



ETA-Danmark A/S
Göteborg Plads 1
DK-2150 Nordhavn
Tel. +45 72 24 59 00
Internet www.etadanmark.dk

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



European Technical Assessment ETA-20/1306 of 2021/01/01

I General Part

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

Trade name of the construction product:

HENSOTHERM®-System für Einzelleitung

Product family to which the above construction product belongs:

Fire Stopping and Sealing Product:
• Penetration Seals

Manufacturer:

RUDOLF HENSEL GMBH
Lauenburger Landstr.11
Börnsen 21039
Germany

Manufacturing plant:

RUDOLF HENSEL GMBH
Lauenburger Landstr.11
Börnsen 21039
Germany

This European Technical Assessment contains:

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

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

EAD 350454-00-1104 for Fire stopping and fire sealing products - Penetration seals, September 2017

This version replaces:

-

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

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full [except the confidential Annex(es) referred to above]. However, partial reproduction may be made with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of the product

- 1) HENSOTHERM®-System für Einzelleitung is a sealant, HENSOMASTIK® 5 KS SP used in combination with HENSOTHERM® 7KS Gewebe pipe wraps (ETA 16/0369) or HENSOTHERM® 7KS viskos sealant used alone, to form a penetration seal around single metallic pipes and plastic pipes, to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of services.
- 2) HENSOMASTIK® 5 KS SP, supplied in liquid form in cans, cartridges or tubes. HENSOTHERM 7KS Gewebe pipe wraps (ETA 16/0369) are also incorporated into the penetration seal where it is penetrated by single plastic pipes and insulated metal pipes.
- 3) HENSOTHERM® 7KS viskos, supplied in liquid form in cans, cartridges or tubes.
- 4) HENSOTHERM®-System für Einzelleitung contains no carcinogenic substances or mutagenic substances, flame retardants or antimicrobiological agents.
- 5) The applicant submitted a written declaration that HENSOTHERM®-System für Einzelleitung does not contain substances which have to be classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the EGDS - taking into account the installation conditions of the construction product and the release scenarios resulting from there. An emission report has also been provided.

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

- 6) The use category of HENSOTHERM®-System für Einzelleitung in relation to BWR 3 (Hygiene, health and environment) is IA1, S/W2

2 Specification of the intended uses of the product in accordance with the applicable European Assessment Document (Hereinafter EAD): EAD 350454-00-1104

Detailed information and data is given in Annex A.

- 1) The intended use of HENSOTHERM®-System für Einzelleitung is to reinstate the fire resistance performance of flexible wall, rigid wall and rigid floor constructions where they are penetrated by single metal and plastic pipes.
- 2) The specific elements of construction that the system HENSOTHERM®-System für Einzelleitung may be used to provide a penetration seal in, are as follows:
 - a. Flexible walls: The wall must have a minimum thickness of 100 mm and comprise steel studs or timber studs lined on both faces with minimum 2 layers of 12.5 mm thick boards and incorporate an infill of stone wool insulation 50 mm thick and 60 kg/m³.
 - b. 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.
 - c. Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

- 3) The System HENSOTHERM®-System für Einzelleitung may be used to provide a penetration seal with single pipes (for details see Annex A).
- 4) Services shall be supported at maximum 300 mm from both faces of the wall.
- 5) On the basis of equivalent or more favorable properties, in general pipe insulations with a classification better than D-s3, d0 can be used in substitution of Armaflex HT. For example see the following list:

Armaflex AF	K-Flex H Duct
Armaflex LS	K-Flex SRC ECO
Armaflex NH	K-Flec ST AD
Armaflex SH	K-Flex St SK
Armaflex Ultima	Flexen Heizungskautschuk Plus
Armaflex XG	Flexen Kältekautschuk Plus
Kaiflex HFplus s2	Eurobatex
Kaiflex HTplus	Eurobatex H
Kaiflex KKplus s2	Eurobatex HF
Kaiflex LS	Eurobatex Plus
Kaiflex ST	Eurobatex Plus UF
K-Flex ECO AD	Eurobatex Super

- 6) The provisions made in this European Technical Assessment are based on an assumed working life of the HENSOTHERM®-System für Einzelleitung of 10 years, provided that the conditions for the packaging/transport/ storage/installation/use/repair are met. The indications given on the 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 choosing the right products in relation to the expected economically reasonable working life of the works.
- 7) Type Y₂: environmental conditions: intended for use at temperatures below 0°C, but with no exposure to rain nor UV, Includes lower classes.

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

Product-type: Sealant and pipe closure		Intended use: Penetration Seal
	Essential characteristic	Product performance
BWR 2 Safety in case of fire		
	Reaction to fire	Class E
	Resistance to fire	Annex A
BWR 3 Hygiene, health and environment		
	Air permeability	No performance assessed
	Water permeability	No performance assessed
	Content, emission and/or release of dangerous substances	Use categories: IA1, S/W2 Declaration of manufacturer
BWR 4 Safety in use		
	Mechanical resistance and stability	No performance assessed
	Resistance to impact/movement	
	Adhesion	
	Durability	Y ₂
BWR 5 Protection against noise		
	Airborne sound insulation	No performance assessed
BWR 6 Energy economy and heat retention		
	Thermal properties	No performance assessed
	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 decision 1999/454/EC – Commission Decision of date 22nd June 1999 on the procedure for attesting the conformity of construction products pursuant to Article 20(2) of Council Directive 89/106/EEC as regards fire stopping, fire sealing and fire protective products, published in the Official Journal of the European Union (OJEU) L178/52 of 14/07/1999, see <https://eur-lex.europa.eu/oj/direct-access.html> of the European Commission¹, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table(s) applies (apply).

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

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

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark A/S prior to CE marking

Issued in Copenhagen on 2021-01-01 by

Thomas Bruun

Managing Director, ETA-Danmark

¹ Official Journal of the European Communities L178/52 of 14/7/1999

ANNEX A – Resistance to Fire Classification – HENSOTHERM®-System für Einzelleitung

A.1 Flexible and Rigid wall constructions with wall thickness of minimum 100 mm

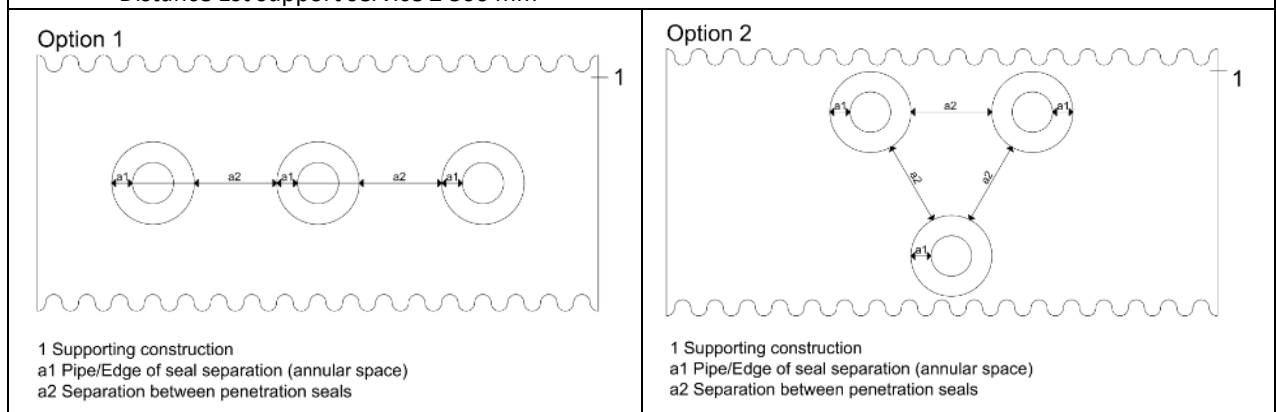
A.1.1 Service Types

Services	Types
Plastic pipes with HENSOTHERM® 7 KS Gewebe 50	<ul style="list-style-type: none"> • PE pipes in accordance with EN 1519-1, EN 12666-1, EN12201-2 • PVC-U pipes in accordance with EN 1329-1, EN 1453-1 and EN 1452-1 • PP pipes in accordance with EN 1852-1: 2009 • PP pipes in accordance with EN 1451-1
Composite pipes with Armaflex insulation	<ul style="list-style-type: none"> • KE KELIT KELOX • Geberit Mepla • Uponor MLC • Viega Sanfix Fosta
Metal pipes with pipe insulation	<ul style="list-style-type: none"> • Copper • Mild & stainless steel • Cast Iron
Multilayer pipes	<ul style="list-style-type: none"> • Raupiano Plus • Polokal 3S • Polokal NG • Silent dB20 • Silent PP

A.1.2 Permitted Distances

a1: annular space = nominally 0 mm and any remaining space filled with HENSOMASTIK® 5 KS SP
a2: Separation between seals ≥ 100 mm

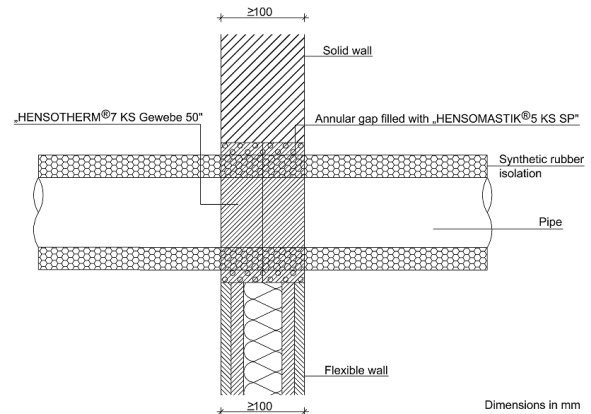
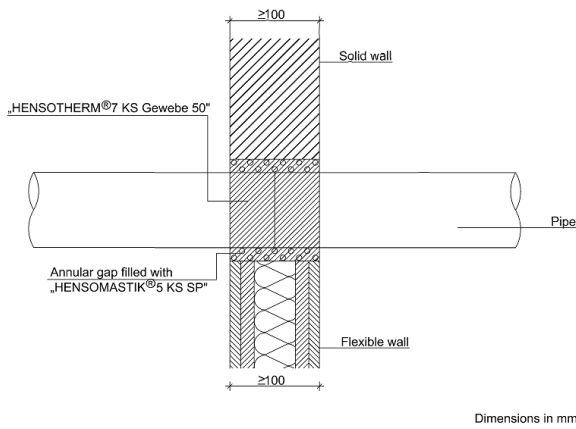
Distance 1st support service ≤ 300 mm



A.1.3 Single Pipes

Penetration Seal: Pipes fitted with 2 lengths of HENSOTHERM® 7 KS Gewebe 50, joint positioned centrally within the wall.

Construction details:



A.1.3.1 Plastic and multilayer pipes without insulation

PE-HD pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
PE-HD	≤56	3.0	2	EI 120 U/U
	>56 ≤75	3.0	3	
	>75 ≤110	4.3	4	
	>110 ≤125	4.8	5	

Geberit Silent PP pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Geberit Silent PP	≤50	2.0	2	EI 120 U/U
	>50 ≤75	2.6	3	
	>75 ≤110	3.6	4	
	>110 ≤125	4.2	5	

Geberit Silent dB20 pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Geberit Silent dB20	≤56	3.2	2	EI 120 U/U
	>56 ≤75	3.6	3	
	>75 ≤110	6.0	4	E 120 U/U EI 90 U/U

Geberit Silent Pro pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Geberit Silent Pro	≤50	3.0	2	EI 120 U/U
	>50 ≤75	3.8	3	
	>75 ≤110	4.5	4	
	>110 ≤125	5.0	5	

Polokal NG pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Polokal NG	≤50	2.0	2	EI 120 U/U
	>50 ≤75	2.6	3	
	>75 ≤110	3.4	4	
	>110 ≤125	3.9	5	

Polokal XS pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Polokal XS	≤50	2.0	2	EI 120 U/U
	>50 ≤110	3.4	4	

Polokal 3S pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Polokal 3S	≤75	3.8	3	EI 120 U/U
	>75 ≤110	4.8	4	
	>110 ≤125	5.3	5	

Raupiano Plus pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Raupiano Plus	≤50	1.8	2	EI 120 U/U
	>50 ≤75	2.5	3	
	>75 ≤110	2.8	4	

Wavin SiTech+ pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Wavin SiTech+	≤50	1.8	2	EI 120 U/U
	>50 ≤110	3.4	4	

Conel Drain pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Conel Drain	≤50	1.8	2	EI 120 U/U
	>50 ≤110	3.9	4	

Pipelife Master 3 pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Pipelife Master 3	≤50	1.8	2	EI 120 U/U
	>50 ≤75	2.3	3	
	>75 ≤110	3.0	4	
	>110 ≤125	3.5	5	

PVC-U pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
PVC-U	≤50	1.8-5.6	2	EI 120 U/U
	>50 ≤75	1.9-5.6	3	
	>75 ≤110	2.2-8.1	4	
	>110 ≤125	2.5-9.3	5	E 120 U/U EI 90 U/U
	>110 ≤125	9.3	5	EI 120 U/U

PP-HT pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
PP-HT	≤50	1.8	2	EI 120 U/U
	>50 ≤75	1.9	3	
	>75 ≤110	2.7	4	

A.1.3.2 Composite and metal pipes with insulation**Geberit Mepla pipes with Armaflex insulation**

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Geberit Mepla	≤16	2.0	1	Armaflex AF/ 11.5-13.5	CS	EI 120 U/C
	>16 ≤40	3.5	1	Armaflex AF/ 13.5-36.5	CS	
	>40 ≤63	4.5	2	Armaflex AF/ 14.0-40.5	CS	
	≤16	2.0	1	Armaflex NH/ 13.0	CS	
	>16 ≤40	3.5	1	Armaflex NH/ 13.0	CS	
	>16 ≤40	3.5	1	Armaflex NH/ 13.0-25.0	CS	E 120 U/C EI 90 U/C
	>40 ≤63	4.5	2	Armaflex NH/ 13.0-25.0	CS	EI 120 U/C

Ke Kelit Kelox pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Ke Kelit Kelox	≤16	2.0	1	Armaflex AF/ 11.5-13.5	CS	EI 120 U/C
	>16 ≤40	4.0	1	Armaflex AF/ 13.5-36.5	CS	
	>40 ≤63	6.0	2	Armaflex AF/ 14.0-40.5	CS	
	≤16	2.0	1	Armaflex NH/ 13.0-25.0	CS	
	>16 ≤40	4.0	1	Armaflex NH/ 13.0-25.0	CS	
	>40 ≤63	6.0	2	Armaflex NH/ 13.0-25.0	CS	

Uponor MLC pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Uponor MLC	≤14	2.0	1	Armaflex AF/ 11.5-13.5	CS	EI 120 U/C
	>14 ≤40	4.0	1	Armaflex AF/ 13.5-36.5	CS	
	>40 ≤63	6.0	2	Armaflex AF/ 14.0	CS	
	>40 ≤63	6.0	2	Armaflex AF/ 14.0-40.5	CS	EI 90 U/C

Pipelife Radopress pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Pipelife Radopress	≤16	2.6	1	Armaflex NH/ 9.0	LS 500	EI 120 U/C
	>16 ≤40	6.0	1	Armaflex AF/ 9.0-19.0	LS 500	

Copper pipes with synthetic rubber insulation classification D-s3, d0 or better

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification	
Copper	≤15	1.0-7.5	1	Armaflex AF/ 11.5	CS	E 120 C/U EI 90 C/U	
	>15 ≤42	1.2-14.2	2	Armaflex AF/ 20-36.5	CS	E 120 C/U EI 90 C/U	
	>42 ≤54	1.5-14.2	2	Armaflex AF/ 13.5-38.0	CS		
Copper	≤15	1.0-7.5	1	Synthetic rubber/ 10	CS	EI 90 C/U	
	>15 ≤42	1.2-14.2	2	Synthetic rubber/ 13-25	CS		
Copper	≥15 ≤54	1.5-14.2	2	Synthetic rubber/ 13-25 CS + Klimarock 20 LI 250mm	CS+LI		EI 120 C/U
	>15 ≤54	1.5-14.2	2	Synthetic rubber/ 25 CS + Klimarock 20 LI 250mm	CS+LI		
	>54 ≤89	2.0-14.2	2	Synthetic rubber/ 19-50 CS + Klimarock 20 LI 250mm	CS+LI	EI 90 C/U	
	>54 ≤89	2.0-14.2	2	Synthetic rubber/ 50 CS + Klimarock 20 LI 250mm	CS+LI	EI 120 C/U	
Copper	≤15	1.0-7.5	1	Armaflex NH/ 13.0	CS	EI 90 C/U	
	>15 ≤42	1.2-14.2	2	Armaflex NH/ 13.0-25.0	CS		
	>42 ≤54	1.5-14.2	2	Armaflex NH/ 19.0-25.0	CS	E 120 C/U EI 90 C/U	

Steel pipes with synthetic rubber insulation classification D-s3, d0 or better

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Steel	>15≤88.9	3.2-14.2	2	Armaflex AF/ 18.0-41.5	CS	E 120 C/U EI 90 C/U
Steel	>15 ≤54	1.5-14.2	2	Synthetic rubber/ 13-25 + Klimarock 20 LI 250 mm	CS+LI	EI 90 C/U
	>15 ≤54	1.5-14.2	2	Synthetic rubber/ 25 CS + Klimarock 20 LI 250 mm	CS+LI	EI 120 C/U
	>54 ≤88.9	2.0-14.2	2	Synthetic rubber/ 19-50 CS + Klimarock 20 LI 250 mm	CS+LI	EI 90 C/U
	>54 ≤88.9	2.0-14.2	2	Synthetic rubber/ 50 CS + Klimarock 20 LI 250 mm	CS+LI	EI 120 C/U
	>88.9 ≤219.1	6.3-14.2	2	Synthetic rubber/ 19-50 CS + Klimarock 20 LI 250mm	CS+LI	EI 90 C/U
Steel	≤15	1.0-7.5	1	Armaflex NH/ 13.0	CS	EI 90 C/U
	>15 ≤42	1.2-14.2	2	Armaflex NH/ 13.0-25.0	CS	
	>42 ≤54	1.5-14.2	2	Armaflex NH/ 19.0-25.0	CS	E 120 C/U EI 90 C/U
	>15 ≤88.9	3.2-14.2	2	Armaflex NH/ 19.0-25.0	CS	EI 90 C/U

Copper pipes with PIR insulation

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Copper	≤15	1.0-7.5	2	PIR / 30	LS 500	EI 120 C/U
	>15 ≤54	1.5-14.2	2	PIR / 30-60	LS 500	EI 30 C/U
	54	1.5-14.2	2	PIR / 30-60	CS	

Steel pipes with PIR insulation

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Steel	≤15	1.0-14.2	2	PIR / 30	LS 500	EI 120 C/U
	>15 ≤54	1.5-14.2	2	PIR / 30-60	LS 500	EI 30 C/U
	>54 ≤88.9	3.2-14.2	2	PIR / 30-80	LS 500	
	88.9	3.2-14.2	2	PIR / 30-80	LS 500	EI 60 C/U
	88.9	3.2-14.2	2	PIR / 30	LS 500	EI 90 C/U
	>88.9 ≤139.7	4.0-14.2	2	PIR / 30-80	LS 500	EI 30 C/U
	139.7	3.2-14.2	2	PIR / 30	CS	EI 60 C/U
	139.7	3.2-14.2	2	PIR / 80	CS	EI 90 C/U

Climate split pipes with cable NYM-J-3x1.5mm²

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
2 x copper pipes plus cable	10+16	2.0	1	PE / 6.0	CS	EI 60 C/U

Isolante K-Flex Twin solar pipe

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Isolante K-Flex Twin Solar Pipe	≥16 ≤25	0.8	2	Isolante / 20.0	CS	EI 90 C/U
	16	0.8	2	Isolante / 20.0	CS	EI 120 C/U

Armaflex Duo solar pipe

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Armaflex Duo solar pipe	20-25	0.8	2	Armaflex /14.0	CS	EI 120 C/U

Würth Flexen Twin solar pipe

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Würth Flexen Twin solar pipe	≥16 ≤25	0.8	2	Vlies / 20.0	CS	EI 90 C/U
	16	0.8	2	Vlies / 20.0	CS	EI 120 C/U

A.1.3.3 Bundle of flexible cable conduits including cables

Pipes	Bundle diameter mm	Cables	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Flexible cable conduits 25mm & 32 mm	125	Empty	5	-	-	EI 120 C/C
	125	NHXH-J 3x 1.5mm ² & NHXH-J 5x 1.5mm ²	5	-	-	

A.1.3.4 Power sockets

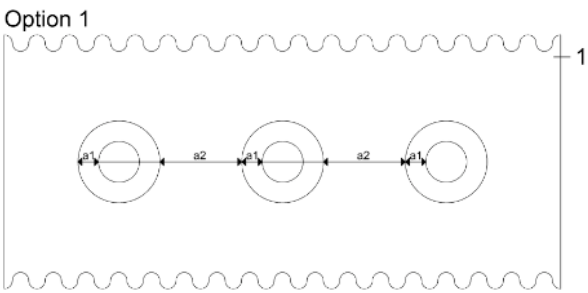
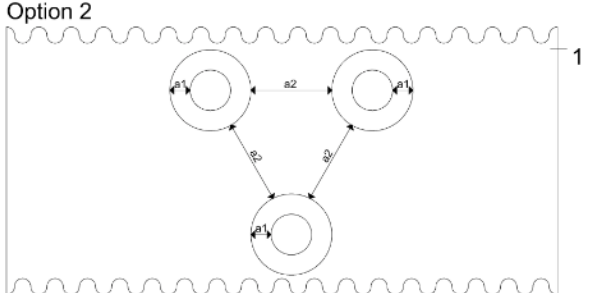
Socket	Layers of HENSOTHERM® 7 KS Gewebe	HENSOTHERM® 7 KS Gewebe	Position Gewebe	Classification
power socket flat with cable 3x1,5 mm ² exposed side	1	60x50 mm (1mm thick)	Inside power socket	EI 120
power socket flat with cable 3x1,5 mm ² unexposed side	1	60x50 mm (1mm thick)	Inside power socket	EI 120
power socket deep with cable 3x1,5 mm ² exposed side	1	60x50 mm (1mm thick)	Inside power socket	EI 120
power socket deep with cable 3x1,5 mm ² unexposed side	1	60x50 mm (1mm thick)	Inside power socket	EI 120
double power socket flat with cable 3x1,5 mm ² exposed side	1	60x50 mm (1mm thick)	Inside power socket	EI 120
double power socket flat with cable 3x1,5 mm ² unexposed side	1	60x50 mm (1mm thick)	Inside power socket	EI 120

A.2 Rigid (concrete) floor constructions with minimum thickness of 150 mm

A.2.1 Service Types

Services	Types
Plastic pipes with HENSOTHERM® 7 KS Gewebe 50	<ul style="list-style-type: none"> • PE pipes in accordance with EN 1519-1, EN 12666-1, EN12201-2 • PVC-U pipes in accordance with EN 1329-1, EN 1453-1 and EN 1452-1 • PP pipes in accordance with EN 1852-1: 2009 • PP pipes in accordance with EN 1451-1
Composite pipes with Armaflex insulation	<ul style="list-style-type: none"> • KE KELIT KELOX • Geberit Mepla • Uponor MLC • Viega Sanfix Fosta
Metal pipes with pipe insulation	<ul style="list-style-type: none"> • Copper • Mild & stainless steel • Cast Iron
Multilayer pipes	<ul style="list-style-type: none"> • Raupiano Plus • Polokal 3S • Polokal NG • Silent dB20 • Silent PP

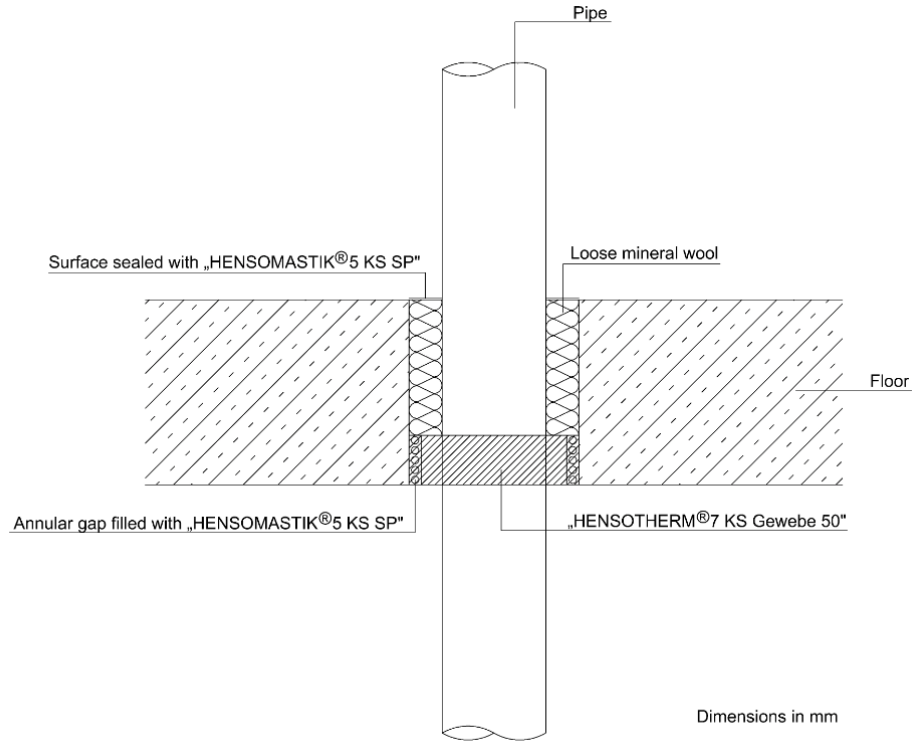
A.2.2 Permitted Distances

<p>a1: annular space = nominally 0 mm and any remaining space filled with HENSOMASTIK® 5 KS SP</p> <p>a2: Separation between seals ≥ 100 mm</p> <p>Distance 1st support service ≤ 300 mm</p>	
<p>Option 1</p>  <p>1 Supporting construction a1 Pipe/Edge of seal separation (annular space) a2 Separation between penetration seals</p>	<p>Option 2</p>  <p>1 Supporting construction a1 Pipe/Edge of seal separation (annular space) a2 Separation between penetration seals</p>

A.2.3 Single Pipes without insulation

Penetration Seal: Pipes fitted with HENSOTHERM® 7 KS Gewebe 50, positioned flush to the soffit. The remaining 100 mm to the top of the floor is packed with loose stone wool insulation and sealed with HENSOMASTIK® 5 KS SP.

Construction details:



A.2.3.1 Plastic and multilayer pipes without insulation

PE-HD pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
PE-HD	≤56	3.0	2	EI 240 U/U
	>56 ≤75	3.0	3	
	>75 ≤110	4.3	4	
	>110 ≤125	4.8	5	
	>125 ≤160	6.2	6	EI 120 U/U

Geberit Silent PP pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Geberit Silent PP	≤50	1.8	2	EI 240 U/U
	>50 ≤75	2.6	3	
	>75 ≤110	3.6	4	
	>110 ≤125	4.2	5	

Geberit Silent Pro pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Geberit Silent Pro	≤50	3.0	2	EI 120 U/U
	>50 ≤75	3.8	3	
	>75 ≤110	4.5	4	
	>110 ≤125	5.0	5	

Geberit Silent dB20 pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Geberit Silent dB20	≤56	3.2	2	EI 240 U/U
	>56 ≤75	3.6	3	
	>75 ≤110	6.0	4	
	>110 ≤135	6.0	5	

Polokal NG pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Polokal NG	≤50	2.0	2	EI 240 U/U
	>50 ≤75	2.6	3	
	>75 ≤110	3.4	4	
	>110 ≤125	3.9	5	

Polokal XS pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Polokal XS	≤50	2.0	2	EI 120 U/U
	>50 ≤75	2.6	3	
	>75 ≤110	3.4	4	

Polokal 3S pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Polokal 3S	≤75	3.8	3	EI 240 U/U
	>75 ≤110	4.8	4	
	>110 ≤125	5.3	5	

Pipelife Master 3 pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Pipelife Master 3	≤50	1.8	2	EI 120 U/U
	>50 ≤75	2.3	3	
	>75 ≤110	3.0	4	
	>110 ≤125	3.5	5	

Wavin SiTech⁺ pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Wavin SiTech ⁺	≤50	1.8	2	EI 120 U/U
	>50 ≤75	2.4	3	
	>75 ≤110	3.4	4	

Conel Drain pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Conel Drain	≤50	1.8	2	EI 120 U/U
	>50 ≤75	2.2	3	
	>75 ≤110	2.7	4	

Raupiano Plus pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
Raupiano Plus	≤50	1.8	2	EI 240 U/U
	>50 ≤75	2.5	3	
	>75 ≤110	2.8	4	
	>110 ≤125	3.1	5	

PVC-U pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
PVC-U	≤50	1.8-5.6	2	EI 240 U/U
	>50 ≤75	1.9-5.6	3	
	>75 ≤110	2.2	4	
	>75 ≤110	2.2-8.1	4	EI 180 U/U
	>110 ≤125	2.5-9.3	5	E 240 U/U EI 180 U/U
	>110 ≤125	2.5	5	EI 240 U/U

PP-HT pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Classification
PP-HT	≤50	1.8	2	EI 240 U/U
	>50 ≤75	1.9	3	
	>75 ≤110	2.7	4	E 240 U/U EI 180 U/U

PE-HD pipes with Armaflex insulation

Pipes	Maximum Pipe diameter Mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
PE-HD	110	4.3	5	Armaflex NH 13.0	CS	EI 180 U/C

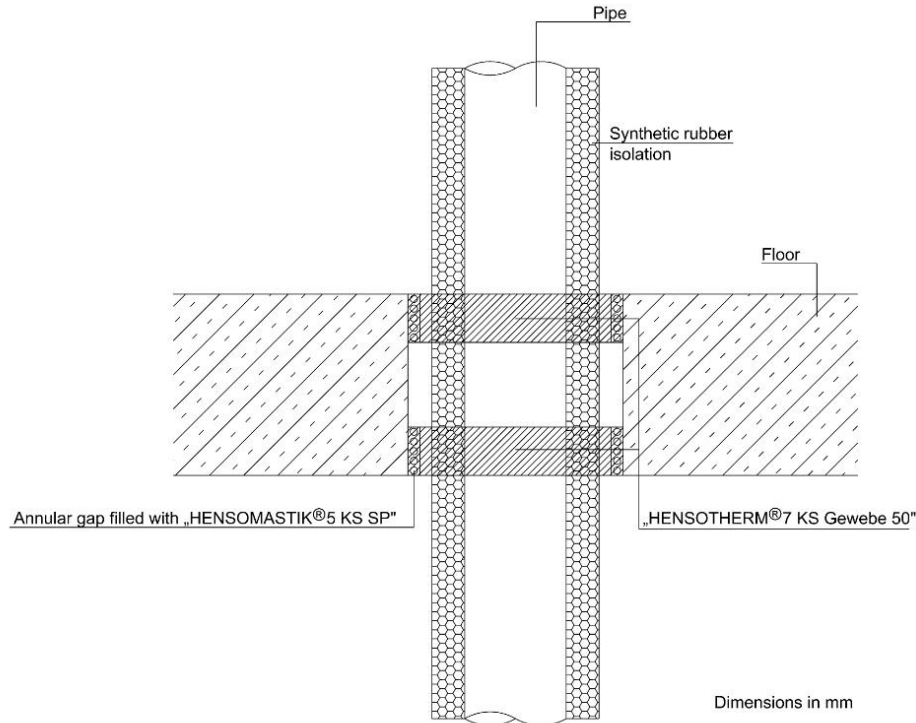
A.2.3.2 Bundle of flexible cable conduits including cables

Pipes	Bundle diameter mm	Cables	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Flexible cable conduits 25mm & 32 mm	125	Empty	5	-	-	EI 120 U/C
	125	NHXXH-J 3x 1.5mm ² & NHXXH-J 5x 1.5mm ²	5	-	-	

A.2.4 Single Pipes with insulation

Penetration Seal: Pipes fitted with HENSOTHERM® 7 KS Gewebe 50, positioned flush to the soffit and top of the floor.

Construction details:



A.2.4.7 Composite and metal pipes with insulation

Geberit Mepla pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Geberit Mepla	≤16	2.0	1	Armaflex AF/ 13.0-13.5	CS	EI 240 U/C
	>16 ≤40	3.5	1	Armaflex AF/ 13.5-36.5	CS	
	>40 ≤63	4.5	2	Armaflex AF/ 14.0	CS	E 240 U/C EI 120 U/C
	>40 ≤63	4.5	2	Armaflex AF/ 40.5	CS	EI 240 U/C
	≤16	2.0	1	Armaflex NH/ 13.0	CS	
	>16 ≤40	3.5	1	Armaflex NH/ 13.0-25.0	CS	
	>40 ≤63	4.5	2	Armaflex NH/ 13.0-25.0	CS	

Ke Kelit Kelox pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Ke Kelit Kelox	≤16	2.0	1	Armaflex AF/ 13.0-13.5	CS	EI 240 U/C
	>16 ≤40	4.0	1	Armaflex AF/ 13.5	CS	
	>16 ≤40	4.0	1	Armaflex AF/ 13.5-36.5	CS	E 240 U/C EI 180 U/C
	>40 ≤63	6.0	2	Armaflex AF/ 14.0-40.5	CS	EI 240 U/C
	≤16	2.0	1	Armaflex NH/ 13.0-25.0	CS	
	>16 ≤40	4.0	1	Armaflex NH/ 13.0-25.0	CS	
	>40 ≤63	6.0	2	Armaflex NH/ 13.0-25.0	CS	

Uponor MLC pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Uponor MLC	≤14	2.0	1	Armaflex AF/ 11.5-13.5	CS	EI 240 U/C
	>14 ≤40	4.0	1	Armaflex AF/ 13.5-36.5	CS	
	>40 ≤63	6.0	2	Armaflex AF/ 14.0	CS	E 240 U/C EI 180 U/C
	>40 ≤63	6.0	2	Armaflex AF/ 40.5	CS	EI 240 U/C
	≤14	2.0	1	Armaflex NH/ 9.0-19.0	LS 500	EI 180 U/C
	>14 ≤40	4.0	1	Armaflex NH/ 9.0-19.0	LS 500	

Vega Raxofix pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Vega Raxofix	≤16	2.2	1	Armaflex NH/ 9.0-19.0	LS 500	EI 180 U/C
	>16 ≤40	3.5	1	Armaflex NH/ 9.0-19.0	LS 500	

Rehau Rautitan pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Rehau Rautitan	≤16	2.6	1	Armaflex NH/ 9.0-19.0	LS 500	EI 180 U/C
	>16 ≤40	6.0	1	Armaflex NH/ 9.0-19.0	LS 500	

Pipelife Radopress pipes with Armaflex insulation

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Pipelife Radopress	≤16	2.0	1	Armaflex NH/ 9.0-19.0	LS 500	EI 180 U/C
	>16 ≤40	4.0	1	Armaflex NH/ 9.0-19.0	LS 500	

Copper pipes with synthetic rubber insulation classification D-s3, d0 or better

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Copper	≤15	1.0-7.5	1	Armaflex AF/ 11.5	CS	EI 240 C/U
	>15 ≤42	1.2-14.2	2	Armaflex AF/ 13.5	CS	
	>15 ≤42	1.2-14.2	2	Armaflex AF/ 13.5-36.5	CS	E 240 C/U EI 120 C/U
	>42 ≤54	1.5-14.2	2	Armaflex AF/ 13.5	CS	EI 240 C/U
	>42 ≤54	1.5-14.2	2	Armaflex AF/ 13.5-38.0	CS	E 240 C/U EI 120 C/U
Copper	>54 ≤89	2.0-14.2	2	Armaflex AF/ 13.5-38.0 CS + Klimarock 20 LI 250mm (top of floor)	CS+LI	EI 90 C/U
	54	1.5-14.2	2	Armaflex AF/ 13.5 CS + Klimarock 20 LI 250mm (top of floor)	CS+LI	EI 180 C/U
	>54 ≤89	3.2-14.2	2	Armaflex AF/ 13.5-38.0 CS + Klimarock 20 LI 250mm (top of floor)	CS+LI	EI 90 C/U
	89	3.2-14.2	2	Armaflex AF/ 38.0 CS + Klimarock 20 LI 250mm (top of floor)	CS+LI	EI 120 C/U
Copper	≤15	1.0-7.5	1	Synthetic rubber / 10	CS	EI 120 C/U
	>15 ≤42	1.2-14.2	2	Synthetic rubber / 13-25	CS	
	>54 ≤89	2.0-14.2	2	Synthetic rubber / 19-50 CS + Klimarock 20 LI 250mm	CS+LI	EI 120 C/U

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Copper	≤15	1.0-7.5	1	Armaflex NH/ 13.0	CS	EI 240 C/U
	>15 ≤42	1.2-14.2	2	Armaflex NH/ 13.0	CS	E 240 C/U EI 180 C/U
	>15 ≤42	1.2-14.2	2	Armaflex NH/ 13.0-25.0	CS	EI 180 C/U
	>42 ≤54	1.5-14.2	2	Armaflex NH/ 13.0-25.0	CS	E 240 C/U EI 180 C/U
Copper	54	1.5-14.2	2	Armaflex NH/ 13-25 CS + Klimarock 20 LI 250 mm	CS+LI	EI 180 C/U
	≥54 ≤89	2.0-14.2	2	Armaflex NH/ 19-32 CS + Klimarock 20 LI 250 mm	CS+LI	EI 120 C/U

Steel pipes with synthetic rubber insulation classification D-s3, d0 or better

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Steel	>15-88.9	3.2-14.2	2	Armaflex AF/ 18.0-41.5	CS	E 240 C/U EI 90 C/U
Steel	>54 ≤88.9	2.0-14.2	2	Armaflex AF/ 13.5-38.0 CS + Klimarock 20 LI 250mm (top of floor)	CS+LI	EI 90 C/U
	54	1.5-14.2	2	Armaflex AF/ 13.5 CS + Klimarock 20 LI 250mm (top of floor)	CS+LI	EI 180 C/U
	≥54 ≤88.9	3.2-14.2	2	Armaflex AF/ 13.5-38.0 CS + Klimarock 20 LI 250mm (top of floor)	CS+LI	EI 90 C/U
	>88.9≤219.1	6.3-14.2	2	Armaflex AF/ 19.0-50.0 CS + Klimarock 20 LI 250 mm (top of floor)	CS+LI	EI 90 C/U
	219.1	6.3-14.2	2	Armaflex AF/ 50.0 CS +Klimarock 20 LI 250 mm (top of floor)	CS+LI	EI 120 C/U
Steel	≥15 ≤54	1.5-14.2	2	Armaflex NH/ 19-25 CS	CS	E 240 C/U EI 180 C/U
	>15-88.9	3.2-14.2	2	Armaflex NH/ 19.0-25.0	CS	E 240 C/U EI 120 C/U
	≥15 ≤88.9	3.2-14.2	2	Armaflex NH/ 19	CS	EI 180 C/U
	88.9	3.2-14.2	2	Armaflex NH/ 19	CS	EI 240 C/U

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Steel	≤15	1.0-7.5	1	Synthetic rubber/ 10	CS	EI 120 C/U
	>15≤42	1.2-14.2	2	Synthetic rubber/ 13-25	CS	
	≥54 ≤88.9	2.0-14.2	2	Synthetic rubber/ 19-50 CS + Klimarock 20 LI 250 mm	CS+LI	EI 120 C/U
	≥88.9 ≤219.1	6.3-14.2	2	Synthetic rubber/ 19 CS + Klimarock 20 LI 250mm	CS+LI	EI 120 C/U
	≥88.9 ≤219.1	6.3-14.2	2	Synthetic rubber/ 19-50 CS + Klimarock 20 LI 250mm	CS+LI	EI 90 C/U

Copper pipes with PIR insulation

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness Mm	Type	Classification
Copper	≤15	1.0-14.2	2	PIR / 30	LS 500	EI 180 C/U
	>15 ≤54	1.5-14.2	2	PIR / 30-50	LS 500	EI 30 C/U

Steel pipes with PIR insulation

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Steel	≤15	1.0-14.2	2	PIR / 30	LS 500	EI 180 C/U
	>15 ≤54	1.5-14.2	2	PIR / 30-50	LS 500	EI 30 C/U
	>54 ≤ 88.9	3.2-14.2	2	PIR / 30-80	LS 500	EI 30 C/U
	≥88.9 ≤139.7	4.0-14.2	2	PIR / 30-80	LS 500	EI 60 C/U

Climate split pipes with cable NYM-J-3x1.5mm²

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
2 x copper pipes plus cable	10+16	2.0	1	PE / 6.0	CS	EI 120 C/U

Isolante K-Flex Twin solar pipe

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Isolante K-Flex Twin Solar Pipe	≥16 ≤25	0.8	2	Isolante / 20.0	CS	EI 180 C/U

Armaflex Duo solar pipe

Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Armaflex Duo solar pipe	20-25	0.8	2	Armaflex /14.0	CS	EI 180 C/U

Würth Flexen Twin solar pipe

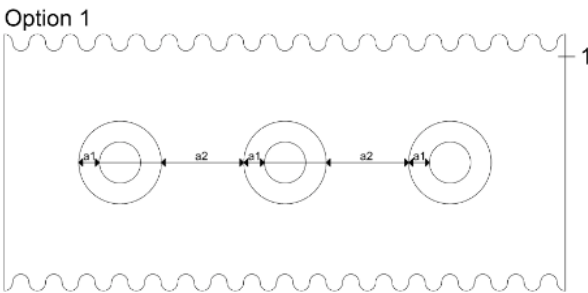
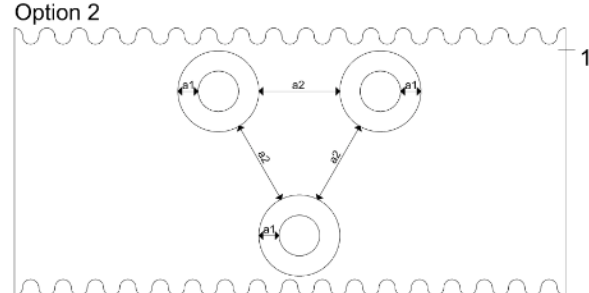
Pipes	Pipe diameter mm	Pipe wall thickness mm	Layers of HENSOTHERM® 7 KS Gewebe 50	Insulation/ thickness mm	Type	Classification
Würth Flexen Twin solar pipe	≥16 ≤25	0.8	2	Vlies / 20.0	CS	EI 120 C/U
Würth Flexen Twin solar pipe	16	0.8	2	Vlies / 20.0	CS	EI 180 C/U

A.3 Flexible and Rigid wall constructions with wall thickness of minimum 100 mm (HENSOTHERM® 7 KS viskos)

A.3.1 Service Types

Services	Types
Plastic pipes with HENSOTHERM® 7 KS viskos	<ul style="list-style-type: none"> • PE pipes in accordance with EN 1519-1, EN 12666-1, EN12201-2 • PVC-U pipes in accordance with EN 1329-1, EN 1453-1 and EN 1452-1 • PP pipes in accordance with EN 1852-1: 2009 • PP pipes in accordance with EN 1451-1
Composite pipes with Armaflex insulation	<ul style="list-style-type: none"> • KE KELIT KELOX • Geberit Mepla • Uponor MLC • Viega Sanfix Fosta
Metal pipes with pipe insulation	<ul style="list-style-type: none"> • Copper • Mild & stainless steel • Cast Iron
Multilayer pipes	<ul style="list-style-type: none"> • Raupiano Plus • Polokal 3S • Polokal NG • Silent dB20 • Silent PP

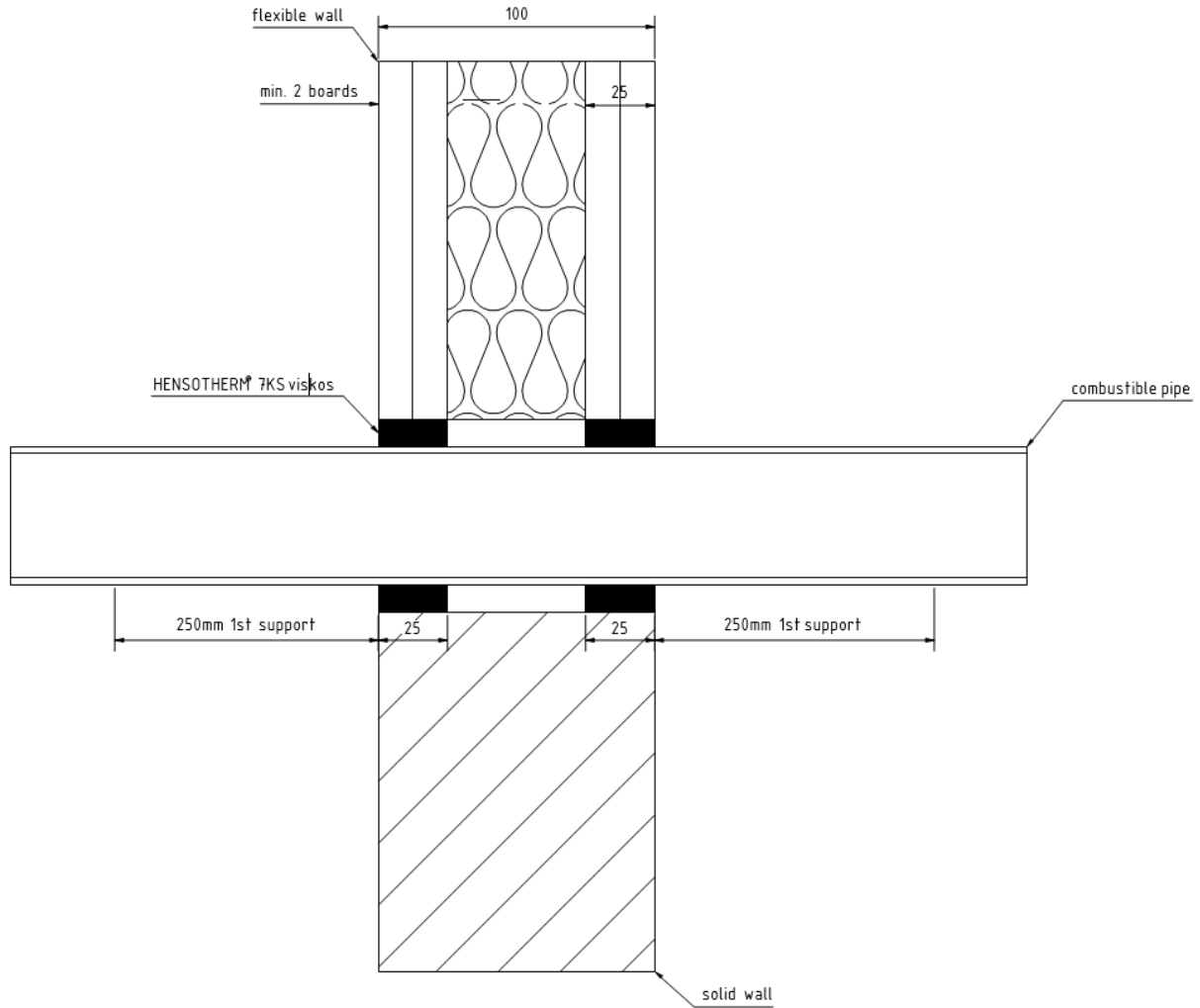
A.3.2 Permitted Distances

<p>a1: annular space = nominally 10-15 mm as defined in the tables a2: Separation between seals ≥ 200 mm</p> <p>Distance 1st support service ≤ 300 mm</p>	
<p>Option 1</p>  <p>1 Supporting construction a1 Pipe/Edge of seal separation (annular space) a2 Separation between penetration seals</p>	<p>Option 2</p>  <p>1 Supporting construction a1 Pipe/Edge of seal separation (annular space) a2 Separation between penetration seals</p>

A.3.3 Single Pipes without insulation

Penetration Seal: Combustible and multilayer pipes sealed with HENSOTHERM® 7 KS viskos, 25 mm deep and positioned flush to both faces of the wall with full depth backing of stone wool min. 30 kg/m³ (except where specified with an *). Min. Separation between seals (a2) = 200 mm, annular space (a1) nominally 10-15 mm as defined in tables.

Construction details:



A.3.3.1 Plastic and multilayer pipes without insulation

PVC-U pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
PVC-U	20	1.5-2.3	10	EI 90 U/U
	50	1.8	10	
	50	1.8-5.6	10	EI 60 U/U
	50	1.8-5.6	10*	EI 120 U/U
	110	2.2-8.1	15	EI 60 U/C

* No stone wool backing

PE 100 pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
PE 100	20	2.0	10	EI 90 U/U
	50	2.9-4.6	10	EI 60 U/U
	50	2.9-4.6	10*	EI 120 U/U
	110	3.4-6.6	10	EI 60 U/U

* No stone wool backing

PP HT pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
PP HT	20	1.9-2.8	10	EI 90 U/U
	50	2.9-4.6	10	EI 90 U/U
	50	2.9-4.6	10*	EI 120 U/U

* No stone wool backing

Polokal NG pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
Polokal NG	50	2.0	10*	EI 120 U/U

* No stone wool backing

Polokal XS pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
Polokal XS	50	2.0	10*	EI 120 U/U

* No stone wool backing

Geberit Silent Pro pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
Geberit Silent Pro	50	3.0	10*	EI 120 U/U

* No stone wool backing

Raupiano Plus pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
Raupiano Plus	50	1.8	10*	EI 120 U/U

* No stone wool backing

Pipelife Master 3 pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
Pipelife Master 3	50	1.8	10*	EI 120 U/U

* No stone wool backing

Wavin SiTech+ pipes

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
Wavin SiTech+	50	1.8	10*	EI 120 U/U

* No stone wool backing

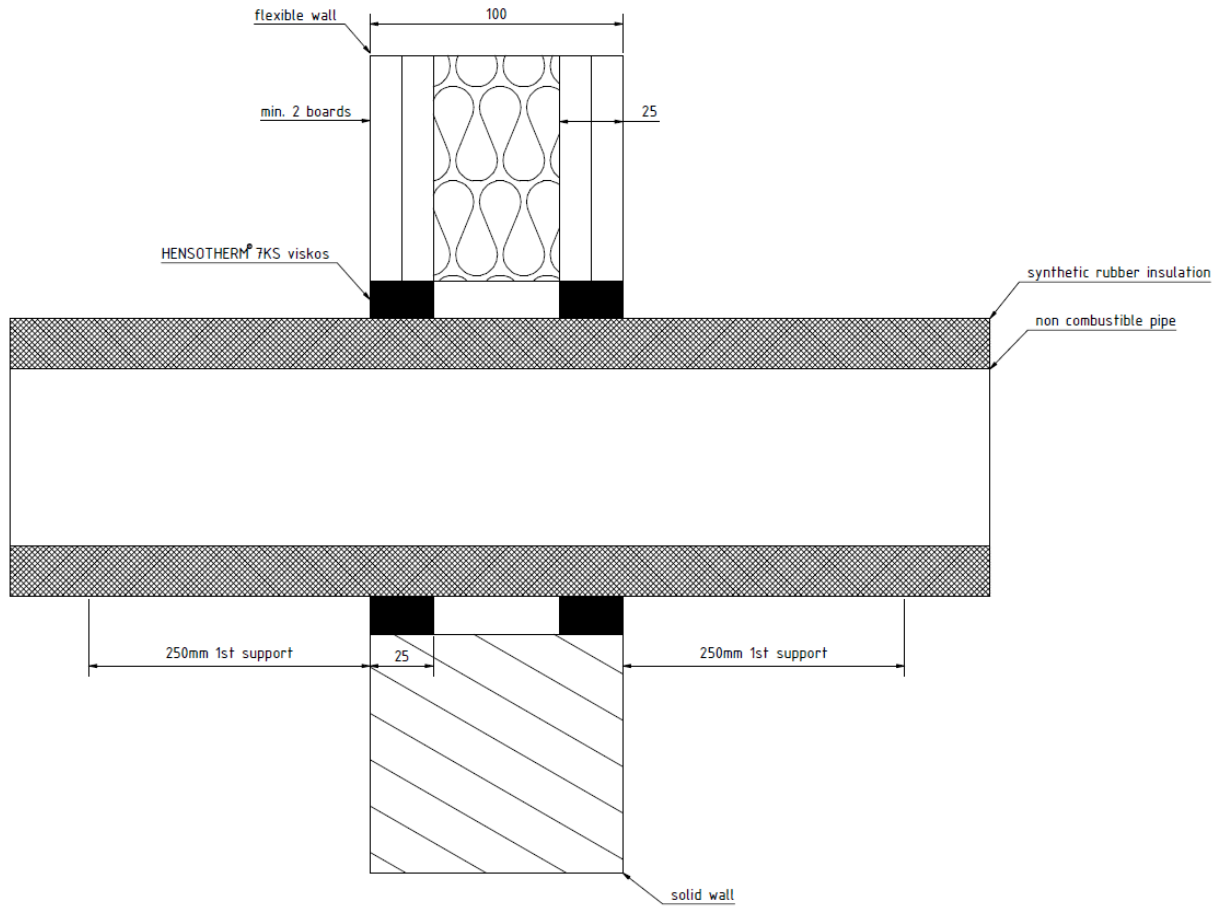
Geberit Mepla

Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
Geberit Mepla	16	2.0	10	EI 60 U/C
	40	3.5	10	EI 60 U/C
	63	4.5	15	EI 30 U/C

A.3.4 Copper and Steel Single Pipes with insulation

Penetration Seal: Insulated metallic pipes sealed with HENSOTHERM® 7 KS viskos, 25 mm deep and positioned flush to both faces of the wall with full depth backing of stone wool min. 30 kg/m³ (except where specified with an *). Min. Separation between seals (a₂) = 200 mm, annular space (a₁) nominally 5-10 mm as defined in tables.

Construction details:



Copper pipes with synthetic rubber insulation classification D-s3, d0 or better

Pipes	Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Insulation/ thickness mm	Type	Classification
Copper	≤15	1.0-7.5	5	Synthetic rubber / 10	CS	EI 90 C/U
	>15 ≤42	1.2-14.2	10	Synthetic rubber / 13	CS	
	>15 ≤42	1.2-14.2	10	Synthetic rubber / 13-25	CS	EI 60 C/U
	≤15	1.0-7.5	10*	Synthetic rubber / 10	CS	EI 120 C/U
	>15 ≤42	1.5-14.2	10*	Synthetic rubber / 13	CS	
	>15 ≤42	1.5-14.2	10*	Synthetic rubber / 25	CS	EI 30 C/U

* No stone wool backing

Steel pipes with synthetic rubber insulation classification D-s3, d0 or better

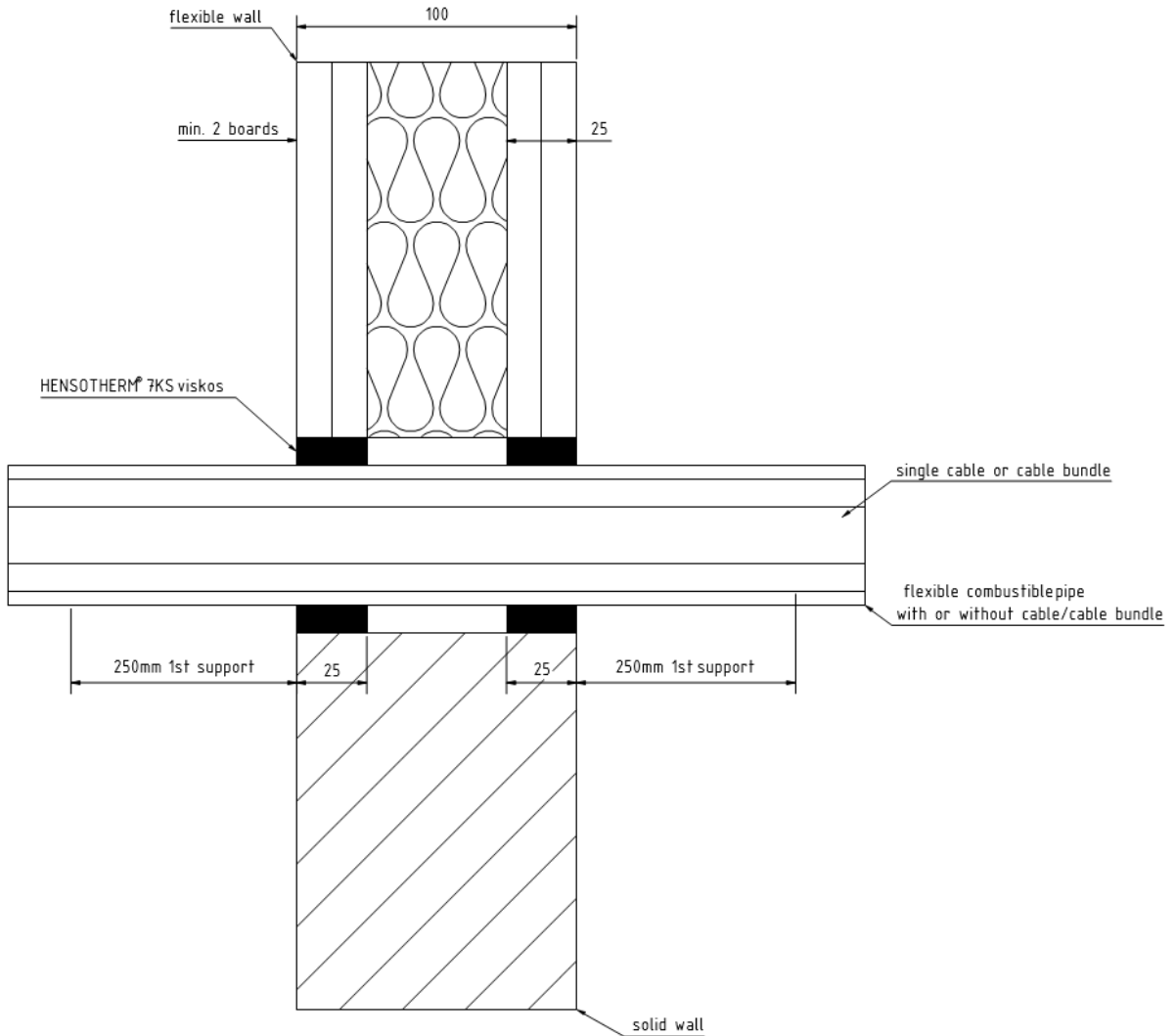
Pipes	Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Insulation/ thickness mm	Type	Classification
Steel	≤15	1.0-7.5	5	Synthetic rubber / 10	CS	EI 90 C/U
	>15 ≤42	1.2-14.2	10	Synthetic rubber / 13	CS	
	>15 ≤42	1.2-14.2	10	Synthetic rubber / 13-25	CS	EI 60 C/U
	≤15	1.0-7.5	10*	Synthetic rubber / 10	CS	EI 120 C/U
	>15 ≤42	1.5-14.2	10*	Synthetic rubber / 13	CS	
	>15 ≤42	1.5-14.2	10*	Synthetic rubber / 25	CS	EI 30 C/U
	>42 ≤88.9	3.2-14.2	10	Synthetic rubber / 19	CS	EI 60 C/U
	≥88.9 ≤139.7	3.2-14.2	10	Synthetic rubber / 19-50	CS	EI 30 C/U

* No stone wool backing

A.3.5 Combustible conduits and cables

Penetration Seal: Combustible conduits and cables sealed with HENSOTHERM® 7 KS viskos, 25 mm deep and positioned flush to both faces of the wall with full depth backing of stone wool min. 30 kg/m³. Min. Separation between seals (a2) = 200 mm, annular space (a1) nominally 0-36 mm, as defined in the tables and in 68 x 68 mm opening.

Construction details:



A.3.4.1 Flexible cable conduit including cables and single cables

Pipes	Opening size mm	Cables	Annular space range mm	Classification
Flexible cable conduit 50 mm	68 x 68	Empty	0-36	EI 120 U/C
		Electrical and telecoms cables up to 21 mm diameter in a bundle		EI 90 U/C
-	Defined by cable diameter and annular space	Single B cable	10	EI 60
		Single C1 cable		EI 90
		Single C2 cable		EI 120
		Single C3 cable		
		Single D1 cable		
		Single D2 cable		EI 90
		Single D3 cable		
		Single E cable		

Type B cable = 1 x 95mm² core HD6.3.3 electrical cable with PVC insulation, PVC sheath and 18-21 mm diameter

Type C1 cable = 4 x 95 mm² core HD604.5 electrical cable with XLPE insulation, EVA sheath and 42 mm diameter

Type C2 cable = 4 x 95 mm² core HD22.4 electrical cable with EPR insulation, PO sheath and 48.4-61 mm diameter

Type C3 cable = 4 x 95 mm² core HD604.5 electrical cable with XLPE insulation, EVA sheath and 42-45.5 mm diameter

Type D1 cable = 4 x 185 mm² core HD603.3 electrical cable with PVC insulation, PVC sheath and 52 mm diameter

Type D2 cable = 4 x 185 mm² core HD22.4 electrical cable with EPR insulation, PO sheath and 64-80 mm diameter

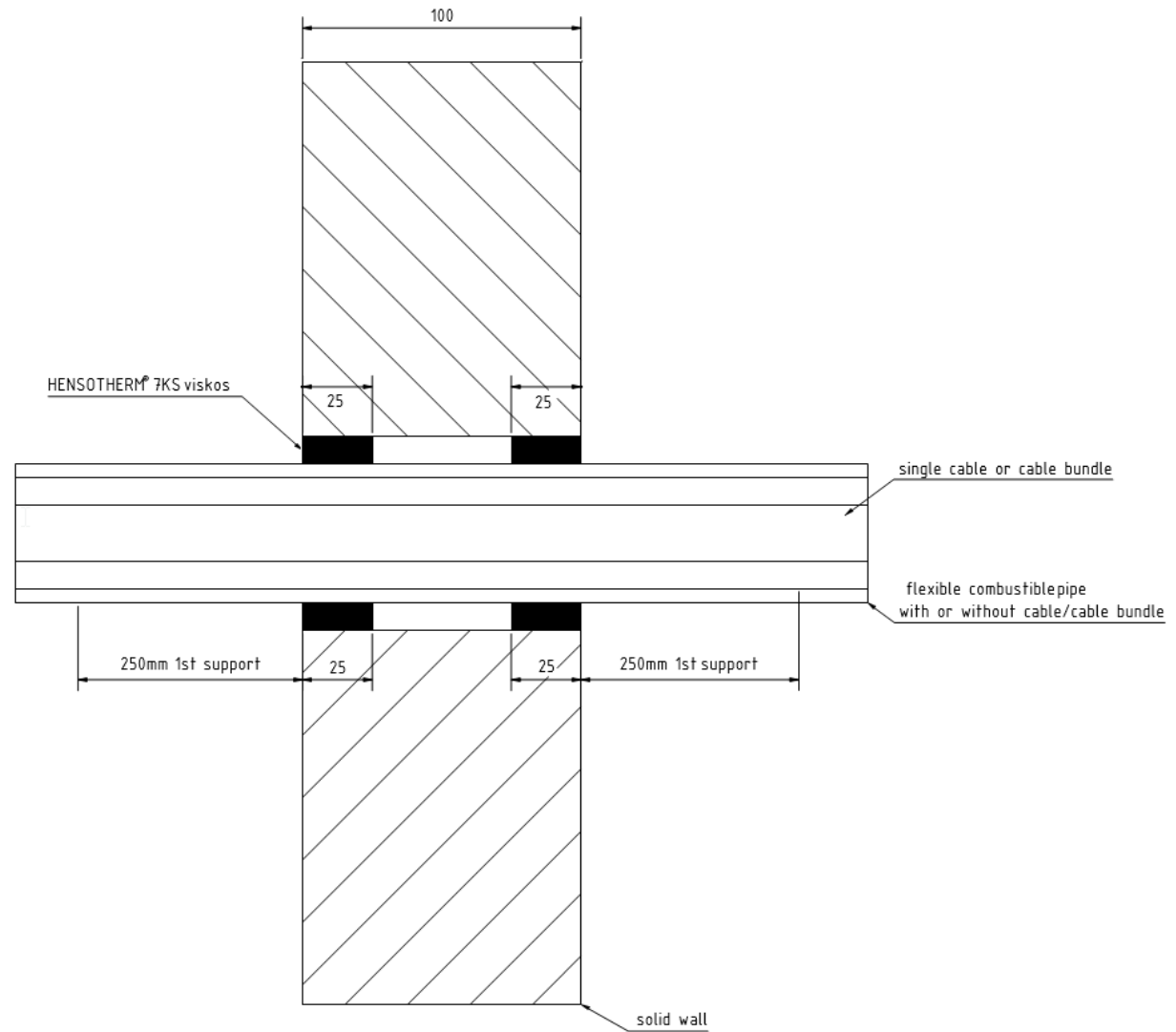
Type D3 cable = 4 x 185 mm² core HD604.5 electrical cable with XLPE insulation, EVA sheath and 13 mm diameter

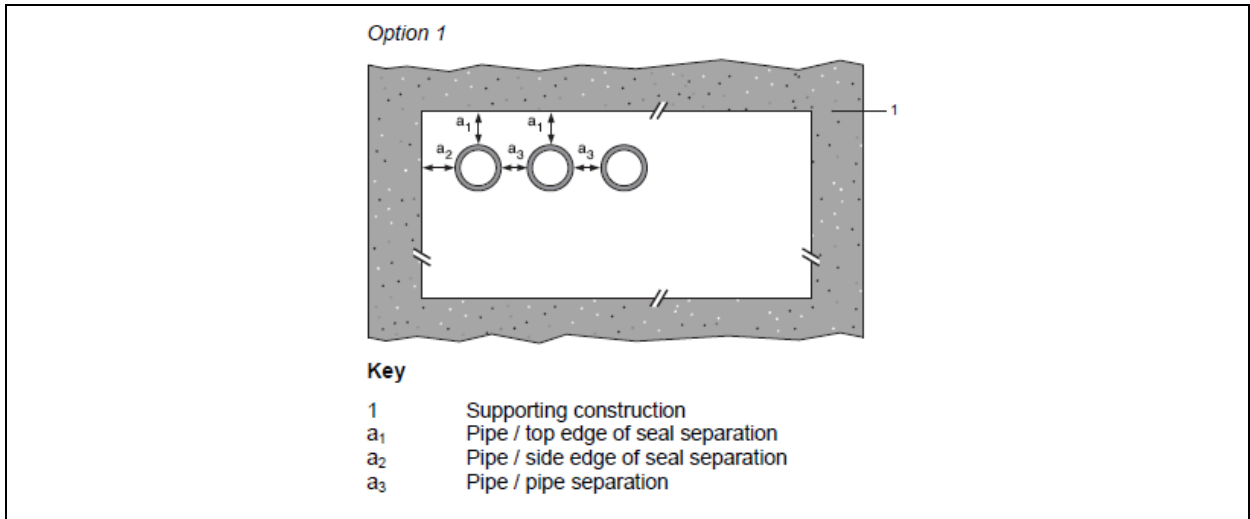
Type E cable = 1 x 185 mm² core HD603.3 electrical cable with PVC insulation, PVC sheath and 23-27 mm diameter

A.4 Rigid wall constructions with wall thickness of minimum 100 mm (HENSOTHERM® 7 KS viskos)

Penetration Seal: Combustible conduits and cables sealed with HENSOTHERM® 7 KS viskos, 25 mm deep and positioned flush to both faces of the wall without loose stone wool. Min. Separation between seals (a2) = 200 mm, annular space (a1) nominally 0-36 mm, as defined in the tables and in 68 x 68 mm opening.

Construction details:





A.4.1.1 Flexible cable conduit including cables and single cables

Pipes	Opening size mm	Cables	Annular space range mm	Classification		
Flexible cable conduit 25 mm	35 x 135	Empty	0-10	EI 240 U/C		
		Single electrical and telecoms cables up to 21 mm diameter		EI 180 U/C		
Flexible cable conduit 40 mm	50 x 210	Empty		0-10	EI 180 U/C	
		Electrical and telecoms cables up to 21 mm diameter in bundles				
Flexible cable conduit 20 mm	30 x 135	Single A1 Cable			0-10	EI 240 U/C
		Single A2 Cable				
		Single A3 Cable				

Type A1 cable = 5 x 1.5 mm² core HD603.3 electrical cable with PVC insulation, PVC sheath and 14 mm diameter

Type A2 cable = 5 x 1.5 mm² core HD22.4 electrical cable with EPR insulation, PO sheath and 11.2-14.4 mm diameter

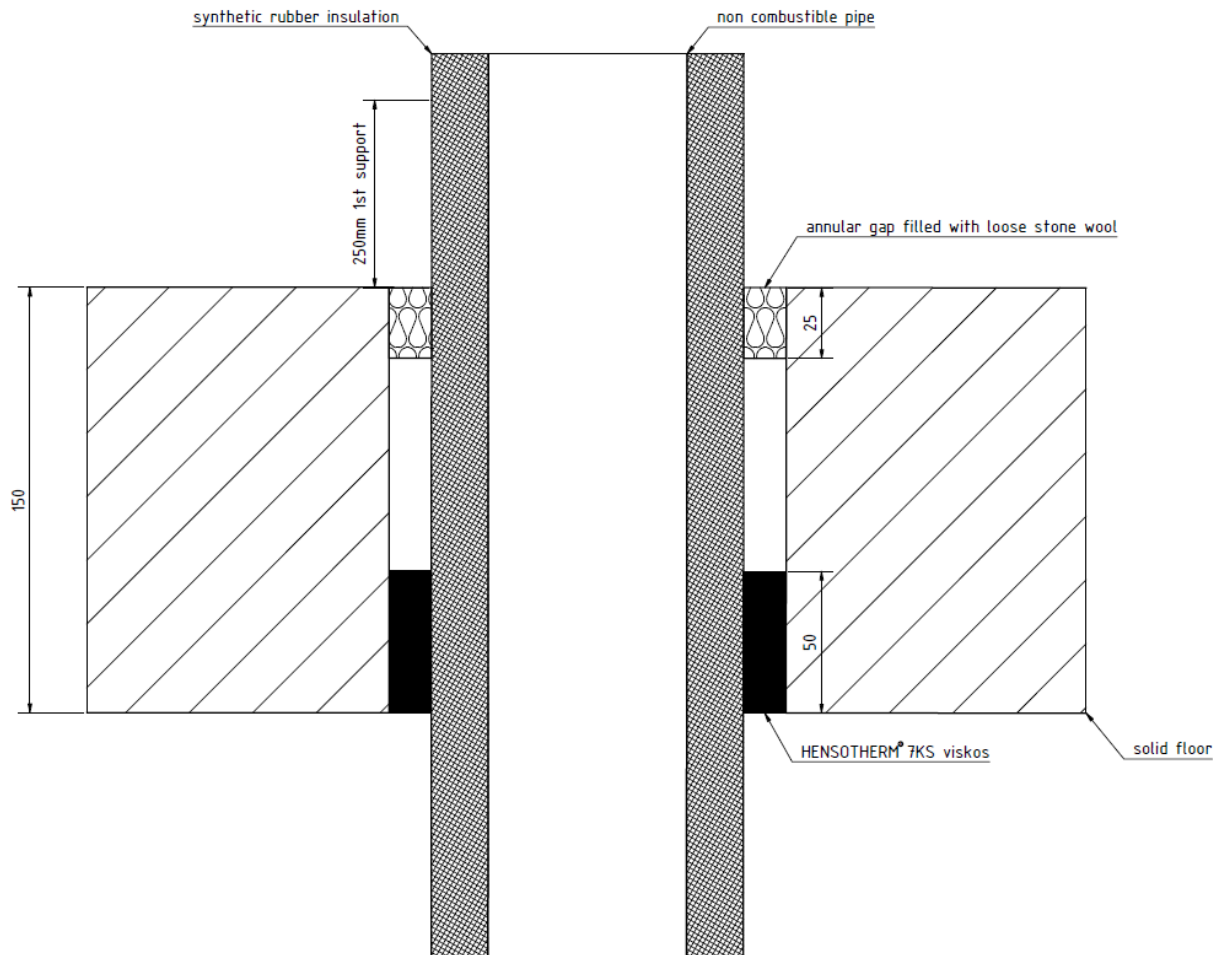
Type A3 cable = 5 x 1.5 mm² core HD604.5 electrical cable with XLPE insulation, EVA sheath and 13 mm diameter

A.5 Rigid floor constructions with wall thickness of minimum 150 mm (HENSOTHERM® 7 KS viskos)

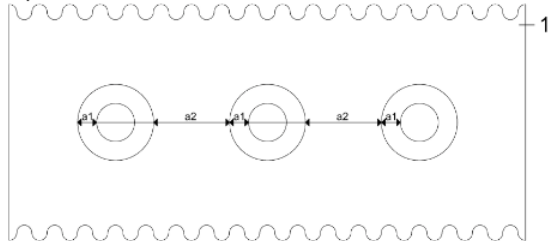
A.5.1 Penetration seals for pipes with and without insulation, in concrete floors

Penetration Seal: Pipes sealed with HENSOTHERM® 7 KS viskos, positioned flush to the soffit with a depth of 50mm (min.). The 25 mm depth from the top of the floor is packed with loose stone wool insulation 30 kg/m³ Min. Separation between seals (a2) = 200 mm, annular space (a1) nominally 1-20 mm as defined in the tables

Construction details:

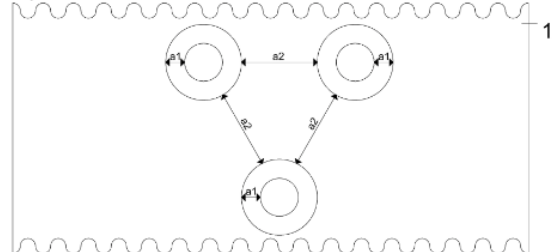


Option 1



1 Supporting construction
a1 Pipe/Edge of seal separation (annular space)
a2 Separation between penetration seals

Option 2



1 Supporting construction
a1 Pipe/Edge of seal separation (annular space)
a2 Separation between penetration seals

Plastic and multilayer pipes

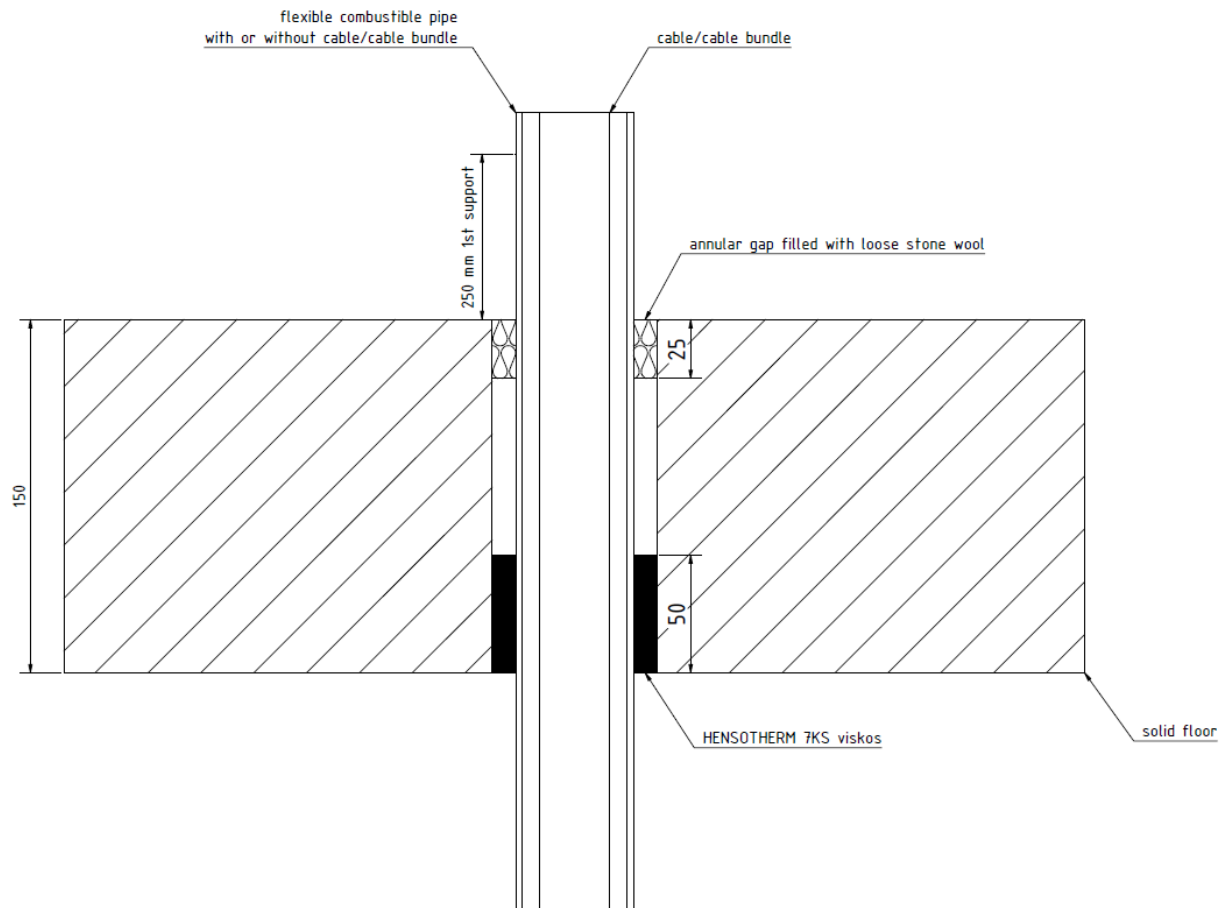
Pipes	Maximum Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Classification
PVC-U	50	1.8-5.6	10	EI 240 U/U
PE 100		2.9-4.6		
PP-HT		2.9-4.6		
Silent PP		1.8		
Polokal NG		2.0		
Polokal XS		2.0		
Silent Pro		3.0		
Raupiano Plus		1.8		
Pipelife Master 3		1.8		
Wavin SiTech+		1.8		

Copper pipes with synthetic rubber insulation classification D-s3, d0 or better

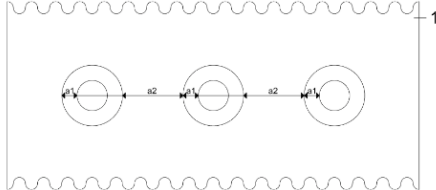
Pipes	Pipe diameter mm	Pipe wall thickness mm	Width of HENSOTHERM® 7 KS viskos/Annular space	Insulation/ thickness mm	Type	Classification
Copper	≤15	1.0-7.5	10	Synthetic rubber / 10	CS	EI 90 C/U
	42	1.2-14.2		Synthetic rubber / 13		EI 120 C/U
	15 ≤42	1.2-14.2		Synthetic rubber / 13		EI 90 C/U
	15 ≤42	1.2-14.2		Synthetic rubber / 13-25		EI 60 C/U

Penetration Seal: Pipes sealed with HENSOTHERM® 7 KS viskos, positioned flush to the soffit with a depth of 50mm (min.). The 25 mm depth from the top of the floor is packed with loose stone wool insulation 30 kg/m³ Min. Separation between seals (a2) = 200 mm, annular space (a1) nominally 1-20 mm as defined in the tables

Construction details:

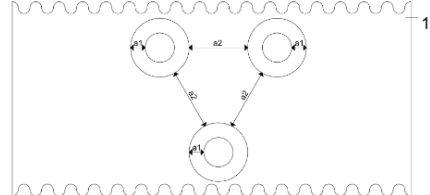


Option 1



1 Supporting construction
a1 Pipe/Edge of seal separation (annular space)
a2 Separation between penetration seals

Option 2



1 Supporting construction
a1 Pipe/Edge of seal separation (annular space)
a2 Separation between penetration seals

Flexible cable conduit including cables

Pipes	Opening size mm	Cables	Annular space range mm	Classification
Flexible cable conduit 50 mm	70 \emptyset	Empty	1-20	EI 240 U/C
		Electrical and telecoms cables up to 21 mm diameter in bundles		EI 180 U/C
-	Defined by annular space and cable diameter	Electrical and telecoms cables up to 21 mm diameter in bundles up to 50 mm \emptyset	1-20	EI 120
		Single electrical and telecoms cables up to 50 mm diameter	10	EI 90
		Single electrical and telecoms cables up to 80 mm diameter	10	EI 60