



Certificates

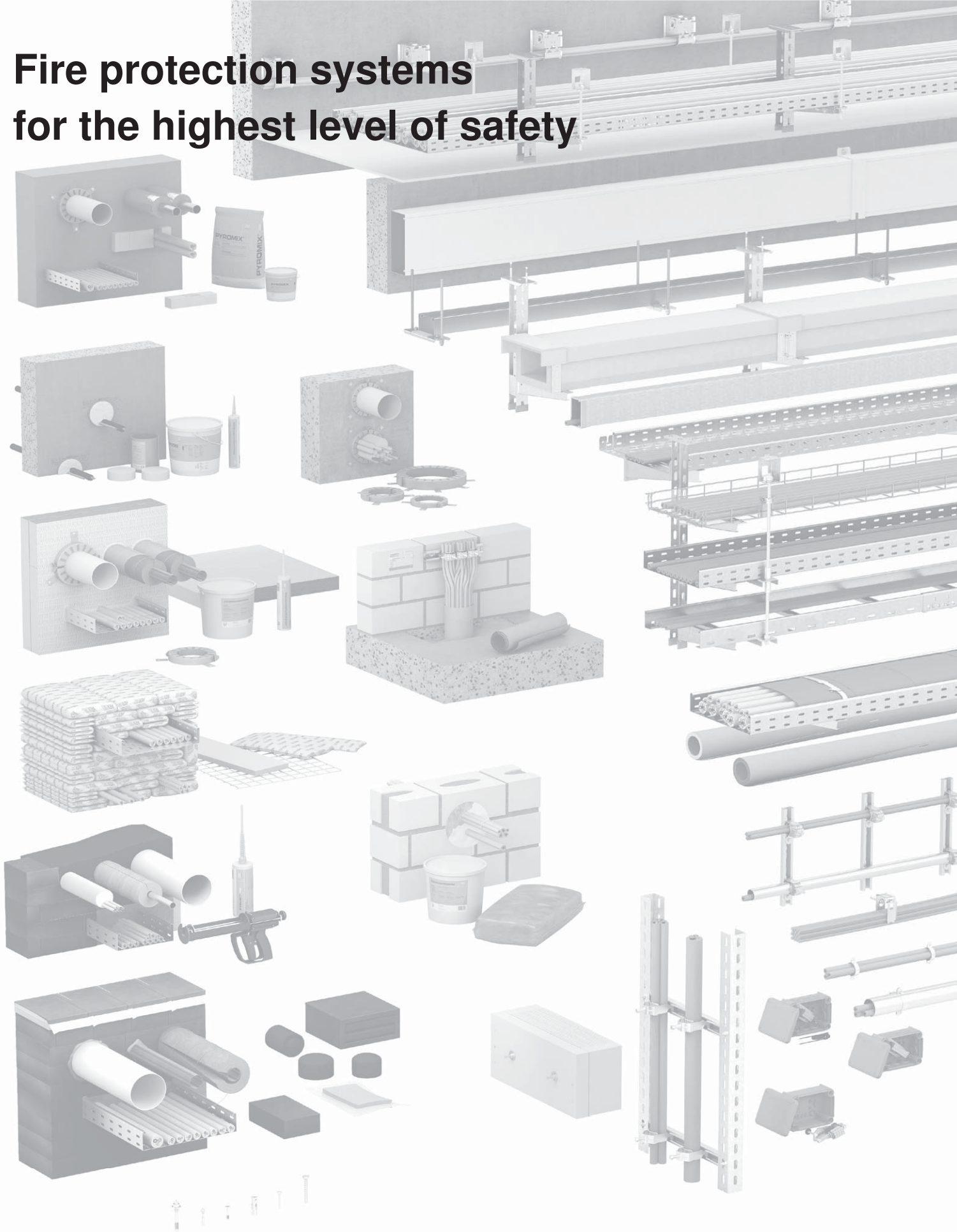


Fire protection ducts

PYROLINE® Con PLC

European Technical Assessment No. ETA-21/0755 issued 09-24-2021

Fire protection systems for the highest level of safety



Be it in a residential building or an industrial complex – OBO has the appropriate solution for fireproof electrical installations. Our tested and certified fire protection systems cover all the relevant fire protection guidelines and provide you with an electrical installation that really serves its purpose. We will be happy to provide you with more details – on our website or personally.



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Authorized and notified according
to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of 9
March 2011

MEMBER OF EOTA



European Technical Assessment ETA-21/0755 of 2021/09/24

General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the
construction product:

AESTUVER PLCS and PLCD cable ducts

Product family to which the
above construction product
belongs:

Fire resistant cable ducts/service ducts

Manufacturer:

James Hardie Europe GmbH
Bennigsen-Platz 1
DE-40474 Düsseldorf
Telephone: 0049 211 54236200
Internet: www.jameshardie.eu

Manufacturing plant:

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Ringstraße 20
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This European Technical
Assessment contains:

19 pages including 1 annex which form an integral part
of the document

This European Technical
Assessment is issued in
accordance with Regulation
(EU) No 305/2011, on the
basis of:

EAD 350142-00-1106 – Fire protective board, slab and
mat products and kits.

This version replaces:

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

The AESTUVER PLCS and PLCD cable ducts is a ready-to-install cable duct element that can be directly mounted on walls or ceiling/floors with a thickness of at least $d = 100$ mm and an apparent density ≥ 350 kg/m³. The cable duct consists of a prefabricated bottom section and a cover made from cement bonded, glass fibre-reinforced boards, according to ETA 11/0458, produced from a mixture of cement, lightweight mineral aggregates and water.

	PLCD EI30	PLCD EI45	PLCD EI60	PLCD EI90	PLCS EI60	PLCS EI90
Width [mm]	≤ 290	≤ 300	≤ 320	≤ 340	≤ 1250	≤ 1250
High [mm]	≤ 145	≤ 150	≤ 150	≤ 165	≤ 1000	≤ 1000
Length [mm]	≤ 1000	≤ 1000	≤ 1000	≤ 1000	≤ 1250	≤ 1250
Usable cross section [wxh] [mm ²]	≤ 260x105	≤ 260x105	≤ 260x105	≤ 260x105	≤ 1190x940	≤ 1150x900
Cable load [kg/m]	15,34	15,34	15,34	15,34	31,84	31,84
Classification	EI30 (ho i>o) E120 (ho i>o)	EI45 (ho i>o) E120 (ho i>o)	EI60 (ho i>o) E120 (ho i>o)	EI90 (ho i>o) E120 (ho i>o)	EI60 (ho i>o) E120 (ho i>o)	EI90 (ho i>o) E120 (ho i>o)

Table 1: Dimensions and cable load

Detailed specifications for identification and performance criteria relevant for fire safety with regard to the construction products are given in Annex A.

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

The AESTUVER PLCS and PLCD cable ducts may be used for interior and exterior applications as fire-protective cable ducts, and the intended use is the field of application to the use type 9 according to EAD 350142-00-1106.

PLCS-duct:

The AESTUVER duct covers are laid loosely on the duct troughs where, in the region of the two longitudinal edges at the sides of the duct cover, a 40 mm wide single- or double layer strip of varying thicknesses and made of an AESTUVER fire protective board (also known as a blank strip) is glued to every service duct using AESTUVER fire protection adhesive and is also fixed to the duct cover using steel staples (distance $a_u \approx 100$ mm apart from one another and approx. $50 \text{ mm} \leq a_R \leq 60$ mm from the respective front end of the duct cover).

A 100 mm wide strip of varying thicknesses and made of an AESTUVER fire protective board (also known as a cover strip) is arranged in the region of the butt joint between each PLCS trough and cover and is fastened to the service duct using a single row of staples. This circumferential joint cover of the butt joint is installed on the inside at the bottom and the outside of the lateral walls and cover. Here, one lateral cover strip and the inner one is fastened to the adjacent service duct pieces using staples. The two other cover strips, i.e., the other lateral one and the top one is fastened to only one of the adjacent service duct pieces. This measure allows to install the duct in corners without access to the backside.

The cables laid inside the service duct – distributed evenly across its width – are laid directly on the base and have limited cable weights – see table 1- or on additional cable carriers where the load bearing capacity of the used cable carrier product determines the maximum cable load.

PLCS service ducts have a maximum allowable span of 1250mm between supports and rest on c-rails with threaded rods or other suspension systems like e.g., support brackets.

PLCD-duct:

The AESTUVER PLCD duct comprises a single-layer AESTUVER duct trough and a double-layered AESTUVER duct cover.

The AESTUVER PLCD duct trough's duct base and the duct walls are connected to each other by using AESTUVER fire protection adhesive and additionally by steel screws or alternatively steel staples. Screw spacing is between 280-330mm, staple spacing is between 100-120mm. Distance from the respective front ends is 50-70mm.

The AESTUVER PLCD duct covers consist of a base plate and a single and centered strip fastened on the inside of the duct cover.

The inner strip running along the entire length of the base plate is fastened to the centre of the base plate by means of steel staples on both sides, spacing 220-230mm, distance to the respective ends 30-40mm.

The base of the AESTUVER PLCD duct is pressed against the ceiling, wall or floor and fastened to it by using at least 3 mm thick steel dividers (either OBO BSK-B1026 or other mechanically and design wise comparable product – for details see annex A10). Steel fasteners are inserted through pre-drilled holes in the dividers and hammered into the ceiling. The size of the steel fasteners is selected depending on the overall weight (duct weight plus cable loads) of the service duct.

The distance between the fasteners is in total $\leq 400\text{mm}$, the fasteners are set alternatingly both on the left and right side of the duct trough, distance sidewise $\leq 800\text{mm}$.

The butt joints of adjacent AESTUVER PLCD duct troughs are butt-jointed to one another. A 5 mm thick single side adhesive foam strip – material class B1 - which has been cut to size, is glued on one side of each AESTUVER PLCD duct trough and duct cover. Adjacent ducts are subsequently pressed firmly against each other. After the AESTUVER PLCD duct troughs have been fastened, the cables are laid into the dividers.

Finally, the 5 mm thick single sided adhesive foam strip – material class B1 - which has been cut to size, is glued on both sides laterally alongside the inner centered AESTUVER board strip of the duct cover.

The AESTUVER PLCD duct covers are then fastened to the lateral walls of the AESTUVER PLCD duct troughs using steel screws, spacing 220-230mm, distance to both ends of the duct cover 30-40mm.

Penetrations:

The remaining gap between the service duct and the wall, with a maximum width of 20 mm, is sealed with Rockwool (packing density approx. $120 \text{ kg/m}^3 \leq \rho \leq 140 \text{ kg/m}^3$, melting point $> 1000 \text{ }^\circ\text{C}$) and is also covered on both sides of the wall by a collar of AESTUVER fire protective boards that surrounds the service duct on four sides, is glued to the service duct with AESTUVER fire protection adhesive and is also joined to the service duct using a single row of staples. The collar is flush with the wall surface and is not joined to the wall in any additional way.

Cable penetrations:

Single cables max. dia. 21 mm.

Bundled cables max. dia. 45 mm.

Both types of cable penetrations must be beefed up by boards 80x80mm (single cable penetration) and 100x100mm (bundled penetration) and sealed. The sealing material must either be according to ETA 15/0556 or of same or better performance proven by an ETA. The drilling hole should comply with the dimensions shown in annex A3 and A11.

See Annex A3 and A11 for more information.

Fasteners and suspensions:

All fasteners which are fire exposed, if not otherwise assessed in this ETA e.g., by explicitly naming a product type, should be limited with regard to tensile stress.

Tensile stress of fasteners and suspensions up to EI60 should not exceed 9 N/mm^2 , for shear stresses 15 N/mm^2 should not be exceeded. For all fire exposures $> \text{EI60}$ tensile stresses should not exceed 6 N/mm^2 and shear stresses should not exceed 10 N/mm^2 .

The suspension devices for the service ducts PLCS must be made of steel and designed for its static use in cold state, where the maximum permitted distance of the suspending brackets is 1250 mm.

Detailed specifications for installation are given in Annex A.

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of at least 25 years, provided the cable ducts are subject to an appropriate use according to the provisions of this assessment.

The indications given on the working life cannot be interpreted as a guarantee given by the manufacturer but are to be regarded only as a means for choosing the right product in relation to the expected economically reasonable working life of the works.

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

Characteristic	Assessment of characteristic										
3.2 Safety in case of fire (BWR 2)											
Reaction to fire	The AESTUVER PLCS and PLCD cable ducts are classified as Euroclass A1 in accordance with EN 13501-1.										
Resistance to fire	See information in Annex A										
Durability and serviceability	Use conditions: Type X										
3.3 Hygiene, health and the environment (BWR 3)											
Content, emission and/or release of dangerous substances*	No dangerous substances										
3.4 Safety and accessibility in use (BWR 4)											
Pull through resistance of mechanical fasteners	No performance assessed										
Shear load resistance of mechanical fastening systems	No performance assessed										
Resistance to soft body impact	No performance assessed										
Resistance to hard body impact	No performance assessed										
Resistance to eccentric load	No performance assessed										
Adhesion	<table border="1"> <thead> <tr> <th>Thickness d</th> <th>Average tensile strength perpendicular to the plane of the board</th> </tr> <tr> <th>[mm]</th> <th>[MPa]</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>1,5</td> </tr> <tr> <td>20</td> <td>0,8</td> </tr> </tbody> </table>	Thickness d	Average tensile strength perpendicular to the plane of the board	[mm]	[MPa]	10	1,5	20	0,8		
Thickness d	Average tensile strength perpendicular to the plane of the board										
[mm]	[MPa]										
10	1,5										
20	0,8										
3.5 Protection against noise (BWR 5)											
Airborne sound insulation	No performance assessed										
Sound absorption	No performance assessed										
Impact sound insulation	No performance assessed										
3.6 Energy economy and heat retention (BWR 6)											
Thermal insulation	R: 0,090 m ² K/W (20 mm board)										
Moisture transfer	<table border="1"> <thead> <tr> <th>Thickness d</th> <th>Water vapour transmission resistance value</th> </tr> <tr> <th>[mm]</th> <th>[μ]</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>36</td> </tr> <tr> <td>15</td> <td>25</td> </tr> <tr> <td>20</td> <td>54</td> </tr> </tbody> </table>	Thickness d	Water vapour transmission resistance value	[mm]	[μ]	10	36	15	25	20	54
Thickness d	Water vapour transmission resistance value										
[mm]	[μ]										
10	36										
15	25										
20	54										

*In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g., transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

3.9 General aspects

The verification of durability is part of testing the essential characteristics. AESTUVER PLCS and PLCD cable ducts may be used in end-use applications according to the provisions for use category X (intended for all uses) without expecting significant changes of the characteristics relevant for fire protection. Products that meet the requirements for type X meet the requirement for all other types.

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

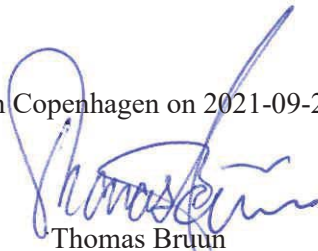
4.1 AVCP system

According to the decision 1999/454/EC of the European Commission, as amended by 2001/596/EC, the system(s) of assessment and verification of constancy of performance (see Annex III to Regulation (EU) No 305/2011) is 1.

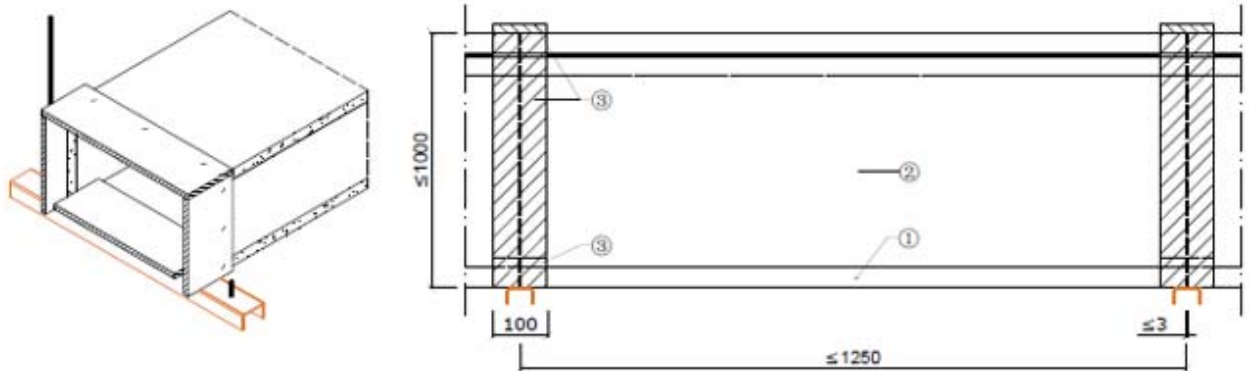
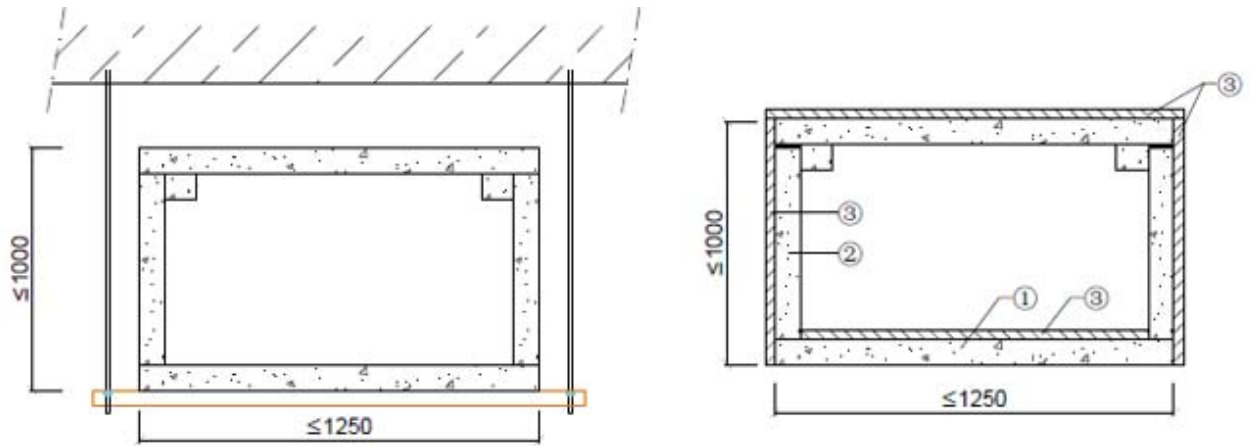
5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD.

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark.

Issued in Copenhagen on 2021-09-24 by

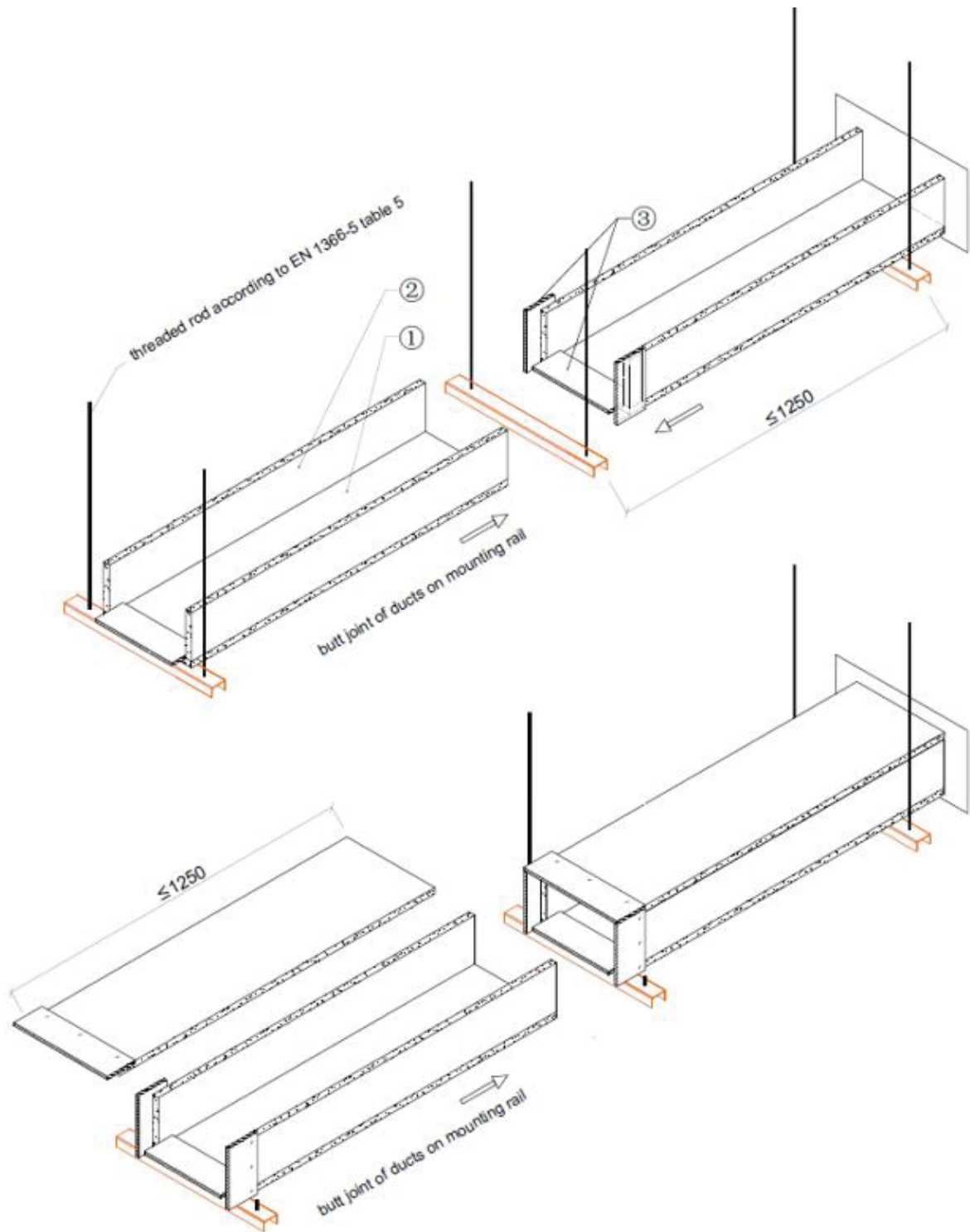


Thomas Bruun
Managing Director, ETA-Danmark



No.	Fire resistance class	Duct base ①	Duct wall ②	Staples used for ① / ②			Cover strips ③	Staples used for ③	
		Thickness d_b [mm]	Thickness d_w [mm]	Dimension [mm]	Distance a_x [mm]	Distance a_u [mm]	Thickness d_c [mm]	Dimension [mm]	Distance a_u [mm]
1	EI 60	30	30	60x11.25x1.53	50-60	90-110 (mean 100)	15	25x11.25x1.53	40-80 (mean 60)
2	EI 90	50	50	80x11.25x1.53			25	35x11.25x1.53	

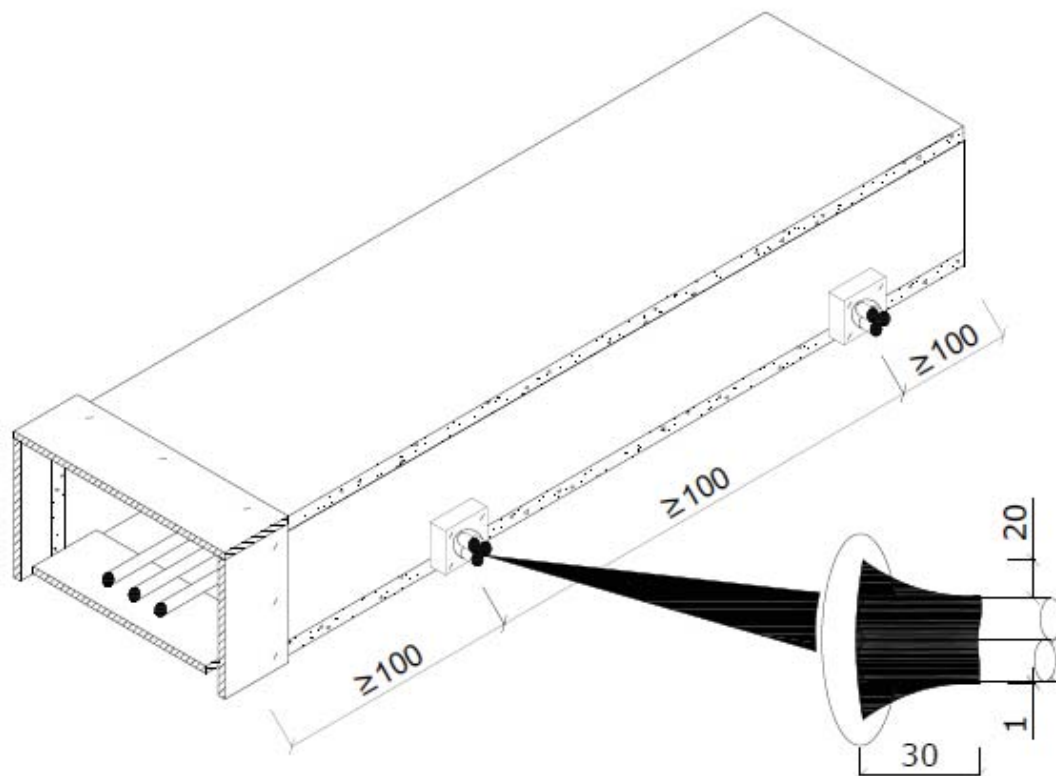
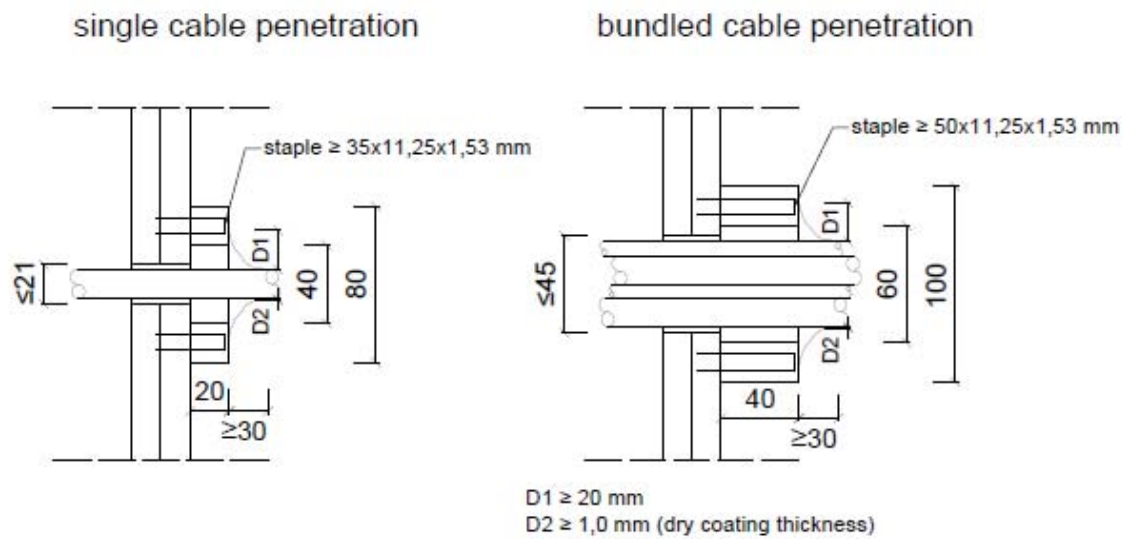
AESTUVER PLCS and PLCD cable ducts	Annex A1
4-sided installation ducts	



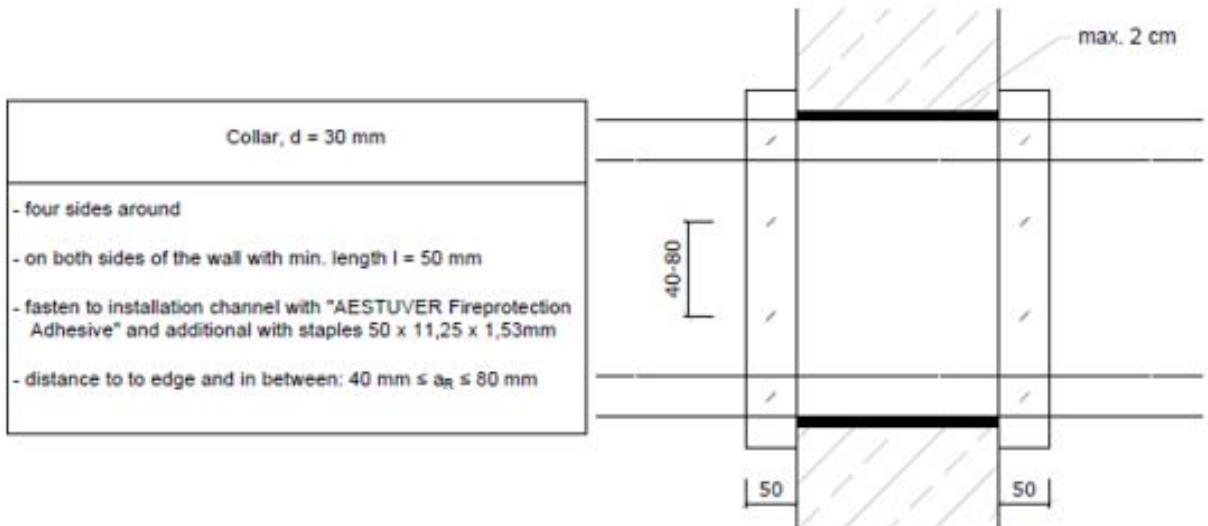
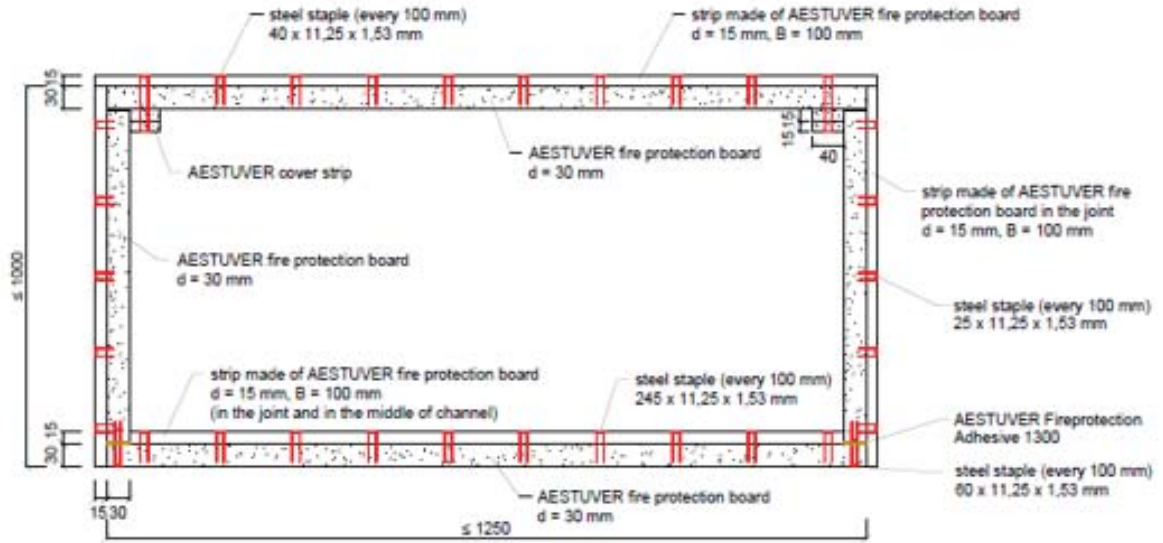
AESTUVER PLCS and PLCD cable ducts

4-sided installation ducts

Annex A2

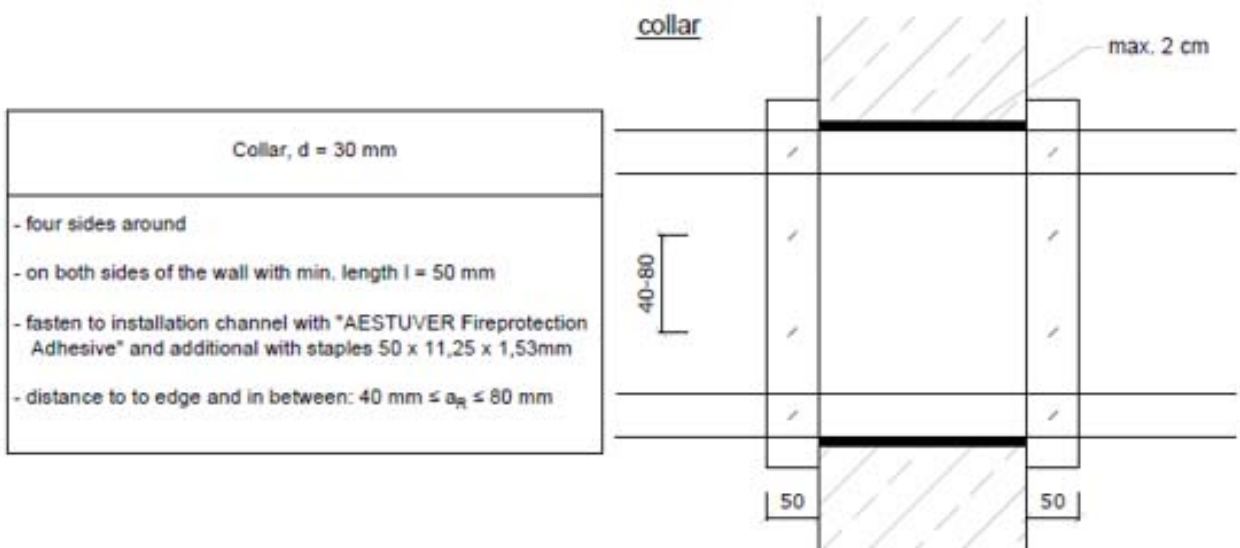
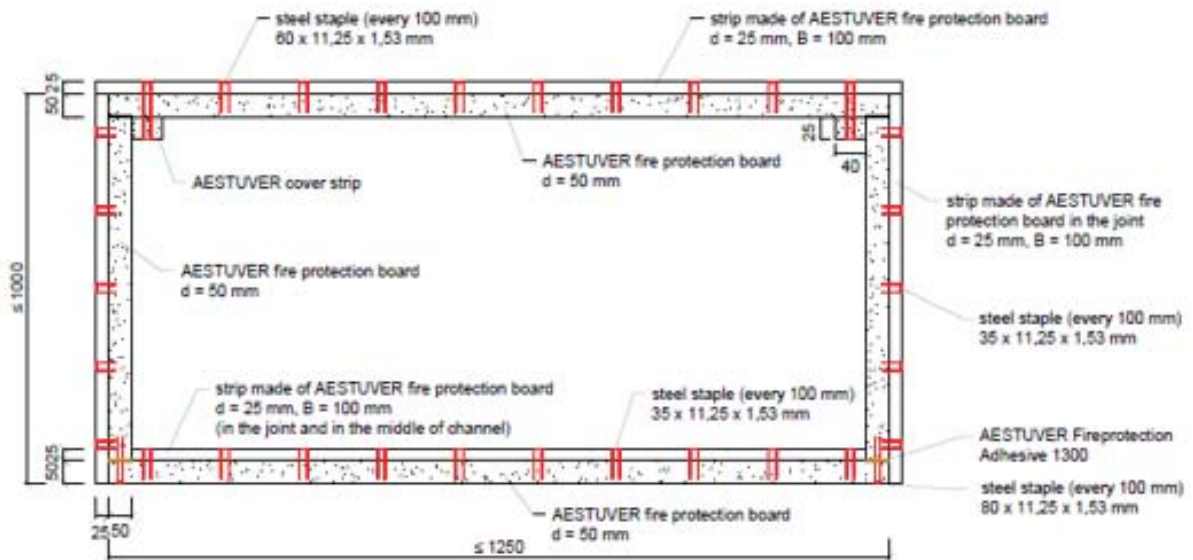


AESTUVER PLCS and PLCD cable ducts	
4-sided installation ducts	Annex A3



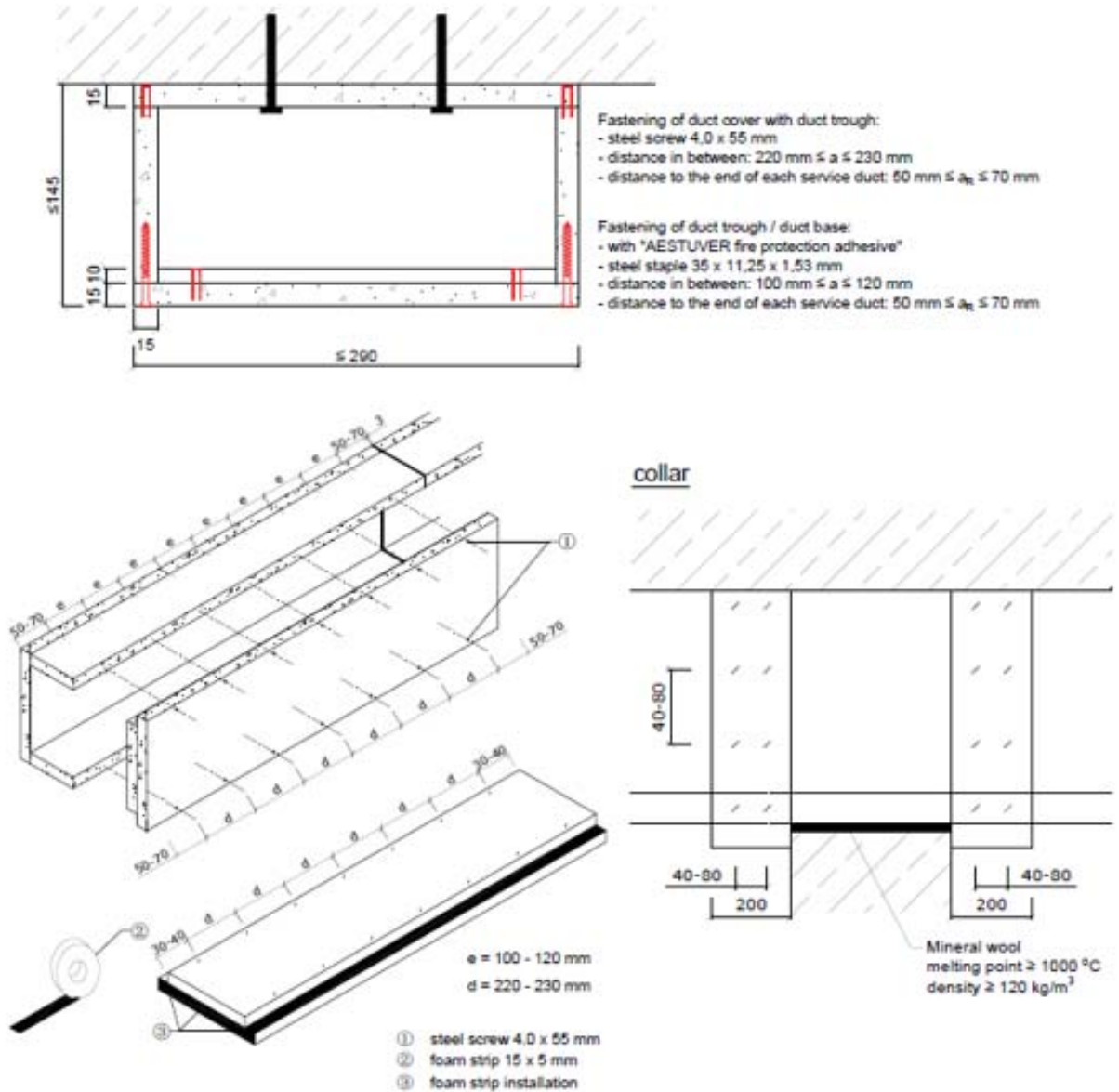
<u>additional constructive details:</u> duct through / duct base	cover strips in the area of lateral joint (butt joint)
<ul style="list-style-type: none"> - fastening in between in a distance of $a = 100$ mm (s.drawing) and additional with "AESTUVER Fireprotection Adhesive" - distance of staples to the end of each service duct: $50 \text{ mm} \leq a_R \leq 60 \text{ mm}$ 	<ul style="list-style-type: none"> - fastening in between in a distance of $a = 100$ mm (s.drawing) and additional with "AESTUVER Fireprotection Adhesive" - distance of staples to the duct wall, the duct cover and the duct base: $50 \text{ mm} \leq a_R \leq 60 \text{ mm}$

AESTUVER PLCS and PLCD cable ducts 4-sided installation ducts Structural design of AESTUVER – exclusive service duct AESTUVER - exclusive service duct of fire resistance class EI 60 (ho i→o) / E 120 (ho i→o)	Annex A4
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additional constructive details: duct through / duct base	cover strips in the area of lateral joint (butt joint)
<ul style="list-style-type: none"> - fastening in between in a distance of $a = 100$ mm (s.drawing) and additional with "AESTUVER Fireprotection Adhesive" - distance of staples to the end of each service duct: $50 \text{ mm} \leq a_{R1} \leq 60 \text{ mm}$ 	<ul style="list-style-type: none"> - fastening in between in a distance of $a = 100$ mm (s.drawing) and additional with "AESTUVER Fireprotection Adhesive" - distance of staples to the duct wall, the duct cover and the duct base: $50 \text{ mm} \leq a_{R1} \leq 60 \text{ mm}$

<p>AESTUVER PLCS and PLCD cable ducts</p> <p>4-sided installation ducts</p> <p>Structural design of AESTUVER – exclusive service duct</p> <p>AESTUVER - exclusive service duct of</p> <p>fire resistance class EI 90 (ho i→o) / E 120 (ho i→o)</p>	<p>Annex A5</p>
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Collar, d = 15 mm	duct cover fastening of base plate with cover strip
<ul style="list-style-type: none"> - three sides around - on both sides of the wall with min. length $l = 200 \text{ mm}$ - fasten to service duct with "AESTUVER Fireprotection Adhesive" and additional with staples 25 x 11,25 x 1,53mm - distance to to edge and in between: $40 \text{ mm} \leq a_R \leq 80 \text{ mm}$ 	<ul style="list-style-type: none"> - fastening in between with staples 18 x 11,25 x 1,53mm - distance of fastening in between $220 \text{ mm} \leq a \leq 230 \text{ mm}$ - distance of staples to the end of each service duct: $30 \text{ mm} \leq a_R \leq 40 \text{ mm}$

AESTUVER PLCS and PLCD cable ducts

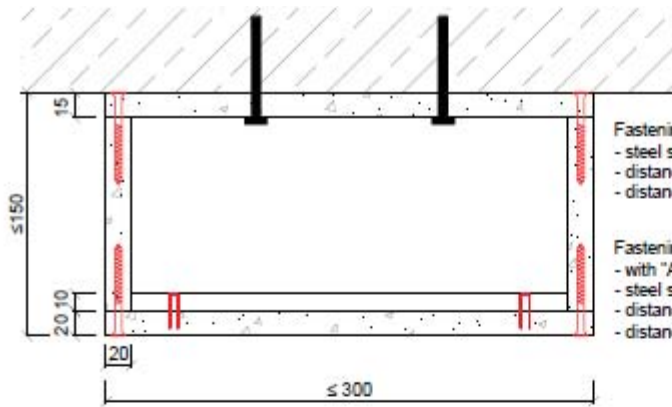
3-sided installation ducts

Structural design of AESTUVER - standard service duct

AESTUVER - standard service duct of fire resistance class:

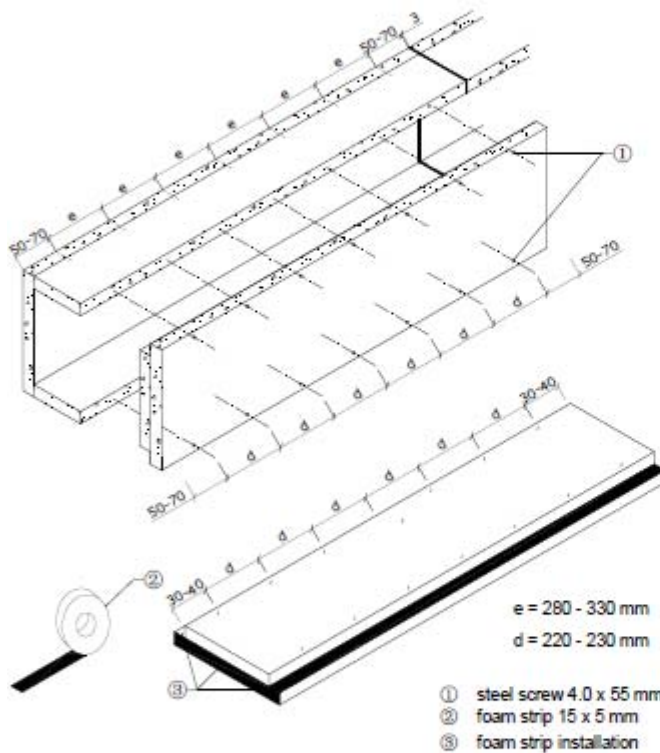
EI 30 (ho i→o) / **E 120** (ho i→o)

Annex A6



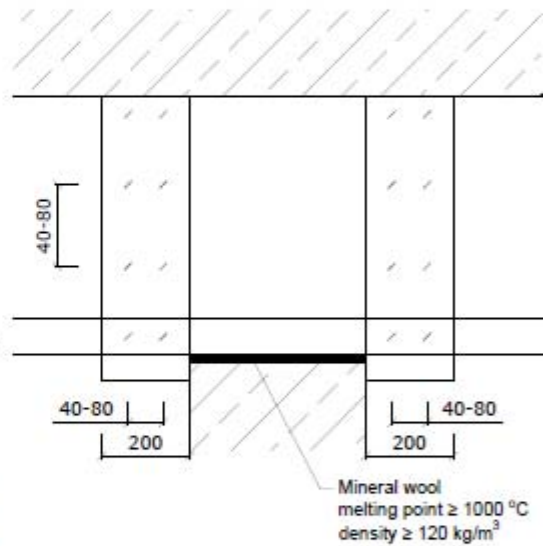
Fastening of duct cover with duct trough:
 - steel screw 4,0 x 55 mm
 - distance in between: $220 \text{ mm} \leq a \leq 230 \text{ mm}$
 - distance to the end of each service duct: $50 \text{ mm} \leq a_R \leq 70 \text{ mm}$

Fastening of duct trough / duct base:
 - with "AESTUVER fire protection adhesive"
 - steel screw 4,0 x 55 mm
 - distance in between: $280 \text{ mm} \leq a \leq 330 \text{ mm}$
 - distance to the end of each service duct: $50 \text{ mm} \leq a_R \leq 70 \text{ mm}$



- ① steel screw 4,0 x 55 mm
- ② foam strip 15 x 5 mm
- ③ foam strip installation

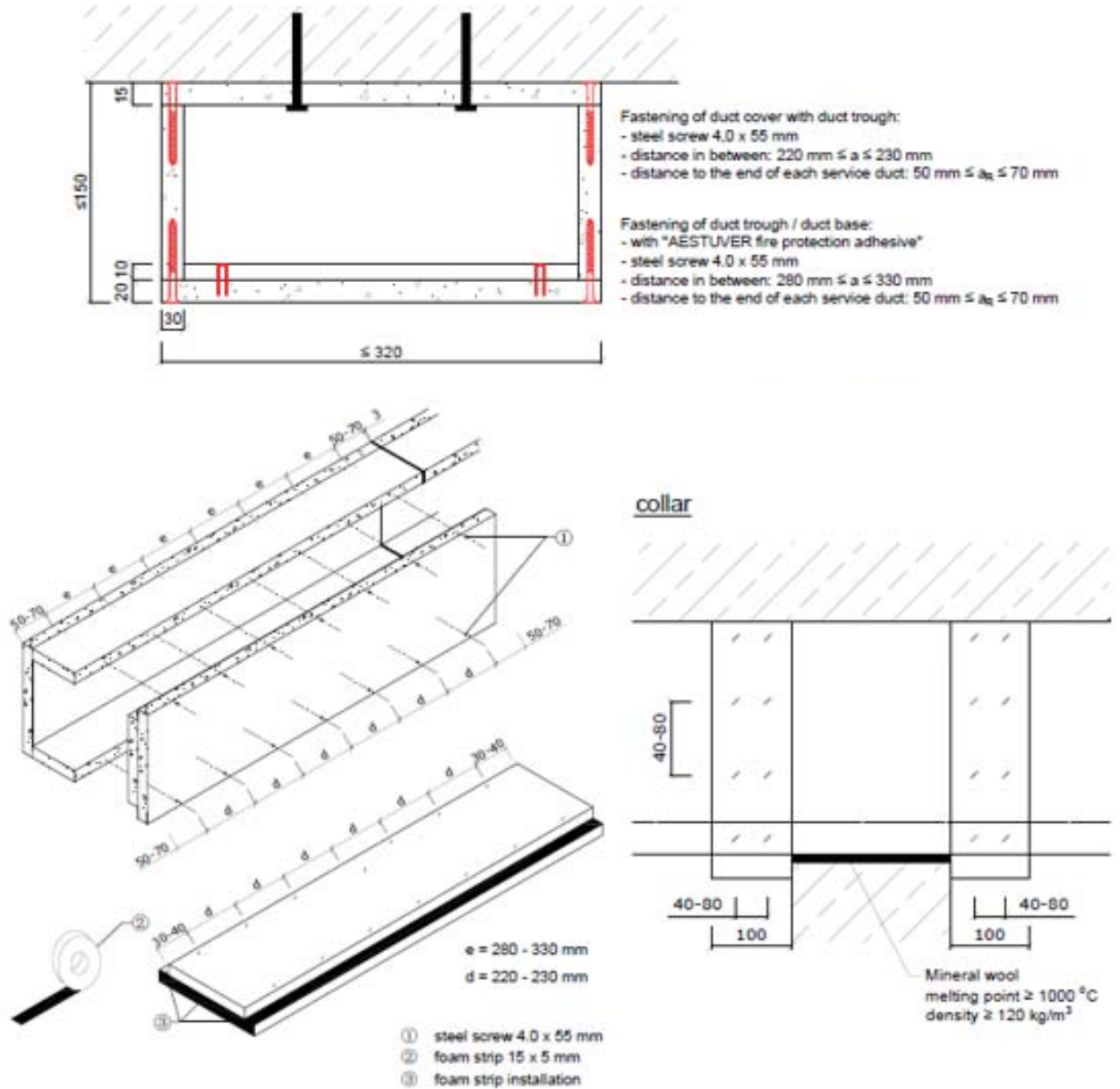
collar



Mineral wool
 melting point $\geq 1000 \text{ }^\circ\text{C}$
 density $\geq 120 \text{ kg/m}^3$

Collar, d = 20 mm	duct cover fastening of base plate with cover strip
- three sides around - on both sides of the wall with min. length $l = 200 \text{ mm}$ - fasten to service duct with "AESTUVER Fireprotection Adhesive" and additional with staples $35 \times 11,25 \times 1,53 \text{ mm}$ - distance to to edge and in between: $40 \text{ mm} \leq a_R \leq 80 \text{ mm}$	- fastening in between with steel screw 4.0 x 55 mm - distance of fastening in between $220 \text{ mm} \leq a \leq 230 \text{ mm}$ - distance of staples to the end of each service duct: $30 \text{ mm} \leq a_R \leq 40 \text{ mm}$

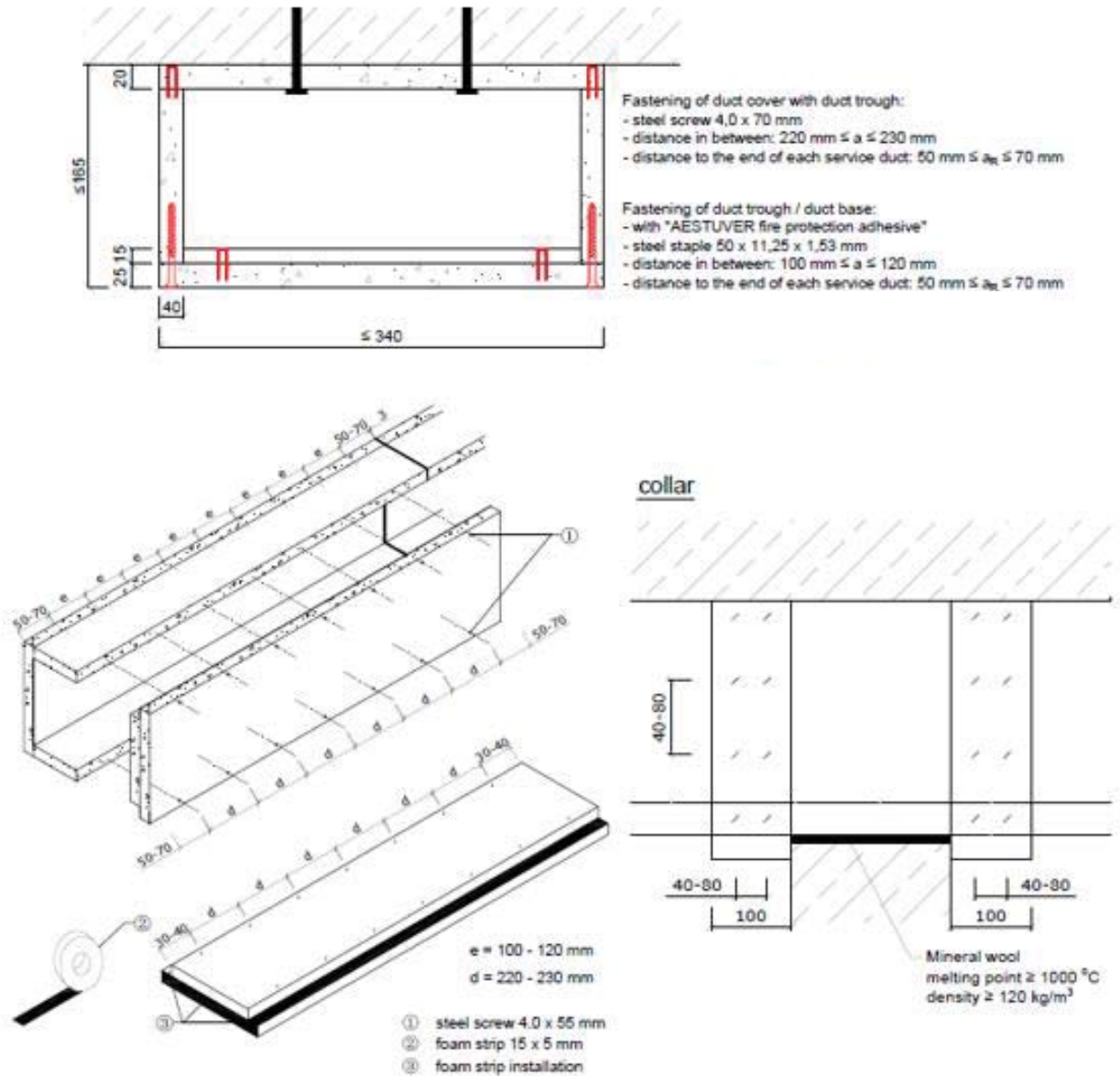
AESTUVER PLCS and PLCD cable ducts 3-sided installation ducts Structural design of AESTUVER - standard service duct AESTUVER - standard service duct of fire resistance class EI 45 (ho i→o) / E 120 (ho i→o)	Annex A7
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Collar, d = 30 mm	duct cover fastening of base plate with cover strip
<ul style="list-style-type: none"> - three sides around - on both sides of the wall with min. length $l = 100 \text{ mm}$ - fasten to service duct with "AESTUVER Fireprotection Adhesive" and additional with staples $35 \times 11,25 \times 1,53 \text{ mm}$ - distance to to edge and in between: $40 \text{ mm} \leq a_R \leq 80 \text{ mm}$ 	<ul style="list-style-type: none"> - fastening in between with steel screw 4,0 x 55 mm - distance of fastening in between $220 \text{ mm} \leq a \leq 230 \text{ mm}$ - distance of staples to the end of each service duct: $30 \text{ mm} \leq a_R \leq 40 \text{ mm}$

AESTUVER PLCS and PLCD cable ducts
 3-sided installation ducts
 Structural design of AESTUVER - standard service duct
 AESTUVER - standard service duct of fire resistance class
EI 60 (ho i→o) / **E 120** (ho i→o)

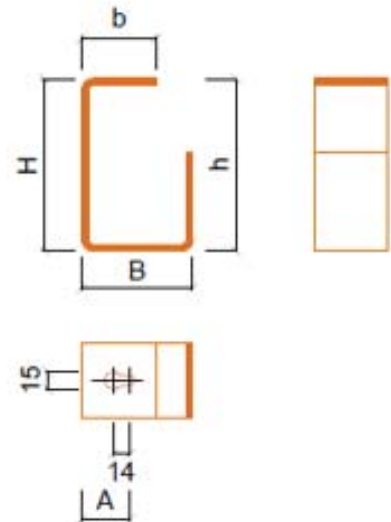
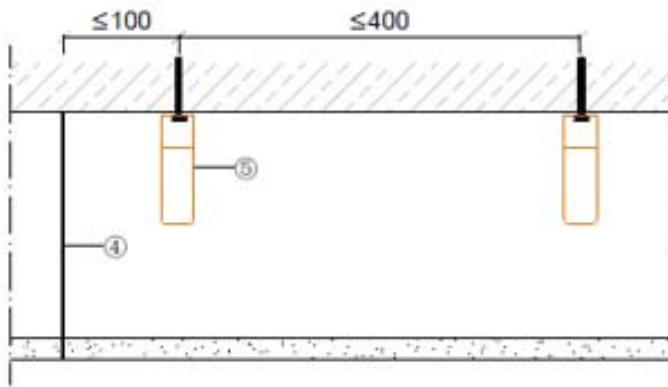
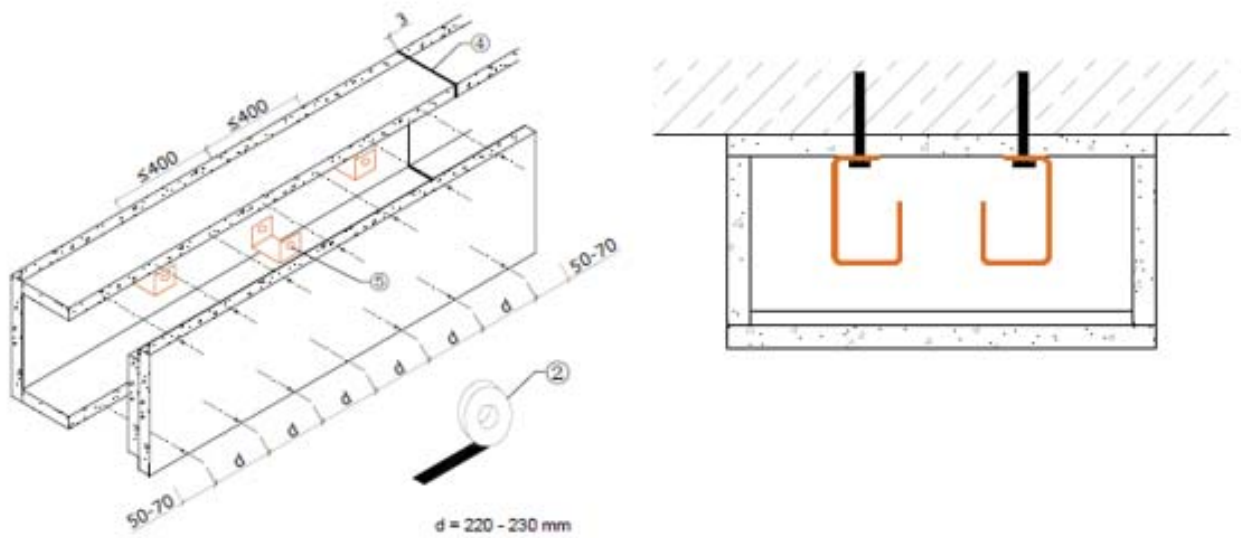
Annex A8



Collar, d = 40 mm	duct cover fastening of base plate with cover strip
<ul style="list-style-type: none"> - three sides around - on both sides of the wall with min. length $l = 100 \text{ mm}$ - fasten to service duct with "AESTUVER Fireprotection Adhesive" and additional with staples 50 x 11,25 x 1,53mm - distance to to edge and in between: $40 \text{ mm} \leq a_R \leq 80 \text{ mm}$ 	<ul style="list-style-type: none"> - fastening in between with staples 30 x 11,25 x 1,53mm - distance of fastening in between $220 \text{ mm} \leq a \leq 230 \text{ mm}$ - distance of staples to the end of each service duct: $30 \text{ mm} \leq a_R \leq 40 \text{ mm}$

AESTUVER PLCS and PLCD cable ducts
 3-sided installation ducts
 Structural design of AESTUVER - standard service duct
 AESTUVER - standard service duct of fire resistance class
EI 90 (ho i→o) / **E 120** (ho i→o)

Annex A9



- ② foam strip
- ④ foam strip material thickness 5 mm
- ⑤ fastener plus bracket for cables

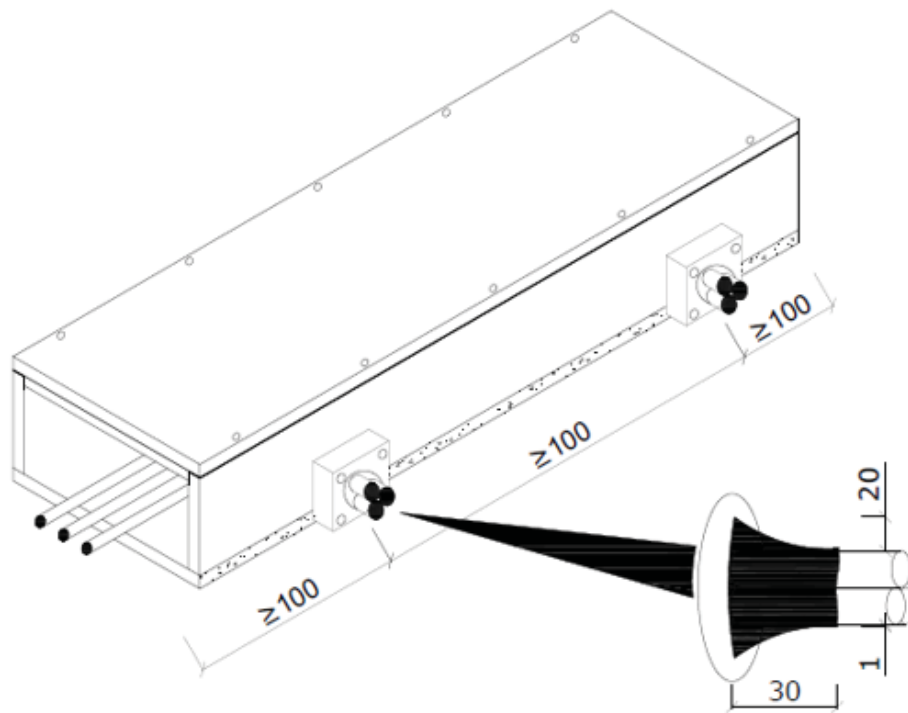
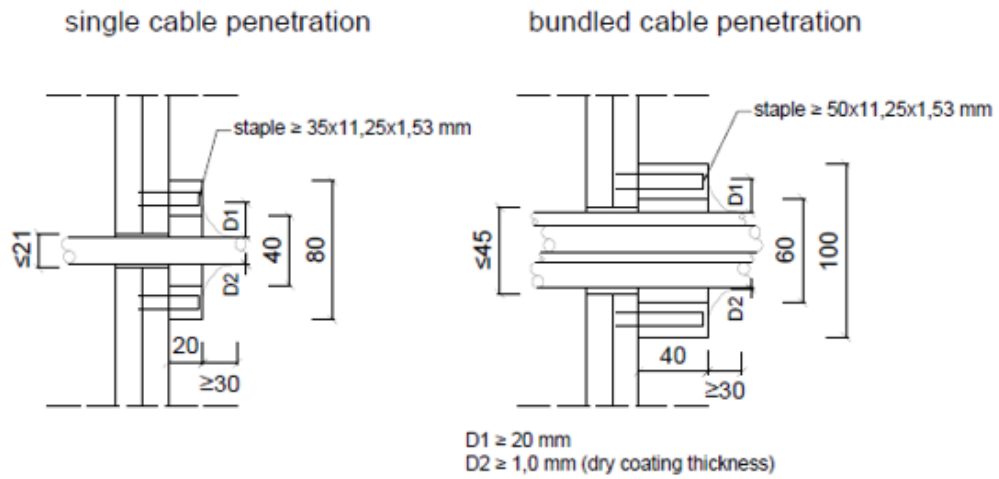
dividers, $t \geq 3$ mm, as installation assistance for floor mounting

Type	dimension H [mm]	dimension h [mm]	dimension B [mm]	dimension b [mm]	dimension A [mm]
BSK - B1026	≤ 101	≤ 69	≤ 130	≤ 75	≤ 65

AESTUVER PLCD cable ducts

3-sided installation ducts
Installation details

Annex A10

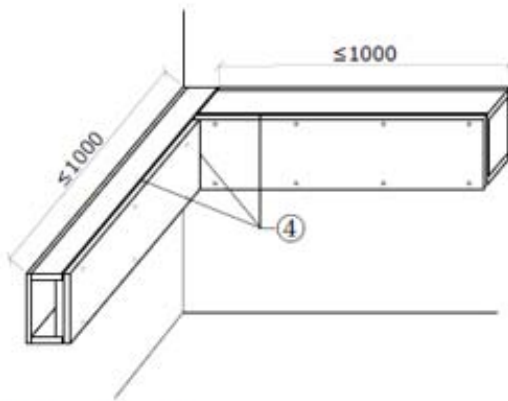


AESTUVER PLCS and PLCD cable ducts

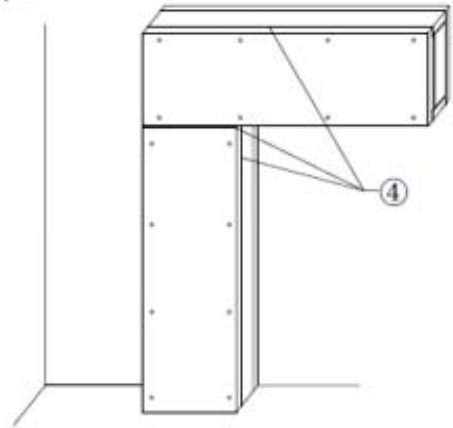
3-sided installation ducts
Cable penetration

Annex A11

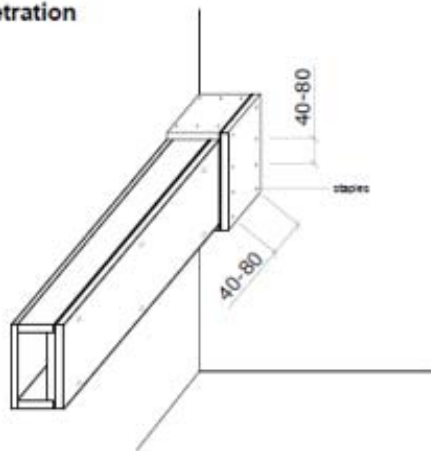
90° edge



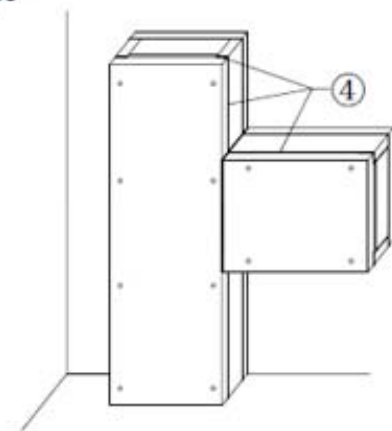
L-shape



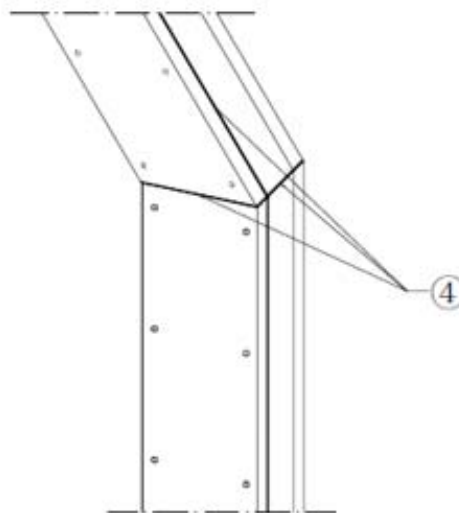
Wall penetration



T-shape



Mitred duct

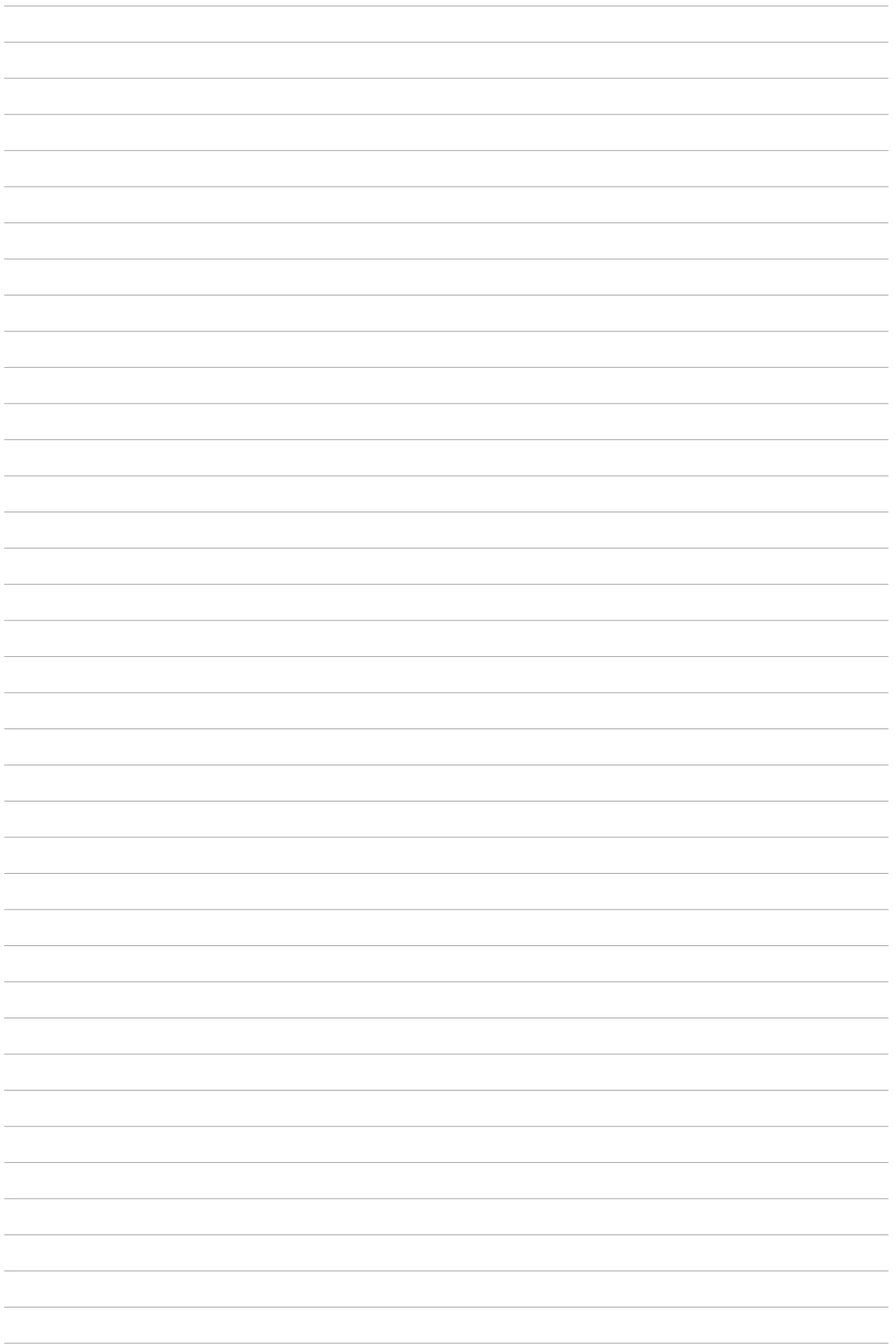


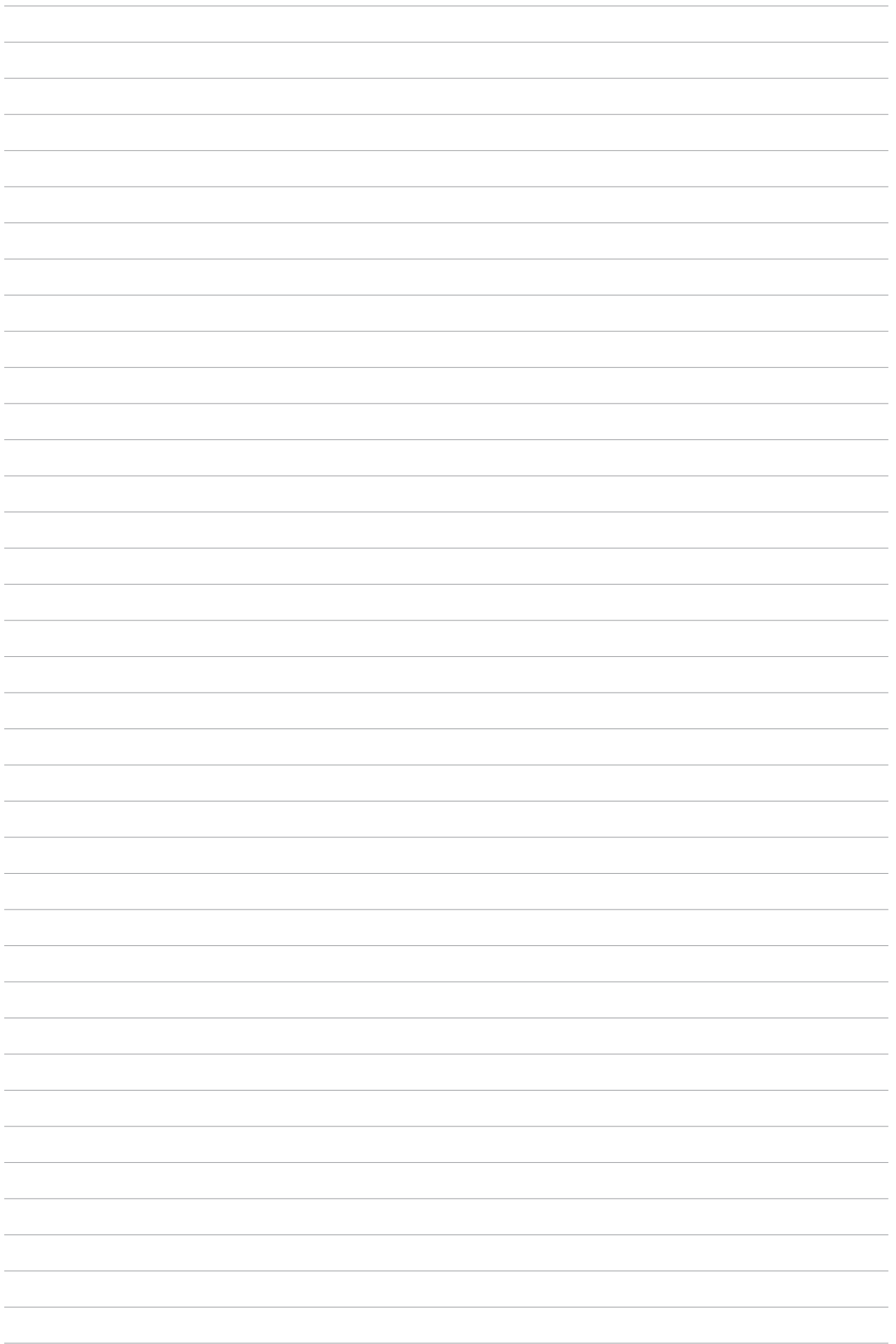
④ foam strip
material thickness 5 mm

AESTUVER PLCS and PLCD cable ducts

3-sided installation ducts
Cable penetration

Annex A12





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Building Connections

