

DE

# LEISTUNGSERKLÄRUNG

entsprechend Anhang III der Anordnung (EU) Nr. 305/2011 (Bauproduktengesetz)

## Hilti Brandschutzstopfen CFS-PL

No. Hilti CFS-PL

**1. Eindeutiger Kenncode des Produkttyps:**

Hilti Brandschutzstopfen CFS-PL

**2. Verwendungszweck:**

Kabelabschottungen siehe ETA-13/0125 (16.04.2018)

Kabeldurchführungen	Kabel, Kabelbündel, Leerrohre	<b>Sämtliche Anwendungen haben in Übereinstimmung mit dem Inhalt der ETA-13/0125 zu sein</b>
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**3. Hersteller:**

Hilti AG, Feldkircherstrasse 100, 9494 Schaan, Principality of Liechtenstein

**4. System oder Systeme zur Bewertung und Überprüfung der Leistungsbeständigkeit:**

System 1

**5. Europäisches Bewertungsdokument:**

EAD 350454-00-1104

**Europäische Technische Bewertung:**

ETA-13/0125 (16.04.2018)

**Technische Bewertungsstelle:**

Österreichisches Institut für Bautechnik

**Notifizierte Stelle:**

MPA Braunschweig, No. 0761

**6. Erklärte Leistung:**

Wesentliche Merkmale	Leistung/ Harmonisierte technische Spezifikation
Brandeigenschaften	Klasse E nach EN 13501-1
Feuerwiderstand	Feuerwiderstand (nach EN 13501-2) und Anwendungsgebiete. Siehe Anhang
Gefährliche Inhaltsstoffe	Siehe Anhang
Schallschutz	Geprüft nach EN ISO 140-3, EN ISO 717-1 und EN ISO 10140-10. Siehe Anhang
Wärmeschutztechnische Eigenschaften	Geprüft nach EN 12667. siehe Anhang
Elektrischer Widerstand	Geprüft nach DIN IEC 60093 (VDE 0303 Part 30):1993-12. siehe Anhang
Langzeitverhalten und Gebrauchstauglichkeit	Klasse Y <sub>1</sub> , in Übereinstimmung mit ETAG 026-2, EOTA Technischer Report - TR024.
Andere	Nicht anwendbar / Nicht bestimmt

Die Leistung des vorstehenden Produkts entspricht der erklärten Leistung/den erklärten Leistungen. Für die Erstellung der Leistungserklärung im Einklang mit der Verordnung (EU) Nr. 305/2011 ist allein der obengenannte Hersteller verantwortlich.

Unterzeichnet für den Hersteller und im Namen des Herstellers von:

Jessica Bello-Salguero  
Product Manager  
Business Unit Fire Protection  
Hilti Corporation

Martin Althof  
Head of Quality  
Business Unit Fire Protection  
Hilti Corporation

### 3.3.3 Dangerous substances

Hilti AG have presented a Material Safety Data Sheet according to Regulation 1907/2006/EC, article 31 and a declaration that Hilti Firestop Plug CFS-PL is in compliance with Regulation 1907/2006/EC concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

Confirmation has been declared that all dangerous chemical substances have been considered for the classification of the products according to the Regulation 1272/2008/EC (classification, labelling and packaging of substances and mixtures, including amendments).

In addition to the specific clauses relating to dangerous substances contained in this European technical approval, 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 Directive, these requirements need also to be complied with, when and where they apply.

### 3.5 Protection against noise (BWR 5)

#### 3.5.1 Airborne sound insulation

Test reports from noise reduction according to EN ISO 140-3 have been provided.

The acoustic tests were performed in a flexible wall, both sides attached by a double layer of 15,8 mm (5/8") gypsum board. The void between the plaster boards was filled with 100 mm mineral wool insulation.

Hilti firestop plug CFS-PL was tested as blank seal. The acoustic characteristic of the walls itself has been measured before an opening of  $\varnothing$  114,5 (4-1/2") with a metal sleeve of  $\varnothing$  114,5 mm inserted was made. The sleeve was sealed either on one side (single plug) or on both sides (double plug) with a plug. Sound reduction is determined for

Single plug:  $R_w (C; C_{tr}) = 54 (0; -6)$ .

Double plug:  $R_w (C; C_{tr}) = 54 (-1; -7)$ .

$R_w$ : weighted sound reduction index (given with spectrum adaptation terms C and  $C_{tr}$ )

#### 3.6.1 Thermal properties

Hilti firestop plug CFS-PL was tested according EN 12667.

Thermal conductivity  $\lambda = 0,089$  W/mK and thermal resistance  $R = 0,563$  m<sup>2</sup>K/W.

#### 3.8.2 Electrical resistivity

Electrical volume resistivity:  $2,17E+9 (\pm 0.5)\Omega\text{cm}$ ;

Electrical surface resistivity:  $49,6E+9 (\pm 10) \Omega$

#### A1.1 Abbreviations used in drawings

Abbreviation	Description	Abbreviation	Description
A, A1, A2,...	Firestop products	tA	Thickness of penetration seal
C, C1, C2,...	Penetrating services	tE	Thickness of the building element
E, E1, E2,...	Building elements (wall, floor)		
w	$\varnothing$ of penetration seal		
s1, s2, sn	Distances		

## ANNEX 3

### RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF HILTI FIRESTOP PLUG CFS-PL, HILTI FIRESTOP FILLER CFS-FIL AND HILTI FIRESTOP PUTTY BANDAGE CSF-P BA

#### a) A3.1 General Information

##### A3.1.1 Wall/floor constructions

#### b) Flexible wall:

The wall must have a minimum thickness of 100 mm and comprise of timber or steel studs lined on both faces with minimum 2 layers of 12,5 mm thick boards according EN 520 type F.

In steel stud construction the space between linings has not to be completely filled with insulation material, especially in the vicinity to the seal. Nevertheless the wall has to be set up according requirements.

For timber stud walls there must be a minimum distance of 100 mm of the seal to any stud and the cavity between stud and seal must be closed by a minimum of 100 mm insulation of Class A1 or A2 (in accordance with EN 13501-1).

#### c) Rigid wall:

The wall must have a minimum thickness of 100 mm and comprise of concrete, aerated concrete or masonry, with a minimum density of 600 kg/m<sup>3</sup>.

#### d) Rigid floor:

The floor must have a minimum thickness of 150 mm and comprise of aerated concrete or concrete with a minimum density of 600 kg/m<sup>3</sup>.

The walls / floors must be classified in accordance with EN 13501-2 for the required fire resistance period or fulfil the requirements of the relevant Eurocode. This ETA does not cover use of the product as a penetration seal in sandwich panel constructions.

### A3.1.2 Beading

The penetration seal depth is minimum 150 mm (figure 1a,  $t_A$ ) independent of the thickness of the wall or floor. In case of walls or floors with a thickness of less than 150 mm a beading has to be used.

Beading: square plates made of gypsum or Calcium Silicate board at a size of  $2 \times W_A$  (100 mm) plus  $W$  (figure 1c, diameter of plug), are installed around the opening at the necessary number of layers. Two frames of the same height on both sides of a wall (figure 1a) have to be built.

It was proofed that no aperture framing is necessary.

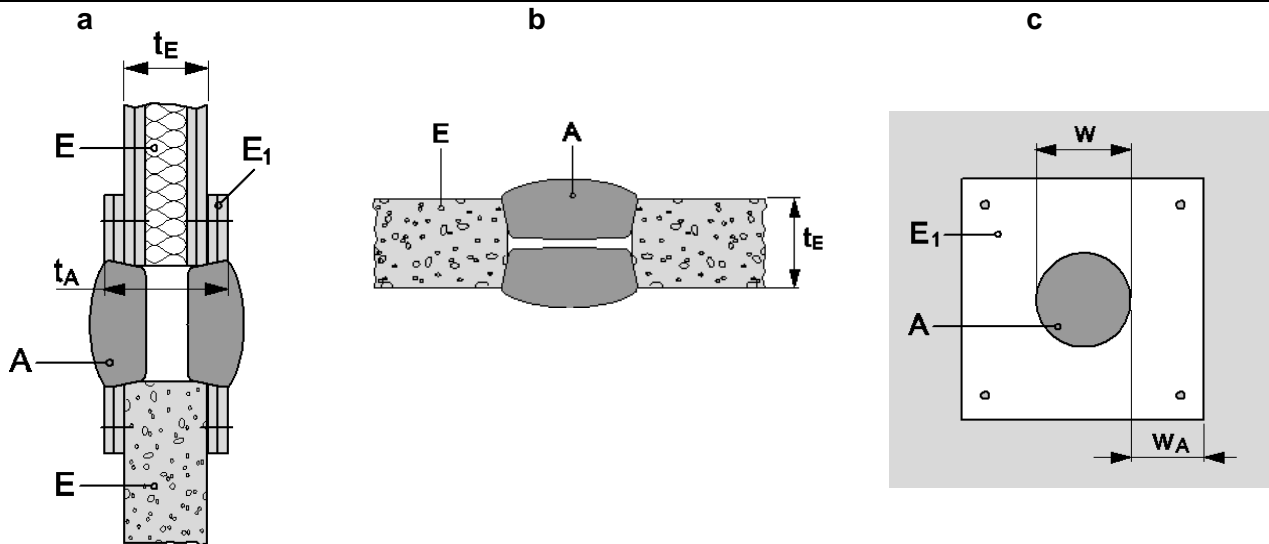


Figure 1: beading and position of the seal in walls / floors

A	Hilti firestop product
E	Building element (rigid or flexible wall construction, floor)
E1	Support frame
$t_A$	Thickness of the seal

$t_E$	Thickness of the building element
$w$	Ø of the seal
$W_A$	Width of the frame, 100 mm

### A3.1.3 Penetration seal types

#### A3.1.3.1 Penetration seal type: Filler

- Gaps between services and Hilti Firestop Plugs CFS-PL (A) are filled with Hilti Firestop Filler CFS-FIL (A<sub>1</sub>), depth 20 mm.

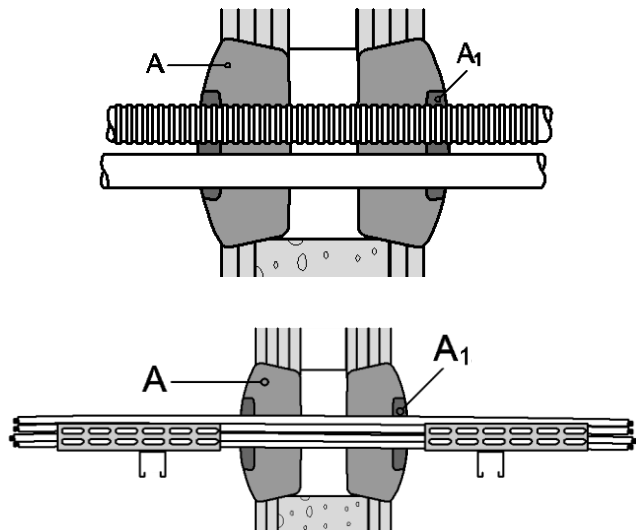


Figure 2: seal type A1

#### A3.1.3.2 Penetration seal type: Putty 2x

- Gaps between services and Hilti Firestop Plugs CFS-PL (A) are filled with Hilti Firestop Filler CFS-FIL (A<sub>1</sub>), depth 20 mm.
- Two layers of Hilti Firestop Putty Bandage CFS-P BA (A<sub>2</sub>) are wrapped around the services or group of services.

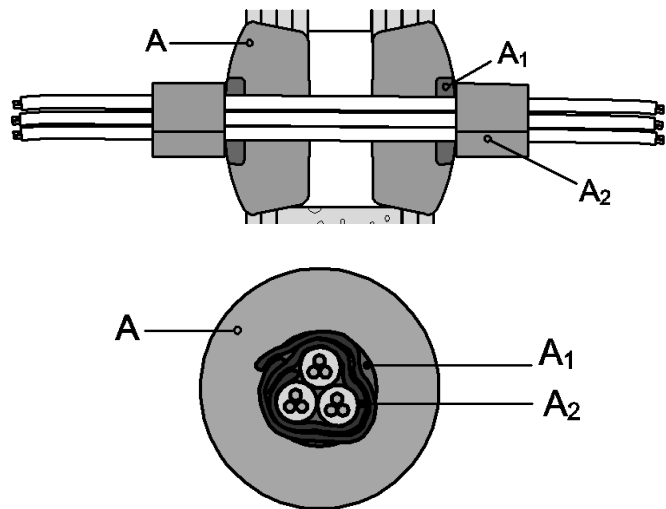


Figure 3: filler (A<sub>1</sub>) plus 2 layers of putty bandage (A<sub>2</sub>)

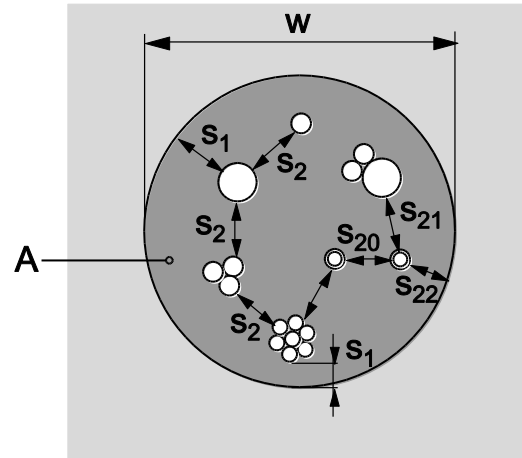
Hilti Firestop Putty Bandage CFS-P BA must be installed with the mesh outside/upside  
For floor applications, Hilti Firestop Putty Bandage CFS-P BA is required on the top side, only.

### A3.1.3.3 Distance Requirements

Distances valid for installations of services in wall and floor penetrations.

Minimum distances in mm (see illustration):

- $S_1 = 0$  (distance between cables and seal edge)
- $S_2 = 0$  (distance between cables)
- $S_{20,21,22} = 0$   $\varnothing \leq 16$  mm
- $S_{20} = 0$   $\varnothing > 16$  mm (distance between conduits to each other)
- $S_{21,22} = 20$   $\varnothing > 16$  mm (distance between conduits and other services or seal edges)



## A3.2 Flexible or rigid walls according to A3.1.1 - minimum wall thickness 100 mm

### A3.2.1 Blank seal (no services) \*

- Construction details (for symbols and abbreviations see figure 1 and Annex 4.1):
- Hilti firestop plugs CFS-PL (A) of seal thickness  $t_A \geq 150$  mm, centered regarding the thickness of the wall (E); beading (E1) according to 2.1.2.
- Hilti firestop plug can be installed in the round opening directly or alternatively in a fitted plastic sleeve (PVC, 2 mm wall thickness, 150 mm length, flush to wall). Last one can be also used according below mentioned cable sealing classifications.

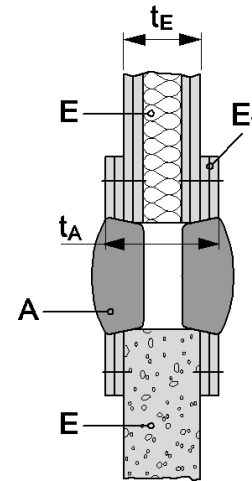


Figure 4: blank seal

### Classification

Seal size  $\varnothing$ : 52 to 250 mm

EI 120

\* If services are added later on in a blank seal only the services listed in the tables below may be added that fulfill the required classification.

### A3.2.2 Penetrating services

- Seal size  $\varnothing$ : 52 to 250 mm
- Hilti firestop plugs CFS-PL (A) of thickness  $t_A \geq 150$  mm,
- centered regarding the thickness of the wall (E);
- beading (E1) according to A3.1.2.

Maximum distance of 1st service support  $\leq 250$  mm (measured from the beading).

Abbreviation	Description
A, A <sub>1</sub> , A <sub>2</sub> ,...	Firestop products: A Plug A <sub>1</sub> Filler A <sub>2</sub> Putty bandage
C <sub>1</sub> , C <sub>2</sub> , C <sub>3</sub>	C <sub>1</sub> conduits C <sub>2</sub> single cables C <sub>3</sub> cable bundle
E, E <sub>1</sub> , E <sub>2</sub> ,...	Building elements
$t_E$	Thickness of the building element

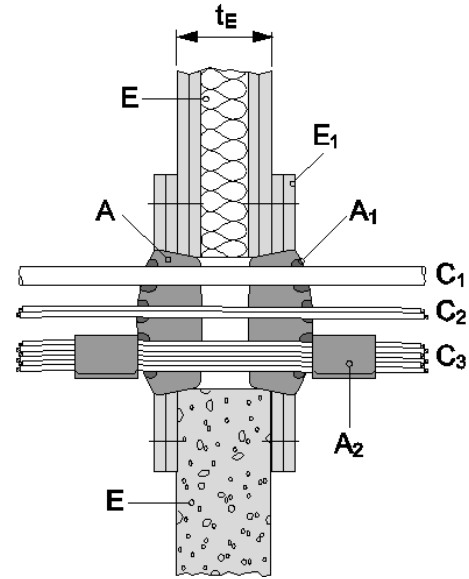


Figure 6: wall penetration

#### A3.2.2.a) Cables

##### Construction details

- Illustration figure 6
- Penetrating services C<sub>2</sub>, C<sub>3</sub>

Penetration seal type:

- Filler (A<sub>1</sub>, A3.1.3.1)
- Putty 2x (A<sub>2</sub>, A3.1.3.3)

All cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports)

Penetration Seal Type	Filler	Filler + Putty 2x
	Classification	
Sheathed cables:		
$\varnothing \leq 21$ mm	EI 120	-
Tied cable bundle $\leq \varnothing 100$ mm; $\varnothing$ single cable $\leq 21$ mm		
$21 < \varnothing \leq 50$ mm	EI 90	EI 120
$50 < \varnothing \leq 80$ mm	EI 90 / E 120	-
Non-sheathed cables (wires): $\varnothing \leq 24$ mm	EI 60 / E 120	-

A3.2.2.b) Small conduits and tubes			
Construction details			
<ul style="list-style-type: none"> <li>Illustration figure 6</li> <li>Services – C<sub>1</sub></li> </ul>		Penetration seal type: <ul style="list-style-type: none"> <li>Filler (A<sub>1</sub>, A3.1.3.1)</li> </ul>	
		<b>Penetration Seal Type</b>	<b>Filler</b>
		<b>Classification</b>	
Ø ≤ 16 mm, wall thickness ≥ 1 mm, arranged linear, with or without cables, with or without cable supports, minimum distance to each other = 0 mm			
Plastic conduits and tubes		EI 120 U/U	
Steel conduits and tubes		EI 120 C/U	
A3.2.2.c) Conduits			
Construction details			
<ul style="list-style-type: none"> <li>Illustration figure 6</li> <li>Services – C<sub>1</sub></li> </ul>		Penetration seal type: <ul style="list-style-type: none"> <li>Filler (A<sub>1</sub>, A3.1.3.1)</li> </ul>	
		<b>Filler</b>	
		<b>Classification</b>	
		<b>Diameter [mm]</b>	
		*PO	*PVC
Flexible conduits	with and without cable	16 - 40	16 - 32
Rigid conduits <ul style="list-style-type: none"> <li>Wall thickness:</li> <li>*PO: 1,55 to 2,30 mm</li> <li>*PVC: 1,90 to 2,80 mm</li> </ul>	with and without cable	16 - 40	16 - 40
Bundle of rigid or flexible conduits, single conduits: Ø ≤ 20 mm	with and without cable	≤ 100	
*PO: Polyolefin (PE, PP, PPE, PPO); *PVC: Polyvinylchloride			



### A3.3 Rigid floor according to A3.1.1, minimum floor thickness 150 mm

#### A3.3.1 Blank seal (no services) \*

- Hilti Firestop Plugs CFS-PL (A) of thickness  $t_A \geq 150$  mm, flush with the soffit of the floor (E);
- beading (E1) according to A3.1.2.

- Hilti firestop plugs CFS-PL (A) on each side.
- seal thickness  $t_A \geq 150$  mm .
- for abbreviations see A3.1.2 Figure 1
- W:  $\varnothing$  of penetration, seal size

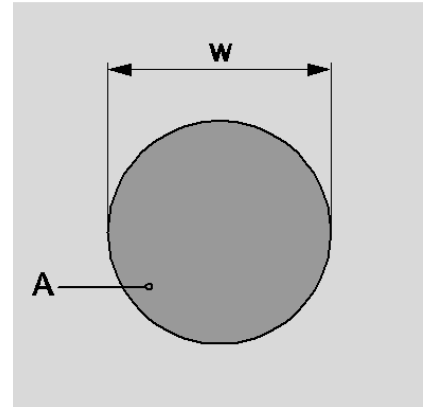


Figure 7: blank seal floor

#### Classification

Seal size  $\varnothing$ : 52 to 250 mm

EI 120

\* If services are added later on in a blank seal only the services listed in the tables below may be added that fulfill the required classification.

#### A3.3.2 Penetrating services

- Seal size:  $\varnothing$  52 to  $\varnothing$  250 mm

Abbreviation	Description
A, A <sub>1</sub> , A <sub>2</sub> ,...	Firestop products: A: Plug A <sub>1</sub> : Filler A <sub>2</sub> : Putty bandage
C <sub>1</sub> , C <sub>2</sub> , C <sub>3</sub>	C <sub>1</sub> conduits C <sub>2</sub> single cables C <sub>3</sub> cable bundle
E, E <sub>1</sub> , E <sub>2</sub> ,...	Building elements
t <sub>E</sub>	Thickness of the building element

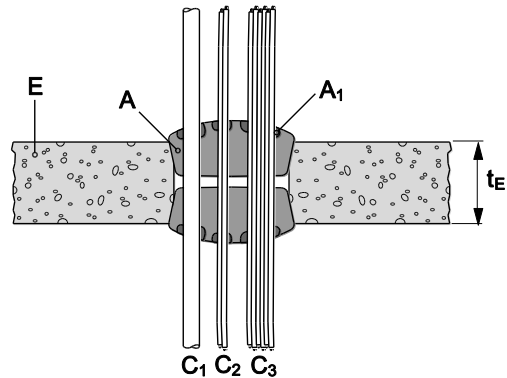


Figure 8: floor penetration

A3.3.2.a) Cables		
Construction details		
<ul style="list-style-type: none"> <li>• Illustration figure 8</li> <li>• Penetrating services C<sub>2</sub>, C<sub>3</sub></li> </ul>	Penetration seal type: Filler (A <sub>1</sub> , A3.1.3.1)	
All cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables, with or without cable supports)		
<b>Penetration Seal Type</b>	<b>Filler</b>	
Sheathed cables:	<b>Classification</b>	
∅ ≤ 21 mm	EI 120	
Tied cable bundle ≤ ∅ 100 mm; ∅ single cable ≤ 21 mm		
21 < ∅ ≤ 50 mm		
50 < ∅ ≤ 80 mm	E 120	
Non-sheathed cables (wires): ∅ ≤ 24 mm	EI 30 / E 120	
A3.3.2.b) Small conduits and tubes		
Construction details		
<ul style="list-style-type: none"> <li>• Illustration figure 8</li> <li>• Services – C<sub>1</sub></li> </ul>	Penetration seal type: <ul style="list-style-type: none"> <li>• Filler (A<sub>1</sub>, A3.1.3.1)</li> </ul>	
	<b>Penetration Seal Type</b>	<b>Filler</b>
		<b>Classification</b>
∅ ≤ 16 mm, wall thickness ≥ 1 mm, arranged linear, with or without cables, with or without cable supports, minimum distance to each other = 0 mm		
Plastic conduits and tubes		EI 120 U/U
Steel conduits and tubes		EI 120 C/U

A3.3.2.c) Conduits				
Construction details				
<ul style="list-style-type: none"> <li>• Illustration figure 8</li> <li>• Services – C<sub>1</sub></li> </ul>		Penetrations - seal type: <ul style="list-style-type: none"> <li>• Filler (A<sub>1</sub>, A3.1.3.1)</li> </ul>		
				<b>Filler</b>
		Diameter [mm]		<b>Classification</b>
		*PO	*PVC	EI 120 U/U
Flexible conduits	with and without cable	16 - 40	16 - 32	
Rigid conduits <ul style="list-style-type: none"> <li>• Wall thickness:</li> <li>*PO: 1,55 to 2,30 mm</li> <li>*PVC: 1,90 to 2,80 mm</li> </ul>	with and without cable	16 - 40	16 - 40	
Bundle of rigid or flexible conduits, single conduits: Ø ≤ 20 mm	with and without cable	≤ 100		
*PO: Polyolefin (PE, PP, PPE, PPO); *PVC: Polyvinylchloride				