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Member of EOTA
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European Technical Assessment

ETA 17/0767
of 09/04/2019

General Part

Technical Assessment Body issuing the European Technical Assessment:	RISE Research Institutes of Sweden AB
Trade name of the construction product	Protega Ecomastic
Product family to which the construction product belongs	Fire stopping and fire sealing Product – Penetration seal- Coated mineral wool slabs "Protega Ecomastic" Used to maintain the fire resistance of separating walls or floors where various types (mixed penetration) of services pass through
Manufacturer	Protega AB, Verkstadsgatan 6B, SE-231 66 Trelleborg, Sweden, www.protega.se
Manufacturing plant(s)	Protega AB, Verkstadsgatan 6B, SE-231 66 Trelleborg, Sweden
This European Technical Assessment contains	21 pages including 1 Annex which form an integral part of this assessment.
This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of	EAD 350454-00-1104, September 2017 – Fire stopping and fire sealing products – Penetration seals.

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Specific parts

1 Technical description of the product

This European Technical Assessment refers to a fire stopping and fire sealing coated mineral wool slab with the designation “Protega Ecomastic” for use in penetration seals used to maintain the fire resistance of separating walls or floors where various and mixed penetrations pass through.

Protega Ecomastic is consisting of two mineral wool boards having a thickness of 60 mm each and nominal density 150 kg/m^3. Both outside faces of the mineral wool boards coated with Protega Ecomastic 5FR with dried thickness of 1 mm. Gaps and joints between board segment are filled with Protega Ecomastic SP. Depending of service, classification and supporting construction service require a layer of Protega Ecomastic 5FR coating or collar Protega Novapipe S.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

Protega Ecomastic is intended to form part of a penetration seal which is used to maintain the fire resistance of a separating element at the position where services pass through.

Penetration seals with Protega Ecomastic is inteded to be penetrated by the following services:

- cables (single or bundled), cable carriers, e.g. cable trays, ladders, baskets
- pipes and conduits of reaction to fire class A1 according to EN 13501-1 with a melting or decomposition point greater than 1000°C (e.g. steel, cast iron, copper and copper alloys, nickel alloys), either insulated or non-insulated, hereafter referred to as "metal pipes". Included in this group are the above pipes with a coating provided the overall reaction to fire class is minimum A2.
- pipes, trunking and conduits of reaction to fire class A1 or A2 according to EN 13501-1 with a melting or decomposition point equal to or less than 1000°C (e.g. lead, aluminium and aluminium alloys) and/or the risk of fracture (glass, fibre cement), either insulated or non-insulated.
- pipes not classified A1 or A2 according to EN 13501-1 (e.g. made from thermoplastic or thermosetting material) including non-homogeneous materials (e.g. glass fibre reinforced plastic pipes or layered pipes), either insulated or non-insulated, hereafter referred to as "plastic pipes".
- trunking and conduits not classified A1 or A2 according to EN 13501-1 (e.g. made from thermoplastic material or thermosetting material) including non-homogeneous materials, either insulated or non-insulated, hereafter referred to as "plastic trunkings” and “plastic conduits”.

A penetration seal may contain either a single type of the services described above, or various types (mixed penetrations). The number of services may vary. The services may or may not include service support constructions.

2.1 Use condition

Protega Ecomastic fulfils the requirements of use condition Z_2 in accordance with EAD 350454-00-1104, September 2017, section 1.2.1.

Type Z_2: Products intended for uses at internal conditions with humidity lower than 85 % RH excluding temperatures below 0 °C, without exposure to rain or UV.

3 Assumed working life of the construction product

The provisions and the verification and assessment methods included or referred to in this ETA have been written based upon the assumed working life of the Fire Stopping and/or Fire Sealing Product for the intended use of 25 years when installed in the works, provided that the Fire Stopping and/or Fire Sealing Product is subject to appropriate use and maintenance. However, if the product is a reactive material or includes a reactive material, the working life is assumed to be 10 or 25 years depending on available evidence. These provisions are based upon current state of the art and the available knowledge and experience.

The indications given as to the working life of the construction product cannot be interpreted as a guarantee given by the product manufacturer or his representative nor by EOTA or the Technical Assessment Body issuing the ETA, but are regarded only as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

4 Performance of the product and references to the methods used for its assessment

Essential characteristics and their performance

Basic requirement for construction work	Essential Characteristics	Performance
BWR 1 - Mechanical resistance and stability	None	Clause 4.1.1
BWR 2 - Safety in case of fire	Reaction to fire	Clause 4.1.2.1
	Resistance to fire	Clause 4.1.2.2
BWR 3 - Hygiene, health and the environment	Air permeability	Clause 4.1.3.1
	Water permeability	Clause 4.1.3.2
	Content and/or release of dangerous substances	Clause 4.1.3.3
BWR 4 - Safety in use	Mechanical resistance and stability	Clause 4.1.4.1
	Resistance to impact/movement	Clause 4.1.4.2
	Adhesion	Clause 4.1.4.3
	Durability	Clause 4.1.4.4
BWR 5 - Protection against noise	Airborne sound insulation	Clause 4.1.5.1
BWR 6 - Energy economy and heat retention	Thermal properties	Clause 4.1.6.1
	Water vapour permeability	Clause 4.1.6.2
BWR 7 - Sustainable use of natural resources	None	Clause 4.1.7.1

4.1.1 Mechanical resistance and stability (BWR 1)

Not relevant, no performance assessed (NPA).

4.1.2 Safety in case of fire (BWR 2)

4.1.2.1 Reaction to fire

No performance assessed (NPA).

4.1.2.2 Resistance to fire

The resistance to fire performance according to EN 13501-2:2016 of penetration seals with Protega Ecomastic is given in Annex 1.

4.1.3 Hygiene, health and the environment (BWR 3)

4.1.3.1 Air permeability

No performance assessed (NPA).

4.1.3.2 Water permeability

No performance assessed (NPA).

4.1.3.3 Content and/or release of dangerous substances

No performance assessed (NPA).

4.1.4 Safety in use (BWR 4)

4.1.4.1 Mechanical resistance and stability

No performance assessed (NPA).

4.1.4.2 Resistance to impact/movement

No performance assessed (NPA).

4.1.4.3 Adhesion

No performance assessed (NPA).

4.1.4.4 Durability

Use condition

Protega Ecomastic fulfils the requirements of use condition Z_2 in accordance with EAD 350454-00-1104, September 2017, section 2.2.9.3.6

Type Z_2: Products intended for uses at internal conditions with humidity lower than 85 % RH excluding temperatures below 0 °C, without exposure to rain or UV.

Component and materials compatibility

Protega Ecomastic fulfils the requirements of suitability of materials in contact in accordance with EAD 350454-00-1104, September 2017, section 2.2.9.4.

4.1.5 Protection against noise (BWR 5)

4.1.5.1 Airborn sound insulation

Test report WYC386075, Exova according to EN ISO 10140-2:2010. Test results expressed in accordance wih EN ISO 717-1.

Test results from test with the specific small sized opening in accordance with EN ISO 10140-5, clause 3.3.3 have been performed.

4.1.6 Energy economy and heat retention (BWR 6)

4.1.6.1 Thermal properties

No performance assessed (NPA).

4.1.6.2 Water vapour permeability

No performance assessed (NPA).

4.1.7 Sustainable use of natural resources (BWR 7)

Not relevant, no performance assessed (NPA).

5 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 1999/454/EC - Commission decision of date 22 June 1999, published in the Official Journal of the European Union (OJEU) L178/52 of 14/07/1999, as amended by Decision of the Commission 2001/596/EC of 8 January 2001, published in the Official Journal of the European Union (OJEU) L209/33 of 2/8/2001, of the European Commission the system of assessment and verification of constancy of performance (see Annex V to the regulation (EU) No 305/2011) given in the following table apply:

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Fire stopping and fire sealing products	For fire compartmentation and/or fire protection or fire performance	Any	1
Fire stopping and fire sealing products	For uses subject to reaction to fire regulations	A, D, E, F	4

6 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at RISE Research Institutes of Sweden AB.

Issued in Borås on 09.04.2019
By RISE Research Institutes of Sweden AB

Johan Åkesson
Certification Manager

Annex A - Resistance to fire classification

1 General information

Protega Ecomastic penetration seals where mixed penetrations pass through fire resistance separating walls or floor have been classified according to EN 13501-2:2016 in accordance with SP Technical Research Institute of Sweden, classification report 6P02061-2rev3.

General information regarding supporting constructions and type of service:

- The seal size may be reduced, provided the total amount of cross sections of the services (including insulation) does not exceed 60% of the penetration area and provided the working clearances are not smaller than the minimum working tolerances used in the test used as basis for approval.
- Mineral wool insulation on metal pipes has a total length of at least 1150 mm and a minimum thickness of 30 mm, centrally located on the pipe and not interrupted by the seal.
- Mineral wool insulation on ventilation pipes on both sides of the service has a total length of at least 600 mm on each side and a minimum thickness of 80 mm.
- The density of pipe insulation may be increased but may not be reduced.
- The installation angles of metal pipes shall be between 90° and 45°.
- The distance between individual seals shall be no less than 200 mm.
- The distance between the seal and the first service support for wall applications shall not be greater than 400 mm.
- The supporting construction is classified in accordance with EN 13501–2.
- The number of boards per side of a flexible wall cannot be less than 2.

5 Classification according EN 13501-2:2016, wall and floor construction

The fire stopping and fire sealing Product – Penetration seal- Coated mineral wool slabs “Protega Ecomastic” is classified according to the following combinations of performances parameters and classes as given below.

5.1 Fire resistance classification EI 30

Table 1

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 30	Large cable seals (maximum1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	No	1, 7, 23, 24, 25,	1, 2, 3, 4, 5
EI 30	Pipe penetration seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	Yes	12, 21	7, 8, 9
EI 30	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	No	5, 7, 18, 19, 23	2, 4, 10, 11, 12, 13, 24
EI 30	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	No	2, 8, 23, 24, 25	1, 2, 5, 14, 15
EI 30	Large cable seals (maximum1200 x 1200 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	Yes	24	4
EI 30	Pipe penetration seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	Yes	12, 14	7, 8, 9

Cont. table 1

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 30	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	No	2, 7, 15, 16, 18, 20, 23, 24, 25	10, 13, 16, 17, 18, 19, 20, 21, 22, 24
EI 30	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	Yes	2, 24	1, 2, 4, 5, 6

2.2 Fire resistance classification EI 45

Table 2

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 45	Large cable seals (maximum1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	No	3, 9, 23, 26	1, 2, 3, 4, 5
EI 45	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	No	6, 11, 17, 18, 19	2, 4, 7, 9, 10, 11, 12, 13, 24
EI 45	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	No	2, 8, 23, 25	1, 4, 25, 26, 27

Cont. table 2

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 45	Large cable seals (maximum1200 x 1200 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm	Yes	24	4
EI 45	Pipe penetration seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm	Yes	12	7, 8, 9
EI 45	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm	No	2, 7, 15, 16, 18, 20, 23, 25	10, 13, 16, 17, 18, 19, 20, 21, 22, 24
EI 45	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	Yes	2, 24	2, 4, 5, 6, 23

2.3 Fire resistance classification EI 60

Table 3

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 60	Large cable seals (maximum1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	No	9, 26, 27	1, 2, 3, 4, 5

Cont. table 3

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 60	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	No	6, 11, 17, 18, 20	2, 4, 7, 9, 10,11, 12, 13, 24
EI 60	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	No	4, 10, 29, 30	1, 14, 15, 25, 27
EI 60	Pipe penetration seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	Yes	12, 40	7, 8, 9
EI 60	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	No	2, 7, 15, 18, 20, 22, 25, 34	7, 10, 13, 16, 17, 19, 21, 22, 24, 31
EI 60	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	Yes	2, 24, 28, 29, 35	4, 14, 28, 29, 30
EI 60	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	Yes	25, 32, 36	4, 21, 25, 32, 33, 34
EI 60	Non-standard mixed seals in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	No	Se figure 1, 2, 3 and 4	44, 45, 46, 47

2.4 Fire resistance classification EI 90

Table 4

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 90	Pipe penetration seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	Yes	12, 21	8, 9, 40
EI 90	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	No	26	12, 35, 36
EI 90	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	Yes	31, 33	38, 39
E1 90	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	Yes	24, 32, 37	4, 21, 25, 32, 33, 34
E1 90	Pipe penetration seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	Yes	13	8, 9, 40

2.5 Fire resistance classification EI 120

Table 5

Fire class	Supporting constructions and type of service	Service treated with Ecomastic 5FR (Yes/No)	Type of specific service according to table 6 Item No	Minimum distances according to table 7 Item No
EI 120	Large cable seals (maximum 1200 x 1200 mm, minimum seal thickness 2 x 60 mm) in flexible wall applications having a thickness not less than 100 mm or concrete or masonry wall application having an overall thickness equal to or greater than 100 mm.	Yes	2, 28, 38	4, 14, 28, 29, 30
EI 120	Large mixed seals (maximum 600 x 600 mm, minimum seal thickness 2 x 60 mm + 30 mm cavity) in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	Yes	2, 7,16, 18, 20, 25, 32, 39	4, 21, 25,32, 33, 34, 40, 41, 42, 43
EI 120	Non-standard mixed seals in concrete or masonry floor applications having an overall thickness equal to or greater than 150 mm.	No	41, 42, 43, 44	44, 45, 46, 47

3 Types of specific service covered by resistance to fire classification for penetration seal Protega Ecomastic

Table 6

Service No	Service type
1	For steel conduits and steel tubes to a maximum diameter of 16 mm, uncapped on the fire side and capped on the non-fore side
2	For steel conduits and steel tubes to a maximum diameter of 16 mm
3	For steel conduits and steel tubes to a maximum diameter of 16 mm, capped on the fire side and uncapped on the non-fore side, but only if not fitted on a cable carrier or if the cable carrier does not pass through the seal
4	For steel conduits and steel tubes to a maximum diameter of 16 mm, only on cable tray, no other cable carrier
5	For steel conduits and steel tubes to a maximum diameter of 16 mm, capped on the fire side and uncapped on the non-fire side
6	For steel conduits and steel tubes to a maximum diameter of 16 mm, uncapped on the non-fire side
7	For plastic conduits and plastic tubes to a maximum diameter of 16 mm, capped on the non-fire side
8	For plastic conduits and plastic tubes to a maximum diameter of 16 mm, capped on one or two sides of the floor
9	For plastic conduits and plastic tubes to a maximum diameter of 16 mm, capped on the non-fire side, but only if not fitted on a cable carrier or if the cable carrier does not pass through the seal
10	For plastic conduits and plastic tubes to a maximum diameter of 16 mm, capped on one or two sides of the floor, only on cable tray, no other cable carrier
11	For plastic conduits and plastic tubes to a maximum diameter of 16 mm
12	For steel pipes with a diameter of 50 mm and a minimum wall thickness of 1,5 mm, capped on the fire side and uncapped on the non-fire side
13	For steel pipes with a diameter of 50 mm and a minimum wall thickness of 3,0 mm, capped on the fire side and uncapped on the non-fire side
14	For copper pipes with a diameter of 15 mm and a minimum wall thickness of 1,0 mm, capped on the fire side and uncapped on the non-fire side
15	For copper pipes with a diameter of 30 mm and a minimum wall thickness of 2,0 mm and fitted with a local and uninterrupted mineral wool insulation
16	For copper pipes with a diameter of 42 mm and a minimum wall thickness of 2,0 mm and fitted with a local and uninterrupted mineral wool insulation
17	For copper pipes with a diameter between 42 mm and 50 mm and a minimum wall thickness of 2,0 mm and fitted with a local and uninterrupted mineral wool insulation
18	For PVC pipes according to EN 1452 / EN 1453 / EN 1329 / EN 1566 with a diameter of 50 mm and wall thickness of 3,7 mm, fitted with 2 pipe collars designated Protega Novapipe S35/50, where pipes are capped on the non-fire side
19	For PVC pipes according to EN 1452 / EN 1453 / EN 1329 / EN 1566 with a diameter of 70 mm and wall thickness of 2,3 mm, fitted with 2 pipe collars designated Protega Novapipe S35/50, where pipes are capped on the non-fire side
20	For PVC pipes according to EN 1452 / EN 1453 / EN 1329 / EN 1566 with a diameter of 75 mm and wall thickness of 2,3 mm, fitted with 2 pipe collars designated Protega Novapipe S35/75, where pipes are capped on the non-fire side
21	First service support at maximum distance of 400 mm from supporting construction

Cont. table 6

Service No	Service type
22	For sheathed cables to a maximum diameter of 21 mm, but only if not fitted on a cable carrier or if the cable carrier does not pass through the seal
23	For sheathed cables to a maximum diameter of 80 mm
24	For non-sheathed cables to a maximum diameter of 24 mm
25	For tied bundles of cables with a maximum diameter of 100 mm made from cables of a diameter not greater than 21 mm
26	For tied bundles of cables with a maximum diameter of 100 mm made from cables of a diameter not greater than 21 mm, but only if not fitted on a cable carrier or if the cable carrier does not pass through the seal
27	For sheathed cables to a maximum diameter of 80 mm; the cable carrier on which they are fitted can only be a cable tray; the maximum infill rate of the cable tray cannot exceed 61%
28	For sheathed cables to a maximum diameter of 62,5 mm
29	For tied bundles of cables with a maximum diameter of 100 mm made from cables of a diameter not greater than 21 mm, only on cable tray, no other cable carrier
30	For sheathed cables to a maximum diameter of 80 mm, only on cable tray, no other cable carrier
31	For sheathed cables to a maximum diameter of 47 mm
32	For sheathed cables to a maximum diameter of 62,5 mm, only on cable tray, no other cable carrier
33	Cables: NYCWY 4x95SM/50 PFSP CU 4x95/50 FKKJ 1 4x95/50 S YMz1Kmbzh 0,6/1 kV 4G95 H07RN-F 4G95
34	Cables: E-YY-J 1x95RM E-YY-O 1x95 RM NYY-J 1x95 RM NYY-O 1x95RM VV 1x95 TT 1x95 RM 0,6/1 kV E-YCWY 4x95SM/50 MCMK 4x95/50 NYCWY 4x95SM/50 PFSP CU 4x95/50 FKKJ 1 4x95/50 S
35	Cables: E-YY-J 5x1,5 RE NYY-J 5x1,5 RE VV 5x1,5 H07RN-F 5G1,5 YMz1Kmbzh 0,6/1 kV 5G1,5 RM PVIK-LS-HF 5x1,5 N2XH-J 5x1,5RE or N2XH-O 5x1,5RE n.n. E-NGNG-J 5x1,5RE or E-3G3G-J 5x1,5RE or ENGNG-O 5x1,5RE or E-3G3G-O 5x1,5RE E-YY-J 1x95RM or E-YY-O 1x95RM NYY-J 1x95RM or NYY-O 1x95RM

	VV 1x95 TT 1x95 RM 0,6/1 kV E-YCWY 4x95SM/50 MCMK 4x95/50 NYCWY 4x95SM/50 PFSP CU 4x95/50 FKKJ 1 4x95/50 S YMz1Kmbzh 0,6/1 kV 4G95 H07RN-F 4G95 PVIK-LS-HF 4x95 N2XH-J 4x95SM or N2XH-O 4x95SM n.n. E-NGNG-J 4x95SM or E-3G3G-J 4x95SM or ENGNG-O 4x95SM or E-3G3G-O 4x95SM E-YCWY 4x185SM/95 MCMK 4x185/95 NYCWY 4x185SM/95 PFSP CU 4x185/95 FKKJ 4x185/95 S YMz1Kmbzh 0,6/1 kV 4G185 svs PVIK-LS-HF 4x185 N2XH-J 4x185SM or N2XH-O 4x185SM n.n. E-NGNG-J 4x185SM or E-3G3G-J 4x185SM or E-NGNG-O 4x185SM or E-3G3G-O 4x185SM E-YY-J 1x185RM or E-YY-O 1x185RM NYY-J 1x185RM or NYY-O 1x185RM VV 1x185 TT 1x185 RM 0,6/1 kV
36	Cables: E-YCWY 4x95SM/50 MCMK 4x95/50 NYCWY 4x95SM/50 PFSP CU 4x95/50 FKKJ 1 4x95/50 S E-YY-J 1x185RM or E-YY-O 1x185RM NYY-J 1x185RM or NYY-O 1x185RM VV 1x185 TT 1x185 RM 0,6/1 kV
37	Cables: YMz1Kmbzh 0,6/1 kV 4G185 svs PVIK-LS-HF 4x185 N2XH-J 4x185SM or N2XH-O 4x185SMn.n. E-NGNG-J 4x185SM or E-3G3G-J 4x185SM or E-NGNG-O 4x185SM or E-3G3G-O 4x185SM
38	Cables: E-YY-J 5x1,5 RE NYY-J 5x1,5 RE VV 5x1,5 H07RN-F 5G1,5 H07RN-F 4G185
39	Cables; E-YY-J 5x1,5 RE NYY-J 5x1,5 RE VV 5x1,5
40	For PVC pipes with a diameter of 120 – 200 mm and a minimum wall thickness of 0.6 mm, capped on the non-fire side

Cont. table 6

41	For ventilation pipes to a maximum diameter of 125 mm with 500 mm rockwool insulation on both sides of the wall, sealed with Protega Ecomastic SP, 0-15x25mm and capped on the fire exposed side
42	For PVC pipes according to EN 1452 with a diameter of 125 mm and wall thickness of 6,0 mm, fitted with 2 pipe collars designated Protega Novapipe S35/125, where pipes are capped on the non-fire side
43	For PVC pipes according to EN 1452 with a diameter of 160 mm and wall thickness of 6,0 mm, fitted with 2 pipe collars designated Protega Novapipe S60/160, where pipes are capped on the non-fire side
44	For PVC pipes according to EN 1452 with a diameter of 200 mm and wall thickness of 6,0 mm, fitted with 2 pipe collars designated Protega Novapipe S60/200, where pipes are capped on the non-fire side

4 Minimum distances covered by resistance to fire classification for penetration seal Protega Ecomastic

Table 7

Item No	Minimum distances
1	Between cable/cable carrier and side aperture edge: 0 mm
2	Between cable carriers: 50 mm
3	Between cable carrier and the lower aperture edge: 100 mm
4	Between cables and upper aperture edge: 50 mm
5	Between cables and cable carriers: 100 mm
6	Between cable carrier and the lower aperture edge: 0 mm
7	Between metal pipes: 100 mm
8	Between metal pipes and top aperture edge:100 mm
9	Between metal pipe and side aperture edge: 100 mm
10	Between cable/cable carrier and plastic pipe: 100 mm
11	Between plastic pipes: 80 mm
12	Between cable tray and lower aperture edge: 100 mm
13	Between plastic pipe and side aperture edge: 100 mm
14	Between cable carrier and the lower aperture edge: 50 mm
15	Between cables and upper aperture edge: 40 mm
16	Between cable/cable carrier and metal pipe: 40 mm
17	Between plastic pipes: 100 mm
18	Between metal pipes: 50 mm

Cont. table 7

19	Between cable carriers: 28 mm
20	Between cables and upper aperture edge: 60 mm
21	Between cable tray and lower aperture edge: 0 mm
22	Between metal pipe and side aperture edge: 55 mm
23	Between cable/cable carrier and side aperture edge: 0 mm
24	Between cables/cable carriers and the side aperture edge: 0 mm
25	Between cable carriers: 40 mm
26	Between cable carrier and the lower aperture edge: 40 mm
27	Between cables and cable carriers: 90 mm
28	Between cable/cable carrier and side aperture edge: 35 mm;
29	Between cable carriers: 115 mm;
30	Between cables and cable carriers: 40 mm.
31	Between cables and upper aperture edge: 68 mm;
32	Between cable/cable carrier and metal pipe: 60 mm;
33	Between cable/cable carrier and plastic pipe: 75 mm;
34	Between cables/cable carriers and the side aperture edge: 30 mm;
35	Between cable carriers: 100 mm;
36	Between cables and upper aperture edge: 100 mm;
37	Between cable tray and lower aperture edge: 100 mm.
38	Between cables and upper aperture edge: >125 mm
39	Between cable tray and lower aperture edge: >100 mm
40	Between metal pipes – mm
41	Between plastic pipes: - mm
42	Between metal pipe and side aperture edge: 150 mm
43	Between plastic pipe and side aperture edge: 150 mm
44	Between PVC pipes: 110 mm
45	Between ventilation pipe and PVC pipe: 130 mm
46	Between PVC pipe and side aperture edge: 110 mm
47	Between ventilation pipe and side aperture edge: 85 mm

5 Figures non-standard mixed pipe penetration seals in wall

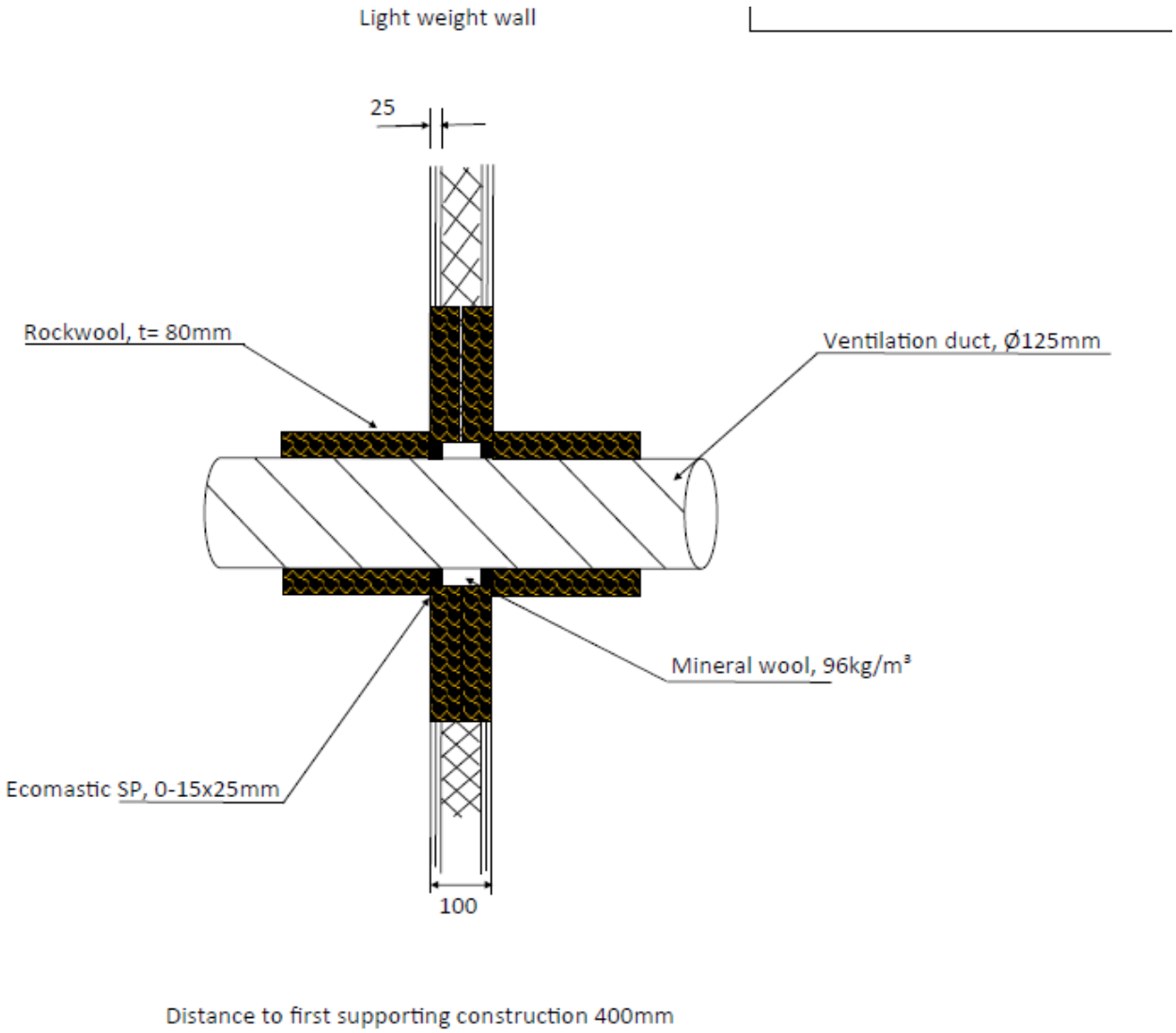

Figure 1.

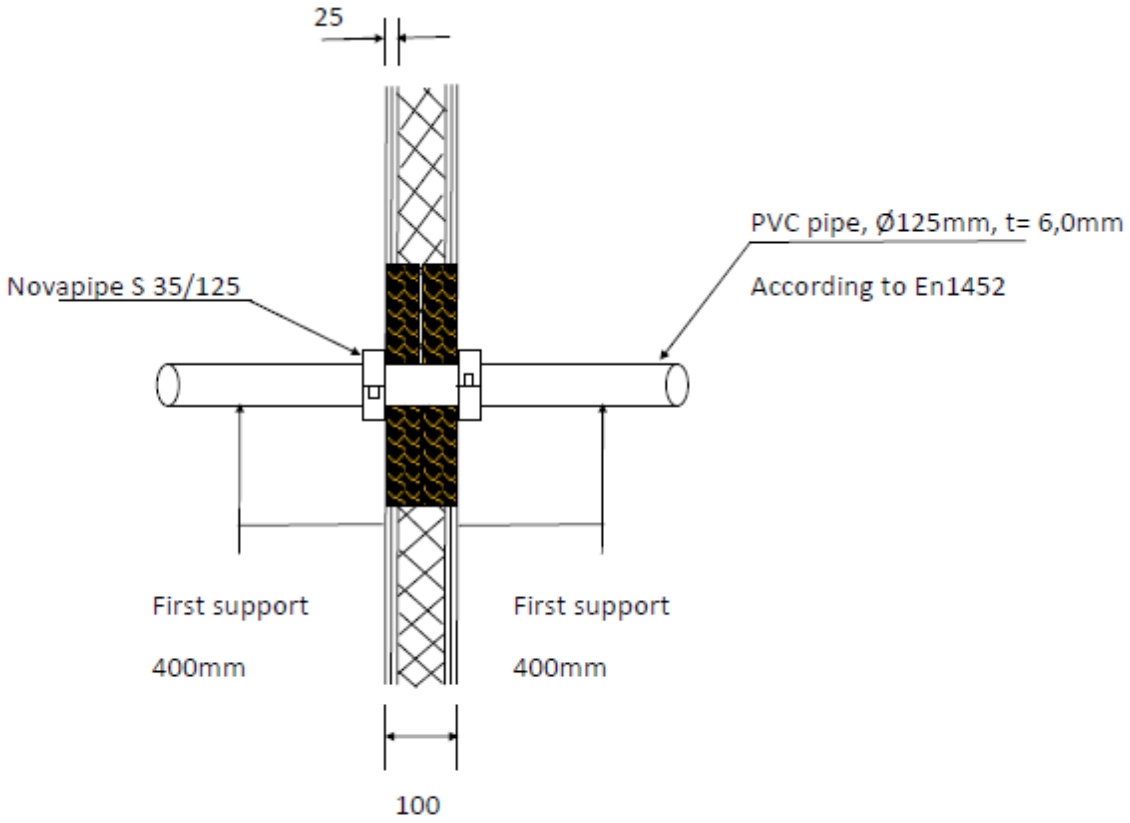
25
PVC pipe, Ø125mm, t= 6,0mm
According to En1452
Novapipe S 35/125
First support
400mm
First support
400mm
100

Figure 2.

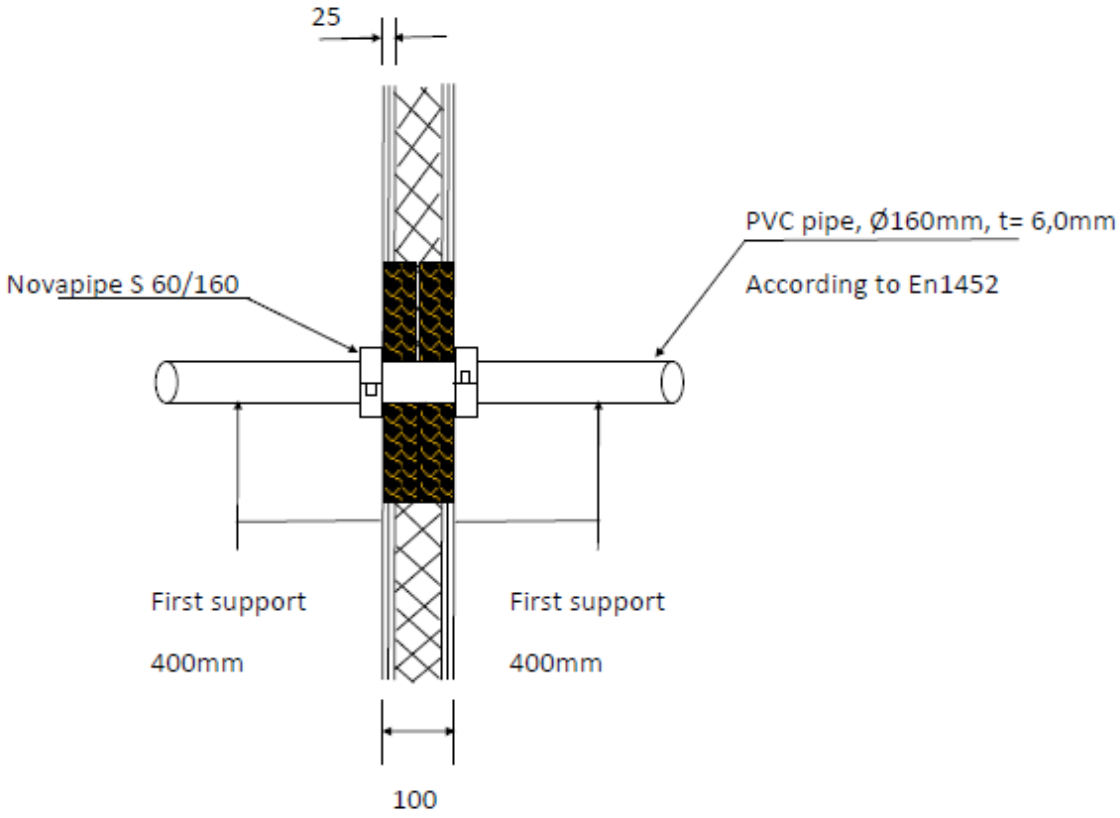
25
PVC pipe, Ø160mm, t= 6,0mm
According to En1452
Novapipe S 60/160
First support
400mm
First support
400mm
100

Figure 3.

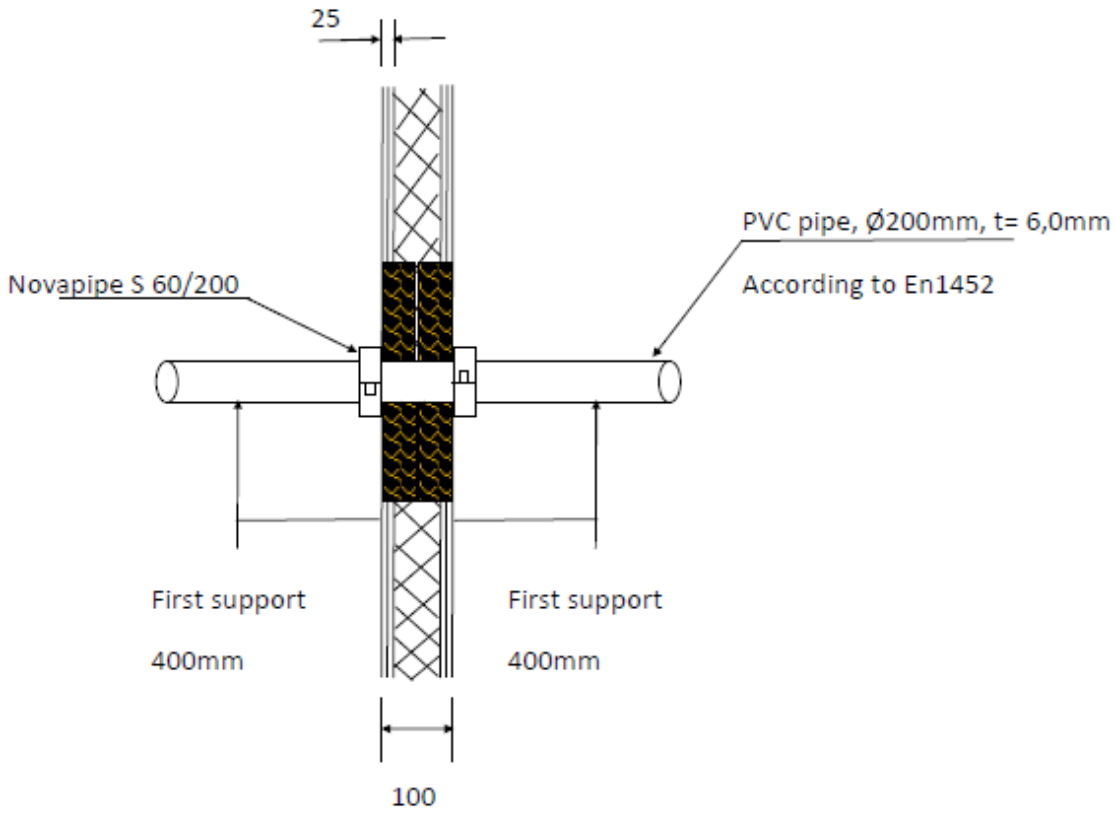
25
PVC pipe, Ø200mm, t= 6,0mm
According to En1452
Novapipe S 60/200
First support
400mm
First support
400mm
100

Figure 4.