BUILDING COMMON GROUND

MAX FRANK®

Assessment / expert report

Egcodist C R90

6941/2011 | 12.04.2011| english

Fire behavior of construction bearings

tested by: MPA, Braunschweig

Note: This is a translation of the German original document not examined by MPA Braunschweig.

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94339 Leiblfing

letter 18948/2016
date 21.10.2016

Validity of expert report No. 6941/2011 dd. 12.04.2011

Dear Sirs,

referring to your enquiry from 14.10.2016 we would like to inform you, that the fire safety statements as per expert report No. 6941/2011 dd. 12.04.2011:

> regarding the fire behavior of construction bearings in connection with adjacent solid structural components in case of fire exposure from one or more sides acc. to DIN 4102-2:1977-09

are still valid.

As basis for the certificate of conformity within the construction supervision process, it is further recommended by MPA Braunschweig – in accordance with the marginal conditions of the expert report No. 6941/2011 dd. 12.04.2011 – to consider the fire resistance analysis of both the construction bearings (elastomer bearings) and the adjacent solid structural components.

The validity of expert report No. 6941/2011 dd. 12.04.2011 and simultaneously of this letter expires on 11.04.2021.

On request and depending on the state of the art, the validity period of this expert report may be extended.

Best regards

Dipl.-Ing. Mittmann
Deputy head of department

Dipl.-Ing. Schmieder
clerk

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letter 6941/2011
date 12.04.2011

Expert report for the fire behavior of construction bearings in connection with adjacent solid construction components in case of fire exposure from one or more sides acc. to DIN 4102-2: 1977-09
1 attachment

Dear Sirs,

by phone call dd. 12.04.2011 Messrs. Max Frank GmbH & Co. KG in Leiblfing asked the material testing institute MPA Braunschweig to draw up an expert report for the fire behavior of construction bearings in connection with adjacent solid constructional components in case of fire exposure from one or more sides acc. to DIN 4102-2: 1977-09.

According to the information provided by the client, the construction bearings shown in attachment 1 must have no negative impact on the fire resistance rating resp. fire resistance class of the adjacent solid structural components in case of fire exposure acc. to DIN 4102-2: 1977-09.

An expert report is required because there is no fire protection analysis (e.g. DIN 4102-4: 1994-03) available for all constructional details of the construction bearings in connection with adjacent solid structural components.

1. Basis and documents of the expert report

The expert report for the constructional bearings in connection with adjacent solid structural components is based on

- DIN 4102-2: 1977-09
- DIN 4102-4: 1994-03
- Beton Brandschutz Handbuch (concrete fire protection manual), 1st edition, published by Beton Verlag [1]
- construction drawings as per attachment 1

Besides these documents all testing experience obtained by the MPA Braunschweig with regard to construction bearings is also incorporated in the fire safety assessment.

2. Constructional description

The description of the construction is based on the information provided by the client. In the following only the relevant details for fire protection will be described.

For static and/or structural-physical reasons and under certain circumstances it might be necessary to design elastomer bearings as construction bearings (linear or point bearings) in horizontal joints between load-transferring solid structural components such as, for example, columns, walls and slabs.

They are primarily used as supports for reinforced and pre-stressed concrete components. Furthermore, they are used as slab supports above brickwork walls which are plastered on both sides.

This includes, in principal, the scheduled transmission of vertical forces. The transmission of horizontal forces is only possible to a limited extend.

The height of the bearings is $d \leq 30$mm.

All sides of the bearings are protected by strips of mineral wool in the width of $d \geq 50$mm (non-combustible, melting point ≥ 1000°C , bulk density ≥ 30 kg/m³, which are, moreover, installed with a compression of $s \geq 10$mm.

For further details regarding the construction of the bearings see attachment 1.

3. Fire safety assessment for the construction bearings in connection with adjacent solid structural components

3.1. In general

Given an exclusively vertical load and subject to certain dimensions, elastomer bearings in an unprotected state can reach high fire resistance ratings despite of construction material class B2 acc. to 4102-1 and despite of a combustion of more than 50%. Based on the tests carried out, the followings statements apply to the tested bearings [1]:

- If horizontal forces occur, minor fire resistance ratings are to be expected – especially for high bearings.
- As to bearings with an installation dimension ≤ 30mm, flames will in general extinguish after fire exposure.

In case of a bearing that cannot be evaluated with regard to fire safety according to the tested bearings as per [1], there is the possibilitiy of applying an insulating cladding.

3.2. Fire safety assessment

Based on the statements in [1] as well as the testing experience with construction bearings gained by MPA Braunschweig, the elastomer bearings made of EPDM as described in section 2 and shown in attachment 1 have no negative effect on the fire resistance rating of the adjacent components in case of fire exposure from one or more sides acc. to the uniform temperature time curve (ETK) as per DIN 4102-2: 1977-09.

The following pre-conditions apply:

- The construction bearings must be completely covered with insulating cladding as described in section 2 and according to the respective fire exposure (on 1, 2, 3 or 4 sides).

- The construction bearings can at least be classified as “normally inflammable“.

- The adjacent solid structural components must consist of reinforced or pre-stressed concrete resp. brickwork with plaster on both sides of fire resistance class “F30“, “F60“ or “F90“ acc. to DIN 4102-2: 1977-09.

Where applicable, additional dynamic forces due to support settlements must also be considered in case of statically indeterminate buildings and/or buildings which are susceptible to settlement.

4. Special notes

4.1. In connection with the fire protection analysis of the bearings‘ adjacent structural components, this expert report may be used within the construction supervision process as basis for the certificate of conformity because the bearings have no negative effect on the fire resistance rating of the adjacent components.

4.2. This expert report only applies with regard to fire safety. Further requirements – e.g. building physics, statics, electrical engineering, ventilation technology or similar - may arise from the valid technical construction regulations of the construction bearings in connection with their adjacent solid structural components and from the particular regional building regulations resp. the regulations for special constructions.

4.3. The preceding fire safety assessment only applies if all load-bearing (load-transferring and reinforcing) components have at least the same fire resistance rating.

4.4. Any amendments and supplements to construction details (deriving from this expert report) are only permitted after consultation with MPA Braunschweig.

4.5. The proper execution is the sole responsibility of the executing companies.

4.6. Validity of this expert report expires on 12.04.2016.

4.7. The period of validity may be extended on request and depending on the state of the art.

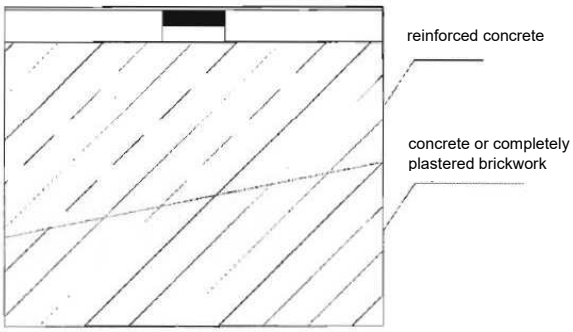
Kind regards

ORR Dr.-Ing. Rohling
Head of department

Dipl.-Ing. Schmieder
clerk

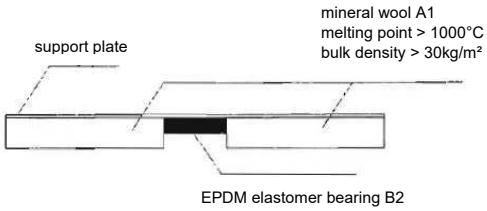
Egcodist F90 Linear bearing

Installation situation

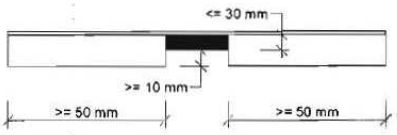


The adjacent components must also meet the requirements for fire safety class F90.

materials

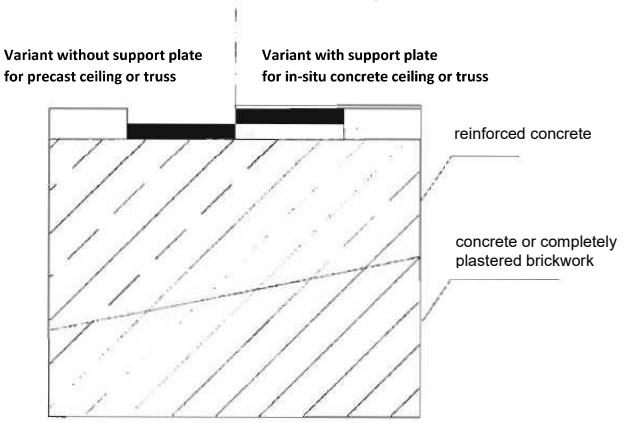


dimensions



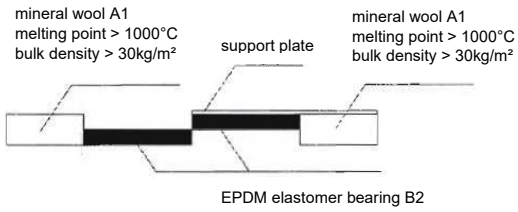
Egcodist F90 Point bearing

Installation situation



The adjacent components must also meet the requirements for fire safety class F90.

materials



dimensions