BUILDING COMMON GROUND

MAX FRANK

Expert's Opinion

Egcostep NG

TP 14-041 | 04.03.2016 | english

Constructive fire protection

Tested by: HP Ingenieure GmbH, Aachen

Note: This is a translation of the German original document not examined by HP Ingenieure GmbH, Aachen

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Englische Übersetzung der deutschen Originalfassung
[Translation of the German original document which has not been examined by Hegger + Partner]

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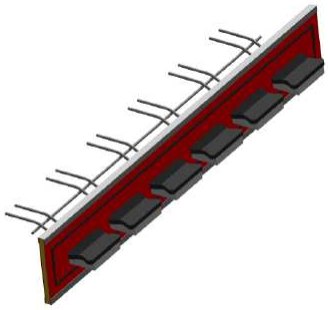
EXPERT'S OPINION

- SHORT VERSION -

CONSTRUCTIVE FIRE PROTECTION

EGCOSTEP NG STAIRCASE BEARING



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Expert's opinion:	TP 14-041
Date:	04.03.2016

1 REASON AND OBJECTIVE

Max Frank GmbH & Co KG has commissioned the engineering office H + P Ingenieure GmbH with the provision of an expert's opinion on the structural fire protection of the Egcostep NG staircase bearing.

Max Frank GmbH & Co KG already possesses the national technical approval no. DIBt Z-157-301 for the Egcodorn, which is used as a shear force dowel in reinforced concrete construction. Following the expert's opinion issued by the Materials Testing Institute (MPA) of the Technical University of Braunschweig, a fire resistance duration F120 has been stated for the Max Frank Egcodorns by means of preliminary fire tests based on DIN 4102-4 und DIN 4102-22.

In this expert's opinion, a review is to be performed basing on the aforementioned investigations to ascertain whether the structural fire protection of the Egcostep staircase bearings can be classified against the backdrop of the current Eurocode DIN EN 1992-1-2.

[...]

2 DESCRIPTION OF THE CONSTRUCTION

2.1 GENERAL INFORMATION

The staircase bearings serve the purpose of transverse force transmission in structural joints between steel reinforced concrete floors or landings and the connecting flights of stairs. The Egcostep NG consists of bearing angles on which the landings are supported with welded-on reinforcements for the transmission of the load into the adjacent load-bearing components. The welded-on reinforcement is manufactured in various bent shapes for anchoring in the load-bearing components.

The Egcostep NG staircase bearings are manufactured as standard in the types S2, S3, S4, S5, S6, S7, S8, S9 and S10 as transverse force transmitting elements. The staircase bearing is cast in concrete between the components, resulting in a different connection. The insulating element in the joints between the components has a thickness d of 14 mm. The flight of stairs is supported on steel angles cast in concrete. The underside of the steel angle is at least 67 mm away from the bottom edge of the concrete. The load is transmitted into the load-bearing steel reinforced concrete components via reinforcing bars welded to the steel angles. These bars are cast into the steel reinforced concrete floors or landings. The underside of these elements is at least 25 mm away from the bottom edge of the concrete (see fig. 1).

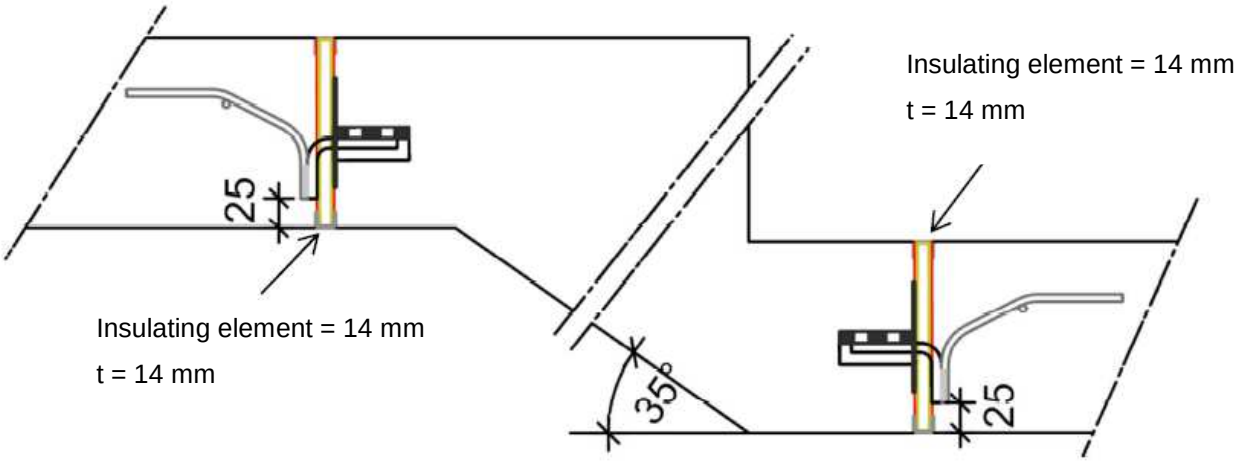

Figure 1: Installation situation with 14 mm thick insulating elements in the joints

[...]

6 SUMMARY

In this expert's opinion, the structural fire protection of connections of steel reinforced concrete components using the Egcostep NG staircase bearings from Max Frank is assessed on the basis of Eurocode 2-1-2. In accordance with the classification of the Egcodorn shear force dowel by the TU Braunschweig into the fire resistance class F120, the Egcostep NG staircase bearing can be classified at least into the fire resistance class R90 if

(1.) the table values in accordance with Section 5 of DIN EN 1992-1-2, Eurocode 2 are used for the adjacent floor slabs or landings and

(2.) the special notes from the expert's opinion by the TU Braunschweig are observed.

Aachen, 4 March 2016

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