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appointed according to Article 29 of Construction Products Regulation 2011 as amended by the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and the Construction Products (Amendment etc.) (EU Exit) Regulations 2020

UK Technical Assessment

0843-UKTA-22/0042
of 20/01/2023

Technical Assessment Body Issuing the UKTA:

UL International (UK) Ltd

Trade name of the construction product

Hilti Firestop Wrap CFS-W

Product family to which the construction product belongs

Fire Stopping and Fire Sealing Products - Penetration Seals

Manufacturer

Hilti Corporation
Feldkircherstrasse 100
9494 Schaan
LIECHTENSTEIN

Manufacturing plant(s)

HILTI production plant 4a
HILTI production plant 5a

This UK Technical Assessment contains

20 pages including Annexes A to C which form an integral part of this assessment.

This UK Technical Assessment* is issued, on the basis of

EAD 350454-00-1104, September 2017

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* in accordance with Construction Products Regulation 2011 as amended by the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and the Construction Products (Amendment etc.) (EU Exit) Regulations 2020

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SPECIFIC PARTS OF THE UK TECHNICAL ASSESSMENT

1

Technical description of the product

“Hilti Firestop Wrap CFS-W” is an intumescent wrap used as a penetration seal for plastic pipes.

Additional Components	Characteristics
Hilti Firestop Acrylic Sealant CFS-S ACR	Water-based acrylic dispersion, according to Annex B.2 of the UKTA
Mineral Wool	Backfilling material of Hilti Firestop Acrylic Sealant CFS-S ACR, according to Annex B.3 of the UKTA
Cementitious Mortar	Any cementitious mortar suitable for use with the intended type of rigid walls or floors may be used, according to Annex B.4 of the UKTA

“Hilti Firestop Wrap CFS-W” is available as endless wrap (“CFS-W EL”) on a roll with a thickness of 4.5 mm and a width of 45 mm, or as single wraps (“CFS-W SG”), pre-cut to a specific length and width, see table below:

Wrap Size	For pipes with nominal outside diameters (mm)	Thickness of wrap (mm)	Recommended aperture diameter (mm)
CFS-W SG 50/1.5”	50	4.5	67
CFS-W SG 63/2”	63	4.5	77
CFS-W SG 75/2.5”	75	4.5	92
CFS-W SG 90/3”	90	9.0	112
CFS-W SG 110/4”	110	9.0	132
CFS-W SG 125/5”	125	9.0	152
CFS-W SG 160/6”	160	13.5	202

2 Specification of the intended use(s) in accordance with the applicable UK Assessment Document (Pre-Exit European Assessment Document): EAD 350454-00-1104

2.1 Intended use

"Hilti Firestop Wrap CFS-W" is intended to be used as a pipe penetration seal around plastic pipes to temporarily or permanently reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of plastic pipes.

The maximum opening size of the penetration seal is related to a maximum pipe diameter of 160 mm with an annular gap of up to 9.5 mm. For more details regarding the maximum opening size, see Annex C of the UKTA.

"Hilti Firestop Wrap CFS-W" can be installed only in the types of separating elements as specified in the following table:

Separating element	Construction
Flexible walls	<ul style="list-style-type: none"> • Steel studs or timber studs lined on both faces with minimum 2 layers of boards (minimum thickness 12.5 mm) according to EN 520 type F • For steel stud walls the space between lining must not be completely filled with insulation material, especially in the adjacent area of the penetration seal • For timber studs walls there must be a minimum distance of 100 mm of the penetration seal to any timber stud. The cavity between the penetration seal and stud has to be closed with minimum of 100 mm of insulation with classification A1 or A2 according to EN 13501-1 • Minimum thickness 100 mm
Rigid walls	<ul style="list-style-type: none"> • Aerated concrete, concrete, masonry • Minimum density 650 kg/m³ (wall type A) • Minimum thickness dependent on specific application according to Annex C of the UKTA • The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period
Rigid walls	<ul style="list-style-type: none"> • Concrete, concrete, masonry • Minimum density 1100 kg/m³ (wall type B) • Minimum thickness dependent on specific application according to Annex C of the UKTA • The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period
Rigid floors	<ul style="list-style-type: none"> • Concrete • Minimum density 2400 kg/m³ (floor type A) or 550 kg/m³ (floor type B) • Minimum thickness dependent on specific application according to Annex C of the UKTA • The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period

This UK Technical Assessment does not cover sandwich panel constructions.

"Hilti Firestop Wrap CFS-W" can only be used as a penetration seal for single plastic pipes. Further details are given in Annex C of the UKTA. Other parts or service support constructions shall not penetrate the penetration seal.

The first support of the pipes shall be located at maximum 260 mm away from both faces of wall constructions and maximum 300 mm from the upper face of floor constructions, for details see Annex C of the UKTA.

2.2 Use condition

"Hilti Firestop Wrap CFS-W" is intended for use at temperatures below 0°C, but with no exposure to rain nor UV and can therefore - according to EAD 350454-00-1104 clause 2.2.9.3.1 - be categorized as Type Y₂. Since the requirements for Type Y₂ are met, also the requirements for Type Z₁ and Z₂ are fulfilled.

2.3 Working life

The provisions made in this UK Technical Assessment are based on an assumed working life of "Hilti Firestop Wrap CFS-W" of 10 years, provided the conditions laid down in the technical literature of the manufacturer relating to packaging, transport, storage, installation, use and repair are met.

The indications given on the intended working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

The real working life might be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for construction works.

2.4 General assumptions

2.4.1 It is assumed that

- > damages to the penetration seal are repaired accordingly,
- > the installation of the penetration seal does not effect the stability of the adjacent building element – even in case of fire,
- > the lintel or floor above the penetration seal is designed structurally and in terms of fire protection such that no additional mechanical load (other than its own weight) is imposed on the penetration seal,
- > the thermal movement in the pipe work will be accommodated in such way that it does not impose a load on the penetration seal,
- > the installations are fixed to the adjacent building element in accordance with the relevant regulations in such a way that, in case of fire, no additional mechanical load is imposed to the penetration seal,
- > the support of the installations is maintained for the required period of fire resistance and
- > pneumatic dispatch systems, compressed air systems, etc. are switched off by additional means in case of fire.

2.4.2 This UK Technical Assessment does not address any risks associated with the emission of dangerous liquids or gases caused by failure of the pipe(s) in case of fire nor does it prove the prevention of the transmission of fire through heat transfer via the medium in the pipes.

2.4.3 This UK Technical Assessment does not verify the prevention of destruction of adjacent building elements with fire separating function or of the pipes themselves due to distortion forces caused by extreme temperatures. These risks shall be accounted for by taking appropriate measures when designing or installing the pipe work.

The mounting or hanging of the pipes or the layout of the pipe work shall be implemented in such a way that the pipes and the fire resistant building elements shall remain functional within a period of time which corresponds to the fire resistance period required.

2.4.4 The risk of downward spread of fire caused by burning material which drips through a pipe to floors below, is not considered in this UK Technical Assessment (see EN 1366-3:2021, clause 1).

2.4.5 The durability assessment does not take account of the possible effect on the penetration seal of substances permeating through the pipe walls.

2.4.6 The assessment does not cover the avoidance of destruction of the penetration seal or of the adjacent building element(s) by forces caused by temperature changes in case of fire. This has to be considered when designing the piping system.

2.5 Manufacturing

The UK Technical Assessment is issued for the product on the basis of agreed data/information, deposited with UL International (UK) Ltd, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to UL International (UK) Ltd before the changes are introduced.

UL International (UK) Ltd will decide whether or not such changes affect the UK Technical Assessment and consequently the validity of the UKCA marking on the basis of the UK Technical Assessment and if so whether further Assessment or alterations to the UK Technical Assessment, shall be necessary.

3

Performance of the product and references to the methods used for its Assessment

Basic requirements for construction works	Essential characteristic	Method of verification	Performance
BWR 2	Reaction to fire	EN 13501-1	Clause 3.1.1 of the UKTA
	Resistance to fire	EN 13501-2	Clause 3.1.2 and Annex C.1 to C.3 of the UKTA
BWR 3	Air permeability (material property)	No performance assessed	
	Water permeability (material property)	No performance assessed	
	Content, emission and/or release of dangerous substances	Declaration of conformity from the manufacturer	
BWR 4	Mechanical resistance and stability	No performance assessed	
	Resistance to impact / movement	No performance assessed	
	Adhesion	No performance assessed	
	Durability	EAD 350454-00-1104 clause 2.2.9	Clause 3.3.4 of the UKTA
BWR 5	Airborne sound insulation	No performance assessed	
BWR 6	Thermal properties	No performance assessed	
	Water vapour permeability	No performance assessed	

3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire

“Hilti Firestop Wrap CFS-W” was assessed according to EAD 350454-00-1104, clause 2.2.1 and classified according to EN 13501-1:2007+A1:2009.

Component	Class according to EN 13501-1:2007+A1:2009
Hilti Firestop Wrap CFS-W	E

3.1.2 Resistance to fire

“Hilti Firestop Wrap CFS-W” was tested according to EAD 350454-00-1104 clause 2.2.2, EN 1363-1 and EN 1366-3: 2009.

Based upon the gained test results and the field of application specified within EN 1363-1 and EN 1366-3:2009 the penetration seal "Hilti Firestop Wrap CFS-W" has been classified according to EN 13501-2:2007+A1:2009. The individual fire resistance classes are listed in Annex C.1 to C.3 of the UKTA.

The maximum fire resistance class of the penetration seal in vertical or horizontal separating element depends on the fire resistance class of the penetrating elements. The fire resistance class of the penetration seal is reduced to the fire resistance class of the penetrating element with the lowest fire resistance classification.

The classifications are not valid for sandwich panel constructions.

3.2 Hygiene, health and the environment (BWR 3)

3.2.1 Air permeability

No performance assessed

3.2.2 Water permeability

No performance assessed

3.2.3 Content, emission and/or release of dangerous substances

The manufacturer has provided a declaration on the content, emission and/or release of dangerous substances in relation to their products with the title "Statement on Product Regulatory Compliance: Version 1.1 October 2022).

In addition to the specific clauses relating to dangerous substances contained in this UK Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed UK 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.

3.3 Safety and accessibility in use (BWR 4)

3.3.1 Mechanical resistance and stability

No performance assessed

3.3.2 Resistance to impact / movement

No performance assessed

3.3.3 Adhesion

No performance assessed

3.3.4 Durability

"Hilti Firestop Wrap CFS-W" fulfils the requirements for the intended use condition.

"Hilti Firestop Wrap CFS-W" is therefore appropriate for use at temperatures below 0°C, but with no exposure to rain nor UV and can – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorised as Type Y₂. Since the requirements for Type Y₂ are met, also the requirements for Type Z₁ and Z₂ are fulfilled.

3.4 Protection against noise (BWR 5)

3.4.1 Airborne sound insulation

No performance assessed.

3.5 Energy economy and heat retention (BWR 6)

3.5.1 Thermal properties

No performance assessed.

3.5.2 Water vapour permeability

No performance assessed.

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

According to the Statutory Instrument 2019 No. 465 – made 5th March 2019 and cited as the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and coming into force on exit day and Statutory Instrument 2020 No. 1359 – made 26th November 2020 and cited as the Construction Products (Amendment etc.) (EU Exit) Regulations 2020 and coming into force immediately before the 2019 Regulations come into force, on the procedure for attesting the conformity of construction products as regards fire stopping, fire sealing and fire protective products, published as ‘Pre-Exit’ European Assessment Documents, (see <https://www.gov.uk/guidance/pre-exit-european-assessment-documents-construction-products>), the system of assessment and verification of constancy of performance (see Annex V to Construction Products Regulation 2011 as amended by the Construction Products (Amendment etc.) (EU Exit) Regulations 2019 and the Construction Products (Amendment etc.) (EU Exit) Regulations 2020) given in the following table(s) apply.

Product(s)	Intended use(s)	Level(s) or class(es)	System
Fire Stopping and Fire Sealing Products	For fire compartmentation and/or fire protection or fire performance	any	1

5 Technical details necessary for the implementation of the AVCP system, as provided for the applicable European Assessment Document

Tasks of the manufacturer:
Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this UK Technical Assessment.

The manufacturer may only use initial / raw / constituent materials stated in the technical documentation of this UK Technical Assessment.

The factory production control shall be in accordance with the Control Plan of 12/09/2019 relating to the UK Technical Assessment 0843-UKTA-22/0042 issued on 20/01/2023 which is part of the technical documentation of this UK technical Assessment. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at UL International (UK) Ltd.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Other tasks of the manufacturer
Additional information

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information:

(a) Technical data sheet:

- Field of application:
- Building elements for which the penetration seal is suitable, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions – the construction requirements.
- Limits in size, minimum thickness etc. of the penetration seal
- Construction of the penetration seal including the necessary components and additional products (e.g. backfilling material) with clear indication whether they are generic or specific.
- Services which the penetration seal is suitable, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. pipe trays)

(b) Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting
- Stipulations on maintenance, repair and replacement

Issued on: 20th January 2023

Report by:



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For and on behalf of UL International (UK) Ltd.

Reviewed by:



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ANNEX A: LIST OF ABBREVIATIONS

A.1 Abbreviations used in drawings

Abbreviation	Description
A ₁	Hilti Firestop Wrap CFS-W
A ₂	Annular gap seal with Hilti Firestop Acrylic Sealant CFS-S ACR
A ₃	Annular gap seal with cementitious mortar
B	Backfilling material (mineral wool)
C	Plastic Pipe
d _c	Pipe diameter (nominal outside diameter)
E	Building element (wall, floor)
S ₁	Minimum distance between single penetration seals
t _{A2}	Thickness of Hilti Firestop Acrylic Sealant CFS-S ACR
t _c	Pipe wall thickness
t _E	Thickness of the building element

ANNEX B: DESCRIPTION OF PRODUCT(S) & PRODUCT LITERATURE

B.1 Hilti Firestop Wrap CFS-W

The Control Plan is defined in document "Control Plan" relating to the UK Technical Assessment UKTA-22/0042, which is a non-public part of this UKTA.

B.2 Hilti Firestop Acrylic Sealant CFS-S ACR

See UKTA-22/0045 (ETA-10/0292)

B.3 Mineral wool

Loose mineral wool products suitable for being used as backfilling material of Hilti Firestop Acrylic Sealant CFS-S ACR

Product	Manufacturer	Specification
Heralan LS	Knauf Insulation GmbH	Product data sheet of Knauf
Isover loose wool SL	Saint-Gobain ISOVER	Product data sheet of Isover
Isover Universal-Stopfwolle	Saint-Gobain ISOVER	Product data sheet of Isover
Rockwool RL	Rockwool	Product data sheet of Rockwool
Paroc Pro Loose Wool	Paroc OY AB	Product data sheet of Paroc

- Combustibility class: A1 or A2 in accordance with EN 13501-1

B.4 Cementitious mortar

Any cementitious mortar suitable for use with the intended type of rigid walls or floors may be used.

B.5 Sound decoupling means

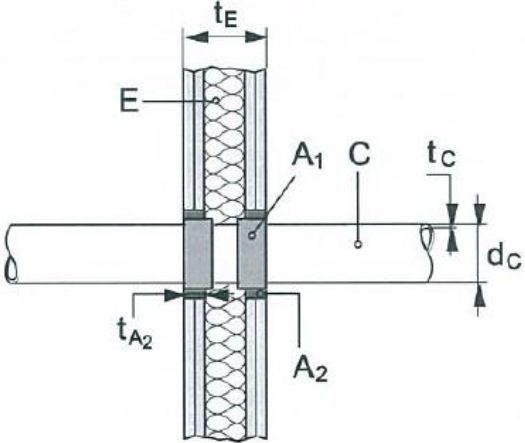
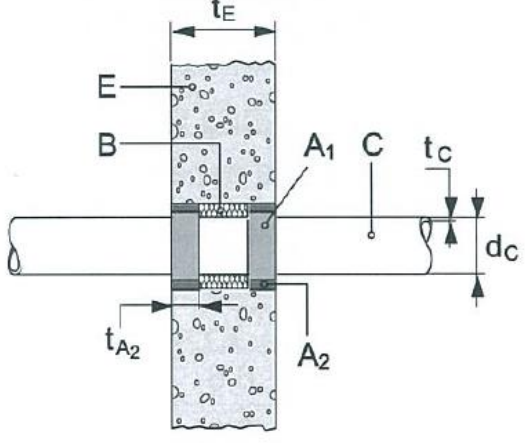
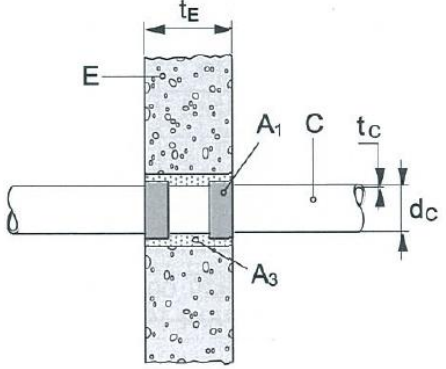
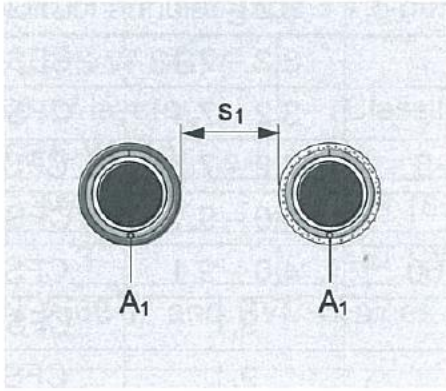
Any sound decoupling means based on PE (foam) may be used with a thickness of 5 mm.

ANNEX C: RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF HILTI FIRESTOP WRAP CFS-W

C.1 Flexible walls and rigid walls type A according to clause 2.1 of the UKTA, minimum wall thickness 100 mm

Penetration seal – Single penetration:

- Hilti Firestop Wrap CFS-W on both sides (A_1), outer edge of the wrap flush with the surface of the wall.
- Annular gap filled within:
 - *Flexible walls (see construction details below):*
Hilti Firestop Acrylic Sealant CFS-S ACR (A_2) on both sides with a depth (t_{A2}) of minimum 25 mm from the surface of the wall supported by mineral wool of minimum 100 kg/m^3 density in the gap between the wall lining around the opening with a depth of minimum 100 mm;
 - *Rigid walls (see construction details below):*
Cementitious mortar (A_3) over the entire thickness of the wall or Hilti Firestop Acrylic Sealant CFS-S ACR (A_2) on both sides with a depth (t_{A2}) of minimum 15 mm from the surface of the wall. The sealant may be backfilled with mineral wool (for suitable mineral wool products see Annex B.3 of the UKTA).
- The maximum annular gap width is given in the tables below;
- Minimum distance between single penetration seals (s_1): 200 mm.

Construction details:	
 <p>Application in a flexible wall (with Hilti Firestop Acrylic Sealant CFS-S ACR – A_2)</p>	 <p>Application in a rigid wall (with Hilti Firestop Acrylic Sealant CFS-S ACR – A_2)</p>
 <p>Application in a rigid wall (with cementitious mortar – A_3)</p>	

Penetrating Services

C.1.1 PVC-U pipes according to EN ISO 15493 and EN ISO 1452

Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 9.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
50	2.2 – 3.6	CFS-W SG	50/1.5"	EI 120 U/C
63	2.2 – 3.6	CFS-W SG	63/2"	EI 120 U/C
75	2.2 – 3.6	CFS-W SG	75/2.5"	EI 120 U/C
≤ 75	2.2 – 3.6	CFS-W EL	1	EI 120 U/C
90	3.7 – 6.0	CFS-W SG	90/3"	EI 90 U/C
110	3.7 – 6.0	CFS-W SG	110/4"	EI 90 U/C
125	3.7 – 6.0	CFS-W SG	125/5"	EI 90 U/C
$> 75 \leq 125$	3.7 – 6.0	CFS-W EL	2	EI 90 U/C
160	2.5 – 11.8	CFS-W SG	160/6"	EI 60 U/C
$> 125 \leq 160$	2.5 – 11.8	CFS-W EL	3	EI 60 U/C
160	11.8	CFS-W SG	160/6"	EI 90 U/C
160	11.8	CFS-W EL	3	EI 90 U/C

The results are also valid for PVC-C pipes according to EN 1566-1¹ and PVC-U pipes according to EN 1329-1 and EN 1453-1.

C.1.2 PE pipes according to EN ISO 15494

Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 9.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
50	1.9 – 6.8	CFS-W SG	50/1.5"	EI 120 U/C
63	1.9 – 6.8	CFS-W SG	63/2"	EI 120 U/C
75	1.9 – 6.8	CFS-W SG	75/2.5"	EI 120 U/C
≤ 75	1.9 – 6.8	CFS-W EL	1	EI 120 U/C
90	3.2 – 7.1	CFS-W SG	90/3"	EI 120 U/C
110	3.2 – 7.1	CFS-W SG	110/4"	EI 120 U/C
125	3.2 – 7.1	CFS-W SG	125/5"	EI 120 U/C
$> 75 \leq 125$	3.2 – 7.1	CFS-W EL	2	EI 120 U/C
160	4.0 – 9.1	CFS-W SG	160/6"	EI 60 U/C
$> 125 \leq 160$	4.0 – 9.1	CFS-W EL	3	EI 60 U/C
160	9.1	CFS-W SG	160/6"	EI 90 U/C
160	9.1	CFS-W EL	3	EI 90 U/C

¹ It is recommended only to use gypsum plaster or cementitious mortar as annular gap seal for PVC-C pipes together with sound decoupling according to Annex B.5 of the UKTA

C.1.3 PE pipes according to EN 1519-1

Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 4.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
50	3.0	CFS-W SG	50/1.5"	EI 120 U/C
63	3.0	CFS-W SG	63/2"	EI 120 U/C
75	3.0	CFS-W SG	75/2.5"	EI 120 U/C
≤ 75	3.0	CFS-W EL	1	EI 120 U/C
90	4.9	CFS-W SG	90/3"	EI 120 U/C
110	4.9	CFS-W SG	110/4"	EI 120 U/C
125	4.9	CFS-W SG	125/5"	EI 120 U/C
$> 75 \leq 125$	4.9	CFS-W EL	2	EI 120 U/C

The results are also valid for PE pipes according to EN 12201-2 and EN 12666-1

C.2 Rigid walls according to clause 2.1 of the UKTA

Penetration seal – Single penetration:

- Hilti Firestop Wrap CFS-W on both sides (A_1)
- Annular gap filled either with cementitious mortar (A_3) over the entire thickness of the wall or with Hilti Firestop Acrylic Sealant CFS-S ACR (A_2) with a depth of minimum 15 mm from the surface of the wall. The sealant may be backfilled with mineral wool (for suitable mineral wool products see Annex B.3 of the UKTA). The maximum annular gap width is given in the tables below;
- Minimum distance between single penetration seals (s_1): 200mm;
- For further construction details see Annex C.1 of the UKTA.

C.2.1 Rigid walls type A according to clause 2.1 of the UKTA (density ≥ 650 kg/m³), minimum wall thickness 150 mm

Penetrating Services

C.2.1.1 PVC-U pipes according to EN ISO 15493 and EN ISO 1452

Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 7.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
160	2.5 – 11.8	CFS-W SG	160/6"	EI 180 U/C
$> 125 \leq 160$	2.5 – 11.8	CFS-W EL	3	EI 180 U/C

The results are also valid for PVC-C pipes according to EN 1566-1¹ and PVC-U pipes according to EN 1329-1 and EN 1453-1

C.2.1.2 PE pipes according to EN ISO 15494

Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 7.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
160	4.0 – 9.1	CFS-W SG	160/6"	EI 180 U/C
$> 125 \leq 160$	4.0 – 9.1	CFS-W EL	3	EI 180 U/C

C.2.1.3 PE pipes according to EN 1519-1

Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 7.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
160	6.2	CFS-W SG	160/6"	EI 180 U/C
$> 125 \leq 160$	6.2	CFS-W EL	3	EI 180 U/C

The results are also valid for PE pipes according to EN 12201-2 and EN 12666-1

C.2.2 Rigid walls type B according to clause 2.1 of the UKTA (density ≥ 1100 kg/m³), minimum wall thickness 175 mm

Penetrating Services

C.2.2.1 PVC pipes according to EN ISO 15493 and EN ISO 1452

Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 8.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
≤ 32	1.8	CFS-W EL	1	EI 240 U/C
90	3.2	CFS-W SG	90/3"	EI 240 U/C
110	3.2	CFS-W SG	110/4"	EI 240 U/C
$> 75 \leq 110$	3.2	CFS-W EL	2	EI 240 U/C
160	3.2 – 13.0	CFS-W SG	160/6"	EI 240 U/C
$> 125 \leq 160$	3.2 – 13.0	CFS-W EL	3	EI 240 U/C

The results are also valid for PVC-C pipes according to EN 1566-1¹ and PVC-U pipes according to EN 1329-1 and EN 1453-1

C.2.2.2 PE pipes according to EN ISO 15494

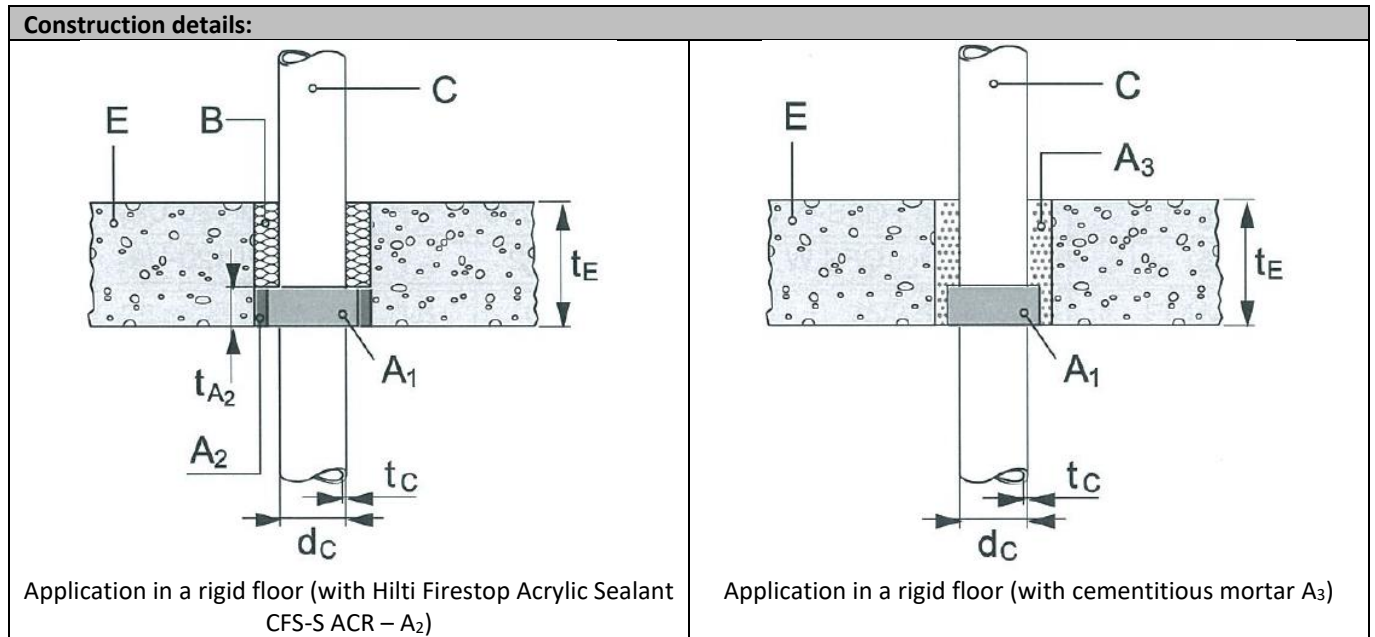
Distance between wrap and penetration seal edge in wall (width of annular gap): ≤ 8.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
≤ 32	1.8	CFS-W EL	1	EI 240 U/C
90	2.7	CFS-W SG	90/3"	EI 240 U/C
110	2.7	CFS-W SG	110/4"	EI 240 U/C
$> 75 \leq 110$	2.7	CFS-W EL	2	EI 240 U/C
160	4.0 – 14.6	CFS-W SG	160/6"	EI 240 U/C
$> 125 \leq 160$	4.0 – 14.6	CFS-W EL	3	EI 240 U/C

C.3 Rigid floors according to clause 2.1 of the UKTA

Penetration seal – Single penetration:

- Hilti Firestop Wrap CFS-W (A_1) on the underside of the floor;
- Annular gap filled either with cementitious mortar (A_3) over the entire thickness of the floor or:
- with Hilti Firestop Acrylic Sealant CFS-S ACR (A_2) with a depth (t_{A2}) of minimum 15 mm from the surface of the floor. The gap behind the sealant is to be backfilled with mineral wool compressed to achieve minimum 60 kg/m^3 density. The maximum annular gap width is given in the tables below;
- Minimum distance between single penetration seals (s_1): 200 mm (see figure in Annex C.1 of the UKTA).



C.3.1 Rigid floor type A according to clause 2.1 of the UKTA (density $\geq 2400 \text{ kg/m}^3$), minimum floor thickness 150 mm

Penetrating Services

C.3.1.1 PVC-U pipes according to EN ISO 15493 and EN ISO 1452

Distance between wrap and penetration seal edge in floor (width of annular gap): $\leq 9.5 \text{ mm}$ ($\varnothing 90 - 125 \text{ mm}$)

Distance between wrap and penetration seal edge in floor (width of annular gap): $\leq 1.5 \text{ mm}$ ($\varnothing > 125 \text{ mm}$)

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
90	3.7 – 6.0	CFS-W SG	90/3"	EI 120 U/C
110	3.7 – 6.0	CFS-W SG	110/4"	EI 120 U/C
125	3.7 – 6.0	CFS-W SG	125/5"	EI 120 U/C
$> 75 \leq 125$	3.7 – 6.0	CFS-W EL	2	EI 120 U/C
160	3.2 – 4.0	CFS-W SG	160/6"	EI 120 U/C
$> 125 \leq 160$	3.2 – 4.0	CFS-W EL	3	EI 120 U/C

The results are also valid for PVC-C pipes according to EN 1566-1¹ and PVC-U pipes according to EN 1329-1 and EN 1453-1.

C.3.1.2 PE pipes according to EN ISO 15494

Distance between wrap and penetration seal edge in floor (width of annular gap): ≤ 9.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
90	7.1	CFS-W SG	90/3"	EI 120 U/C
110	7.1	CFS-W SG	110/4"	EI 120 U/C
125	7.1	CFS-W SG	125/5"	EI 120 U/C
$> 75 \leq 125$	7.1	CFS-W EL	2	EI 120 U/C

C.3.1.3 PE pipes according to EN 1519-1

Distance between wrap and penetration seal edge in floor (width of annular gap): ≤ 3.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
50	3.0	CFS-W SG	50/1.5"	EI 120 U/C
63	3.0	CFS-W SG	63/2"	EI 120 U/C
75	3.0	CFS-W SG	75/2.5"	EI 120 U/C
≤ 75	3.0	CFS-W EL	1	EI 120 U/C
90	4.8	CFS-W SG	90/3"	EI 120 U/C
110	4.8	CFS-W SG	110/4"	EI 120 U/C
125	4.8	CFS-W SG	125/5"	EI 120 U/C
$> 75 \leq 125$	4.8	CFS-W EL	2	EI 120 U/C
160	6.2	CFS-W SG	160/6"	EI 120 U/C
$> 125 \leq 160$	6.2	CFS-W EL	3	EI 120 U/C

The results are also valid for PE pipes according to EN 12201-2 and EN 12666-1

C.3.2 Rigid floor type A according to clause 2.1 of the UKTA (density $\geq 2400 \text{ kg/m}^3$), minimum floor thickness 200 mm

Penetrating Services

C.3.2.1 PVC-U pipes according to EN ISO 15493 and EN ISO 1452

Distance between wrap and penetration seal edge in floor (width of annular gap): $\leq 7.5 \text{ mm}$.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
≤ 32	1.8	CFS-W EL	1	EI 240 U/C
50	2.2 – 3.6	CFS-W SG	50/1.5"	EI 180 U/C
63	2.2 – 3.6	CFS-W SG	63/2"	EI 180 U/C
75	2.2 – 3.6	CFS-W SG	75/2.5"	EI 180 U/C
≤ 75	2.2 – 3.6	CFS-W EL	1	EI 180 U/C
90	3.2	CFS-W SG	90/3"	EI 240 U/C
90	3.2 – 6.0	CFS-W SG	90/3"	EI 180 U/C
110	3.2	CFS-W SG	110/4"	EI 240 U/C
110	3.2 – 6.0	CFS-W SG	110/4"	EI 180 U/C
$> 75 \leq 110$	3.2	CFS-W EL	2	EI 240 U/C
125	3.7 – 6.0	CFS-W SG	125/5"	EI 180 U/C
$> 75 \leq 125$	3.7 – 6.0	CFS-W EL	2	EI 180 U/C
160	2.5 – 3.2	CFS-W SG	160/6"	EI 60 U/C
$> 125 \leq 160$	2.5 – 3.2	CFS-W EL	3	EI 60 U/C
160	3.2 – 11.8	CFS-W SG	160/6"	EI 120 U/C
$> 125 \leq 160$	3.2 – 11.8	CFS-W EL	3	EI 120 U/C
160	11.8	CFS-W SG	160/6"	EI 180 U/C
$> 125 \leq 160$	11.8	CFS-W EL	3	EI 180 U/C
160	11.8 – 13.0	CFS-W SG	160/6"	EI 120 U/C
$> 125 \leq 160$	11.8 – 13.0	CFS-W EL	3	EI 120 U/C

The results are also valid for PVC-C pipes according to EN 1566-1¹ and PVC-U pipes according to EN 1329-1 and EN 1453-1

C.3.2.2 PE pipes according to EN ISO 15494

Distance between wrap and penetration seal edge in floor (width of annular gap): ≤ 7.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
≤ 32	1.8	CFS-W EL	1	EI 240 U/C
50	1.9 – 6.8	CFS-W SG	50/1.5"	EI 180 U/C
63	1.9 – 6.8	CFS-W SG	63/2"	EI 180 U/C
75	1.9 – 6.8	CFS-W SG	75/2.5"	EI 180 U/C
≤ 75	1.9 – 6.8	CFS-W EL	1	EI 180 U/C
90	2.7	CFS-W SG	90/3"	EI 240 U/C
90	2.7 – 7.1	CFS-W SG	90/3"	EI 180 U/C
110	2.7	CFS-W SG	110/4"	EI 240 U/C
$> 75 \leq 110$	2.7	CFS-W EL	2	EI 240 U/C
110	2.7 – 7.1	CFS-W SG	110/4"	EI 180 U/C
125	3.2 – 7.1	CFS-W SG	125/5"	EI 180 U/C
$> 75 \leq 125$	3.2 – 7.1	CFS-W EL	2	EI 180 U/C
125	7.1	CFS-W SG	125/5"	EI 180 U/C
125	7.1	CFS-W EL	2	EI 180 U/C
160	4.0 – 14.6	CFS-W SG	160/6"	EI 180 U/C
$> 125 \leq 160$	4.0 – 14.6	CFS-W EL	3	EI 180 U/C
160	14.6	CFS-W SG	160/6"	EI 240 U/C
$> 125 \leq 160$	14.6	CFS-W EL	3	EI 240 U/C

C.3.3 Rigid floor type B according to clause 2.1 of the UKTA (density ≥ 550 kg/m³), minimum floor thickness 150 mm

Penetrating Services

C.3.3.1 PVC-U pipes according to EN ISO 15493 and EN ISO 1452

Distance between wrap and penetration seal edge in floor (width of annular gap): ≤ 9.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
90	3.7 – 6.0	CFS-W SG	90/3"	EI 120 U/C
110	3.7 – 6.0	CFS-W SG	110/4"	EI 120 U/C
125	3.7 – 6.0	CFS-W SG	125/5"	EI 120 U/C
$> 75 \leq 125$	3.7 – 6.0	CFS-W EL	2	EI 120 U/C
160	4.0	CFS-W SG	160/6"	EI 120 U/C
$> 125 \leq 160$	4.0	CFS-W EL	3	EI 120 U/C

The results are also valid for PVC-C pipes according to EN 1566-1¹ and PVC-U pipes according to EN 1329-1 and EN 1453-1

C.3.3.2 PE pipes according to EN ISO 15494

Distance between wrap and penetration seal edge in floor (width of annular gap): ≤ 9.5 mm.

Pipe diameter d_c (mm)	Pipe wall thickness t_c (mm)	Type of CFS-W (A_1)	Size (CFS-W SG) / No. of layers (CFS-W EL)	Classification
90	7.1	CFS-W SG	90/3"	EI 120 U/C
110	7.1	CFS-W SG	110/4"	EI 120 U/C
125	7.1	CFS-W SG	125/5"	EI 120 U/C
$> 75 \leq 125$	7.1	CFS-W EL	2	EI 120 U/C