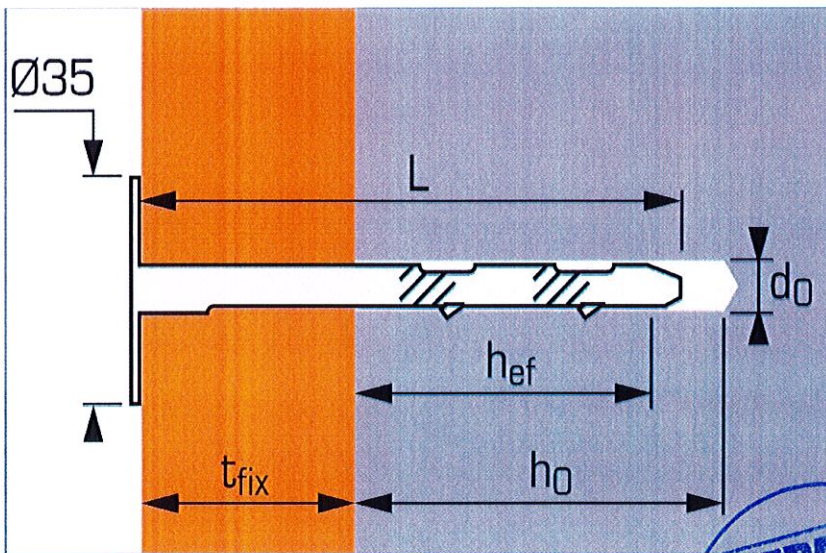
#### Corresponding documents

- [1] DIN EN 206:2014-07 Concrete - Specification, performance, production and conformity  
[2] Test report PB 3.2/17-091-1 Insulation anchor ISOMET - Testing according to Technical Report TR 020 "Evaluation of Anchorages in Concrete concerning Resistance to Fire" (May 2004) to determine the characteristic steel stresses under tensile stress, MFP Leipzig GmbH of 10/01/2018, SPIT)  
[3] TR 020:2004-05 Evaluation of Anchorages in Concrete concerning Resistance to Fire  
[4] TR 048:2016-08 Details of tests for post-installed fasteners in concrete  
[5] DIN EN 1992-1-2:2010-12 Design of concrete structures - Part 1-2: General rules - Structural fire design

Annex 1 Installation parameters of the Insulation anchor ISOMET



Picture A1.1 Figure insulation anchor ISOMET



Picture A1.2 Figure in installation condition

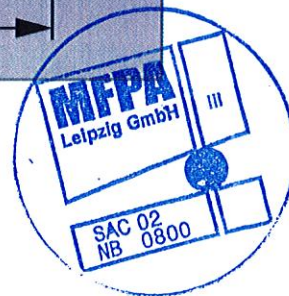


Table A1.3 Material parameters

Anchor size	Anchor depth	Insulation thickness	Drilling depth	Drilling diameter	Total anchor length (mm) L	Code	
	(mm) $h_{ef}$	(mm) $t_{fix}$	(mm) $h_0$	(mm) $d_0$		Galvanised version	Stainless st. A4 version
8X80/30	50	30	60	8	80	059730	059700
8X110/60		60			110	059740	059710
8X120/70		70			120	059880	-
8X140/90		90			140	059750	059720
8X170/120		120			170	059760	-
8X200/150		150			200	059770	-
8X250/200		200			250	055291	-
8X300/250		250			300	055643	-



Provided by the client.

Annex 2 Graphical evaluation of the test results according to TR 020: 2004-05 [3]

Diagram A2.1 Graphical evaluation of the Insulation anchor ISOMET in size 8 with a length of 200 mm and an anchorage depth of 50 mm

