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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-22/0045
of 31/03/2023

Technical Assessment Body Issuing the UKTA:

UL International (UK) Ltd

Trade name of the construction product

Hilti Firestop Acrylic Sealant CFS-S ACR

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

This UK Technical Assessment contains

23 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

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

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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 Acrylic Sealant CFS-S ACR" is a 1-component sealant used to form a pipe penetration seal based on filling substances and acrylic binder.

For further details on "Hilti Firestop Acrylic Sealant CFS-S ACR" see Annex B.1 of the UKTA.

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 Acrylic Sealant CFS-S ACR" is intended to be used as a pipe penetration seal to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they have been penetrated by metal pipes, plastic pipes and composite pipes.

The thickness of the penetration seal in flexible walls has to be minimum 100 mm.

The thickness of the penetration seal in rigid walls has to be minimum 100 mm.

The thickness of the penetration seal in rigid floors has to be minimum 150 mm.

The maximum opening size of the penetration seal must comply with the dimensions as specified in the following table. For details see Annex C of the UKTA.

"Hilti Firestop Acrylic Sealant CFS-S ACR" can only be used as penetration seal for metal pipes, plastic pipes, and composite pipes. Further details are given in Annex C of the UKTA. Other parts or service support constructions shall not penetrate the penetration seal.

"Hilti Firestop Acrylic Sealant CFS-S ACR" can be installed only in the types of separating elements as specified in the following table.

Separating element	Construction	Maximum opening size of the penetration seal
Flexible walls	<ul style="list-style-type: none">• Timber or steel studs lined on both faces with minimum 2no. layers of boards (minimum thickness 12,5mm) with classification A2-s1, d0 or A1 according to EN 13501-1• For timber stud walls there must be a minimum distance of 100mm between the penetration seal and any timber stud. The cavity between the penetration seal and the timber stud has to be closed with minimum 100mm of insulation with classification A1 or A2 according to EN 13501-1• Minimum thickness 100mm• Classification according to EN 13501-2: \geq EI 90• This UK Technical Assessment does not cover sandwich panel constructions and flexible walls where the lining does not cover studs on both sides	<p>Ø 300mm For details see Annex C of the UKTA</p>
Rigid walls	<ul style="list-style-type: none">• Aerated concrete, concrete, masonry• Minimum density 650kg/m³• Minimum thickness 100mm• The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period	<p>Ø 300mm For details see Annex C of the UKTA</p>

Separating element	Construction	Maximum opening size of the penetration seal
Rigid walls	<ul style="list-style-type: none"> • Aerated concrete, concrete, masonry • Minimum density 550kg/m³ • Minimum thickness 200mm • The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period 	<p>Ø 300mm</p> <p>For details see Annex C of the UKTA</p>
Rigid walls	<ul style="list-style-type: none"> • Concrete, masonry • Minimum density 2400kg/m³ • Minimum thickness 150mm • The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period 	<p>Ø 300mm</p> <p>For details see Annex C of the UKTA</p>
Rigid floors	<ul style="list-style-type: none"> • Aerated concrete, concrete • Minimum density 550kg/m³ • Minimum thickness 150mm • The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period 	<p>Ø 300mm</p> <p>For details see Annex C of the UKTA</p>
Rigid floors	<ul style="list-style-type: none"> • Concrete • Minimum density 2400kg/m³ • Minimum thickness 150mm • The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period 	<p>Ø 300mm</p> <p>For details see Annex C of the UKTA</p>

2.2 Use condition

"Hilti Firestop Acrylic Sealant CFS-S ACR" 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.

Although a penetration seal is intended for indoor applications only, the construction process may result in it being subjected to more exposed conditions for a period before the building envelope is closed. For this case provisions shall be made to protect temporarily exposed penetration seals according to the UKTA-holder's installation instructions.

2.3 Working life

The provisions made in this UK Technical Assessment are based on an assumed working life of "Hilti Firestop Acrylic Sealant CFS-S ACR" 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 preparation of the seals does not affect 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 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.

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 this UKTA
	Resistance to fire	EN 13501-2	Clause 3.1.2 and Annex C.1 to C.6 of this UKTA
BWR 3	Air permeability	EN 1026	Clause 3.2.1 of this UKTA
	Water permeability	Annex C of EAD 350454-00-1104	Clause 3.2.2 of this UKTA
	Content and/or release of dangerous substances	Declaration of conformity by 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 this UKTA
BWR 5	Airborne sound insulation	EN ISO 10140-1	Clause 3.4.1 of this UKTA
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 Acrylic Sealant CFS-S ACR” was assessed according to EAD 350454-00-1104 clause 2.2.1 and classified according to EN 13501-1 as shown below:

Component	Class according to EN 13501-1
Hilti Firestop Acrylic Sealant CFS-S ACR	D – s1, d0

3.1.2 Resistance to fire

“Hilti Firestop Acrylic Sealant CFS-S ACR” was tested according to EAD 350454-00-11-4 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 Acrylic Sealant CFS-S ACR” has been classified according to EN 13501-2. The individual fire resistance classes are listed in Annex C.1 to C.6 of the UKTA.

The maximum fire resistance class of the penetration seal in vertical or horizontal separating elements 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.

3.2 Hygiene, health and environment (BWR 3)

3.2.1 Air permeability

The air permeability of “Hilti Firestop Acrylic Sealant CFS-S ACR” with a thickness of 25 mm on both sides of the wall was tested according to EN 1026:2000 and EN 12211:2000 in an aerated concrete wall. The dimension of the tested joint was 1000 mm x 50 mm.

Up to a pressure difference of 9700 Pa no air permeability was measured.

3.2.2 Water permeability

The water permeability of “Hilti Firestop Acrylic Sealant CFS-S ACR” has been tested according to the principles given in Annex C of EAD 350454-00-1104. The specimen consisted of 2 mm Hilti Firestop Acrylic Sealant CFS-S ACR (dry film thickness) on mineral wool. Test result: Water tight to 1000 mm head of water or 9806 Pa.

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.

Provisions shall be taken to prevent a person from stepping onto a horizontal penetration seal or falling against a vertical penetration seal (e.g. by covering with a wire mesh)

3.3.3 Adhesion

No performance assessed.

3.3.4 Durability

All components of "Hilti Firestop Acrylic Sealant CFS-S ACR" fulfil the requirements for the intended use condition.

"Hilti Firestop Acrylic Sealant CFS-S ACR" 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 categorized 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

Test reports from noise reduction according to EN ISO 10140-1:2010+A1:2012+A2:2014, EN ISO 10140-2:2010 and EN ISO 717-1:2013 have been provided. The tests were performed in a joint (length 1200mm, depth 100mm, width 25mm) in a rigid wall backfilled with compressed mineral wool. Installation depth of "Hilti Firestop Acrylic Sealant CFS-S ACR" was 12mm on both sides of the wall.

The reached values for the airborne sound insulation are given in the following table.

R _{s,w} in dB	C in dB	C _{tr} in dB
64	-2	-7

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 in the applicable EAD

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 30/11/2021 relating to the UK Technical Assessment 0843-UKTA-22/0045 issued on 31/03/2023 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: 31st March 2023

Report by:



C. Sweeney
Project Engineer Associate
Built Environment

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

Reviewed by:



D. Yates
Senior Project Engineer
Built Environment

ANNEX A: REFERENCE DOCUMENTS and LIST OF ABBREVIATIONS

A.1 References to standards mentioned in the UKTA

EN 1026	Windows and doors – Air permeability – Test method
EN 1366-3	Fire resistance tests for service installations – Part 3: Penetration seals
EN 13501-1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests
EN 13501-2	Fire classification of construction products and building elements – Part 2: Classification using test data from fire resistance tests

A.2 Other reference documents

EOTA TR 024	Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products
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A.3 Abbreviations used in drawings

Abbreviation	Description
A, A ₁ , A ₂ ,..	Hilti Firestop Acrylic Sealant CFS-S ACR
B	Bacfilling material
C, C ₁ , C ₂ ,..	Penetrating services
D	Pipe insulation
E, E ₁ , E ₂ ,..	Building element (wall, floor)
L _D	Length of insulation
d _c	Pipe diameter
h	Height/length of penetration seal
s ₁ , s ₂	Distances
t _A	Thickness of penetration seal
t _B	Thickness of backfilling material
t _c	Pipe wall thickness
t _D	Thickness of insulation
t _E	Thickness of the building element
W _A	Width of penetration seal (annular space)

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

B.1 Hilti Firestop Acrylic Sealant CFS-S ACR

Hilti Firestop Acrylic Sealant CFS-S ACR is a 1-component product and is composed essentially of filling substances and an acrylic binder.

It is available in cartridge 310ml, foil pack 580ml, bucket 5l / 19l

Suitable dispensers:

Hilti CB 200-P1 (for 310 ml cartridge)

Hilti CS 270-P1 (for 580 ml foil pack)

A detailed specification of the product is contained in document "Identification / Product Specification relating to the UK Technical Assessments UKTA- 22/0045 and UKTA-22/0045, Hilti Firestop Acrylic Sealant CFS-S ACR" which is a non-public part of this UKTA.

The Control Plan is defined in document "Control Plan relating to the UK Technical Assessments UKTA- 22/0045 and UKTA-22/0045 - Hilti Firestop Acrylic Sealant CFS-S ACR", which is a non-public part of this UKTA

B.2 Mineral Wool

Mineral wool products suitable for being used as pipe insulation material

Manufacturer	Product designation	Specification
Isover	Protect BSR 90 alu	Product data sheet of manufacturer
Paroc	PAROC Section AluCoat T	Product data sheet of manufacturer
Rockwool	Conlit 150 P	Product data sheet of manufacturer
Rockwool	Klimarock	Product data sheet of manufacturer
Rockwool	Rockwool 800 pipe sections	Product data sheet of manufacturer

B.3 OKTAGON formwork tie rod system ("Schalungsspannstelle")

The formwork tie rod system is made of HDPE and available in different lengths for a wall thickness up to 600mm. Inner diameter: 22mm, diameter of protection flange: 60mm.

Manufacturer: Nevoga GmbH, Freilassing, Germany (www.nevoga.com)



B.4 Formwork distance control pipe ("Abstandsrohr")

The formwork distance control pipe is a weather resistant plastic pipe with enhanced impact resistance. It is available in lengths of 2000 to 2500mm and cut to the required length on site. Inner diameter: 26mm, outer diameter 32mm.

Manufacturer: Nevoga GmbH, Freilassing, Germany (www.nevoga.com)



B.5 Technical product literature

Technical data sheet and instructions for use of Hilti Firestop Acrylic Sealant CFS-S ACR.

ANNEX C: RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF “HILTI FIRESTOP ACRYLIC SEALANT CFS-S ACR”

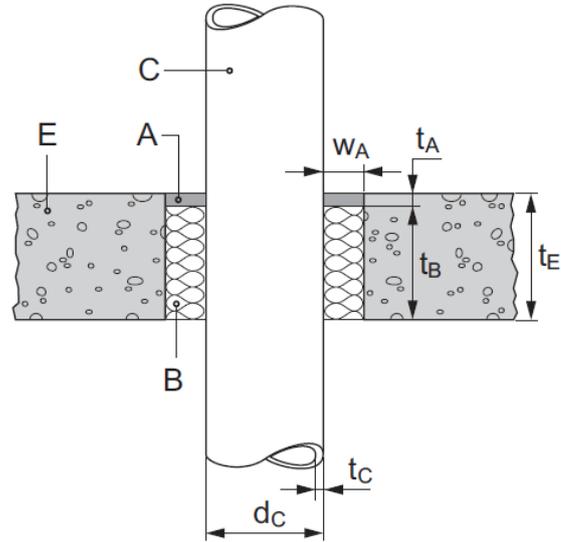
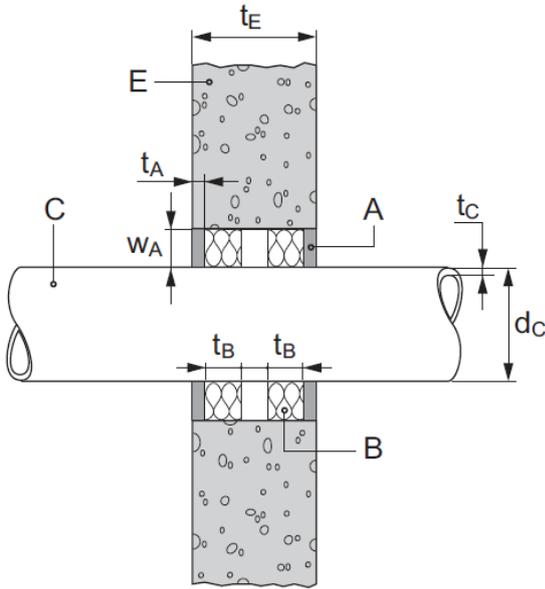
C.1	General Information
C.1.1	Wall / floor constructions
a)	<p>Flexible walls: The wall must have a minimum thickness of 100 mm and comprise timber or steel studs lined on both faces with minimum 2 layers of 12.5mm thick boards according to EN 520 type F.</p> <p>For timber stud walls there must be a minimum distance of 100 mm of the seal to any stud and the cavity between stud and seal must be closed and a minimum of 50 mm insulation of Class A 1 or A2 (in accordance with EN 13501-1) in the cavity between stud and seal is necessary.</p>
b)	<p>Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³</p>
c)	<p>Rigid walls: The wall must have a minimum thickness of 200 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 550 kg/m³</p>
d)	<p>Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete or masonry, with a minimum density of 2400 kg/m³</p>
e)	<p>Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete, with a minimum density of 550 kg/m³</p>
f)	<p>Rigid floors: The floor must have a minimum thickness of 150 mm and comprise concrete, with a minimum density of 2400 kg/m³</p>
	<p>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 UKTA does not cover use of the product as a penetration seal in sandwich panel constructions.</p>

C.2 Rigid walls and rigid floors according to Annex C.1.1 d) and f) of the UKTA

Penetration seal:

Wall: 15 mm (t_A) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on both sides, stone wool according to Annex B.2 of the UKTA as backfilling material (t_B = minimum 50 mm on both sides)

Floor: 15 mm Hilti Firestop Acrylic Sealant CFS-S ACR (A) on the upper side, stone wool according to Annex B.2 of the UKTA as backfilling material (t_B = gap filled completely)



Penetrating Services

Classification

Steel pipes non-insulated (C)

Single penetration

Distance between pipe and seal edge:

Wall (width of annular space, W_A): 10.5 – 35.5mm;

Floor: Maximum penetration seal diameter: 260mm (annular space W_A depending on pipe diameter)

Pipe diameter (d_c) between $\varnothing 32$ mm and $\varnothing 159$ mm, with minimum wall thickness (t_c) 1.8mm and 4.5mm respectively¹, maximum wall thickness 14.2mm²

E 180 C/U

The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)

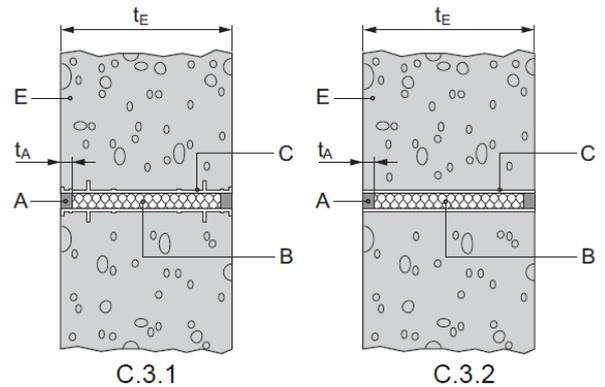
¹ Interpolation of minimum pipe wall thickness between 1.8mm for diameter 32mm and 4.5mm for diameter 159mm for pipe diameters in between.

² 14.2mm is the maximum value covered by the rules in EN 1366-3. This value may be limited by the particular pipe dimensions available in practice.

C.3 Rigid walls according to Annex C.1.1 c) of the UKTA

Penetration seal:

15mm (t_A) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on both sides of the opening of the formwork tie system / formwork distance pipe (C), loose stone wool (B) as backfilling material (t_B = gap filled completely)



Penetrating Services

Classification

C.3.1 OKTAGON formwork tie rod system (“Schalungsspannstelle”, “Oktagon-Spreize”) – see Annex B.3 of the UKTA

EI 120

C.3.2 Formwork distance pipe (“Abstandsrohr”, “Distanzrohr”) – see Annex B.4 of the UKTA

EI 120

C.4 Flexible and rigid walls according to Annex C.1.1 of the UKTA

Penetration seal:

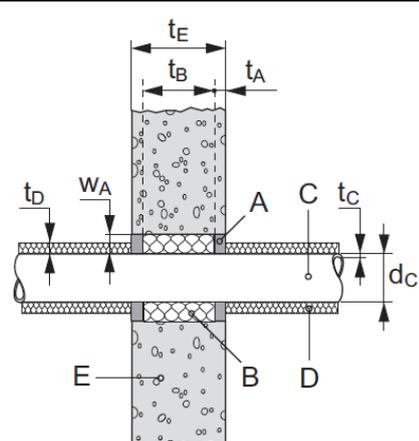
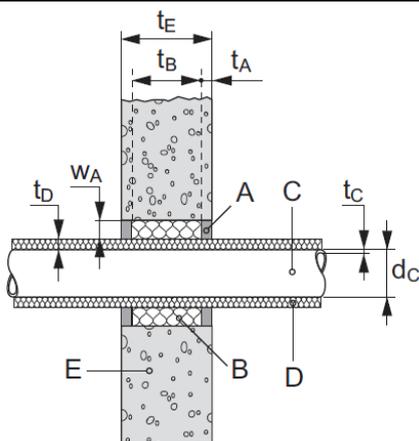
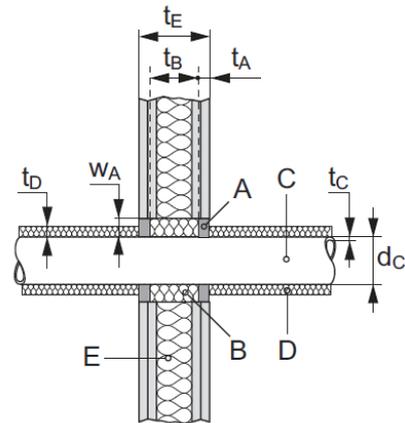
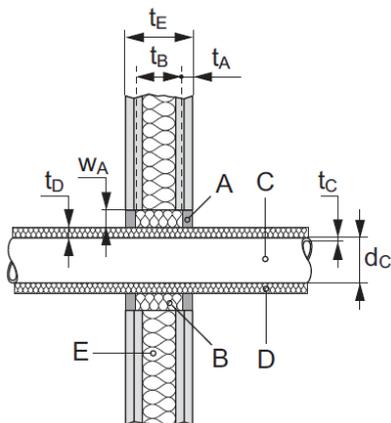
10mm (t_A) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on both sides of the wall, stone wool according to Annex B.2 of the UKTA as backfilling material (t_B = gap filled completely)

Maximum seal diameter: 300 mm (annular space W_A depending on pipe diameter)

C.4.1 Continued pipe insulation

Sustained insulation

Interrupted insulation



Penetrating Services	Classification
Steel pipes (C) with continued insulation (D) - sustained	
Insulation thickness (t_b) \geq 20mm: Pipe diameter (d_c) between \varnothing 26.9mm and \varnothing 48.3mm, with minimum wall thickness (t_c) 1.4mm and 1.6mm respectively ³ , maximum wall thickness 14.2mm ²	EI 120 C/U
Insulation thickness (t_b) \geq 40mm: Pipe diameter (d_c) between \varnothing 26.9mm and \varnothing 168.3mm, with minimum wall thickness (t_c) 1.4mm and 2.6mm respectively ⁴ , maximum wall thickness 14.2mm ²	EI 120 C/U
Steel pipes (C) with continued insulation (D) - interrupted	
Insulation thickness (t_b) \geq 20mm: Pipe diameter (d_c) between \varnothing 26.9mm and \varnothing 48.3mm, with minimum wall thickness (t_c) 1.4mm and 1.6mm respectively ³ , maximum wall thickness 14.2mm ²	EI 120 C/U
Insulation thickness (t_b) \geq 40mm: Pipe diameter (d_c) between \varnothing 26.9mm and \varnothing 168.3mm, with minimum wall thickness (t_c) 1.4mm and 2.6mm respectively ⁴ , maximum wall thickness 14.2mm ²	EI 120 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)	
Copper pipes (C) with continued insulation (D) - sustained	
Insulation thickness (t_b) \geq 20mm: Pipe diameter (d_c) between \varnothing 28mm and \varnothing 42mm, with minimum wall thickness (t_c) 1.0mm and 1.5mm respectively ⁵ , maximum wall thickness 14.2mm ²	EI 120 C/U
Insulation thickness (t_b) \geq 40mm: Pipe diameter (d_c) between \varnothing 42mm and \varnothing 88.9mm, with minimum wall thickness (t_c) 1.5mm and 2.0mm respectively ⁶ , maximum wall thickness 14.2mm ²	EI 90 C/U
Copper pipes (C) with continued insulation (D) - interrupted	
Insulation thickness (t_b) \geq 20mm: Pipe diameter (d_c) between \varnothing 28mm and \varnothing 42mm, with minimum wall thickness (t_c) 1.0mm and 1.5mm respectively ⁵ , maximum wall thickness 14.2mm ²	EI 120 C/U
Insulation thickness (t_b) \geq 40mm: Pipe diameter (d_c) between \varnothing 42mm and \varnothing 88.9mm, with minimum wall thickness (t_c) 1.5mm and 2.0mm respectively ⁶ , maximum wall thickness 14.2mm ²	EI 120 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)	
Geberit Mepla pipes (C) with continued insulation (D) – sustained	
Produced by Geberit Int., Jona, CH	
Insulation thickness (t_b) \geq 20mm: Pipe dimension (d_c , t_c): \varnothing 16 x 2.25mm \varnothing 20 x 2.5mm \varnothing 26 x 3.0mm \varnothing 32 x 3.5mm	EI 120 U/C

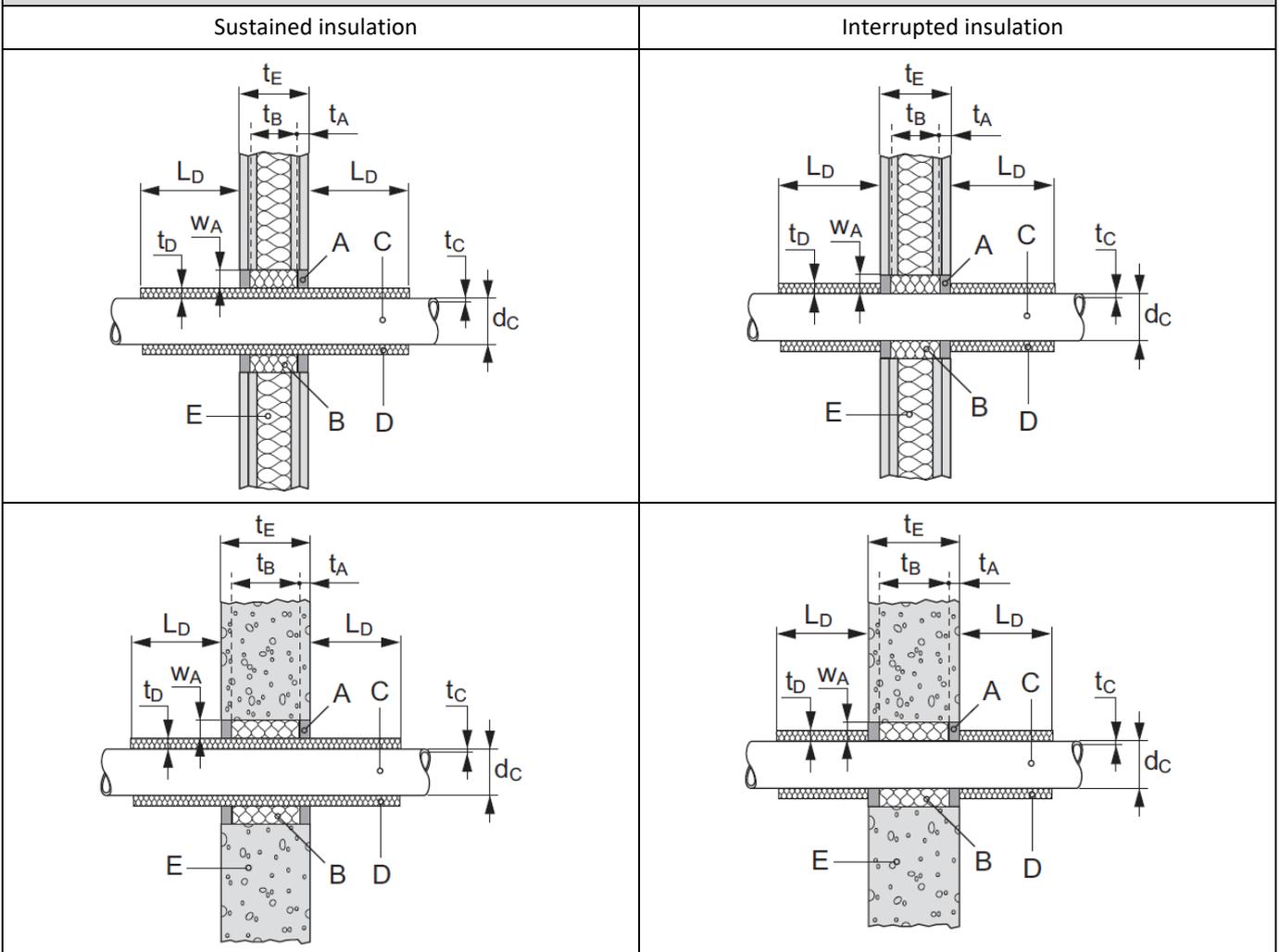
³ Interpolation of minimum pipe wall thickness between 1.4mm for diameter 26.9mm and 1.6mm for diameter 48.3mm for pipe diameters in between

⁴ Interpolation of minimum pipe wall thickness between 1.4mm for diameter 26.9mm and 2.6mm for diameter 168.3mm for pipe diameters in between

⁵ Interpolation of minimum pipe wall thickness between 1.0mm for diameter 28mm and 1.5mm for diameter 42mm for pipe diameters in between

⁶ Interpolation of minimum pipe wall thickness between 1.5mm for diameter 42mm and 2.0mm for diameter 88.9mm for pipe diameters in between

C.4.2 Local pipe insulation



Steel pipes (C) with local insulation (D) - sustained

Insulation		Pipe		Classification
thickness (t_D) [mm]	length (L_D) [mm]	diameter (d_C) [mm]	wall thickness (t_C) [mm]	
20	≥ 450	26.9 – 48.3	1.4 / 1.6 ³ - 14.2 ²	EI 120 C/U
20 – 40	≥ 500	48.3	1.6– 14.2 ²	EI 120 C/U
40	≥ 450	48.3 – 168.3	1.6 / 2.6 ⁷ - 14.2 ²	EI 90 C/U
40	≥ 700	48.3 – 168.3	1.6 / 2.6 ⁷ - 14.2 ²	EI 120 C/U

⁷ Interpolation of minimum pipe wall thickness between 1.6mm for diameter 48.3mm and 2.6mm for diameter 168.3mm for pipe diameters in between

Steel pipes (C) with local insulation (D) - interrupted				
Insulation		Pipe		Classification
thickness (t _D) [mm]	length (L _D) [mm]	diameter (d _C) [mm]	wall thickness (t _C) [mm]	
20	≥ 500	26.9 – 48.3	1.4 - 14.2 ²	EI 120 C/U
40	≥ 500	168.3	2.6– 4.5	EI 90 C/U
40	≥ 500	168.3	4.5 - 14.2 ²	EI 120 C/U
40	≥ 700	168.3	2.6 - 14.2 ²	EI 120 C/U
40	≥ 700	48.3 – 168.3	1.6 / 2.6 ⁷ - 14.2 ²	EI 90 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)				
Copper pipes (C) with local insulation (D) - sustained				
Insulation		Pipe		Classification
thickness (t _D) [mm]	length (L _D) [mm]	diameter (d _C) [mm]	wall thickness (t _C) [mm]	
20	≥ 450	28 – 42	1.0 / 1.5 ⁵ - 14.2 ²	EI 120 C/U
20 - 40	≥ 500	42	1.5 - 14.2 ²	EI 120 C/U
40	≥ 500	42 – 88.9	1.5 / 2.0 ⁶ - 14.2 ²	EI 90 C/U
40	≥ 700	88.9	2.0 - 14.2 ²	EI 120 C/U
Copper pipes (C) with local insulation (D) - interrupted				
Insulation		Pipe		Classification
thickness (t _D) [mm]	length (L _D) [mm]	diameter (d _C) [mm]	wall thickness (t _C) [mm]	
20	≥ 500	28 – 42	1.0 / 1.5 ⁵ - 14.2 ²	EI 120 C/U
20 - 40	≥ 500	42	1.5 - 14.2 ²	EI 120 C/U
40	≥ 500	42 – 88.9	1.5 / 2.0 ⁶ - 14.2 ²	EI 120 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)				
Geberit Mepla pipes (C) with continued insulation (D) – sustained				Classification
Insulation thickness (t _D) 20mm, insulation (L _D) ≥ 500mm: Pipe dimension (d _C , t _C): Ø16 x 2.25mm Ø20 x 2.5mm Ø26 x 3.0mm Ø32 x 3.5mm				EI 120 U/C

C.5 Rigid floor according to Annex C.1.1 e) of the UKTA

Penetration seal:

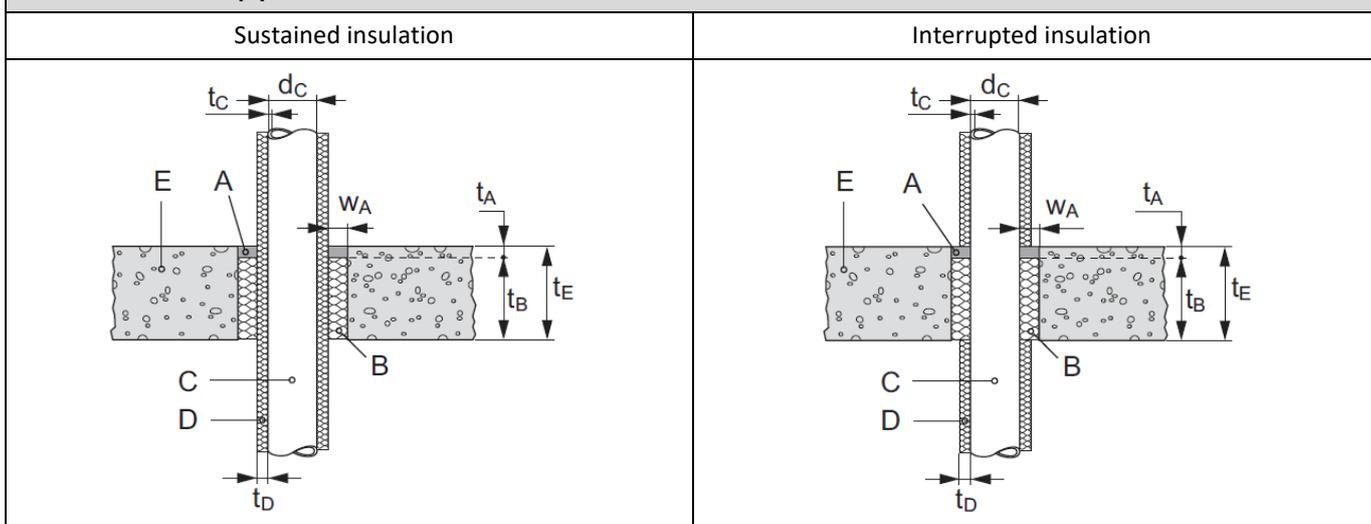
10mm (t_A) Hilti Firestop Acrylic Sealant CFS-S ACR (A) on the top side of the floor construction, stone wool according to Annex B.2 of the UKTA as backfilling material (t_B = gap filled completely)

For classifications EI 90 C/U and EI 120 C/U: Maximum penetration seal diameter: 300mm (annular space W_A depending on pipe diameter)

For classifications EI 180 C/U: Distance between pipe and seal edge in floor constructions (width of annular space, W_A): 13 – 48mm

Pipe insulation made of mineral wool according to Annex B.2 of the UKTA

C.5.1 Continued pipe insulation



Penetrating Services	Classification
Steel pipes (C) with continued insulation (D) - sustained	
Insulation thickness (t_D) ≥ 20 mm: Pipe diameter (d_c) between $\varnothing 26.9$ mm and $\varnothing 48.3$ mm, with minimum wall thickness (t_c) 1.4mm and 1.6mm respectively ³ , maximum wall thickness 14.2mm ²	EI 180 C/U
Insulation thickness (t_D) ≥ 40 mm: Pipe diameter (d_c) between $\varnothing 26.9$ mm and $\varnothing 168.3$ mm, with minimum wall thickness (t_c) 1.4mm and 2.6mm respectively ⁴ , maximum wall thickness 14.2mm ²	EI 120 C/U
Steel pipes (C) with continued insulation (D) - interrupted	
Insulation thickness (t_D) ≥ 20 mm: Pipe diameter (d_c) between $\varnothing 26.9$ mm and $\varnothing 48.3$ mm, with minimum wall thickness (t_c) 1.4mm and 1.6mm respectively ³ , maximum wall thickness 14.2mm ²	EI 180 C/U
Insulation thickness (t_D) ≥ 40 mm: Pipe diameter (d_c) between $\varnothing 26.9$ mm and $\varnothing 168.3$ mm, with minimum wall thickness (t_c) 1.4mm and 2.6mm respectively ⁴ , maximum wall thickness 14.2mm ²	EI 120 C/U

The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)

Copper pipes (C) with continued insulation (D) - sustained				
Insulation thickness (t_D) ≥ 20 mm: Pipe diameter (d_c) $\varnothing 42$ mm, with minimum wall thickness (t_c) 1.5mm and maximum wall thickness 14.2mm ²				EI 120 C/U
Insulation thickness (t_D) ≥ 40 mm: Pipe diameter (d_c) between $\varnothing 42$ mm and $\varnothing 88.9$ mm, with minimum wall thickness (t_c) 1.5mm and 2.0mm respectively ⁶ , maximum wall thickness 14.2mm ²				EI 90 C/U
Copper pipes (C) with continued insulation (D) - interrupted				
Insulation thickness (t_D) ≥ 20 mm: Pipe diameter (d_c) between $\varnothing 28$ mm and $\varnothing 42$ mm, with minimum wall thickness (t_c) 1.0mm and 1.5mm respectively ⁵ , maximum wall thickness 14.2mm ²				EI 120 C/U
Insulation thickness (t_D) ≥ 40 mm: Pipe diameter (d_c) $\varnothing 42$ mm, with minimum wall thickness (t_c) 1.5mm and maximum wall thickness 14.2mm ²				EI 120 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)				
Geberit Mepla pipes (C) with continued insulation (D) – sustained				
Insulation thickness (t_D) ≥ 20 mm: Pipe dimension (d_c, t_c): $\varnothing 16 \times 2.25$ mm $\varnothing 20 \times 2.5$ mm $\varnothing 26 \times 3.0$ mm $\varnothing 32 \times 3.5$ mm				EI 90 U/C
C.5.2 Local pipe insulation				
Sustained insulation		Interrupted insulation		
Steel pipes (C) with local insulation (D) - sustained				
Insulation		Pipe		Classification
thickness (t_D) [mm]	length (L_D) [mm]	diameter (d_c) [mm]	wall thickness (t_c) [mm]	
20	≥ 450	26.9 – 48.3	1.4 / 1.6 ³ - 14.2 ²	EI 180 C/U
40	≥ 500	168.3	2.6– 14.2 ²	EI 90 C/U
40	≥ 700	168.3	2.6– 14.2 ²	EI 120 C/U

Steel pipes (C) with local insulation (D) - interrupted				
Insulation		Pipe		Classification
thickness (t_D) [mm]	length (L_D) [mm]	diameter (d_c) [mm]	wall thickness (t_c) [mm]	
20	≥ 500	26.9 – 48.3	1.4 / 1.6 ³ - 14.2 ²	EI 180 C/U
40	≥ 500	168.3	2.6– 14.2 ²	EI 120 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than unalloyed steel and a melting point of minimum 1100°C, e.g. low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys)				
Copper pipes (C) with local insulation (D) - sustained				
Insulation		Pipe		Classification
thickness (t_D) [mm]	length (L_D) [mm]	diameter (d_c) [mm]	wall thickness (t_c) [mm]	
20	≥ 450	42	1.5 - 14.2 ²	EI 120 C/U
20 - 40	≥ 700	42	1.5 - 14.2 ²	EI 120 C/U
40	≥ 700	42 – 88.9	1.5 / 2.0 ⁶ - 14.2 ²	EI 120 C/U
40	≥ 500	88.9	2.0 - 14.2 ²	EI 90 C/U
40	≥ 700	88.9	2.0 - 14.2 ²	EI 180 C/U
Copper pipes (C) with local insulation (D) - interrupted				
Insulation		Pipe		Classification
thickness (t_D) [mm]	length (L_D) [mm]	diameter (d_c) [mm]	wall thickness (t_c) [mm]	
20 – 40	≥ 600	28 – 42	1.0 / 1.5 ⁵ - 14.2 ²	EI 120 C/U
40	≥ 500	28 – 42	1.0 / 1.5 ⁵ - 14.2 ²	EI 120 C/U
20 - 40	≥ 500	42	1.5 - 14.2 ²	EI 120 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.				
Geberit Mepla pipes (C) with local insulation (D) - sustained				Classification
Insulation thickness (t_D) 20mm, insulation length (L_D) ≥ 500 mm: Pipe dimension (d_c , t_c): Ø16 x 2.25mm Ø20 x 2.5mm Ø26 x 3.0mm Ø32 x 3.5mm				EI 90 U/C

C.6 Rigid floor according to Annex C.1.1 f) of the UKTA	
Penetration seal: See Annex C.5 of the UKTA, except that the maximum penetration seal diameter for classifications EI 180 C/U is 260mm with the annular space (W_A) depending on the pipe diameter	
C.6.1 Continued pipe insulation	
Steel pipes (C) with continued insulation (D) - sustained	Classification
	See Annex C.5 of the UKTA
Steel pipes (C) with continued insulation (D) - interrupted	Classification
	See Annex C.5 of the UKTA
Copper pipes (C) with continued insulation (D) - sustained	Classification
Insulation thickness (t_b) \geq 20mm: Pipe diameter (d_c) \varnothing 28mm, with minimum wall thickness (t_c) 1.0mm and maximum wall thickness 14.2mm ²	EI 180 C/U
Insulation thickness (t_b) \geq 20mm: Pipe diameter (d_c) between \varnothing 28mm and \varnothing 42mm, with minimum wall thickness (t_c) 1.0mm and 1.5mm respectively ⁶ , maximum wall thickness 14.2mm ²	EI 120 C/U
Insulation thickness (t_b) \geq 40mm: Pipe diameter (d_c) between \varnothing 42mm and \varnothing 88.9mm, with minimum wall thickness (t_c) 1.5mm and 2.0mm respectively ⁶ , maximum wall thickness 14.2mm ²	EI 90 C/U
Copper pipes (C) with continued insulation (D) - interrupted	Classification
Insulation thickness (t_b) \geq 20mm: Pipe diameter (d_c) between \varnothing 28mm and \varnothing 42mm, with minimum wall thickness (t_c) 1.0mm and 1.5mm respectively ⁵ and maximum wall thickness 14.2mm ²	EI 120 C/U
Insulation thickness (t_b) \geq 40mm: Pipe diameter (d_c) between \varnothing 42mm and \varnothing 88.9mm, with minimum wall thickness (t_c) 1.5mm and 2.0mm respectively ⁶ , maximum wall thickness 14.2mm ²	EI 120 C/U
Insulation thickness (t_b) \geq 40mm: Pipe diameter (d_c) \varnothing 88.9mm, with minimum wall thickness (t_c) 2.0mm, maximum wall thickness 14.2mm ²	EI 180 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.	
Geberit Mepla pipes (C) with continued insulation (D) - sustained	Classification
	See Annex C.5 of the UKTA

C.6.2 Local pipe insulation				
Steel pipes (C) with local insulation (D) - sustained				Classification
				See Annex C.5 of the UKTA
Steel pipes (C) with local insulation (D) - interrupted				Classification
				See Annex C.5 of the UKTA
Copper pipes (C) with local insulation (D) - sustained				
Insulation		Pipe		Classification
thickness (t_D) [mm]	length (L_D) [mm]	diameter (d_c) [mm]	wall thickness (t_c) [mm]	
20	≥ 425	28	1.0 - 14.2 ²	EI 180 C/U
20	≥ 450	28 – 42	1.0 / 1.5 ⁵ - 14.2 ²	EI 120 C/U
20 – 40	≥ 700	42	1.5 - 14.2 ²	EI 120 C/U
40	≥ 700	42 – 88.9	1.5 / 2.0 ⁶ - 14.2 ²	EI 120 C/U
40	≥ 500	88.9	2.0 - 14.2 ²	EI 90 C/U
40	≥ 700	88.9	2.0 - 14.2 ²	EI 180 C/U
Copper pipes (C) with local insulation (D) - interrupted				
Insulation		Pipe		Classification
thickness (t_D) [mm]	length (L_D) [mm]	diameter (d_c) [mm]	wall thickness (t_c) [mm]	
20 – 40	≥ 500	28 – 42	1.0 / 1.5 ⁵ - 14.2 ²	EI 120 C/U
40	≥ 500	42 – 88.9	1.5 / 2.0 ⁶ - 14.2 ²	EI 120 C/U
40	≥ 500	88.9	2.0 - 14.2 ²	EI 180 C/U
The field of application given above is also valid for other metal pipes with lower heat conductivity than copper and a melting point of minimum 1100°C, e.g. unalloyed steel, low alloyed steel, cast iron, stainless steels, Ni alloys (NiCu, NiCr and NiMo alloys) and Ni.				
Geberit Mepla pipes (C) with local insulation (D) - sustained				Classification
				See Annex C.5 of the UKTA