

Efectis Nederland Report

2011-Efectis-R1019[Rev. 2]

Fire resistance in the sense of NEN 6069:2016 of various types of WAVIN pipe penetrations through various types of walls or floors, sealed with System BM-R90 fire collars

Efectis Nederland BV
Centre for Fire Safety
Brandpuntlaan Zuid 16
2665 NZ BLEISWIJK
P.O. Box 554
2665 ZN BLEISWIJK

www.efectis.nl

T 088 fire safety (088 3473 723)
F 088 3473 724
E nederland@efectis.com

Date July 2017
Author(s) Dr. Ir. G. van den Berg
P.A. Ram

Number of pages 10 (incl. appendix)
Number of appendices 1 (Construction Drawings)

Sponsor WAVIN Nederland B.V.
J.C. Kellerlaan 8
7772 SG HARDENBERG

Project name Fire resistance of WAVIN pipe penetrations sealed with System BM-R90 fire collars
Project numbers ENL-17-000618

All rights reserved.

No part of this document may be reproduced and/or published by means of printing, photocopying, microfilm, or by any other method without prior permission from Efectis.

If this report was issued on behalf of a customer, please refer to the General Terms and Conditions for Research Assignments to Efectis or the relevant agreement signed between the parties for the rights and obligations of the customer and the contractor.

This Efectis Report may be made available to immediate stakeholders for consultation.

1 Introduction

On the instructions of WAVIN Nederland B.V. (Hardenberg), Efectis Nederland has made an assessment of various fire test results. These fire tests have been performed in the laboratory of IBMB/MPA Braunschweig (Germany). IBMB / MPA Braunschweig is a notified test laboratory, is member of EGOLF, and has an ISO 17025 accreditation.

From these test reports only the pipes of type WAVIN pipes have been taken into account. The name of the fire collars as used in the fire tests is changed into System BM-R90. This is only a name-change, the collars are exactly identical to those which are tested.

The assessment was made on the basis of Dutch standard NEN 6069:2016. For the definition of the field of application associated with the test result, the following knowledge has been used:

- The European test method as described in EN 1366-3:2009 and the Extended Application document, ref. prEN 15080-14, which at the moment circulates within CEN TC127;
- The knowledge and experience which regard to fire resistance of penetration seals which is gained in the laboratory of Efectis.

The full details of the test results and the assessment performed, are described in Efectis report 2011-Efectis-R0830 [Rev. 1]. The present report only presents the conclusions and the associated drawings from report 2011-Efectis-R0830 [Rev. 1].

2 Conclusion pipe penetrations sealed with BM-R90 fire collars

2.1 General

The following pipe penetration configurations are allowed:

- WAVIN pipes of following types and associated diameter ranges:
 - WAVIN SiTech+ with diameter range 50 – 160 mm
 - WAVIN AS with diameter range 56 – 160 mm
 - WAVIN PE with diameter range 70 – 160 mm
 - Wafix PP with diameter range 40 – 160 mm
 - PVC-U with diameter range 32 – 200 mm
- The pipes are fitted with an associated BM-R90 fire collar
 - at both sides of the penetration, in case of a wall support construction; or
 - at the directly exposed side of the penetration, in case of a floor support construction.
- In the BM-R90 fire collar the following amount of intumescent is required:
 - Diameter DN 40 mm : 30 x 7.8 mm;
 - Diameter DN 50 mm : 30 x 9.6 mm;

- Diameter DN 75 mm : 30 x 12.0 mm;
 - Diameter DN 90 mm : 30 x 12.8 mm;
 - Diameter DN 110 mm : 30 x 14.5 mm;
 - Diameter DN 125 mm : 50 x 13.2 mm;
 - Diameter DN 140 mm : 50 x 18.0 mm;
 - Diameter DN 160 mm : 50 x 18.9 mm;
 - Diameter DN 180 mm : 50 x 23.0 mm;
 - Diameter DN 200 mm : 50 x 28.0 mm.
- The following number of fixations are required for the BM-R90 fire collars:
- Diameter DN 40 mm : 3 fixations;
 - Diameter DN 50 mm : 3 fixations;
 - Diameter DN 75 mm : 4 fixations;
 - Diameter DN 90 mm : 4 fixations;
 - Diameter DN 110 mm : 4 fixations;
 - Diameter DN 125 mm : 4 fixations;
 - Diameter DN 140 mm : 4 fixations;
 - Diameter DN 160 mm : 5 fixations;
 - Diameter DN 180 mm : 5 fixations;
 - Diameter DN 200 mm : 6 fixations.
- Fixations of the fire collars should be carried out with steel M8 threaded rods for flexible walls and with plugs and screws for massive stone-like materials.
- It is allowed to install continuous insulation around the pipes of type WAVIN PE, with a maximum thickness of 5 mm.
- It is allowed to install the pipes either straight through the wall or floor, or under an angle of 45 degrees.
- It is allowed to install the pipes with a coupling in the wall or floor.
- It is allowed to install the pipes with two 45 degrees couplings in order to make a 90 degrees bend at the wall or floor.
- It is allowed to install the pipes with “zero” working distances.
- It is allowed to work with “oversized” holes in the supporting construction, where the maximum allowed oversize is 15 mm all around the pipe. The oversized area should be completely filled with either mortar, gypsum, or mineral wool for non-insulated pipes.
- The pipes are supported at a distance of 500 mm from the face of the floor or wall supporting construction.

See the drawings in the Annex.

2.2 Fire resistance 60 minutes

Under the following conditions and within the sense of Annex A of NEN 6069:2016, the fire resistance of pipe penetrations is **60 minutes**. The pipe penetration configurations as described in paragraph 2.1 are allowed. The pipe penetrations are situated in a support construction of one of the following types:

- A massive, stone-like floor with a thickness and density of at least 150 mm and at least 650 kg/m^3 , respectively.
- A massive, stone-like wall with a thickness and density of at least 70 mm and at least 650 kg/m^3 , respectively.
- A flexible wall with:
 - a thickness of at least 70 mm, and
 - a fire resistance of at least 60 minutes.
- A shaft wall construction:
 - made of massive, stone-like material with density of at least 650 kg/m^3 , and
 - a thickness of at least 70 mm.

See the drawings in the Annex.

2.3 Fire resistance 90 minutes

Under the following conditions and within the sense of Annex A of NEN 6069:2016, the fire resistance of pipe penetrations is **90 minutes**. The pipe penetration configurations as described in paragraph 2.1 are allowed. The pipe penetrations are situated in a support construction of one of the following types:

- A massive, stone-like floor with a thickness and density of at least 150 mm and at least 650 kg/m^3 , respectively.
- A massive, stone-like wall with a thickness and density of at least 100 mm and at least 650 kg/m^3 , respectively.
- A flexible wall with:
 - a thickness of at least 100 mm, and
 - a fire resistance of at least 90 minutes.

See the drawings in the Annex.



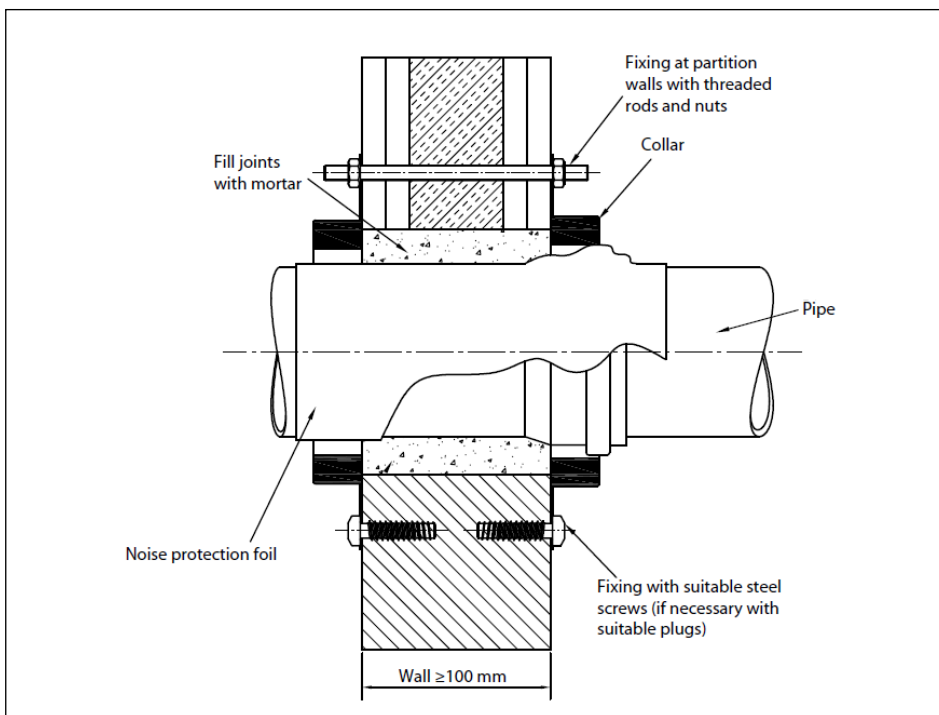
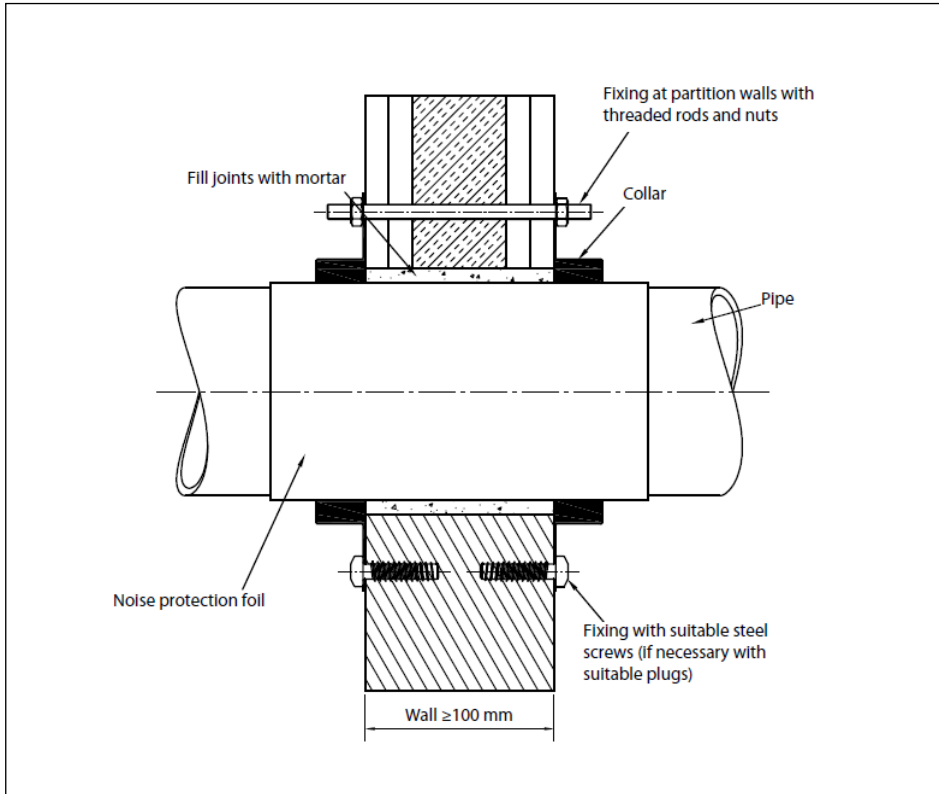
Dr. Ir. G. van den Berg

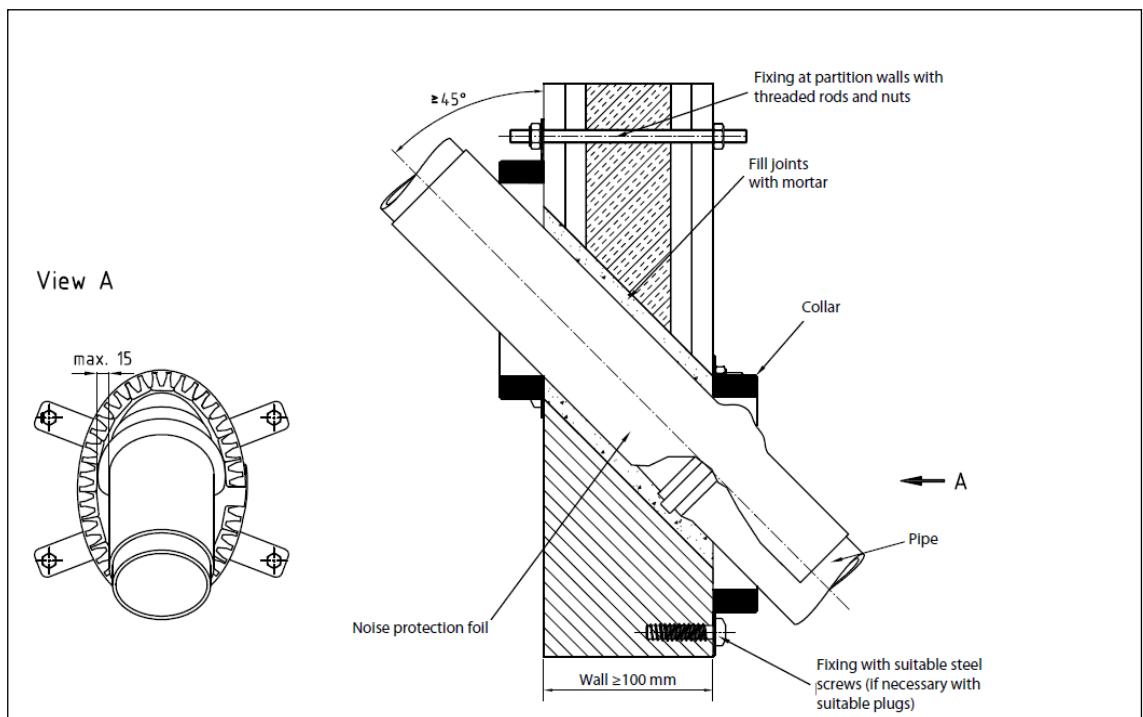
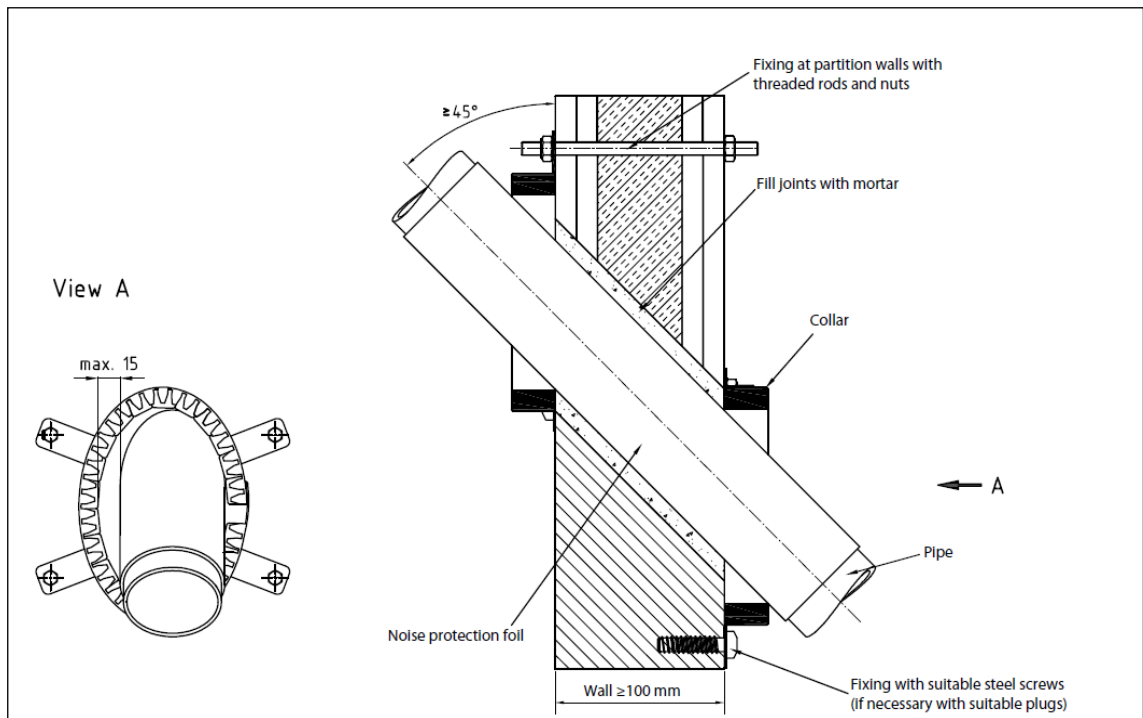


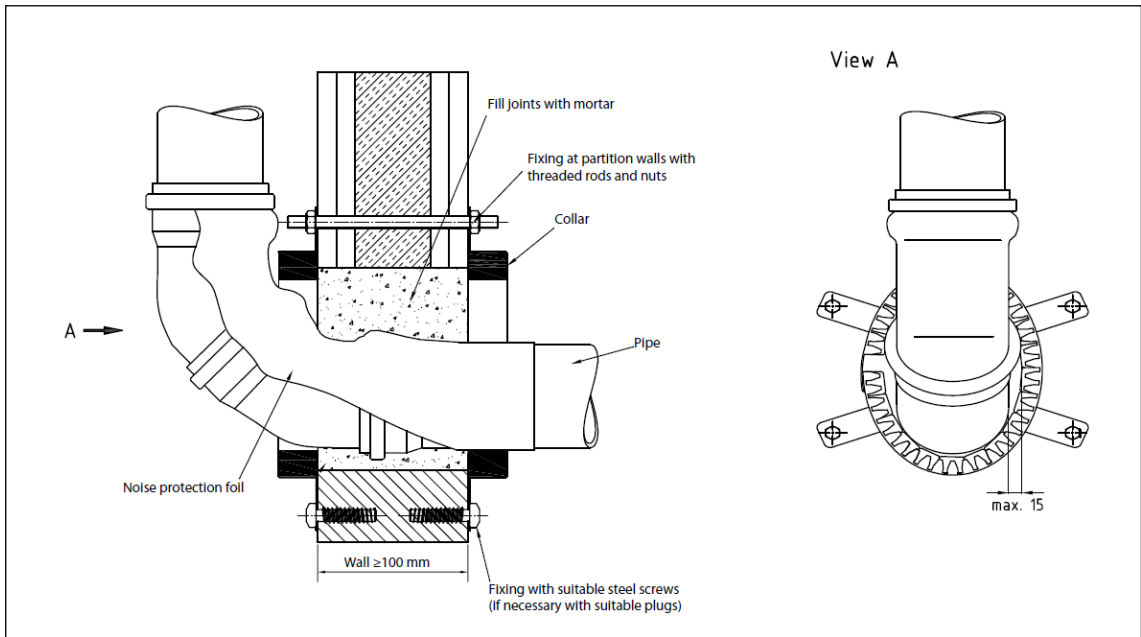
P.A. Ram

Annex A – Construction drawings

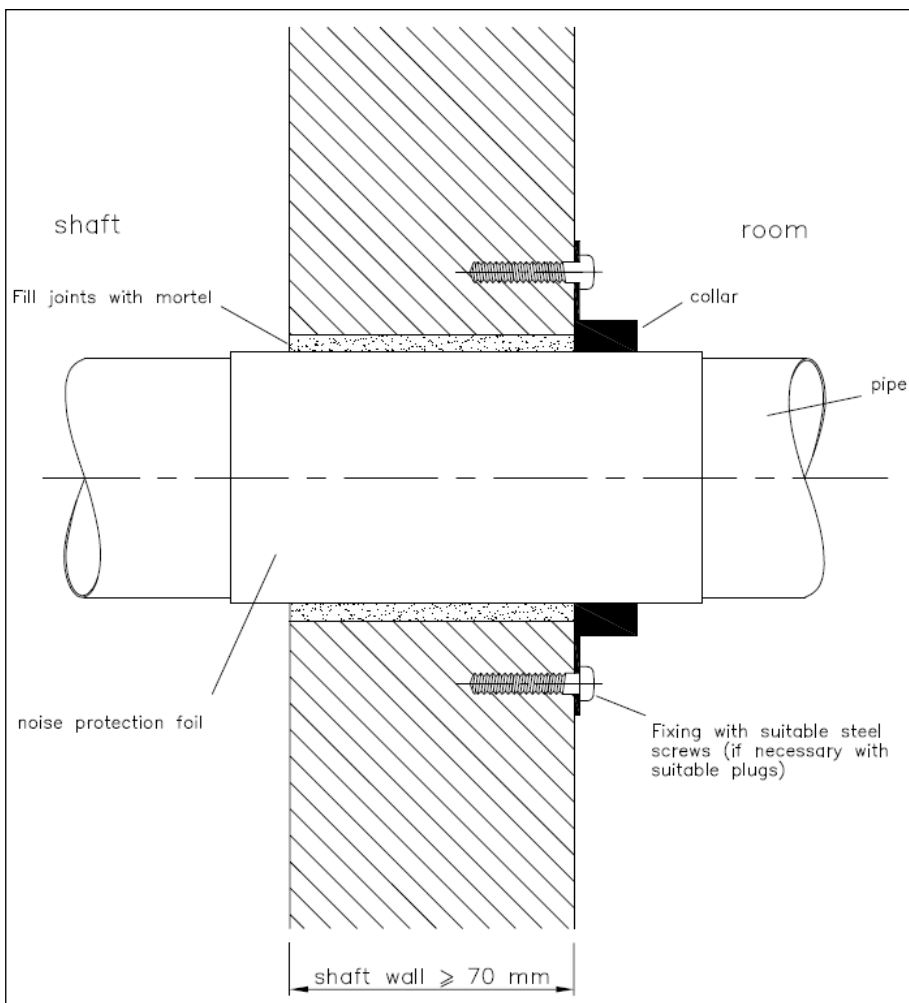
WALL CONFIGURATIONS







SHAFT WALL CONFIGURATION



FLOOR CONFIGURATIONS

